# Part 13

# Peruvian standard gauge steam locomotive lists

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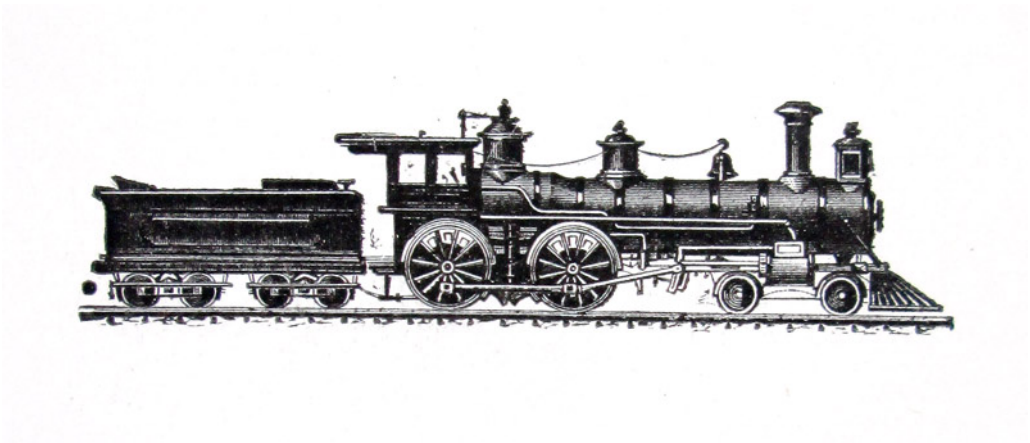
**This file can be found, along with the five Chilean parts in the series and files for other South American countries, at http://www.railwaysofthefarsouth.co.uk/05x03chileansteamlocos.html**



These lists, though benefitting from modern technology in both research and presentation, build upon those produced by many other investigators, from Wilfred Beckerlegge and Paul Dewhurst in the 1920s to John Kirchner and Allen Copeland eighty or ninety years later. As such, their content will, I hope, be helpful for researchers and authors in the future. Feel free to use this material, though an acknowledgement would be appreciated.

# General introduction

These lists grew from the publication of the book *Railways at the End of the World* (The Araucaria Press, Casterton, Cumbria, UK ISBN 978-0-9928622-0-6), back in 2014. During the research undertaken when gathering information for that volume, it had sometimes been frustrating when locomotives in southern Chile could not be easily identified. Once the book had been published there was more time available, and it gradually became obvious that a list of the engines of the Chilean state railways (*EFE*) would have to cover the whole country to be of any use, and thus it expanded all the way up to Arica. Then, during the Covid pandemic, the first moves were made to extend these lists to some of the other smaller South American countries.

The foundations were built upon earlier lists created by others such as Allen Copeland, John Kirchner, and Reimar Holzinger. Additional information has been added bit by bit to their work. Photographs too have been inserted, though these have been kept small, partly to reduce the file sizes and partly to minimise the risk that copyright owners will object. The main purpose of the images is in any case to enable locos spotted in other photographs elsewhere to be identified. When high-resolution versions are likely to be available from museums and archives, this has been flagged up, to encourage interested readers to purchase what they need from those who care for historic drawings or photographs.

As news of this work has spread, assistance has come from other researchers, including in particular Chris West, Claus Gaertner and Martin Murray. Grateful thanks is due to their selfless willingness to share information and images.

Whilst many of the written sources consulted have been in Spanish, these lists are currently solely available in English. This partly results from my own lack of linguistic confidence, but is also a reflection of the fact that keeping a fast-changing document synchronised in two different tongues is very time-consuming. Nevertheless, quotes from historic documents have usually been left in Spanish and it is to be hoped that in the future a Spanish version of the whole work can be created.

Close examination of these pages is likely to remain strictly a minority interest, whilst even fewer are likely to print out all 5200+ pages! Thus the files have been designed to be read on screen, with hyper-links from the contents page to aid in finding each section. The density of information is likely to discourage browsing on a mobile phone, but hopefullyy the layout is suitablefor display on tablets as well as larger computers.

It will be obvious that this is a work still in progress, with updates being uploaded to the web roughly on a quarterly basis at present. Comments, additional items of information or images, and suggestions to improve the layout, would all be very much appreciated, and the author can be contacted at martincoombs11@gmail.com

# This Peruvian list

There is a greater variety of initial sources for Peruvian locomotive information than for some of the other South American countries. The lists in this file were first compiled using Costa y Laurent's 1908 volume [1], the 1927 US Dept. of Commerce report [2], modern lists by Reimar Holzinger [3] and Allen Copeland [4], and Bob Whetham's two volumes on *The Railways of Peru* [5] which also contain lists by Copeland. Of these, Allen Copeland's lists deserve particular acclaim for the enormous amount of hard work that must have gone into their creation. Thanks also to Claus Gaertner for flagging up several mistakes in earlier versions of this file.

# Introducción general

Estas listas tienen su origen en la publicación del libro *Railways at the End of the World* (The Araucaria Press, 1 Fellview, Casterton, Cumbria, LA6 2SA, Reino Unido. ISBN 978-0-9928622-0-6), en 2014. Durante la investigación realizada para recopilar información para dicho volumen, a veces resultaba frustrante que las locomotoras del sur de Chile no se pudieran identificar fácilmente.

Tras la publicación del libro, se dispuso de más tiempo, y poco a poco se hizo evidente que una lista de las locomotoras de los Ferrocarriles Estatales de Chile (EFE) tendría que abarcar todo el país para ser útil, por lo que se amplió hasta Arica. Posteriormente, durante la pandemia de COVID-19, se dieron los primeros pasos para extender estas listas a algunos de los otros países sudamericanos más pequeños.

Las bases se construyeron sobre listas anteriores creadas por otros autores, como Allen Copeland, John Kirchner y Reimar Holzinger. Poco a poco, se ha ido añadiendo información adicional a su trabajo. También se han insertado fotografías, aunque de tamaño reducido, en parte para reducir el tamaño de los archivos y en parte para minimizar el riesgo de objeción de los titulares de los derechos de autor. El objetivo principal de las imágenes es, en cualquier caso, permitir la identificación de las locomotoras que aparecen en otras fotografías en otros lugares. Se ha informado sobre la disponibilidad de versiones en alta resolución en museos y archivos para animar a los lectores interesados a adquirir lo que necesiten de quienes se interesan por los dibujos o fotografías históricas.

A medida que se ha difundido la noticia de este trabajo, otros investigadores, como Chris West, Claus Gaertner y Martin Murray, han colaborado. Les agradezco enormemente su desinteresada disposición para compartir información e imágenes.

Si bien muchas de las fuentes consultadas están en español, estas listas actualmente solo están disponibles en inglés. Esto se debe en parte a mi falta de confianza en el idioma, pero también a que mantener sincronizado un documento en constante evolución en dos idiomas diferentes requiere mucho tiempo. No obstante, las citas de documentos históricos se han mantenido generalmente en español y es de esperar que en el futuro se pueda crear una versión en español de toda la obra.

Es probable que el análisis minucioso de estas páginas siga siendo un interés minoritario, y es probable que aún menos impriman las más de 5200 páginas. Por lo tanto, los archivos se han diseñado para su lectura en pantalla, con hipervínculos desde la página de contenido para facilitar la búsqueda de cada sección. La densidad de información probablemente desaconseje la navegación en un teléfono móvil, pero esperamos que el diseño sea adecuado para su visualización tanto en tabletas como en ordenadores de mayor tamaño.

Es evidente que este es un trabajo en curso, con actualizaciones que se suben a la web aproximadamente trimestralmente. Se agradecerán comentarios, información o imágenes adicionales, y sugerencias para mejorar el diseño. Se puede contactar con el autor en martincoombs11@gmail.com

# Esta lista peruviana

Existe una mayor variedad de fuentes iniciales de información sobre locomotoras peruanas que para algunos de los otros países de América del Sur. Las listas de este archivo se compilaron primero utilizando el volumen de 1908 de Costa y Laurent [1], el informe del Departamento de Comercio de los Estados Unidos de 1927 [2], listas modernas de Reimar Holzinger [3] y Allen Copeland [4] y los dos volúmenes de Bob Whetham. sobre *The Railways of Peru* [5] que también contiene listas de Copeland.  De estos, las listas de Allen Copeland merecen un reconocimiento especial por la enorme cantidad de trabajo arduo que debe haber invertido en su creación.  Gracias también a Claus Gaertner por señalar varios errores en versiones anteriores de este archivo.

# List of contents

Red text = hyper-links to appropriate pages.

For a full index of Peruvian steam engines organised by builders' names and numbers please see the tail end of the Peruvian narrow gauge steam locos file in this series.

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# Other parts of this work

This is one of a number of PDF files covering the steam locomotives of Chile and other South American countries across a wide variety of gauges. The other files can be accessed by clicking on the red hyperlinks listed below.



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# Notes and sources

The structure of this document is based upon the earlier ones for Chilean locos. The original starting point was the locomotive list created by Reimar Holzinger,

## Sources

[1] *Reseña historica de los ferrocarriles del Perú*, Federico Costa y Laurent, L. Fabbri, Lima, 1908. https://babel.hathitrust.org/cgi/pt?id=hvd.32044024286486&view=1up&seq=13

[2] *Railways of South America part II*. US Bureau of foreign & Domestic Commerce, Govt. Printing Office, Washington DC, 1926.

[3] Peru lists by Reimar Holzinger, probably in SLS library file L8655.

[4] Peru lists by Allen Copeland, 2012.

[5] *Railways of Peru volumes 1 and 2*, Robert D. Whetham, Trackside Publications, Skipton, Yorkshire, UK, 2007-8.

[6] *Intra-South American trade in used steam locomotives and its raisons d'etre*, Ian Thomson Newman, in *Locomotives International* issue 116, 7, 8 or 9?, 2019.

[7] *Some notes on surviving steam locomotives of the FC Central del Perú*, Ian Thomson, *Locomotives International* issue 38, May-June 1997.

[8] *The World of South American Steam*, Ken Mills and Roy Christian. 1974. Privately published. pp15-25.

[9] The blog of Sr. Elio Galessio at https://trenesdelperu.blogspot.com/ has a vast range of interesting snippets about Peruvian railways. The blog was compiled between 2009 and 2016.

[10] *Anales de la Obras Públicas del Perú 1887*, Públicación Oficial, Lima. https://babel.hathitrust.org/cgi/pt?id=uva.x002212217&view=1up&seq=569

[11] *Anales de la Obras Públicas del Perú 1886*, Públicación Oficial, Lima. Absolutely essential for anyone studying the history of Peru's railways in any detail. Each annual volume contains several hundred pages, in the earlier years usually broken into three sections on administration, technical and statistics. The admin. section mostly covers financial matters, the technical section can be of interest, whilst the statistical tables show which locos were in use but unfortunately from 1902 onward were on foldout pages which have not been scanned. Look first at the index, usually in the back but later moving to the front, to find the pages of each section relevant to railways. In general there is more of interest in the earlier volumes, as is common in such government documents relating to railways. References here will usually be in the form [11, year, pages] eg. [11, 1894, p345 ]. Links to the annual volumes via the Hathi Trust website are as follows, but note that you may need to use a VPN to convince the server that you are resident in the USA in order to gain access to some of the volumes.

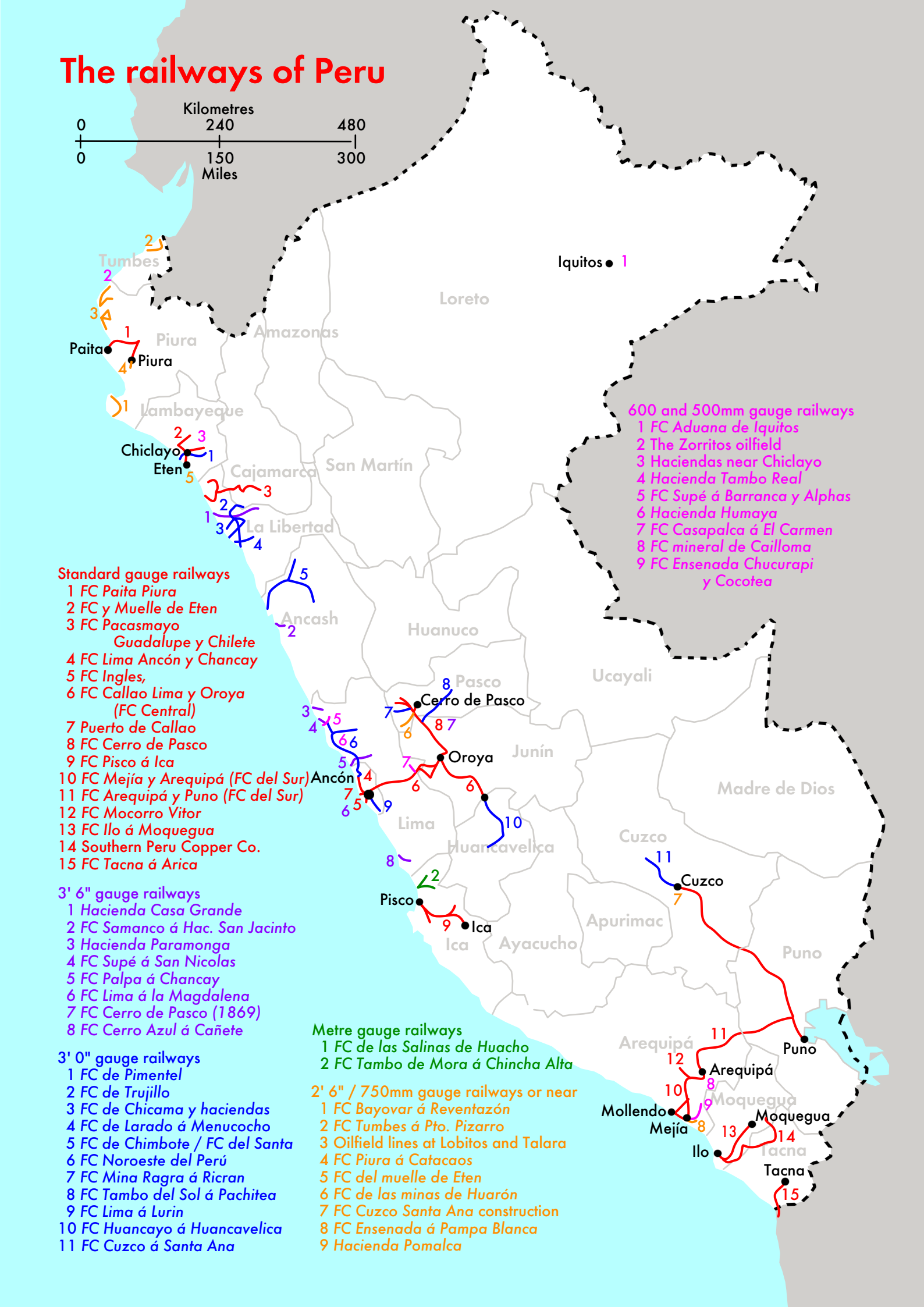
*Anales del Cuerpo de ingenieros del Peru*

| | |
|---|---|
| 1874 vol. 1 | https://babel.hathitrust.org/cgi/pt?id=uiug.30112110329171&view=1up&seq=9 |
| 1874 vol. 2 | https://babel.hathitrust.org/cgi/pt?id=uiug.30112110882500&view=1up&seq=11 |

*Anales de Obras Públicas*

| | |
|---|---|
| 1884 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212236&view=1up&seq=7 |
| 1885 part 1 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212237&view=1up&seq=7 |
| 1885 part 2 | ? |
| 1886 | https://babel.hathitrust.org/cgi/pt?id=nyp.33433090818141&view=1up&seq=13 |
| 1887 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212217&view=1up&seq=5 |
| 1888 | https://babel.hathitrust.org/cgi/pt?id=nyp.33433090818182&view=1up&seq=13 |
| 1889 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212219&view=1up&seq=1 |
| 1890 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212220&view=1up&seq=5 |
| 1891 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212221&view=1up&seq=7 |
| 1892 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212222&view=1up&seq=7 |
| 1893 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212223&view=1up&seq=7 |
| 1894 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212224&view=1up&seq=9 |

# The railways of Peru




600 and 500mm gauge railways
1 FC Aduana de Iquitos
2 The Zorritos oilfield
3 Haciendas near Chiclayo
4 Hacienda Tambo Real
5 FC Supé á Barranca y Alphas
6 Hacienda Humaya
7 FC Casapalca á El Carmen
8 FC mineral de Cailloma
9 FC Ensenada Chucurapi y Cocotea

Standard gauge railways
1 FC Paita Piura
2 FC y Muelle de Eten
3 FC Pacasmayo Guadalupe y Chilete
4 FC Lima Ancón y Chancay
5 FC Ingles,
6 FC Callao Lima y Oroya (FC Central)
7 Puerto de Callao
8 FC Cerro de Pasco
9 FC Pisco á Ica
10 FC Mejía y Arequipá (FC del Sur)
11 FC Arequipá y Puno (FC del Sur)
12 FC Mocorro Vitor
13 FC Ilo á Moquegua
14 Southern Peru Copper Co.
15 FC Tacna á Arica

3' 6" gauge railways
1 Hacienda Casa Grande
2 FC Samanco á Hac. San Jacinto
3 Hacienda Paramonga
4 FC Supé á San Nicolas
5 FC Palpa á Chancay
6 FC Lima á la Magdalena
7 FC Cerro de Pasco (1869)
8 FC Cerro Azul á Cañete

3' 0" gauge railways
1 FC de Pimentel
2 FC de Trujillo
3 FC de Chicama y haciendas
4 FC de Larado á Menucocho
5 FC de Chimbote / FC del Santa
6 FC Noroeste del Perú
7 FC Mina Ragra á Ricran
8 FC Tambo del Sol á Pachitea
9 FC Lima á Lurin
10 FC Huancayo á Huancavelica
11 FC Cuzco á Santa Ana

Metre gauge railways
1 FC de las Salinas de Huacho
2 FC Tambo de Mora á Chincha Alta

2' 6" / 750mm gauge railways or near
1 FC Bayovar á Reventazón
2 FC Tumbes á Pto. Pizarro
3 Oilfield lines at Lobitos and Talara
4 FC Piura á Catacaos
5 FC del muelle de Eten
6 FC de las minas de Huarón
7 FC Cuzco Santa Ana construction
8 FC Ensenada á Pampa Blanca
9 Hacienda Pomalca

| | |
|---|---|
| 1895 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212225&view=1up&seq=5 |
| 1896 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212226&view=1up&seq=1 |
| 1897 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212227&view=1up&seq=1 |
| 1898 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212239&view=1up&seq=7 |
| 1899 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212240&view=1up&seq=9 |
| 1900 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212241&view=1up&seq=9 |
| 1901 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212242&view=1up&seq=9 |
| 1902 | https://babel.hathitrust.org/cgi/pt?id=njp.32101049918459&view=1up&seq=11 |
| 1903 | https://babel.hathitrust.org/cgi/pt?id=njp.32101049918467&view=1up&seq=7 |
| 1904 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212245&view=1up&seq=5 |
| 1905 part 1 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212246&view=1up&seq=1 |
| 1905 part 2 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212247&view=1up&seq=7 |
| 1906 | Combined with 1905. |
| 1907 part 1 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212260&view=1up&seq=5 |
| 1907 part 2 | https://babel.hathitrust.org/cgi/pt?id=njp.32101049918483&view=1up&seq=7 |
| 1908 part 1 | https://babel.hathitrust.org/cgi/pt?id=nyp.33433090818307&view=1up&seq=9 |
| 1908 part 2 | https://babel.hathitrust.org/cgi/pt?id=njp.32101049918491&view=1up&seq=13 |
| 1909 | Combined with 1908. |
| 1910 | Combined with 1908. |
| 1911 part 1 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212249&view=1up&seq=9 |
| 1911 part 2 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212250&view=1up&seq=7 |
| 1912 part 1 | https://babel.hathitrust.org/cgi/pt?id=nyp.33433090817879&view=1up&seq=6 |
| 1912 part 2 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212252&view=1up&seq=5 |
| 1913 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212253&view=1up&seq=9 |
| 1914 | https://babel.hathitrust.org/cgi/pt?id=nyp.33433090817911&view=1up&seq=1 |
| 1915 | https://babel.hathitrust.org/cgi/pt?id=uva.x002212255&view=1up&seq=5 |
| 1916 | https://babel.hathitrust.org/cgi/pt?id=njp.32101049918533&view=1up&seq=9 |
| 1917 | https://babel.hathitrust.org/cgi/pt?id=njp.32101049918558&view=1up&seq=3 |
| 1918 part 1 | https://babel.hathitrust.org/cgi/pt?id=njp.32101049918541&view=1up&seq=7 |
| 1918 part 2 | https://babel.hathitrust.org/cgi/pt?id=njp.32101049918566&view=1up&seq=7 |
| 1919 part 1 | https://babel.hathitrust.org/cgi/pt?id=njp.32101049918574&view=1up&seq=7 |

[12] Photographs taken by Herr Alphons Stübel in the 1870s, available at https://leibniz-ifl.de/forschung/forschungsinfrastrukturen/digitale-sammlungen/collection-alphons-stuebel

[13] *The Hunslet Engine Works, over a century and a half of locomotive building,* Don Townsley, 1998, Plateway Press.

[14] Photos by Herr Alphons Stübel taken during the 1870s and archived at the Leibniz Institute for Regional Geography, Archive for Geography. Leipzig, Germany. Low resolution versions of all Herr Stübel's photographs are available online at https://ifl.wissensbank.com/esearcha/browse.tt.html

[15] *El Ferrocarril de Arequipá: Historia documentada de su origen, construcción é inauguración*, Lima 1871. A copy in the New York Public Libraries has been made available for on-demand reprinting via the internet.

[16] *Railways of the Andes*, Brian Fawcett, George Allen & Unwin, London, 1963. Second edition published by Plateway Press in 1997.

[17] *Railway & Locomotive Engineering*, 14th volume, March 1901, p115. https://babel.hathitrust.org/cgi/pt?id=mdp.39015021242055&view=1up&seq=195&skin=2021

[18] *El Ferrocarril a Huancavelica, Opiniones téxnicas, Discursos, Mapas y Fotografías conmemorativas de la inauguración*, 1927, Lima. https://books.google.com.pe/books?id=v8iCAAAAIAAJ&vq=ferrocarril+huancavelica&dq=-ferrocarril+huancavelica&hl=es&pg=PP1#v=onepage&q&f=false

[19] *FC Central Trasandino, Sección de Callao y Lima a La Oroya, Documentos*, 1870, Lima. Available at https://

repositoriodigital.bnp.gob.pe/bnp/recursos/2/flippingbook/4000000131/files/assets/basic-html/page-1.html from p449 onwards.
[20] *Ferrocarril de Arequipa a Puno, Documentos*, 1870, Lima. Available at https://repositoriodigital.bnp.gob.pe/bnp/recursos/2/flippingbook/4000000132/files/assets/basic-html/page-466.html In second half of volume.
[21] *Informaciones y memorias de la Sociedad de Ingenieros del Perú*. https://catalog.hathitrust.org/Record/010193370
[22] *Historia de los Ferrocarriles de Lima*, 1965, Ing. Alberto Regal, Instituto de Vias de Transporte, Lima.
[23] *The Central Railway of Peru and the Cerro de Pasco Railway*, Donald Binns, 1996, Trackside Publications.
[24] *Los FFCC del Perú, Collección de Leyes, Decretos, pontratos y demas documentos relatiois a los FFCC del Peru,* hecha de orden de D. Enrique Meiggs, 1876. https://babel.hathitrust.org/cgi/pt?id=uiug.30112108061018&view=1up&seq=9
[25] *Retazos de la Historia de Ilo*, by Luis E. Kuon Cabello, 1994. The railway chapter is online at http://www.luiskuoncabello.com/uploads/7/4/5/5/74552227/07._el_ferrocarril_v1.pdf
[26] *American Locomotive Engineering and Railway Mechanism, With a practical Treatise on the Construction and Principles of the Locomotive Engine and Railway Cars*, two volumes, Weissenborn G., 1871, The American Industrial Publishing Co., and more recent reprints.

## Dimensions

Imperial unit driving wheel and cylinder dimensions, ie. in inches, have been added if it seems likely that they were originally created in that system.

## Photographs

Photos have been added here solely to aid in the identification of locos seen in other images elsewhere. They have been found from many different sources, and may still be in copyright. For those reasons, and to keep the file sizes down, they are of low resolution, the majority being only 600 pixels across. The names of photographers will be added as time permits. As these documents are likely to have a very limited readership and are not being produced commercially, it is hoped that copyright holders will understand and permit their presence here. If not, please contact the author and they can be removed.

The list is arranged in date order for entry to service (which may have been some time after construction) of the first engine of each class, subsequent batches of the same class follow-on, keeping all engines of the same class together; thus the list of engine numbers is not consecutive, nor are the classes in alphabetical order. There are cross-references for replacement engines.

## Baldwin loco classes and specification sheets

Baldwin loco details in the following lists usually include the class and a volume and page reference to the the appropriate spec. sheet. These can be found at https://digitalcollections.smu.edu/digital/collection/rwy/id/32 amongst the collections at the DeGolyer Library of Southern Methodist University in Texas. An explanation of Baldwin's class system can be found at https://guides.smu.edu/c.php?g=1029481&p=7460937

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# Peruvian railway names and gauges

## Standard gauge railways in this file

- *FC Lima y Huacho / FC Lima, Ancon y Chancay*
- *La Cía. Lima y Oroya / FC Callao Lima y Oroya / FC Central*
- *FC y Muelle de Eten*
- *FC Pacasmayo, Guadalupe y Chilete / FC Pacasmayo a Guadalupe y Magdalena*
- *FC Ilo á Moquegua*
- *FC Pisco á Ica*
- *FC Tacna á Arica / FC Arica á Tacna*
- *FC Arequipá á Puno / FC del Sur*
- *FC Cerro de Pasco*
- *FC Mejía á Arequipá / FC del Sur*
- *FC Paita á Piura*
- *(Southern Peru Copper Co.)*
- *Agencia Portuario de Callao*

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## Narrow gauge railways in file 14

### 3' 6" gauge railways

- *FC Cerro de Pasco* (1869)
- *FC Supé á San Nicolas*
- *FC Cerro Azul á Cañete*
- *FC Samanco á Hacienda San Jacinto*
- *Ingenio Infantas*
- *Hacienda San José*
- *Hacienda Casa Grande* (also 3' 0")
- *Azucarera Nepena SA*
- *Hacienda Paramonga*

### Metre gauge railways

- *FC Chancay á Palpa*
- *FC Tambo de Mora a Chincha Alta*
- *FC Playa Chica a Huacho*

### 3' 0" gauge railways

- *FC de Pimentel*
- *FC Cuzco á Santa Ana*
- *FC de Chimbote*
- *FC de Trujillo / FC de Trujillo a Menoaucho / FC Saliverry a Trujillo*
- *FC Chimbote á Huaraz*
- *FC Laredo y Menucocho / Hacienda Laredo*
- *FC del Santa*
- *FC Noroeste del Peru*
- *FC Lima á Lurin / FC Lima á Chilia*
- *FC del Puente*
- *FC Mina Ragra á Ricran*
- *FC Huancayo á Huancavelica*
- *FC Tambo del Sol á Pachitea / FC Tambo del Sol a Pucallpa*
- *Hacienda Chincha*
- *Hacienda Chiclin*
- *Larco Herrera Hermanos*
- *Hacienda Cartavio*
- *Hacienda Casa Grande*
- *Hacienda Pampas*
- *Hacienda Roma*
- *Hacienda Chicamita*
- *Hacienda Chiquitoy*
- *Hacienda Zauzal*
- *Hacienda Casa Grande* (also 3' 6" gauge)

### 800mm gauge railways

- *FC Bayovar á Reventazón*

### 2' 6" or 750mm gauge railways

- *FC Tumbes á Puerto Pizarro*
- *FC Piura á Catacos*
- *FC de Minas de Huarón*
- *FC Cuzco á Santa Ana* (construction)
- *FC Ensenada á Pampa Blanca*
- Talara oilfield
- Lobitos oilfield / *FC Lobitos El Tablazo*

### 700 or 690 mm gauge railways

- *Hacienda Pomalca*

*FC Mineral de Cailloma*

### 2' 0" or 60cm gauge railways

- FC Ensenada Chucurapi y Cocotea
- FC Casapalca á El Carmen
- FC Supé á Barranca y Alphas
- FC Aduana de Iquitos
- Zorritos oilfield
- *FC Samanco á Hacienda San Jacinto*
- *Ingenio Infantas*
- *Hacienda San José*
- *Hacienda Casa Grande* (also 3' 0")
- *Azucarera Nepena SA*
- *Hacienda Paramonga*

### 500mm gauge railways

- *Hacienda Pro*
- *Hacienda Chuquitanta*
- *Hacienda Monte Rico Grande*
- *Hacienda Punta Piedra*
- *Hacienda San Guillermo*

## Railways in adjacent countries

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## Other abbreviations

| | |
|---|---|
| d/w | driving wheels |
| cyls. | cylinder bore and stroke |
| w/n | works or builders' numbers |

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# Peru

## Background – the country

U

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# 13.1 The north-west

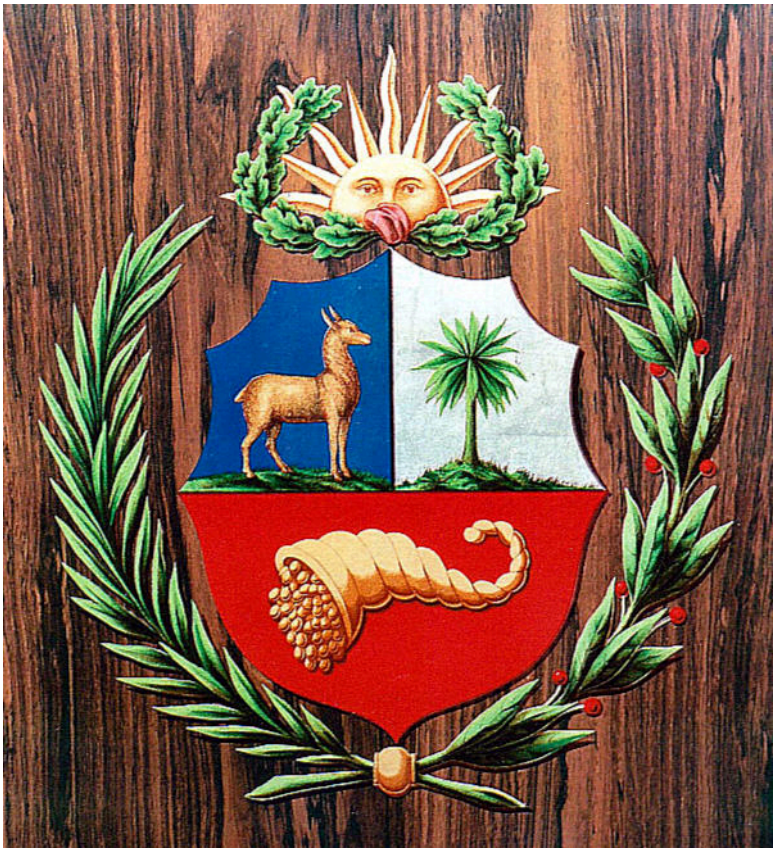
## 13.1.1 *El FC Paita á Piura*

***Región de Piura***

**1874-1890**

## operated by the Peruvian Corporation

**1890-1959**



The carriage-side coat of arms of the Peruvian Corporation, from an example transfer in the collection of Gerald Hartley.

### Background

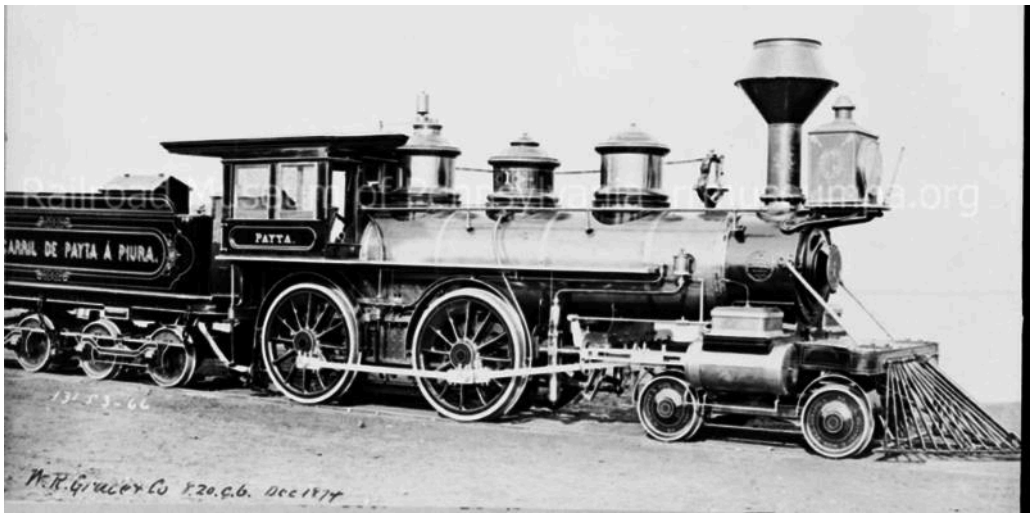
Standard gauge. 105 km. in length. First proposals 1869, and initial work began in 1872 under Sr. Federico Blume. Opened 1874 to La Huaca, 1876 to Viviate, 1879 during the War of the Pacific to Sullana, and later in 1887 to Piura. Another source implies reopened after the war to Sullana in 1885 and only in 1890 to Piura.
Operation taken over by the Peruvian Corporation in 1929. First diesel loco arrived 1939 and all steam OoS by 1952. Closed 1959 and lifted 1962.
"Freight traffic consisted primarily of agricultural products including rice, cotton, sugar, fruits and vegetables. Charcoal was also an important commodity. In 1932, charcoal made up almost one third of the 54,600-tons of freight carried.' []

### *4-4-0 d/w 56", cyls. 13x22", built by Baldwin in 1874*

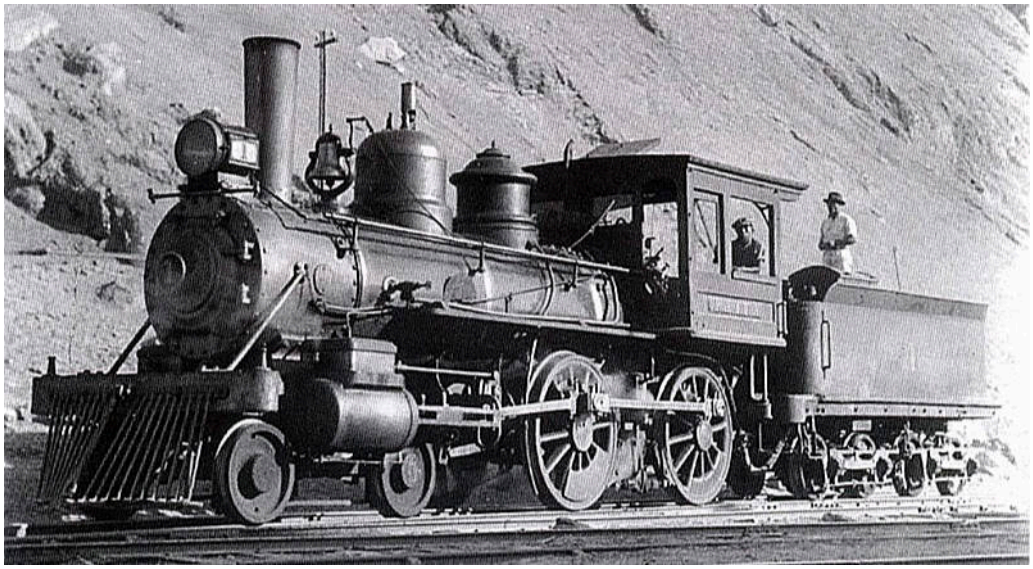
Ordered via W. R. Grace & Co. for *FC Paita Piura*. BLW class 08-20C nos. 6-8. Spec. is in vol. 7 p128. Mark on tanks to be 'FERRO-CARRIL DE PAYTA A PIURA'. Annotation mentions an extra order later on in 1921 re change to oil burning. New boilers for all three in 1927.

**1 'PAYTA'** w/n 3678 Ran 31159.70 km. in 1893 [11, 1893 p648].

| | | |
|---|---|---|
| | | Ran 9150.36 km. in 1894 [11, 1894 p432]. |
| | | Ran 5878.39 km. in 1895 [11, 1895 p258]. |
| | | Ran 9259.76 km. in 1896 [11, 1896 p700]. |
| | | Ran 24325.90 km. in 1897 [11, 1897 p590]. |
| **2 'PIURA'** | w/n 3679 | Ran 23484 km. in 1893 [11, 1893 p648]. |
| | | Ran 30581.45 km. in 1894 [11, 1894 p432]. |
| | | Ran 19368.42 km. in 1895 [11, 1895 p258]. |
| | | Ran 16702.74 km. in 1896 [11, 1896 p700]. |
| | | Ran 20140.20 km. in 1897 [11, 1897 p590]. |
| **3 'FEDERICO BLUME'** | w/n 3680 | Ran 26082.50 km. in 1893 [11, 1893 p648]. |
| (BLW spec. sheet implies name on | | Ran 23136.78 km. in 1894 [11, 1894 p432]. |
| cab to be **'F. BLUME'**. | | Ran 25207.67 km. in 1895 [11, 1895 p258]. |
| | | Ran 27893.38 km. in 1896 [11, 1896 p700]. |
| | | Ran 10238.20 km. in 1897 [11, 1897 p590]. |




This image is from Baldwin negative 13153-66 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.



## The fleet in 1874 and 1886

The Anales del Cuerpo de Ingenieros, source [11. 1874B p262] says that there were "*Seis locomotoras de 20 toneladas de peso, sin alijo ( tender; ) las locomotoras con cuatro ruedas motoras y un boggie de cuatro ruedas. Los tenders con*

*capacidad de 8 metros 3 de agua.*"
Source [11, 1886 p159], the *Anales de las Obras Públicas del Perú* for 1886, summarises the fleet:
"*seis locomotoras de Rogers pars gradiente de dos por ciento, capaces de arrastrar de subida cien toneladas de peso bruto á razon de treinta y cuatro kilómetros por hora.*
And on p165: *"Las locomotoras serin del sistema Rogers, aun cuando no se compren'en la fabrica del inventor."*
It is interesting that both of these reports show the presence of six locos, with three perhaps then being shipped elsewhere before 1892.

## The fleet in 1892

An inspection report by Ing. Emeterio Pérez in the 1892 Anales states as follows: *Posee la linea tres locomotoras, cuatro coches para pasajeros, quince bodegas, nueve carros de plataforma y algunos carritos de empuje para cuadrillas; cantidad, como se podra comprender, insuficiente para poder sostener cómodamente el trafico. El estado del material rodante es en su generalidad malo, y se comprende que asi sea, pues, su pequefio mimero, el abandono en que parece ha estado, y en fin, el trabajo de 150 ó únas kilometros casi diario, en linea desnivelada, ha producido, naturalmente, el desgaste de todo el material, a parte del aseo y comodidades que se han descuidado por complete. De las tres locomotoras que posee, la número 1 se encuentra en buen estado, pues ha recibido una reparation bastante seria, despues de la que, la someti a una presion de 190 libras, sin producirse esca-pe alguno. Las numeros II y III, se encuentran en estado de servicio, pues tienen sus piezas principales (caldero, caja de fuego, cilindros ....) en estado de trabajo; estas dos maquinas, fueron sometidas a presión de 180 libras, sin notar en ellas, mas que ligeras filtraciones provenientes de la operation que se hacia en frio.*
*Los ejes y ruedas en el material rodante, estan bastante gastados, necesitando cambiarlos, cuando menos, en un quince por ciento.* [11, 1892 p265-6].

## Transfer of a loco from the *FC del Sur* to the *FC Paita á Piura* in 1894?

The following paragraph appeared in the 1894 Anales [11, 1894 p176]. No further details are yet known.
*Traslación de una máquina al ferrocarril de Paita a Piura.*
*Lima, Abril 9 de 1894. Visto el anterior recurso del representante de la Peruvian Corporation Limited, por el cual pide autorizacion para trasladar de Mollendo a Paita una de las varias máquinas que existen sin aplicacion en Ia Empresa de los ferrocarriles del Sur, y la cual se necesita para Ia reparación de Ia linea ferrea de Paita a Piura. Concedese la autorización solicitada y pasese at Ministerio de Hacienda, para que por la Aduana de Mollendo se permita el embarque de Ia máquina y útiles respectivos con destino a Paita.*
Later that year, though possibly before the additional engine had arrived, the following summary of the locomotive situation was presented: *MATERIAL RODANTE.*
*No obstante haberse terminado el ferrocarril hasta Piura, el contratista aún no ha cumplido con tener el material rodante que ofrecio, pues solo tiene 3 locomotoras, 4 coches de pasajeros, 12 bodegas, 11 carros (dos de ellos con tanque) y algunos carritos para camineros.*
*El estado de este material es el siguiente:*
*De las 3 locomotoras, las números **2** y **3** han sido ultimamente reparadas sobre todo la No **2** que se encuentra hoy bastante bien, faltándole solo el arreglo de sus ruedas. Ambas se usan con petroleo. La No. **1** que aún no se ha arreglado, esta en la factoria en malas condiciones y no se le usa por falta de tráfico.* [11, 1894 pp345-6].

## *??? d/w?, cyls. ?, built by ? in ?*

Ordered for ? BW says used for yard service, but I am not convinced. The report below confirms that it came from the *FC del Sur*, but states that it was too heavy for the rails of the poor quality track here, and was therefore banned from use in early 1896. However, that is inconsistent with the 1896 mileage shown below.

| | | |
|---|---|---|
| **4** | w/n ? | Ran 11525.72 km. in 1894 [11, 1894 p432]. |
| | | Ran 22815.93 km. in 1895 [11, 1895 p258]. |
| | | Ran 21615.20 km. in 1896 [11, 1896 p700]. |

Ran 21792 km. in 1897 [11, 1897 p590].

## A section from an inspection report, January 1896

*MATERIAL RODANTE.*

*Sin embargo de haber terminado la proroga concedida a la empresa, para el cumplimiento de las obligaciones de su contrato como antes he dicho, aún no cuenta esta empresa con el material rodante a que esta obligada, pues solo tiene: 4 locomotoras, 4 coches de pasajeros, 14 bodegas, 16 carros de plataforma, siendo el estado de este material, el siguiente:*

*De las cuatro locomotoras, la num.* ***4****, últimamente transportada de los ferrocarriles del Sur, tiene un peso demasiado grande para ser soportada por rieles de 45 libras por yarda, como son los de esta linea; esta circunstancia, y la de estar en tan mal estado la via, hacia que una vez que la linea era recorrida por esta locomotora, quedaba en tal estadó, que ofrecia peligro al tráfico de los otros trenes, razones por las que me he visto precisado a ordenar la suspension de su triáfico. Las otras se encuentran en tan malas condiciones, que no he querido proceder a la prueba de sus calderos por terror de que queden completamente inutilizadas para el tráfico, con grande perjuicio para el comercio, limitandome tan solo a ordenar a la Empresa, no exceder de 120 libras de vapor por pulgada cuadrada, en estas locomotoras. Al respecto, me comunica la Empresa, que próximamente deben llegarles tres calderos, ruedas y demas repuestos, para la completa reparation de estas maquinas.*

*…*

*Paita, Enero 4 de 1896.*

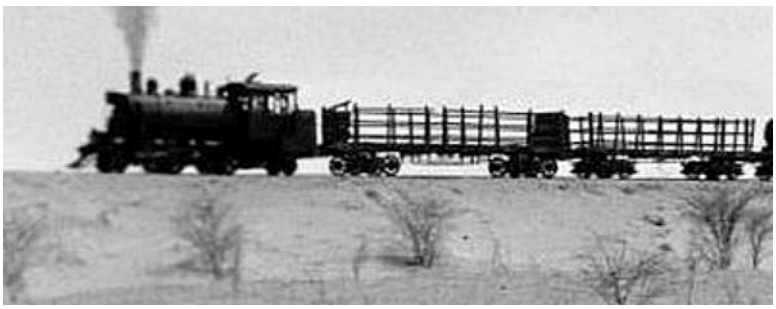
*EMETERIO PÉREZ,*

*Ingeniero.*

## *2-4-2ST d/w 48", cyls 14x24", built by Rogers in 1899*

Ordered via W. R. Grace & Co. for *FC de Payta a Piura*. Some lists say this was an 0-4-4T, but Connelly's Rogers list specifically says 'double-ender'.

**5 'La HUACHA'** w/n 5411

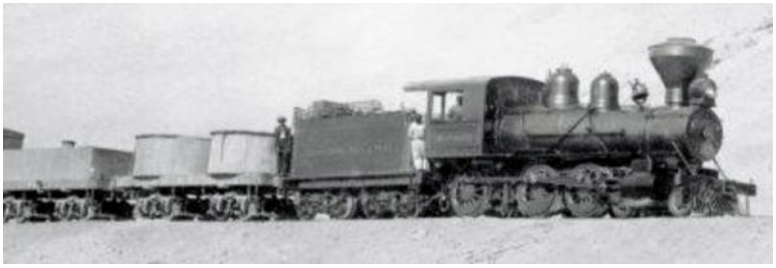


This photo, taken on the *FC Paita Piura*, presumably shows 2-4-2ST no. **5 'La HUACHA'**.

## *4-6-0 d/w 68"?, cyls. 19x26"?, built by ALCo Rogers in 1906*

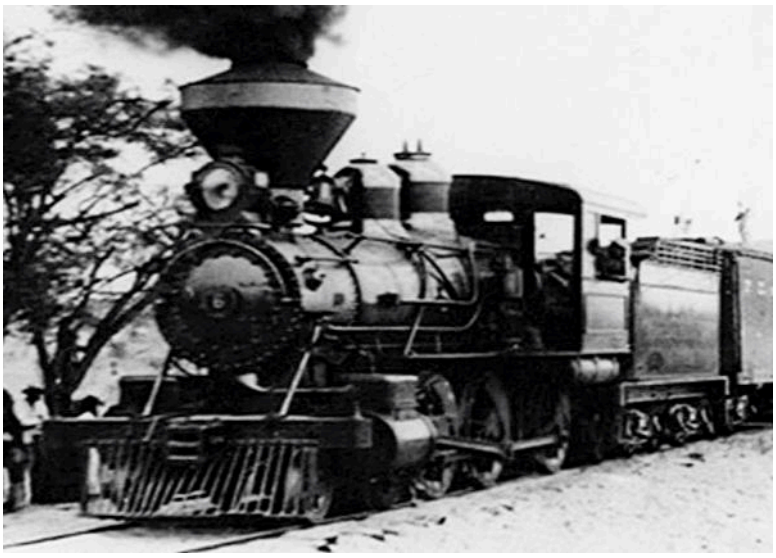
Ordered for Paita á Piura railway. Copeland says d/w 54" and cyls. 17x24".

**6** w/n 41529



This image was posted on Facebook by Jaine Leon Olavarria. It supposedly shows a train between Sullana and Paita. The engine is a 4-6-0 with a

Radley & Hunter stack. It presumably is the ALCo 4-6-0 of 1906, no. **6**, though the domes do look rather Baldwin-like. The first two wagons in the train may well have been water carriers, though it is not clear whether they were for loco use or merely to transfer water to Sullana.



Another image of no. **6**, this time from Sr. Abrill Talevera's *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos* page on Facebook.

A further image from Sr. Abrill Talevera's *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos* page on Facebook, this time showing no. **6** without its Radley & Hunter stack.

### *0-4-0STT d/w 31", cyls. 11x16", built by Porter in 1912*

Ordered W. R. Grace for Peruvian Corporation for *FC de Paita a Piura*. 20½ tons.

**7** w/n 5223

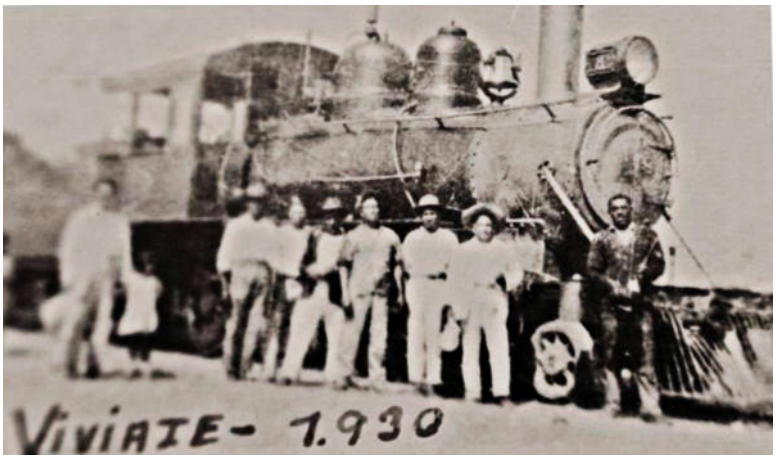
### *2-6-0 d/w 50", cyls. 16x24", built by Baldwin in 1917*

Ordered for Peruvian Corporation, possibly for Pacasmayo or Pisco, according to BW. BLW class 08-26D no. 207. Spec. is in vol. 66 p188. Radley & Hunter stack.

**8 'SOJO'** w/n 46969 Later went to *FC Pacasmayo Guadalupe y Magdalena*.

A 2-6-0 supposedly on the *FC de Paita á Piura*, in a photo found on a local history Facebook page. If this is the loco listed immediately above, then it has clearly lost its spark arresting stack.

Whilst this photo is too poor to add much to our knowledge of this loco, it does show that the running number, **8**, was displayed in the usual way on the tender.




*FC Paita Piura* no. **8** at Viviate in 1930.

## 2-8-0 d/w 44", cyls. 18x24?", built by Baldwin in 1921

Ordered for Peruvian Corporation for Paita Piura railway. BLW class 10-30E no. 179. Spec. is in vol. 66 p190. Road numbers and name on cab in gold leaf. No number plates. Belpaire boiler by special request.

**9 'MIRAFLORES'** w/n 54856

This image is from Baldwin negative 08036-1 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.

### *2-6-2T d/w ?, cyls. ?, built by Kitson in 1925*

Ordered for Lima Railway. Ex Lima railway 0-6-2T no. **7** or **8**, rebuilt 1938.

**10** w/n 5393 or 5394

## The fleet in 1925

*Railways of South America part II*, the 1927 US Dept. of Commerce report [2] that is a staple source for studying the locomotives of each of these South American countries, says that there were six engines in the fleet in 1925, but gives no details. Of course the missing four other machines may not have been scrapped or sold, but might merely have been awaiting overhaul. In particular locos nos. **1** to **3** each received a new boiler in 1927, so a couple of years earlier might well have been out of service in anticipation of that.

## A report from the early 1950s

A set of Peruvian Corporation report survive in the PC archive held by University College, London, but housed at The National Archives in Kew. The Paita-Piura section included the following references to steam locos.

3. Steam Locos.

Engine No.9 has had a general overhaul - and is in good shape and should easily see us through until the Diesel locomotives are functioning properly.

Engine No.8 is under repairs in the Workshops to supplement No.9. After the new Diesel Locos are in service these two steam engines should be put into grease and stored for emergency use only. All other steam locos should be scrapped and disposed of. It is psychologically bad to have a lot of derelicts around the yards - the same remarks apply to scrap rolling stock.

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## 13.1.2 *El FC y Muelle de Eten*

***Región de Lambayeque***

**1871-1965?**

## Latterly owned by *Transportes y Embargues del Norte SA (TIENSA)*


CERTIFICADO No. 053 POR ACCIONES

EMPRESA DEL FERRO-CARRIL Y MUELLE DE ETEN

CAPITAL SOCIAL $2211000

DIVIDIDO EN 2211 ACCIONES DE S/. 1000 CADA UNA

La Empresa del Ferrocarril y Muelle de Eten, reconoce al portador como propietario de acciones numeradas del Nº al Nº de

UN MIL SOLES ORO

cada una totalmente pagadas, sujetas a las estipulaciones de la escritura social de quince de Julio de 1931 extendida en el registro del Notario público Don Alberto Solano.

Lima, de de

Director Presidente del Directorio Director

A share certificatte from the Empresa del Ferro-carril y Muelle de Eten, as found on Sr. Elio Galessio's blog at https://trenesdelperu.blogspot.com/

### Background

Standard gauge. Concessions first granted in 1867, Eten via Monsefu to Chiclayo with branch to Ferreñafe and second branch Chiclayo via Pomalca and Tumán to Pátapo. Opened 1871. 67 km.

Deep cutting required to reach top of hill inland of the pier, but otherwise mostly level and with few earthworks.

Extended from 1874 to haciendas at Pátapo, Tumán and Pucala. 24 km more.

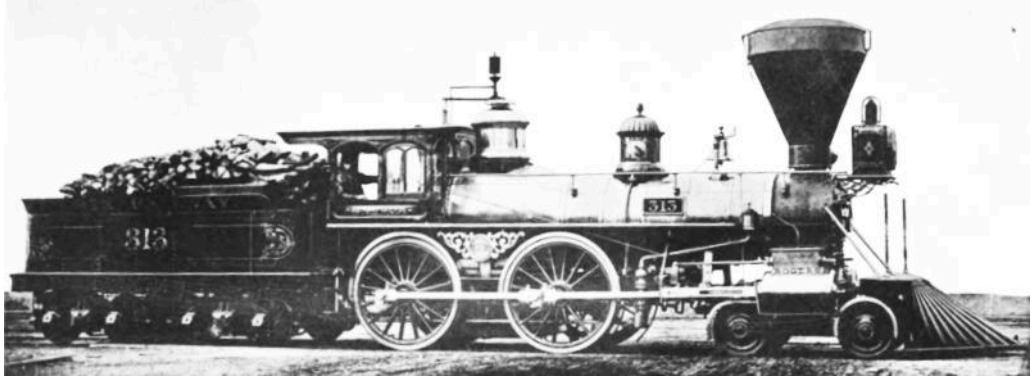
Abandoned in stages from early 1950s through to 1965, and then final lengths at pier closed in late 1970s.

### *4-4-0 d/w 55¾", cyls. 14x22", built by Rogers in 1870*

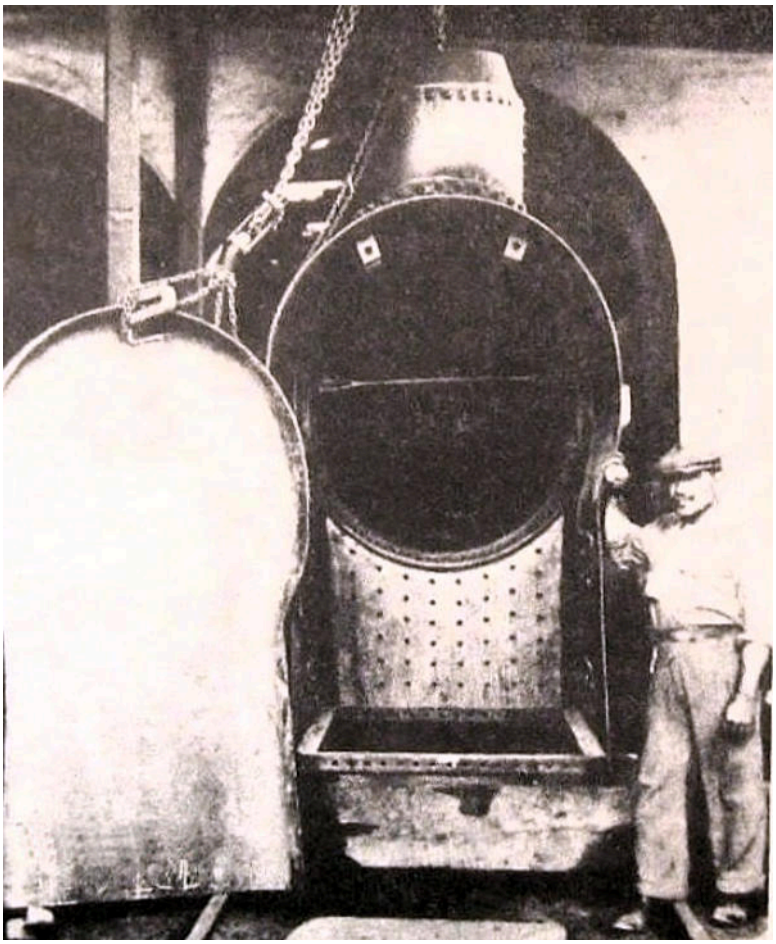
Ordered for Eten railway. Rogers order no. 715. 140psi.

| | | |
|---|---|---|
| **1[1] 'GARCIA'** | w/n (1756) | Ran 10600 km in 1888 [11, 1888 p499]. |
| | | Ran 18230 km. in 1890 [11, 1890 p738]. |
| | | Supposedly ran same distance, 18230 km., in 1891 [11, 1891 p442]! |
| | | Ran 15900 km. in 1892 [11, 1892 p460]. |
| | | Ran 16600 km. in 1893 [11, 1893 p640]. |
| | | Ran 18400 km. in 1894 [11, 1894 p424]. |
| | | Ran 18000 km. in 1895 [11, 1895 p250]. |
| | | Ran 18800 km. in 1896 [11, 1896 p692]. |

| | | |
|---|---|---|
| | | Ran 18240 km. in 1897 [11, 1897 p574].<br>Out of service in 1908, possibly withdrawn though that is not certain.<br>Number had been reused by then for the ex no. **6 'HUASCAR'**. |
| **2 'ALTHAUS'** | w/n (1757) | Ran 20550 km in 1888 [11, 1888 p499].<br>Ran 18178 km. in 1890 [11, 1890 p738].<br>Supposedly ran same distance, 18178 km., in 1891 [11, 1891 p442]!<br>Ran 8600 km. in 1892 [11, 1892 p460].<br>Ran 9500 km. in 1893 [11, 1893 p640].<br>Ran 18204 km. in 1894 [11, 1894 p424].<br>Ran 18000 km. in 1895 [11, 1895 p250]<br>Ran 16600 km. in 1896 [11, 1896 p692].<br>Ran 18010 km. in 1897 [11, 1897 p574].<br>In good condition in 1908, and described than as "*tipo pasajeros*". Later renamed **'CHICLAYO'**.<br>1913 "*Las demas locomotoras han sido debidamewnte atendidas y se encuentran en buen estado, salvo la No. 2, cuyo caldero que todavia puede soportar algo, sera cambiado, cuando sea necesario, por el caldero nuevo pedido con tal objeto a los EE.UU., y que se encuentra qui desde fines de año.* " [Box EFE 2 at the *Archivo General de la Nacion*]<br>1914 "*Como hay un caldero nuevo de repuesto, en el momento oportuno yu cuando se juzgue necesario, se cambiara el de la locomotora No. 2, que todavia puede soportar algun servicio.*" [Box EFE 2 at the *Archivo General de la Nacion*]<br>Still in service in 1967. At Pto. Eten in 2005. |
| **3 'MEIGGS'** | w/n (1792) | Ran 8630 km in 1888 [11, 1888 p499].<br>Ran 18223 km. in 1890 [11, 1890 p738].<br>Supposedly ran same distance, 18223 km., in 1891 [11, 1891 p442]!<br>Ran 15200 km. in 1892 [11, 1892 p460].<br>Ran 15500 km. in 1893 [11, 1893 p640].<br>Ran 16600 km. in 1893 [11, 1893 p640].<br>Ran 18175 km. in 1894 [11, 1894 p424].<br>Ran 18000 km. in 1895 [11, 1895 p250].<br>Ran 14200 km. in 1896 [11, 1896 p692].<br>Ran 18160 km. in 1897 [11, 1897 p574].<br>In good condition in 1908, and described than as "*tipo pasajeros*".<br>In service 1908.<br>1913 "A la locomotora no. **3** se le ha hecho una completa reparacion en su maquinaria y caldero, y construido un estanqua nuevo para agua; quedando en muy buena condicion para el servicio." [Box EFE 2 at the *Archivo General de la Nacion*] |

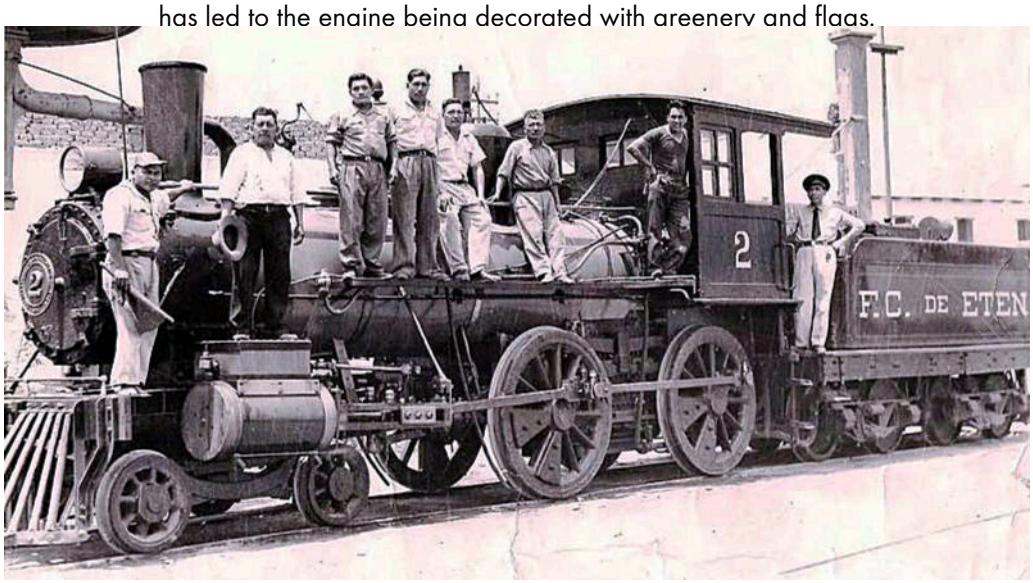


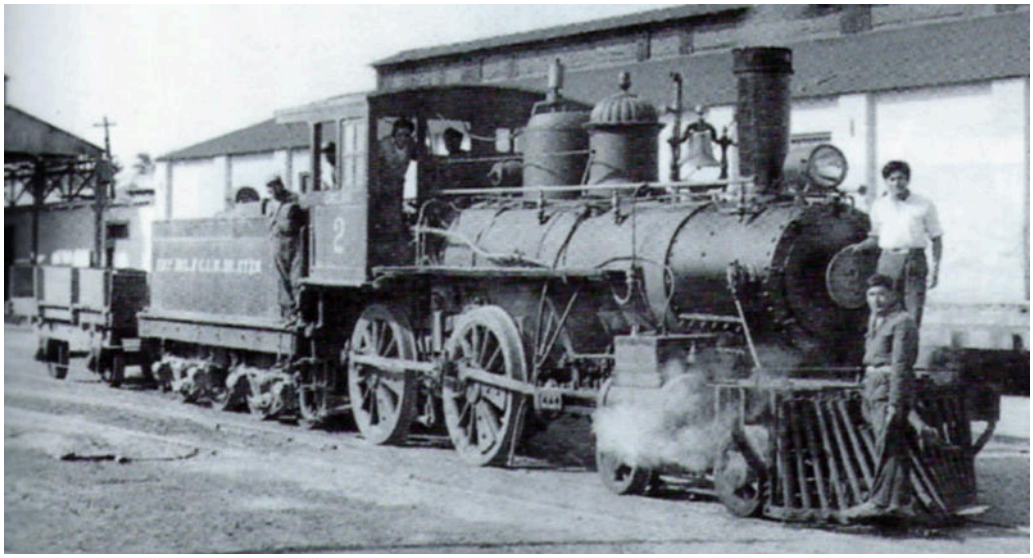

This was a Rogers class P 4-4-0 of approximately the same size as the Eten engines, as illustrated in a Rogers catalog from 1876. Whilst details may obvious have differed from the three locos listed above, major features such as the firebox-mounted dome are likely to have been standard.



This view taken in the Puerto Eten boiler shop ,and reproduced on the *Atenas del Mar* Facebook page, does indeed show a firebox-mounted dome, and comfirms that major rebuilding work was undertaken from an early date.

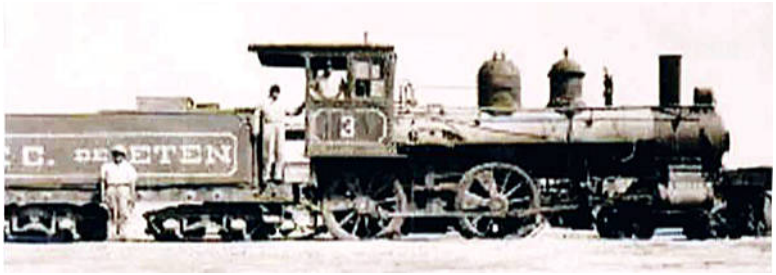

No. 2 before it lost its Radley & Hunter stack, which unusually has a Lions Club slogan around the rim possibly just for the occasion which has led to the engine being decorated with greenery and flags.



This view by the late Bob Whetham shows no. **2** still in use in 1967.

Not a good image of no. **3** but sufficient to show that the boiler mountings were similar to those on no. **2** though with the bell a little closer to the sand-dome which itself was slightly less tall.



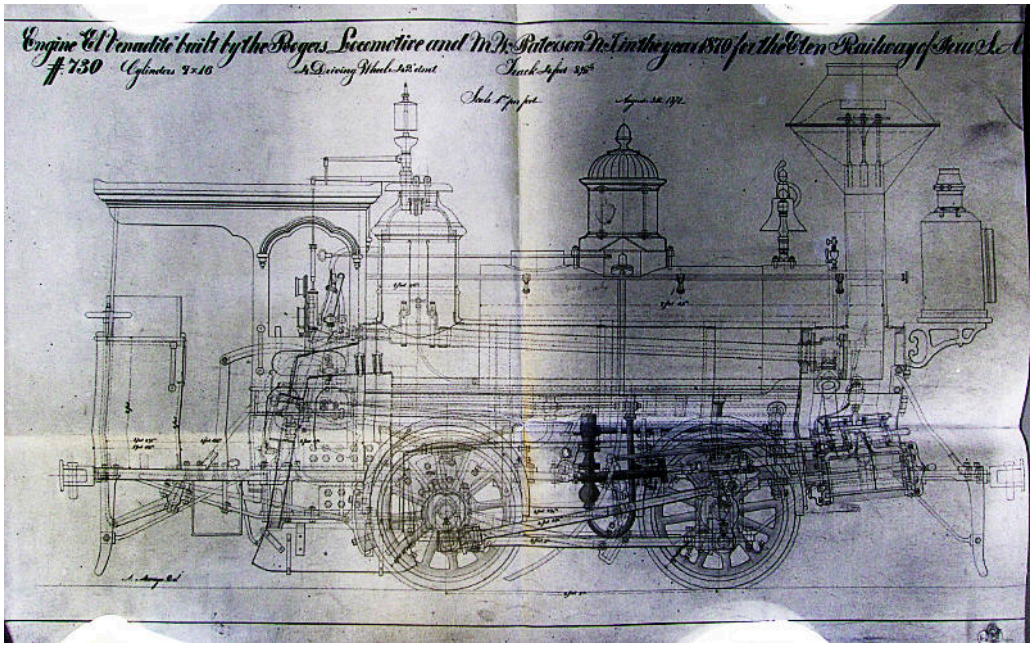
This one is no better, but this time the sand-dome seems be as tall as that on no. **2**. However, the bell is confirmed as further back. The loco seems to have lost its whistle.

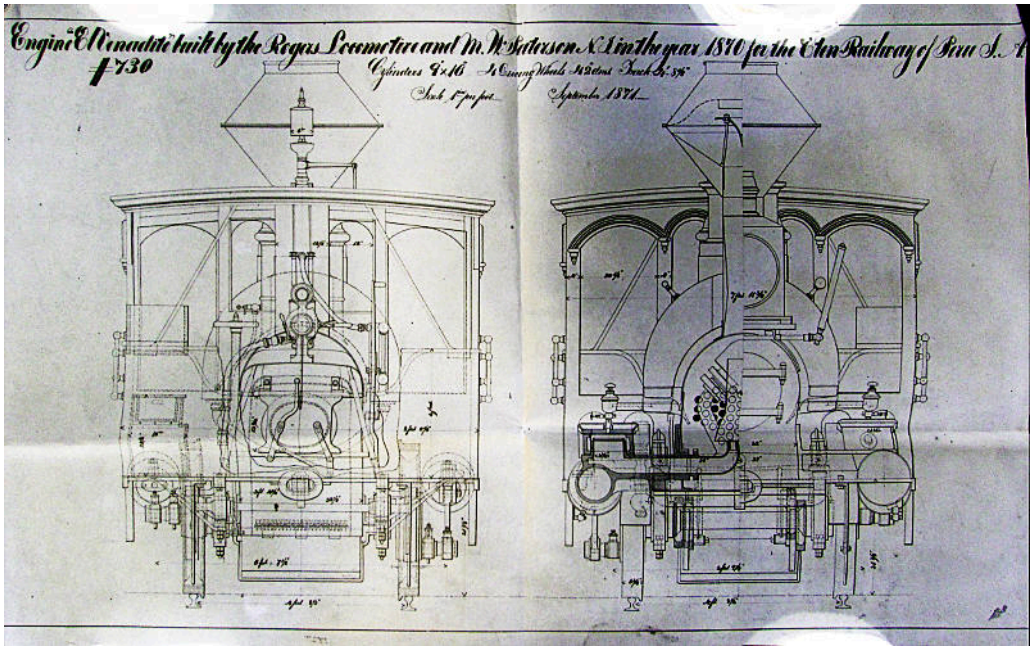
### *0-4-0T d/w 42", cyls. 9x16", built by Rogers in 1870*

Ordered for Eten railway. Rogers order no. 730. Shipped Aug. 5th 1871. Wheelbase 6' 3". Tank 400 gals.

**4[1] 'El VENADITO'** w/n (1812)

Out of service in 1908? and in fact probably withdrawn by 1889 when no. **4[2]** was delivered.





Images tonally inverted from photostats of original Rogers blue-prints in the P. C. Dewhurst collection at the NRM in York.

### *2-2-0T steam car d/w 30", cyls. 5x12", built by Rogers in 1870*

Ordered for Eten railway. Rogers order no. 729.

**5**[1] **'El GUAINABÍ'** w/n (1814) Ran 4500 km in 1888 [11, 1888 p499].
Ran 4500 km. in 1890 [11, 1890 p738].
Supposedly ran same distance, 4500 km., in 1891 [11, 1891 p442]!
Ran 2000 km. in 1892 [11, 1892 p460].
Ran 3000 km. in 1893 [11, 1893 p640].
Ran 5207 km. in 1894 [11, 1894 p424].
Ran 4000 km. in 1895 [11, 1895 p250].
Ran 4600 km. in 1896 [11, 1896 p692].
Ran 5000 km. in 1897 [11, 1897 p574].
Later renumbered **6**[2] , before 1908, and renamed **'VENADITO'**?. Described then as for shunting and as Superintendent's car.
Derelict by 1967. Now in children's park in Chiclayo?

The Rogers 2-2-0T as seen in a local park in 1975.

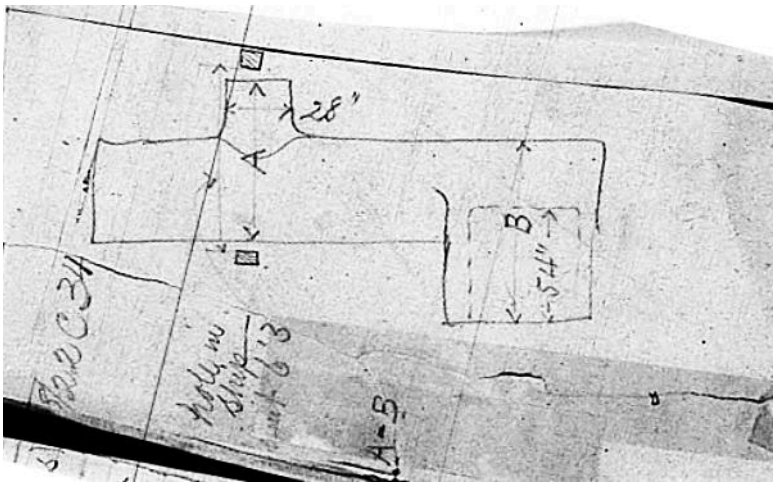
## The fleet in 1874

Source [11, 1874B p234] confirms that the fleet was made up of the above five engines at that time.

### *4-4-0 d/w 56", cyls. 14x22", built by Baldwin in 1878*

Ordered for Eten railway. BLW class 08-22C no. 34. Spec. is in vol. 8 p174. Mark on tank 'FERRO-CARRIL DE ETEN Y FERREÑAFE'. To be fitted with a diamond stack.

**6[1] 'HUASCAR'** w/n 4228 Ran 750 km. in 1890 [11, 1890 p738].
Supposedly ran same distance, 750 km., in 1891 [11, 1891 p442]!
Ran 000 km. in 1892 [11, 1892 p460].
Ran 1050 km. in 1893 [11, 1893 p640].
Ran 360 km. in 1894 [11, 1894 p424].
Ran 650 km. in 1895 [11, 1895 p250.
Ran 1860 km. in 1896 [11, 1896 p692].
Ran 2000 km. in 1897 [11, 1897 p574].
Later renumbered **1[2]** by 1908. Described then as in 'new' condition, and in use on '*trenes mixtos*'.
1914? "*Con motivo del descarrilamiento ocurrido en enero del pte. año se ejecutaron refecciones de importancia en la locomotora No. 1 como fueron construccion de la caseta y trompas, cabecera y plataforma del; tenmder, ademas de la reparacion de distintos organos de la maquina misma que resultaron averiados a consecuencia del siniestro.*" and " *y reparar ademas, los daños sufriodos por la No. 1 en el descarrilo de 16 de enereo ultimo.*" [Box EFE 2 at the *Archivo General de la Nacion*]




The Baldwin spec. sheet for this loco, in vol. 8 p174, is accompanied by a sketch of the boiler, and includes a clearly-modified pencilled reference to the dome being in the forward position rather than over the firebox as originally specified. Also the boiler shape specified had been altered from 'wagon-top' to 'straight'. These should be relatively easy to spot on any photos of this loco.

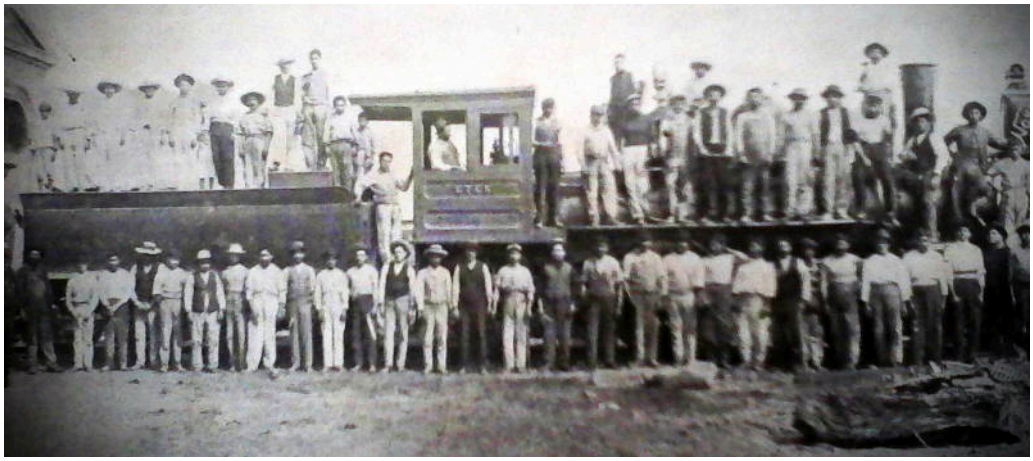
## Unidentified locomotives

Three photos below show unidentified tender engines. To put these into context, the railway had five 4-4-0 tender locos in its life, The first three were Rogers nos. **1-3**, originally named **'GARCÍA', 'ALTHAUS'** (later renamed **'CHICLAYO'**) and **'MEIGGS'**. Two of these, nos. **2** and **3**, had long lives and were well photographed. No. **1[1]**, on the other hand, had disappeared by 1908. Then there was Baldwin no. **6 'HUASCAR'** which was later renumbered **1[2]**, and finally Baldwin no. **8** named **'MONSEFU'**. No. **8** was also photographed many times, but no. **6** has not been identified in any images.

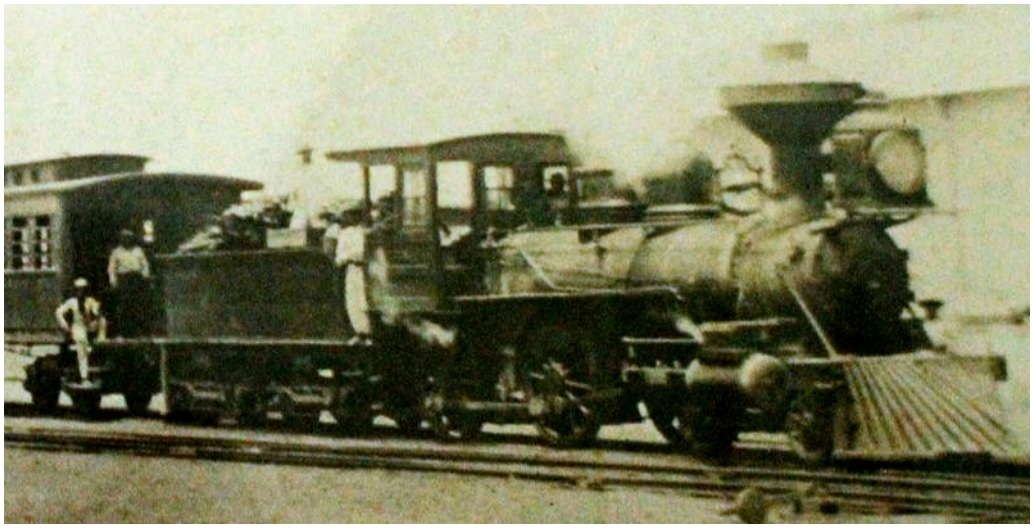
Thus there were two 4-4-0s whose appearances are uncertain, no. **1**[1] and no. **6** later **1**[2], and coincidentally the photos below clearly show two different machines.

**A**

The following photo was found on the Facebook page *Antiguas fotos de Chiclayo*. It appears to show an early American-built tender loco named **'ETEN'**. This probably belonged to the *FC de Eten* unless anyone can think of another suggestion. However, there is no record of any of the railway's engines bearing this name.



A posed photo with the workers and admin. staff of the railway company in 1912. Although most detail is obscured by the workers lined up along the side and running board of the loco and tender, a few points can be noted. The running board is slightly above the level of the bottom of the cabside, as on engines **1-3**, but not on no. **8**. However, there is a short extension forward from the cab bottom front corner unlike on any of the afore-mentioned engines. There is a straight stack, and two panels on the cabside unlike on any photos of the other engines.



Another shot seemingly showing a loco possibly named **'ETEN'** and this time with the numeral **1** on the dome. One viewer dated this to 1921 but with what authority is not known. This time the engine is carrying a Radley & Hunter stack.

**B**

The third mystery shot shows an early engine with firebox-mounted dome and a diamond stack. The wheels would seem to have the two part balance weights of early Rogers locos. In the circumstances, despite the cab floor being level with the running board, I think we can assume that this shows one of the first three engines, ie. no. **1, 2** or **3**.

Engines in arid locations like northern Peru and with poor quality water needed re-boilering every fifteen or twenty years. It would seem very possible that new boilers arriving in the 1880s or 1890s would have had domes mounted further forward, and that at this point the cab might well have been reconstructed, resulting in the sides now extending slightly below the running boards.

This supposed 1890 shot taken at the hacienda Tumán may be the oldest yet seen from this railway. The loco is notable not only for having an early diamond stack rather than the more advanced Radley & Hunter style seen in other views, but also for having a shallow cab finishing exactly at running board level. The steam dome is over the firebox unlike those in other photos, and the tender has a pilot as well as the engine itself.

See above for no. **6**[2], ex no. **5**.

### *0-4-2 d/w 48", cyls. 11x18", built by Rogers in 1889*

Ordered via Hoadley & Co. for ?

**4**[2] **'FERREÑAFE'** w/n 4191

Connelly's Rogers list says 'double-ender'.

Ran 24720 km in 1888 [11, 1888 p499]. NB If this refers to this engine rather than to the previous no. **4**[1] which was a Rogers 0-4-0ST, then it must have arrived early in 1888, but the alternative, that this kind of mileage was run by a small saddle tank, seems very unlikely.

Ran 13360 km. in 1890 [11, 1890 p738].

Supposedly ran same distance, 13360 km., in 1891 [11, 1891 p442]!

Ran 16580 km. in 1892 [11, 1892 p460].

Ran 18500 km. in 1893 [11, 1893 p640].

Ran 13200 km. in 1894 [11, 1894 p424].

Ran 12000 km. in 1895 [11, 1895 p250].

Ran 24060 km. in 1896 [11, 1896 p692].

Ran 13000 km. in 1897 [11, 1897 p574].

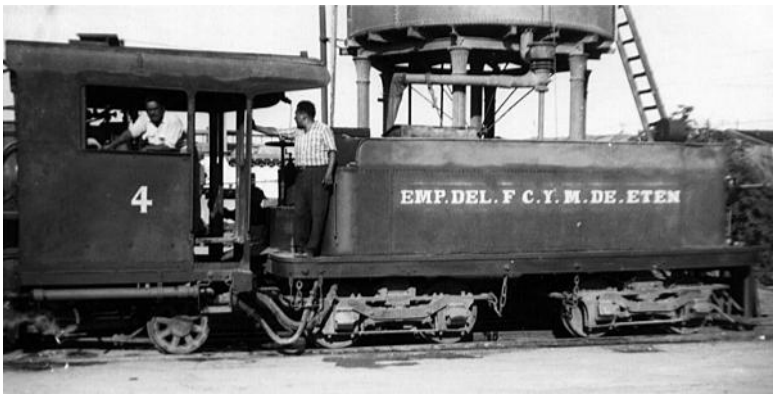
In '*estado regular*' in 1908, and for use on *trenes mixtos*. Rebuilt 1955? [3].

1913 "*Se ha comenzados ???? una importante reparacion en el caldero de la locomotora No. **4**, haciendola una caja de fuego nueva.*" [Box EFE 2 at the *Archivo General de la Nacion*]

1914? "*En la actualidad se lleva a cabo una formal refeccion de la locomotora No. **4**, para la que ya se ha hecho una nueva caja de fuego.*" and "*Terminar la reparacion del caldero de la locomotora No. 4*" [Box EFE 2 at the *Archivo General de la Nacion*]


A Rogers builder's photo, with the name seeming to be spelled incorrectly, though at that time both versions appear to have been accepted.


A pair of photos of Eten no. **4** , by courtesy of Garth Samuel and Richard Pelham. The cab with its rounded roof eaves may well have originated in the 1955 rebuild. It is interesting that the locations of the domes remained constant throughout the loco's life.




This view of the rebuilt no. **4** on a passenger train can be dated to the 1960s by the 1960 model Ford Ranch Wagon alongside. Note the piston valve cylinders, showing that the rebuild was substantial.

### *0-4-2T d/w 36", cyls. 9x15", built by Rogers in 1890*

Ordered for ? Possibly ex *FC C. Oroya* no. **29**? though [RH] believed it had been no. **27** of the La Chalaca company. Clearly must have arrived here some time after 1908, and maybe as late as 1955. Ex **27** La Chalaca Co. [3].

**4**[3]? **'La CHALACA'** w/n 4414 Rebuilt as 0-4-2 in 1955, rebuilt back to 0-4-2T in 1964? In service late 1960s/early 1970s.

Given that the photos above show no. **4**[2] in service into the 1960s, the numbering of this engine as **4**[3] must be in doubt, or perhaps the two engines have got muddled and maybe it is this machine that is illustrated in those photos.

### *0-4-2ST d/w ?, cyls. ?, built by Rogers in 1891*

Ordered for ?

**5**[2] w/n ? Rebuilt 1964? In service late 1960s/early 1970s.

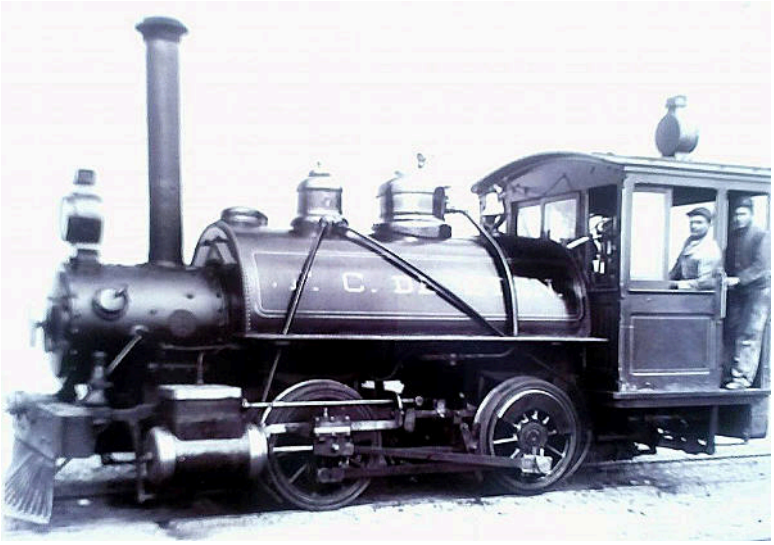
These two images of no. **5**, old and new, were found in Sr. Elio Galessio's blog [9].

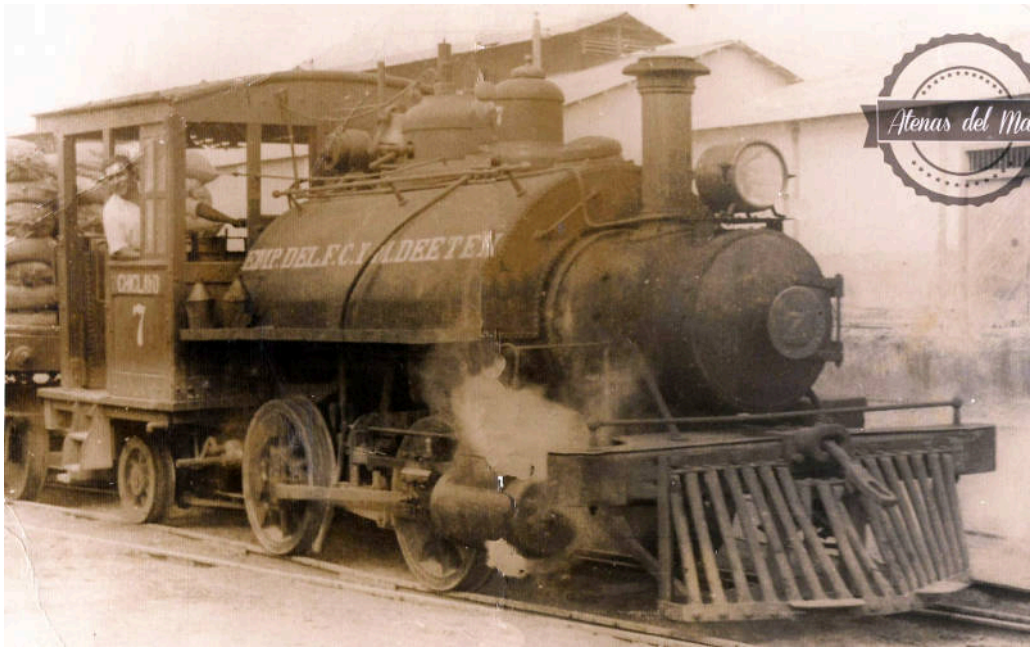
One way of distinguishing loco no. **5** from the other Eten saddle tanks is that is has cylinders which gently slope backwards rather than being mounted horizontally.


***0-4-0ST d/w 37", cyls. 10x16", built by Baldwin in 1903***

Ordered via J. M. Ceballos for *Empresa del FC y Muelle de Eten*. BLW class 04-14C no. 139. Spec. is in vol. 26 p122. Mark on tank 'F. C. DE ETEN'. No name shown.

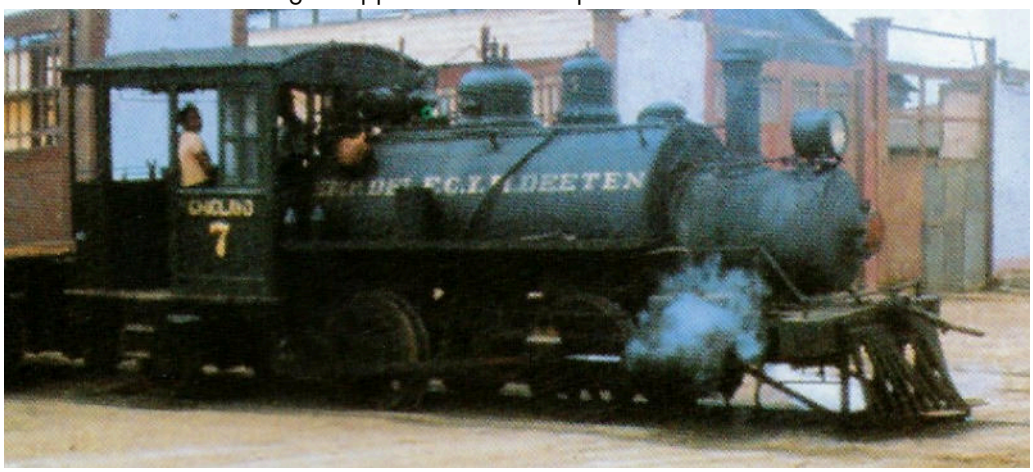
**7 '?'** w/n 22762 In estado nueva in 1908 and in use then for *mixtos y cambios*. Rebuilt 1956, as 0-4-2ST? In service late 1960s/early 1970s. Stored at Pto. Eten in 2005.






No. **7** in service, with a very much shorter chimney, and a shorter steam

dome which presumably implies that by then it had been reboilered. Note also that this engine appears to have acquired the **'CHICLAYO'** name.




A photo by Thomas Walsh showing no. **7** at Puerto Eten.

## The fleet in 1908

Costa y Laurent [1], writing in 1908, lists seven engines, those listed above as nos. **1**[2], **2, 3, 4**[2], **5**[2], **6**[2] and **7**. That is logical and leaves no major puzzles.

LOCOMOTORAS

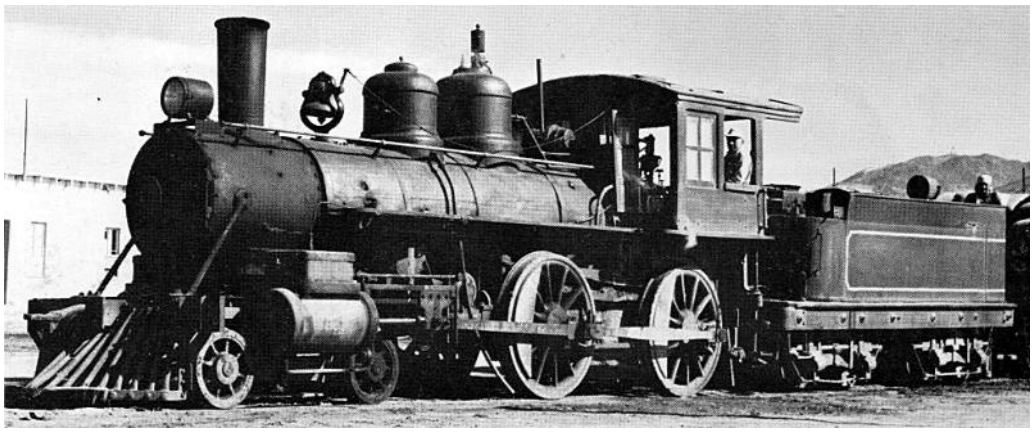
| No. | NOMBRE | Fabricante | Tipo | Fecha en la que entró al servicio por la vez. | Servicio que hace | PESOS Equipada para el servicio de la locomotora | del tender | Pares de ruedas acopladas | Presion normal de la caldera | Estado de conservación. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sin nombre | Baldwin | Pasajeros | 1878 | Trenes mixtos | 29.760 | 19.120 | 2 | 140 | nueva |
| 2 | ,, | Rogers | ,, | 1871 | ,, | 27.775 | 18 100 | 2 | 140 | buena |
| 3 | ,, | ,, | ,, | 1871 | ,, | 27.775 | 18.100 | 2 | 140 | buena |
| 4 | ,, | ,, | ,, | 1890 | ,, | 24.600 | 20 125 | — | 140 | regular |
| 5 | ,, | ,, | Cambios | 1891 | M. y cambios | 17 035 | ,, | 2 | 120 | buena |
| 6 | ,, | ,, | ,, | 1871 | Suptcia. | 10 440 | ,, | 1 | 120 | regular |
| 7 | ,, | ,, | ,, | 1904 | M. y cambios | 16.735 | ,, | 2 | 120 | nueva |

### *4-4-0 d/w 56", cyls. 14x22", built by Baldwin in 1910*

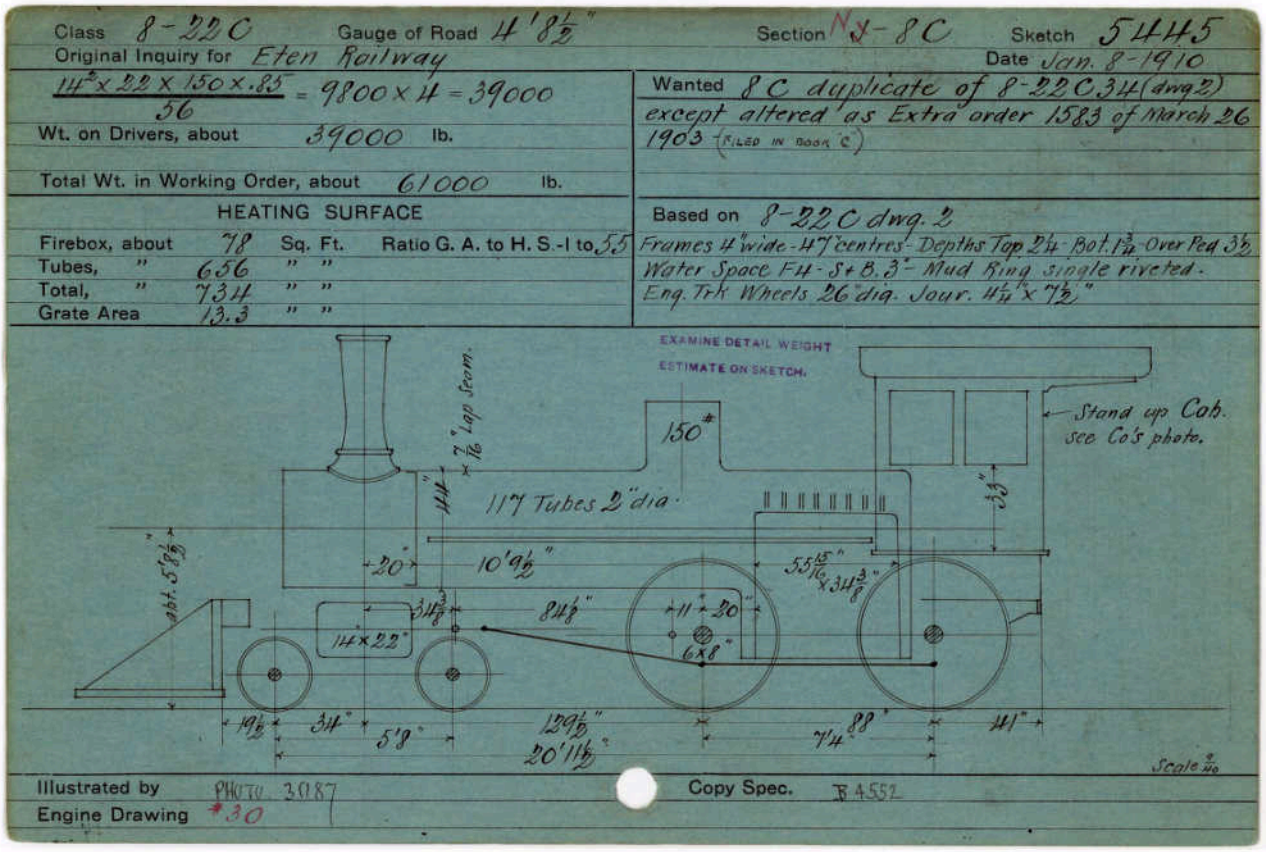
Ordered for *Empresa del Muelle de Eten*. BLW class 08-22C no. 123. Spec. is in vol. 36 p220. Mark on tank 'F. C. DE ETEN'. Bell between sandbox and smokestack. Monsefú is the name of a town in northern Peru.

**8 'MONSEFU'** w/n 35189 Rebuilt 1958? In service late 1960s/early 1970s.

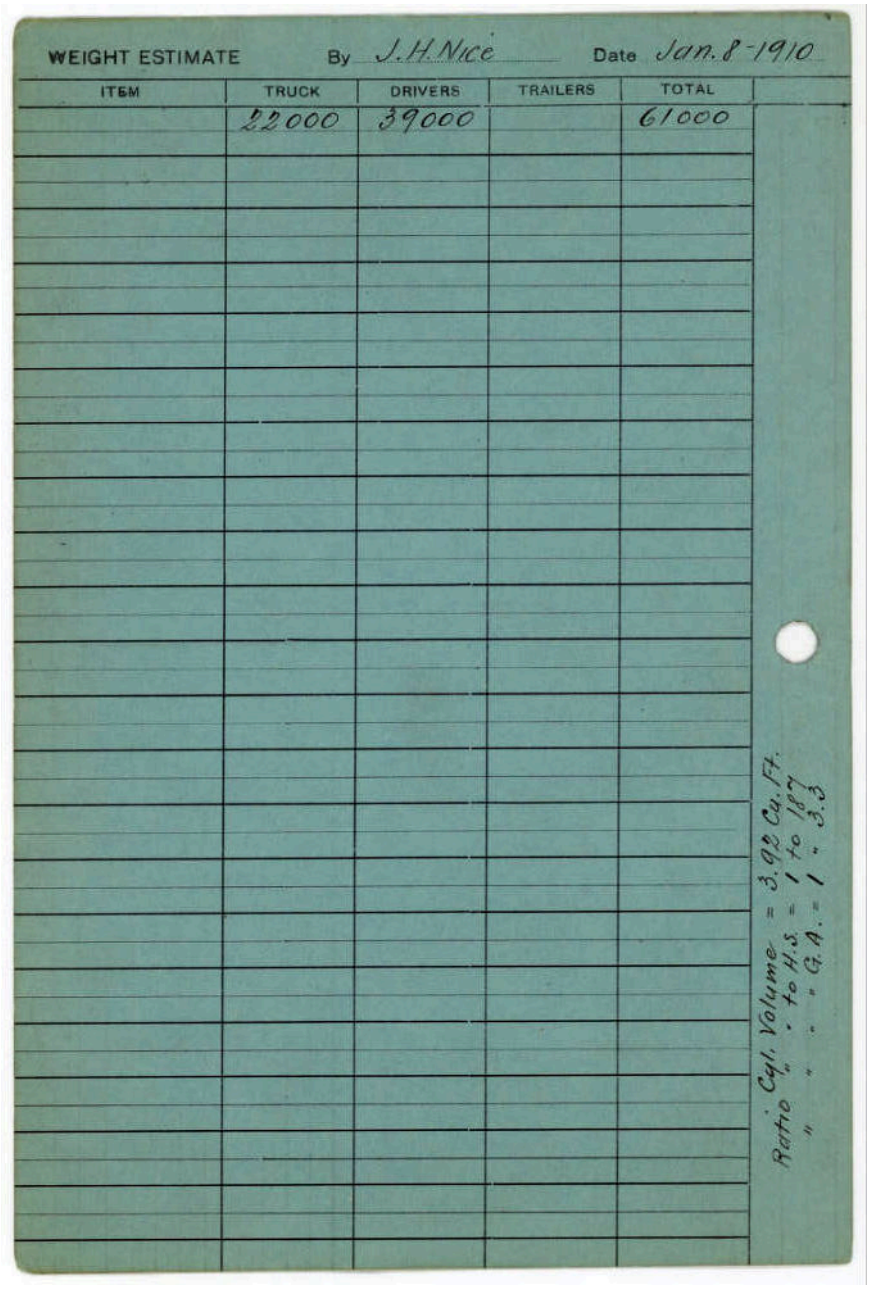

No. **8 'MONSEFU'** as depicted in a photo available from Getty Images.



The photo was found in Mills and Christian's *World of South American Steam*, published in 1974 [9].




The development card seen above and below would appear to have been that created when the order for Baldwin 0-22C no. 123 was being agreed. The dimensions given appear to be identical to those of the loco as constructed.



WEIGHT ESTIMATE By J.H. Nice Date Jan. 8-1910

| ITEM | TRUCK | DRIVERS | TRAILERS | TOTAL |
|---|---|---|---|---|
| | 22000 | 39000 | | 61000 |

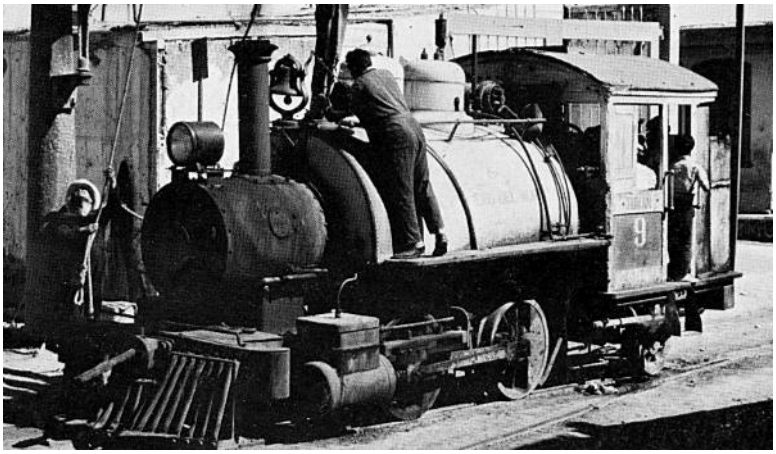
Ratio Cyl. Volume = 3.92 Cu. Ft.
" " to H.S. = 1 to 187
" " " G.A. = 1 = 3.3

### *0-4-2ST d/w 37", cyls. 11x16", built by Baldwin in 1913*

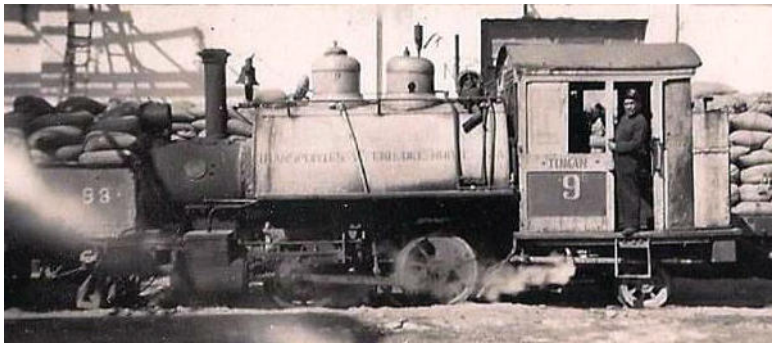
Ordered for *Empresa del FC y Muelle de Eten*. BLW class 06-16 1/3C no. 66. Spec. is in vol. 49 p135. As many parts as possible to be made interchangeable with engine no. **7**. Mark on tankside 'E. DEL F. C. y M. DE ETEN' (sic).

**9 'PIMENTEL'** w/n 40735 1914? "*Con su personal efectuo tambien la armadura de la locomotora **"Pimentel" No. 9.***" and "*La llegada en estos dias, de la nueva locomotora No. **9**, ha sido un gran alivio para el recergado servicio que ahora se hace.*" [Box EFE 2 at the *Archivo General de la Nacion*]
Renamed **'TUMAN'**? In service late 1960s/early 1970s.


This image is from Baldwin negative 04700 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.



The photo was found in Mills and Christian's *World of South American Steam*, published in 1974.




## The fleet in 1914

1915 *"En las locomotoras Nos.* ***1, 2, 3, 5, 7, 8, 9****, se han efectuado reparaciones consistentews en redduccion de bronces, limpieza de inyectores, colocacion de parrillas en los hornos, etc., habiendose cambiado 20 tubos de calefaccion en el caldero de la No.* ***2****, 16 en la No.* ***3****, 24 en la No.* ***8****. habiendose ejecutado identicos trabajos en la No.* ***6****.*

*La No.* ***5*** *se encuentra actualmente reparando, habiendose tomado las medidas necesarias identicos para hacer el pedido de un nuevo caldero.*

*Ha sido terminada ya la refeccion de la locomotyora No.* ***4*** *y puesta enservicio; se la ha dotado de una nueva caja de fuego, nuevos tubos, siendo tambien nuevas las planchas exteriores de la misma caja, los tubos de vapor, cilindros y pistones."*

However, if no. **6** had been renumbered **1** by 1908, how come we have an engine with that number in 1914?

## The fleet in 1915

*"Locomotoras.– **No. 1** – Reduccion general de bronces, cambio de empaquetadora metalica de los pistones y cuñas, reparacion de los tubos del caldero, limpieza dew inyectores, cambio de dos ruedas y dos cajones. En las locomotoras Nos. **2, 3, 4, 6, 7, 8** y **9**, se han efectuado trabajos de reparacion analogos, habiendosele cambiado, ademas, a la **No. 4** la chimenea para poder quemar leña, y colocado 24 tubos nuevos para el caldero de la **No. 7**. A la locomotora **No. 5**…"*

and *"Locomotoras. – En todas estas se ha efectuado las reparaciones corrientes, como reduccion general de bronces, limpieza de inyectores, reparacion de llaves, etc., y ademas las siguientes:*

***No. 1**. – Cambio de 48 tubos del caldero, nueva valvula de bronce para la llave del soplador; reparacion de la empaquetadura de los pistones, colocacion de los pares de ruedas de acero, media parrilla y un pedestal de fierro fundido par un truque del tender.*

***No. 2**. – Colocacion de dos arcos para el caldero y forro exterior de planchas de zinc.*

***No. 3**. – Reparacion de tubos del caldero y dos chumaceras nuevas para el truque.*

***No. 4**. – Reparacion de los tubos del caldero en el extremo a la caja de fuego dos valvulas nuevas de bronce y nuevo cedazo para la chimenea.*

***No. 5**. – Cambio de las zapatas de fierro de los breques y un resorte nuevo.*

***No. 6**. – Una chumacera nueva.*

***No. 7**. – Cuatro resortes nuevos, dos zapatas de bronce; reparacion de los tubos del caldero en el extremo a la caja de fuego, cuatro zapatas de fierro fundido para los breques.*

***No. 8**. – Reparacion de empaquetaduras metalicas, un par de ruedas de acero y 4 chumaceras de bronce para un truque del tender.*

***No. 9**. – Reparacion de los tubos del caldero en el extremo a la caja de fuego."*

## The fleet in 1925

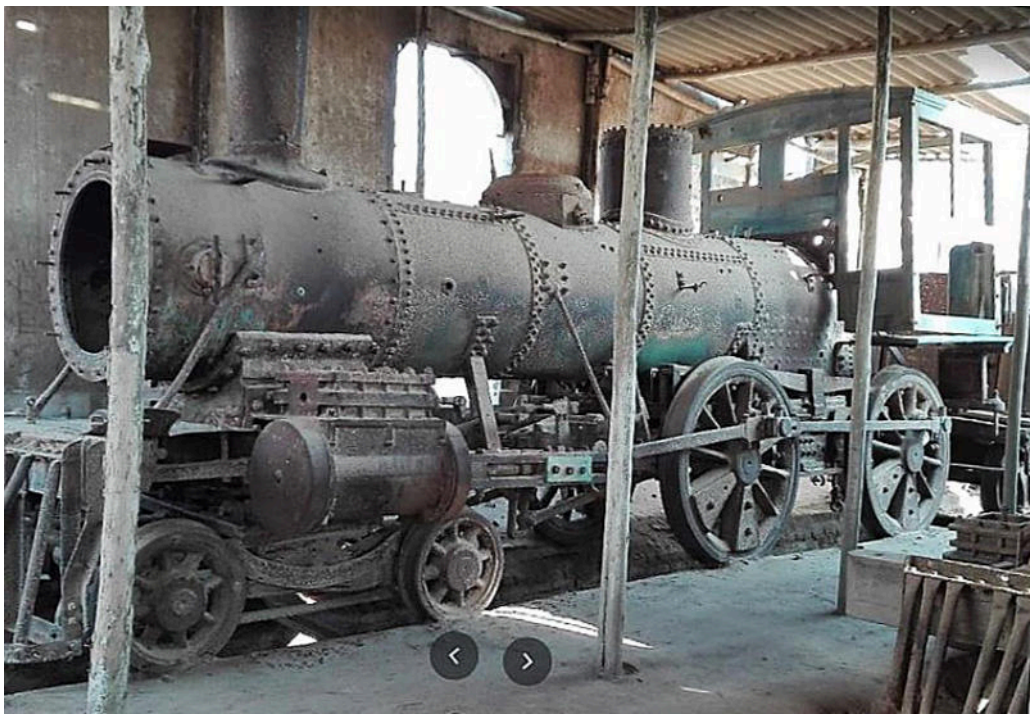
Source [2], the US report, states that there were five locos of 45 tons each, three of 20 tons, and one of 10 tons. It generalizes when it implies that all were 4-4-0s. Similarly the cylinder sizes were given as 14x22" or 11x16". The railway had indeed had five 4-4-0s with 14x22" cylinders, though other sources had given the impression that the very first had disappeared by that date.

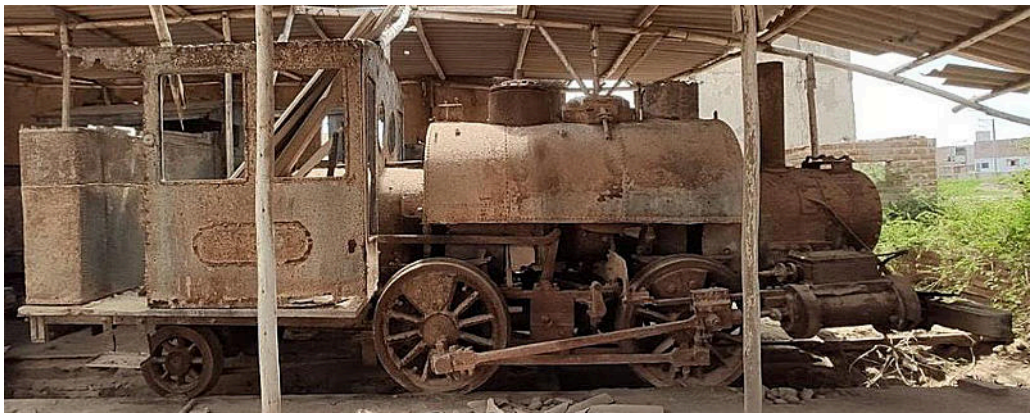
"In 1924 owned 4 4-4-0, 3 0-4-2 and 1 2-2-0, 80-freight cars, 15 passenger cars and one rail motor."

## The survivors

"There is a good collection of old steam locomotives of this private line belonging to the *Compañía del Ferrocarril y Muelle de Eten*. By Law 15974 its rolling stock was handed over to the municipalities of Chiclayo, Ferreñafe, Pimentel and Monsefú. Some old passenger coaches exist and a wagon all in very bad condition. They are in charge of the municipality but are the responsibility of the Peruvian Institute of Culture. An abandoned station can also be seen at Eten."

Locos in store at Puerto Eten in recent years.





## The *Archivo General de la Nacion*

The *AGN* in Lima, at its site along the side of the Palacio de Justicia, holds seven boxes of *FC y Muelle de Eten* papers. Unfortunately the *AGN* is nothing like the Chilean *Archivo Nacional* or *Archivo de la Administracion*, or the Costa Rican *Archivo Nacional*. Those may not be quite as high-tech as the British National Archives at Kew, but they are at least reasonably quick and efficient at getting researchers seated and supplied with documents. In contrast, the

*AGN* can take a few days to book you a seat, then only handing over one folio from a box at any one time, and moreover charging 7 Soles per box for photographic permits. The online catalogue by the way, gives no detail of the contents of any item. Small wonder that I could only view five of the *FC y Muelle de Eten* boxes over two full mornings. In the circumstances deep access to the archives is likely to be limited to those living in Lima, for visitors are likely to find the experience both long-winded and expensive.

The boxes that I examined were nos. 2, 3, 4, 6 and 7. As well as some details of loco (and other types of) maintenance in the years 1913-18 and the the 1950s as reported above, they contained details and outline plans of bridges, buildings, and the *muelle*, proposals for extensions of the line, legal documents including land transfers, etc.

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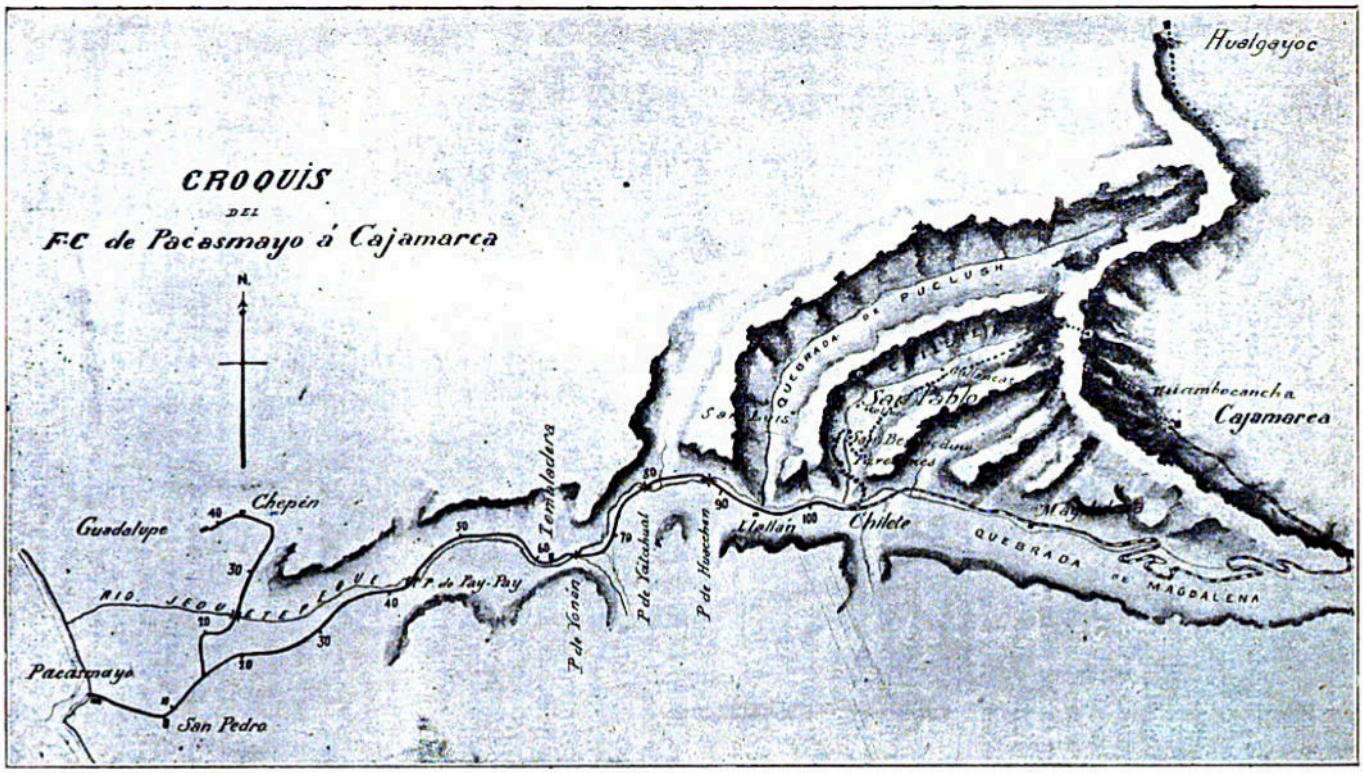
## 13.1.3 *El FC Pacasmayo, Guadalupe y Chilete*

***Regiónes de La Libertad y Cajamarca***

**1870-1890**

## then operated by the Peruvian Corporation

**1890-1968**




The map shows Pacasmayo to the left, on the coast. Chilete is just right of centre, and Cajamarca away to the right. The branch to Guadalupe heads north not far from the coast.

### Background

Standard gauge. 105 +25 km. Originally intended to reach Cajamarca but never got there. Construction began 1871, reached Chilete in 1908. First 10km built by Sr. Rafael Barbe, then taken over by Sres. Zapata y Gregorio Garcia. Taken over by government which contracted construction to Enrique Meiggs.

146 km. in operation by 1874 but floods in 1877 led to operations being suspended. Operations resumed under government control again, but only as far as Yonah. 26 km. branch from San Pedro to Guadalupe, which no doubt served the large Hacienda Lurifico at ???

Line handed to Peruvian Corporation in 1880, and extended again to Chilete in 1907-8.

Railway eventually closed in 1968, though lines at port remained for several years after that.

Station at Pacasmayo has been restored as a museum. There are two BP 0-4-0WTs ex *FC Central* locomotives lying derelict there.

The information below requires careful study to reconcile various conflicting loco names.

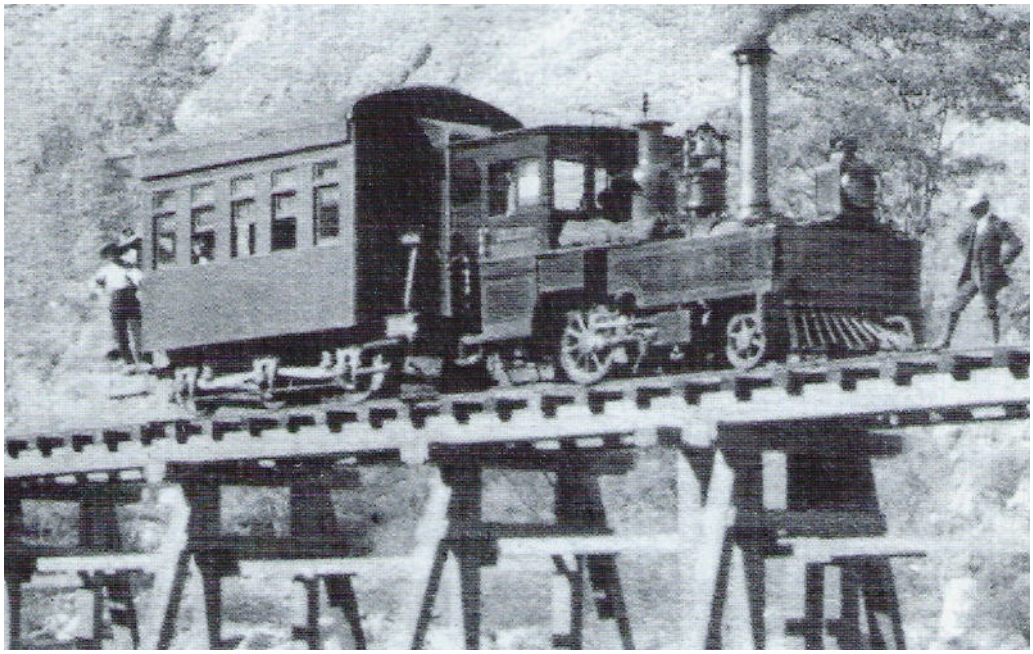
### *2-2-0T d/w ?, cyls. ?, built by ? in ?*

Ordered for ? Possibly one of the two Rogers 2-2-0Ts from the *FC Lima y Huacho* (see next section of this file).

**1 'CHILETE'** w/n ? An unnamed '*carro á vapor*' was listed in the 1892 mileage table but with no distance run specified [11, 1892 p452].

In use 1907 but off roster by 1908 according to AC.


When compared with the photo and blueprint of the *FCLAC* steamcars in section 13.2.1, this one has a shorter chimney, a bellstand, some kind of small tank in the gap between tank and cab, and different cab side windows, but otherwise appears to be of the same basic design. Photo from Sr. Abrill Talevera's *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos* page on Facebook.



**'CHILETE'** on the La Monica bridge.

### *2-6-0 d/w 49", cyls. 17x22", built by Rogers in 1871*

Ordered for *FC Pacasmayo Guadalupe y Magdalena*.

**2 'PACASMAYO'** w/n (1889) "*40 toneladas de peso, 12 años de servicio, en reparacion en la factoria, su fogon y tubos gastados*" [11, 1884 p298]. Comment in 1887 list was: *Esta maquina se encuentra actualmente en reparacion, mu dando sus tubos y reconstruyendo su tender* [11, 187 p502].
Ran 17036.04 km. in 1890 [11, 1890 p748].
Ran 6533.29 km. in 1891 [11, 1891 p434].
Ran 14143.09 km. in 1892 [11, 1892 p452].
Ran 12016.62 km. in 1893 [11, 1893 p632].
Ran 9711.27 km. in 1894 [11, 1894 p416].

Ran 12817.06 km. in 1895 [11, 1895 p242].
Ran 9934.98 km. in 1896 [11, 1896 p680].
Ran 17926.94 km. in 1897 [11, 1897 p582].
Described in 1908 as being in good condition at that time.
Involved in derailment at Yonan siding on 9th July 1954 but solely minor damage to tender.

**3 'La VIÑA'** w/n (1892) La Viña was apparently the railhead 16 km. east of Chilete until floods cut the route in 1878. This loco was trapped in floods that year but rescued and returned to service, see paragraph below. Was in service in 1884 but not in 1887 or thereafter. Was this the **'La VIÑA'** that ended up on the *FC Pisco á Ica*?

### *2-6-0 d/w 49", cyls. 17x22", built by Danforth in 1873*

Ordered for *Pacasmayo Guadalupe y Magdalena*

**4 'MAGDALENA'** w/n 821 Trapped in floods/washouts in 1878 and abandoned for many years at La Viña station. Possibly never returned to service. Not listed in 1908.

**5[1] 'CACERES'** w/n 822 Name not mentioned in 1884 list [11, 1884 pp298-9] or in 1887 [11, 1887 p500-3].
Ran 11120.98 km. in 1890 [11, 1890 p748].
Ran 14653.71 km. in 1891 [11, 1891 p434].
Ran 11228.57 km. in 1892 [11, 1892 p452].
Ran 8391.14 km. in 1893 [11, 1893 p632].
Name not mentioned in 1894-6 mileage lists.
Not listed in 1908.

### *2-6-0 d/w 45", cyls. 18x22", built by Rogers in 1873*

Ordered for *FC Pacasmayo Guadalupe y Magdalena*. Copeland's list says that these engines were stored and only shipped to Peru somewhat later.

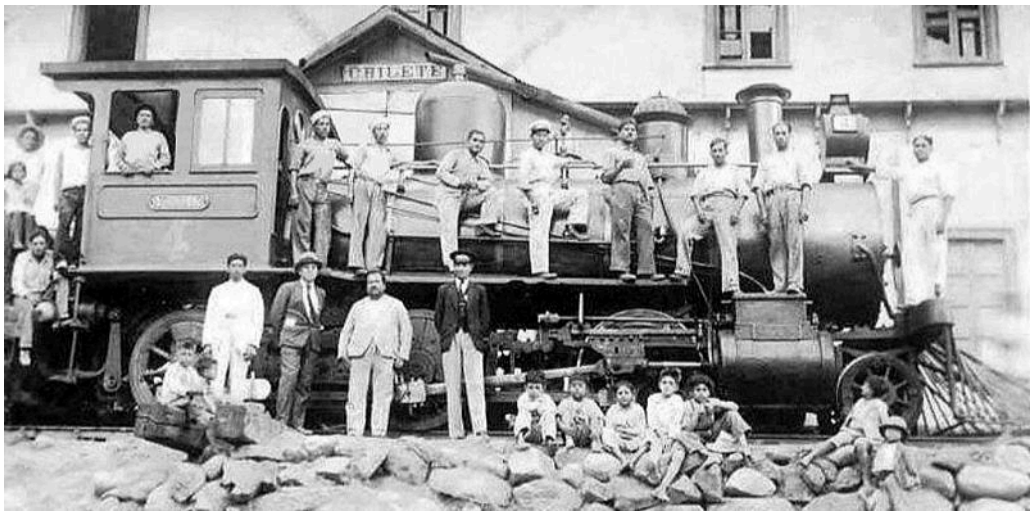
**5[2] 'GUADALUPE'** w/n 2353 Later renamed **'CAJAMARCA'**? before 1887. Repairs that year: *Tubos del escape del vapor reparados. Chimenea id. 16 tubos del caldero cambiados. Pernos, tornillos y bronces id. Anillos de los pistones, renovados. Pistones torneados. Anillos de los cilindros cambiados. Las correderas, cepilladas. Estrobos de las excentricas, reparados. Llaves de desfogue de los cilindros, cambiados. Resorte de la palanca id. Casa y reloj, reparados. Tender, completamente reparado.* [11, 1887 p500]. In use on Pacasmayo to Guadalupe trains at that time.
Not listed in mileage tables 1888-1893.
Ran 5498.12 km. in 1894 [11, 1894 p416].
Ran 8283.68 km. in 1895 [11, 1895 p242].
Ran 9252.66 km. in 1896 [11, 1896 p680].
Ran 1046.19 km. in 1897 [11, 1897 p582].
Described in 1908 as being in good condition at that time.
Involved in accident on 9th December 1937 at Km. 38.5 when loco and train tail-ended the previous train in the dark. Minor damage (cow-catcher destroyed and smokebox door damaged) to loco.

**6 'CONTRATISTA'** w/n 2355 Later renamed **'GUADALUPE'**? before 1908. Trapped in floods/washouts in 1878 and abandoned for many years at La Viña station. This makes it difficult to understand how in 1887 the following repairs could be

undertaken: *42 tubos del caldero, renovados. Caja de fuego, reparada. Tubos de vapor id. Tubos de escape, renovaclos. Pernos, tornillos, cufias y bronces, id. Anillos de los pistones de los cilindros, id. Pistones de los cilindros, torneados. Correderas, cepilladas. Estrobos de las excentricas, id. Puerta de la hornilla, renovada Pistones de las bombas, tornedas. Una valvula, renovada. Tender, totalmente reparado. Casa y reloj, id.* [11, 1887 p501]. In use on Pacasmayo to Guadalupe trains at that time.
Named in 1890 mileage table but no figure given for distance run. [11, 1890 p748].
Ran 11265.53 km. in 1891 [11, 1891 p434].
Ran 14354.009 km. in 1892 [11, 1892 p452].
Ran 13138.78 km. in 1893 [11, 1893 p632].
Ran 12215.20 km. in 1894 [11, 1894 p416].
Ran 11782.42 km. in 1895 [11, 1895 p242].
Ran 18827.24 km. in 1896 [11, 1896 p680].
Ran 16893.34 km. in 1897 [11, 1897 p582].
Described in 1908 as being in good condition at that time.
Derailed 21st January 1929 at Chepen station. no damage.

**7 'TRUJILLO'** w/n 2357 Trapped in floods/washouts in 1878 and abandoned for many years at La Viña station. Possibly never returned to service. Not listed in 1908.

**8[1] 'PERUANA'** w/n 2359 "*40 toneladas de peso, 10 años de servicio, en estado regular para el servicio*" [11, 1884 p298]. Repairs in 1887: *Chimenea, renovada. Tender, completamente reparado. Casa y reloj, id. Anillos de los pistones renovados. Cilindros y pistones torneados. Correderas, cepilladas. Pernos, tornillos, cuñas y bronces renovados. Bombas, torneadas. 20 tubos del caldero, renovados. Anillos y pistones para las bombas, id. Tapa de cilindro, id. Resortes centrales, reparados. Estrobos de excentrica, id*. [11, 1887 p501].
In use on Pacasmayo to Guadalupe trains at that time.
Named in 1890 mileage table but no figure given for distance run. [11, 1890 p748].
Named in 1891 mileage table but no figure given for distance run. [11, 1891 p434].
Named in 1892 mileage table but no figure given for distance run. [11, 1892 p452].
Named in 1893 mileage table but no figure given for distance run. [11, 1893 p632].
Named in 1894 mileage table but no figure given for distance [11, 1894 p416].
Named in 1895 mileage table but no figure given for distance [11, 1895 p242].
Named in 1896 mileage table but no figure given for distance [11, 1896 p680].
Named in 1897 mileage table but no figure given for distance [11, 1897 p582].
Under repair in 1908.




This appears to be a Rogers mogul, numbered **4**, and the station name behind it is Chilete. Other than that, little is known, though the cabside name-plate appears to be relatively short.

### *0-4-0ST d/w 34", cyls. 10x18", built by Rogers in 1871*

Ordered for *FC Pacasmayo Guadalupe y Magdalena.*

**9**[1] **'RELÁMPAGO'** w/n (1895) "*Las dos maquinas pequeñas; el "**Rayo**" y el "**Relampago**" de servicio constante en Pacasmayo y para el trayecto de San Pedro, estan muy gastadas y necesitan de una refaccion completa*" [11, 1884 p299]. Repairs done in 1887 included: *Composturas y renovaciones: I2 tubos al caldero, nuevos. Tubos de vapor reparados. Correderas, cepillada. Anillos de los cilindros, renovados. Pistones de los cilindros, nuevos y de acero. Bomba y piston, torneados. Resortes centrales y palanca renovados. Caja de humo reparada. Chimenea renovada. Estrobos de excentrica cepillados. Pernos, tornillos, cuñas y bronces renovados* [11,1887 p501].

Ran 4084.08 km. in 1890 [11, 1890 p748].

Ran 3273.30 km. in 1891 [11, 1891 p434].

Named in 1892 mileage table but no figure given for distance run. [11, 1892 p452].

Ran 1270.22 km. in 1893 [11, 1893 p632].

Ran 1708.62 km. in 1894 [11, 1894 p416].

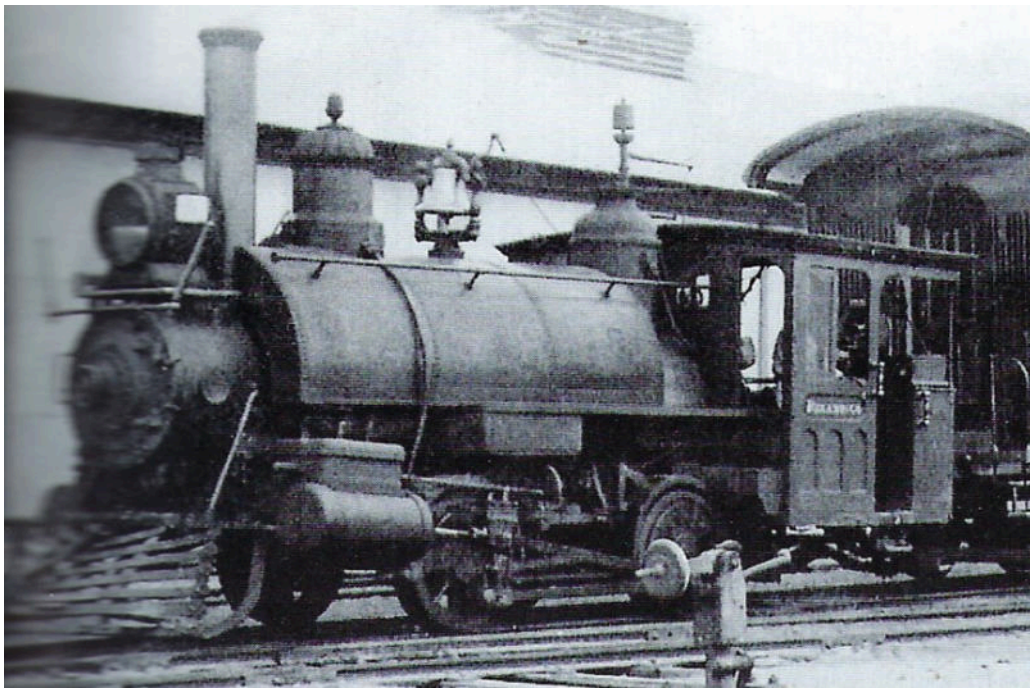
Named in 1895 mileage table but no figure given for distance [11, 1895 p242].

Named in 1896 mileage table but no figure given for distance [11, 1896 p680].

Named in 1897 mileage table but no figure given for distance [11, 1897 p582].

Described in 1908 as for *patio* (shunting) use, and in good condition at that time.

Source [5] vol. 1 p40 says still in use in 1931.



No. **9 'RELAMPAGO'** by Rogers.

### *0-4-0 d/w 34",cyls. 10½x18", built by Rogers in 1873*

Ordered for *FC Pacasmayo Guadalupe y Magdalena*. Held and not shipped until July 1874.

**10 'RAYO'** w/n 2230 "*Las dos maquinas pequeñas; el "**Rayo**" y el "**Relampago**" de servicio constante en Pacasmayo y para el trayecto de San Pedro, estan muy gastadas y necesitan de una refaccion completa*" [11, 1884 p299]. Repairs done in 1887 included: *Anillos de los cilindros renovados. Pistones de los cilindros torneados. Bomba y piston id. Pernos, tornillos, cuñas y bronces renovados. Tubos de vapor reparados. Resortes id* [11, 1887 p501].
Ran 512 km. in 1890 [11, 1890 p748].
Ran 1123.65 km. in 1891 [11, 1891 p434].
Named in 1892 mileage table but no figure given for distance run. [11, 1892 p452].
Ran 5370.00 km. in 1893 [11, 1893 p632].
Ran 2496.62 km. in 1894 [11, 1894 p416].
Named in 1895 mileage table but no figure given for distance [11, 1895 p242].
Named in 1896 mileage table but no figure given for distance [11, 1896 p680].
Named in 1897 mileage table but no figure given for distance [11, 1897 p582].
In good condition in 1908.

### *2-6-0 d/w 49", cyls. 17x22", built by Rogers in 1873*

Ordered for *FC Pacasmayo Guadalupe y Magdalena*. Connelly's Rogers list says these locos were sold to the *FC Mexicano* as their nos. **34-37** in May 1873 via W. W. Evans. Copeland confirms these locos were never delivered to this railway.

(**?** w/n 2221)
(**?** w/n 2223)
(**?** w/n 2225)
(**?** w/n 2227)

### *? d/w ?, cyls. ?, built by ? in ?*

Ordered for ?

| | | |
|---|---|---|
| **'FAVORITA'** | w/n ? | Identity unknown but in 1887 the following repairs were undertaken on this engine: *Los tubos del caldero reparados. Anillos de los pistones, pistones y correderas id. Un eje acoplado renovado. Dos ruedas id. Tapas de la caja de vapor id. Pernos, tornillos y bronces id. Un cochecito nuevo para pasajeros* [11,1887 p501].<br>Named in 1893 mileage table but no figure given for distance run. [11, 1893 p632].<br>Ran 114.53 km. in 1894 [11, 1894 p416]. NB Text explicitly states that this loco was not numbered. |

## The 1878 floods

Serious washouts and flooding in 1878 destroyed sections of track and left four locomotives marooned. One of them, the **'La VIÑA'**, was rescued and returned to service, but three others, **'TRUJILLO', 'MAGDALENA'** and **'GUADALUPE'**, were abandoned at the isolated La Viña station for many years [11, 1884 p298]. "*Las locomotoras se encuentran en un estado ruinoso, han sustraido la mayor parte de las piezas principales y estan abandonadas a la intemperie.*" [11, 1887 p503].

The remaining five large locos were listed in 1884 as follows:

***"1° "La Peruana"*** *40 toneladas de peso, 10 años de servicio, en estado regular para el servicio.*

***2.° "La Pacasmayo"*** *40 toneladas de peso, 12 años de servicio, en reparacion en la factoria, su fogon y tubos gastados.*

***3.° "La Cajamarca"*** *40 toneladas de peso, 10 años de servicio, estado aparente de servicio, regular.*

***4..• "La Contratista,"*** *como la anterior.*

***5.' "La Viña"*** *40 toneladas de peso, 12 años de servicio, acaba de ser reparada y ha recibido algunas piezas accesorias nuevas, esta sirviendo bien.*"

This is confusing, as there is no mention of **'CACERES'** but both **'CAJAMARCA'** and **'CONTRATISTA'** are mentioned. These were presumably the original nos. **5** and **6** renumbered.

A more general comment followed:

"*Las locomotoras que he anotado como en un estado aparente de servicio regular, necesitaran sin embargo muy pronto de una refaccion mayor, por su tiempo de servicio, y porque desde la ocupacion chilena, las refacciones mayores han sido evitadas en lo posible. La falta de un registro de locomotoras llevado en orden, conforme a lo prescrito por el articulo 74 del Reglamento de ferrocarriles no me permite entrar en mas detalles.*".

Then on p304, a perplexing reference:

*El material rodante tampoco ha sufrido ningun deterioro; pero hay una locomotora en el corte de Santa Clara, tres mas en la Viña y un cierto numero de coches y carros, que se hallan sin salida hasta que se restableza el trazo continuo del ferrocarril o se emplee otro modo para su traslacion.*"

## The fleet in 1887

Source [10], the *Anales de las Obras Públicas del Perú* for 1887, summarises the fleet on pages 500-503: (NB Loco names have been shown in bold here, for easy of searching.)

"*Material rodante.—El material rodante se compone de: 6 Locomotoras y un carrito a vapor. 4 Coches de 1a clase para pasajeros. 4 Coches de 2a clase para pasajeros. Coche mixto. 5 Bodegas. 3 Jaulas. 44 Carros plataformas (dos inservibles.) Carro de equipaje.*

*Los coches de 14 y 24 clase necesitan ser pintados.*

*Locomotoras.—(«**Cajamarca**», «**Contratista**» y «**Peruana**». Diametro de los cilindros, 0m455. Golpe 0m568. Distancia de los ejes 2m13. Diametro de las ruedas 1m11, Superficie de los tubos 73m²12. Superficie de la Caja de fuego 11m²48. Número de tubos 164. Superficie de un tubo 0m²445. Peso, cargadas 53 toneladas. Según el registro de*

*locomotoras, las composturas y renovaciones son las siguientes:*
*«**Cajamarca**».--Tubos del escape del vapor reparados. Chimenea id. 16 tubos del caldero cambiados. Pernos, tornillos y bronces id. Anillos de los pistones, renovados. Pistones torneados. Anillos de los cilindros cambiados. Las correderas, cepilladas. Estrobos de las excéntricas, reparados. Llaves de desfogue de los cilindros, cambiados. Resorte de la palanca id. Casa y reloj, reparados. Tender, completamente reparado.*
*«**Peruana**».—Chimenea, renovada. Tender, completamente reparado. Casa y reloj, id. Anillos de los pistones renovados. Cilindros y pistones torneados. Correderas, cepilladas. Pernos, tornillos, cuñas y bronces renovados. Bombas, torneadas. 20 tubos del caldero, renovados. Anillos y pistones para las bombas, id. Tapa de cilindro, id. Resortes centrales, reparados. Estrobos de excéntrica, id.*
*«**Contratista**» –42 tubos del caldero, renovados. Caja de fuego, reparada. Tubos de vapor id. Tubos de escape, renovados. Pernos, tornillos, cuñas y bronces, id. Anillos de los pistones de los cilindros, id. Pistones de los cilindros, torneados. Correderas, cepilladas. Estrobos de las excéntricas, id. Puerta de la hornilla, renovada. Pistones de las bombas, tornedas. Una válvula, renovada. Tender, totalmente reparado. Casa y reloj, id,*
*« **Rayo** y **Relámpago**». Diametro de los cilindros 0m278. Golpe 0m46. Distancia de los ejes 1m98. Diámetro de las ruedas 0m83. Número de tubos 64. Superficie de los tubos 26m²81. Largo de los tubos 2m97. Superficie de un tubo 0m419. Peso, vacías; 20 toneladas. «**Relámpago**».—Composturas y renovaciones: 12 tubos al caldero, nuevos. 12 tubos de vapor reparados. Correderas, cepillada. Anillos de los cilindros, renovados. Pistones de los cilindros, nuevos y de acero. Bomba y pistón, torneados. Resortes centrales y palanca renovados. Caja de humo reparada. Chimenea renovada. Estrobos de excéntrica cepillados. Pernos, tornillos, cuñas y bronces renovados. «R**ayo**» Anillos de los cilindros renovados. Pistones de los cilindros torneados. Bomba y piston id. Pernos, tornillos, cuñas y bronces renovados. Tubos de vapor reparados. Resortes id.*
*«**Favorita**». Los tubos del caldero reparados. Anillos de los pistones, pistones y correderas id. Un eje acodado renovado. Dos ruedas id. Tapas de la caja de vapor id. Pernos, tornillos y bronces id. Un cochecito nuevo para pasajeros.*
*El valor medio total de las composturns y renovaciones de las maquinas, ascendió en el primer año del arrendamiento á doce mil soles de plata (S. 12,000.)*
*«**Pacasmayo**». Diámetro de los cilindros 0m442. Golpe 0m568. Distancia de los ejes 2m13. Diámetro de las ruedas 1m20. Superficie de los tubos 74m²47. Superficie de la caja de fuego 8m²48. Numero de tubos 164. Superficie de un tubo 0m²454. Esta maquina se encuentra actualmente en reparacion, mudando sus tubos y reconstruyendo su tender.*
*Las locomotoras que hacen el servicio de Pacasmayo a Guadalupe son: «**Cajamarca**», «**Contratista**» y «**Peruana**». Se encuentran en muy buen estado y marchan ordinariamente con la velocidad de 23 kilómetros por hora.*
*El recorrido medio, anual de las locomotoras, es de 10,656 kilometros. Los materiales consumidos por kilómetro son: Leña 30k437. Aceite 0'0416. Sebo 0k0536. Hilaza 0k0007. El costa del material consumido es: Leña por mil kilógramos S. 4 60. Aceite por litro S. 0.37. Sebo por kilógramo S. 0.35. Hilaza por kilógramo S. 0.46.*
*Sección de Yonan a la Villa.*
*Esta Seccion que no corre á cargo de la Empresa actual, y que desde el año de 1877 ha venido sufriendo una série de averías, producidas por las crecientes del rio, y que eras inevitables, puesto que la vía había sido construida en el mismo cauce del rio, probablemente por economía, y no se había tornado la menor precaución, siquiera para atenuar los efectos de la invasion de las aquas, hoy se haya, pues, en completa ruina.*
*En la superstructura, sólo se puede contar con los rieles, deduciendo una tercera parte por pérdidas y con las casas de las estaciones de Chilete y la Viña cuyo valor ha disminuido en un 50 por ciento. No habiendo habido vigilancia alguna, el público ha dispuesto, á su antojo, de ese costoso material. Los pernos y planchas ó platinas han desaparecido. Los durmientes, también, casi han desaparecido y los pocos que quedan se hallan en estado inservible*
*En cuanto al material rodante, en Lives se encuentran una bodega y una jaula; en Chilete una jaula; en la Viña un coche de primera clase, dos coches de 2a clase, de estos uno inservible, dos jaulas, una bodega y tres locomotoras («**Trujillo**», «**Magdalena**» y «**Guadalupe**». Las locomotoras se encuentran en un estado ruinoso, han sustraído la mayor parte de las piezas principales y están abandonadas á la intemperie.* ”

## Livesey & Co. report in 1889

Messrs Livesey & Co. inspected a number of Peruvian railways in 1889, immediately prior to the setting up of the Peruvian Corporation. The collected reports are in the Peruvian Corporation archive held by University College,

London, but actually available for inspection at The National Archives, Kew. Their report on this railway includes the following paragraphs:

Rolling stock.

The rolling stock consists of 6 locomotives, 9 passenger cars, and 44 wagons. All this stock has been allowed to fall to a low ebb, and requires thorough overhauling and repair. £6,000 have been allowed for this work.

Yonan to Chilete Railway destroyed in 1878.

In 1878 a severe flood carried away a considerable portion of the Railway, which is now only worked as far as Yonan.

It would not be difficult to restore the Line to Chilete, as a great part of it is in good condition, the rails yet being on the ground.

The rolling stock of this Section, most of which is lying at La Viña, consists of—

Rolling stock at La Viña.

Three locomotives.
Three passenger coaches.
Sixteen freight cars.

These locomotives have been left out of doors for ten years at the mercy of the weather, and are necessarily the worse for wear; although they have not suffered, owing to the dryness of the climate, as much as might have been expected.

## The fleet in 1908

Costa y Laurent [1], writing in 1908, gives the fleet as comprising the above locos **2, 5, 6, 8, 9** and **10**.

LOCOMOTORAS

| No. | NOMBRE | Fabricante | Tipo | Fecha en la que entró al servicio por la vez. | Servicio que hace | PESOS Equipada para el servicio de la locomotora | del tender | Pares de ruedas acupladas | Presión normal de la caldera | Estado de conservación. |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Pacasmayo ... | Rogers | Mogul | Año 1871 | Tráfico | 28,000 K. | 17,000 K. | 3 pares | 120 Lbs | Bueno |
| 5 | Cajamarca ... | ,, | ,, | ,, 1873 | ,, | 23,000 ,, | 17,000 ,, | 3 ,, | 120 ,, | ,, |
| 6 | Guadalupe.... | ,, | ,, | ,, 1873 | ,, | 23,000 ,, | 17,000 ,, | 3 ,, | 120 ,, | ,, |
| 8 | Peruana . | ,, | ,, | ,, 1871 | ,, | 23,000 ,, | 17,000 ,, | 3 ,, | 120 ,, | En reparn |
| 9 | Relámpago... | ,, | Tanque | ,, 1871 | Patio | 20,000 ,, | | 2 ,, | 110 ,, | Bueno |
| 10 | Rayo ..... | ,, | ,, | ,, 1873 | ,, | 20,000 ,, | | 2 ,, | 110 ,, | ,, |

### *2-6-0 d/w 50", cyls. 16x24", built by Baldwin in 1917*

Ordered for Peruvian Corporation for *FC Paita a Piura*. BLW class 08-26D no. 207. Spec. is in vol. 66 p188.
Radley & Hunter stack. Shipped south to Pacasmayo at unknown date.
**$8^2$ 'SOJO'** w/n 46969

## The fleet in 1925 and 1932

Source [2] reported that there were seven American-built locos in service in 1925. However, it looks as the majority of the fleet was replaced during the early decades of the 20th century.
In 1932, the railway owned seven locomotives, 14 passenger cars and 61 freight cars. Four of the locomotives were designated for train service, and three for switching. All were fueled by coal.
The original Rogers 0-4-0ST yard locomotives were eventually replaced by Beyer Peacock 0-4-0WT locomotives

brought in from the Central Railway of Peru.

### *2-8-0 d/w ?, cyls. ?, built by ? in ?*

Ordered for ?  It has been speculated that this was ex *FC Paita a Piura* no. **9**, but whilst they have similarities the two engines are not identical.

**9**[2]  w/n ?


No. **9** from the *Memoria Sobre Rieles - Museo de Historia Ferroviaria Peruana* page on Facebook.

### *? d/w ?, cyls. ?, built by ? in ?*

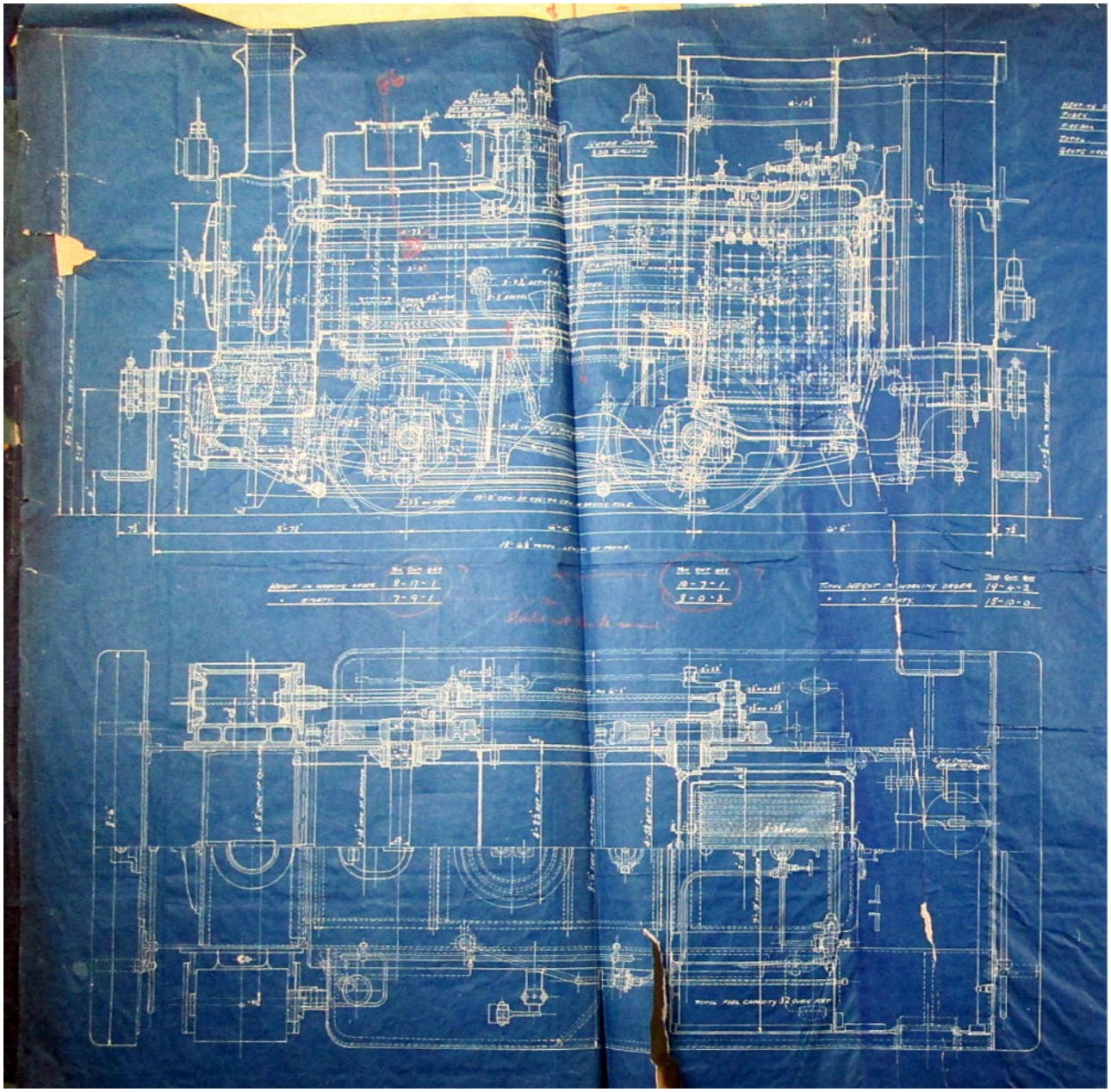
Ordered for ?

**11**  w/n ?

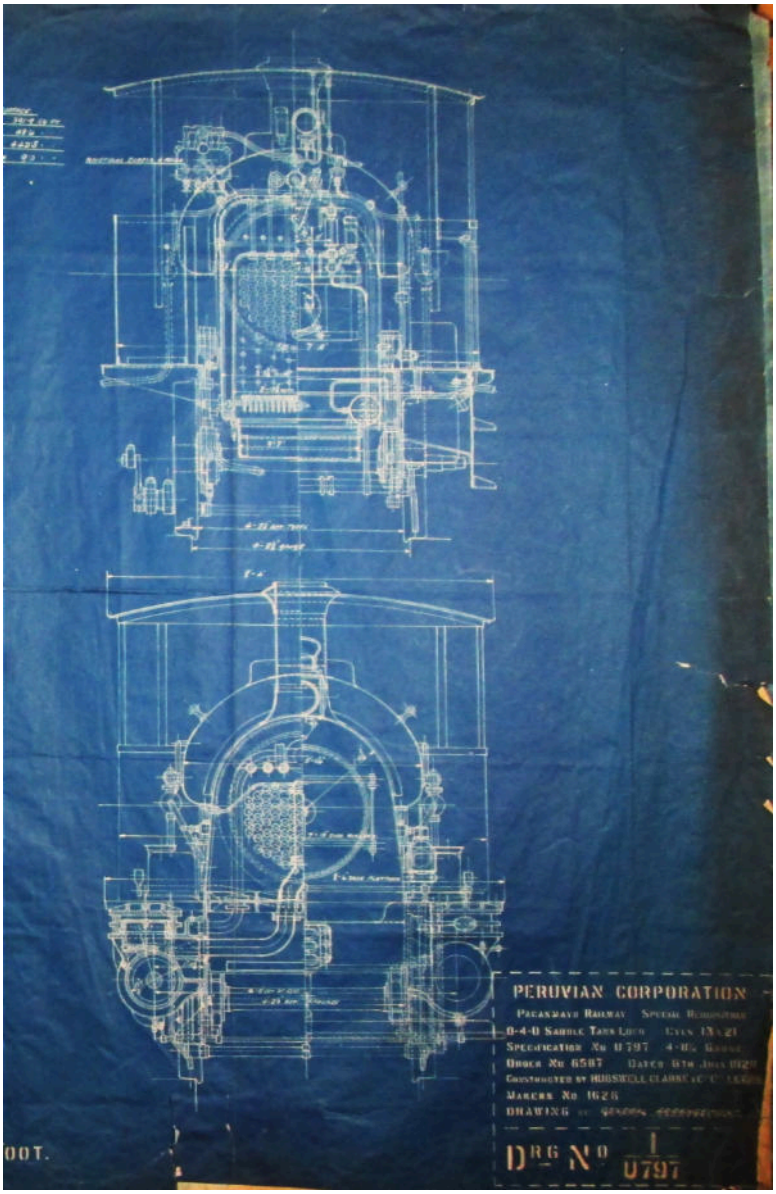
### *0-4-0ST d/w 39½", cyls. 13x21", built by Hudswell Clarke in 1929*

Ordered for Peruvian Corporation.  Copeland's list gives cyls. as 10x16".

**12**  w/n 1626



Drawings found in the Hunslet archive at Statfold Barn Farm in Staffordshire, UK. The Hunslet Engine Company took over the assets and goodwill of a number of defunct British loco builders over the decades.




### *? d/w ?, cyls. ?, built by ? in ?*

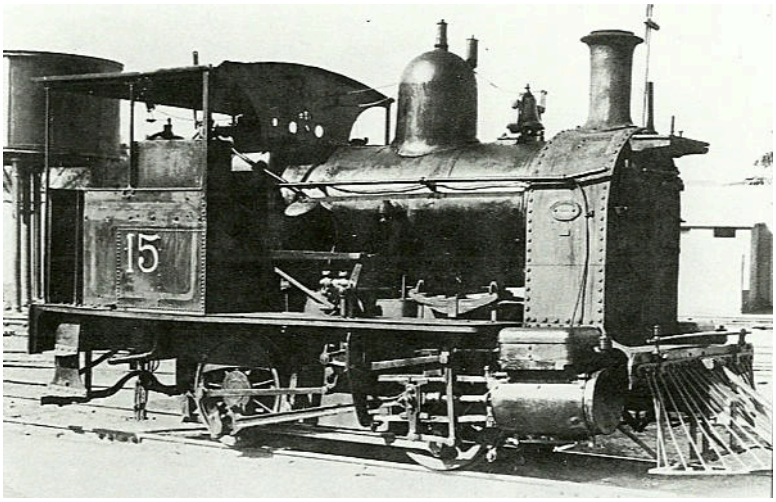
Ordered for ?

| | | |
|---|---|---|
| **13** | w/n ? | |

### *0-4-0WT d/w 39½", cyls.13x21", built by Beyer Peacock in 1909? or 1913?*

Three engines 5282-5184 ordered for *FC Central* as their nos. **31²**, ?, and **32²**.

| | | |
|---|---|---|
| **14** | w/n 5182 | Present in late 1960s/early ’70s. |
| **15** | w/n ? | |
| **16** | w/n 5183 | Present in late 1960s/early ’70s. |




This BP well tank numbered **15** has as yet not been precisely identified.

Two of the ex *FCC* Beyer Peacock tank locos lay derelict at the site
of the old Pacasmayo station for many years. This photo of one of them
is from Sr. Elio Galessio's blog at
http://trenesdelperu.blogspot.com/2011/07/loomotora-beyer-peacock-en-pacasmayo.html


More recently, the development of Pacasmayo's tourist potential
has prompted a certain amount of tidying up, including the painting of these two engines.

### *2-6-0 d/w ?, cyls. ?, built by ALCo in ?*

Ordered for ?

**2**[2] w/n ?

**4**[2] w/n ?

Another photo from a Facebook post by Sr. Abrill Talavera of Arequipá. This was captioned as being on the Chilete line. The precise identity of this 2-6-0 is still in doubt, though it has a Rogers style sand-dome and a rather later style – possibly ALCo – steam dome. The cabside bears the number **4**.

### *? d/w ?, cyls. ?, built by ? in ?*

Ordered for ?

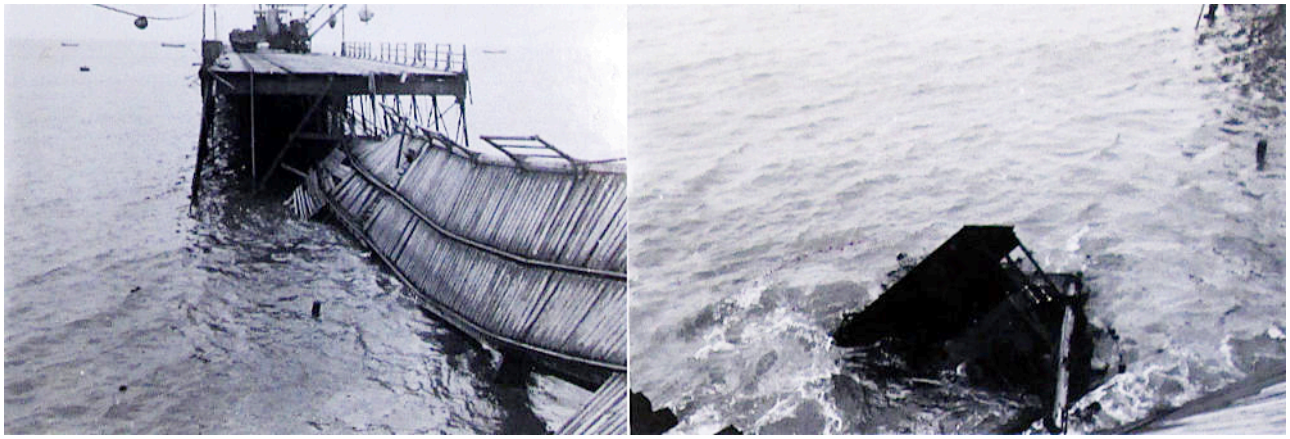
**5**[2] w/n ? .

**6**[2] w/n ?

This image was found on a Facebook page devoted to the Chepén area along this railway. The loco was probably a 2-6-0 but has a strange smokebox door and a Danforth-style cross-compensating beam in front of it. It has not yet been identified. 1958 was suggested as the date of the photo.

## Collapse of the Pacasmayo mole 1946

At the beginning of October 1946 part of the Pacasmayo mole or jetty collapsed, sending a loco no. **10** into the sea. It is not clear precisely which engine this was, though it might have been the original Rogers 0-4-0 no. **10 'RAYO'** from 1873.



The left hand image shows the collapsed section of the jetty,
whilst on the right is the loco in the sea.

## A report from the early 1950s

A set of Peruvian Corporation reports survive in the PC archive held by University College, London, but housed at The National Archives in Kew. The Pacasmayo railway section includes the following:

(b) Steam Locomotives.

These consist of (a) 4 old Rogers 2-6-0 type of ancient American vintage. 3 are in service and one is in shops under a rebuild with a new (reconditioned) boiler which was prepared in Trujillo shops (b) three small 0-4-0 Tank Engines for mole and yard shunting, all three being in service.

These locomotives cover the present freight traffic but if there are any extensive new developments such as mineral traffic or limestone for a possible new Cement Works additional locomotive power will be required.

Assuming the new Paita 500 HP Diesel locomotives prove successful the most economical way of operating the Pacasmayo freight traffic would be by complete dieselisation and scrapping of the old steam locomotives. The old 0-4-0 Tank locomotives should continue until they are finally worn out when they too could be replaced by diesel at some long distant date.

If however increased freight traffic should come on us too quickly to provide new locomotives in time requirements would have to be met by transfer of two or thee of the older lighter type locomotive up from the Central or Southern Railways. Under no circumstances however difficult should we do anything to discourage additional freight traffic and should cooperate to the maximum.

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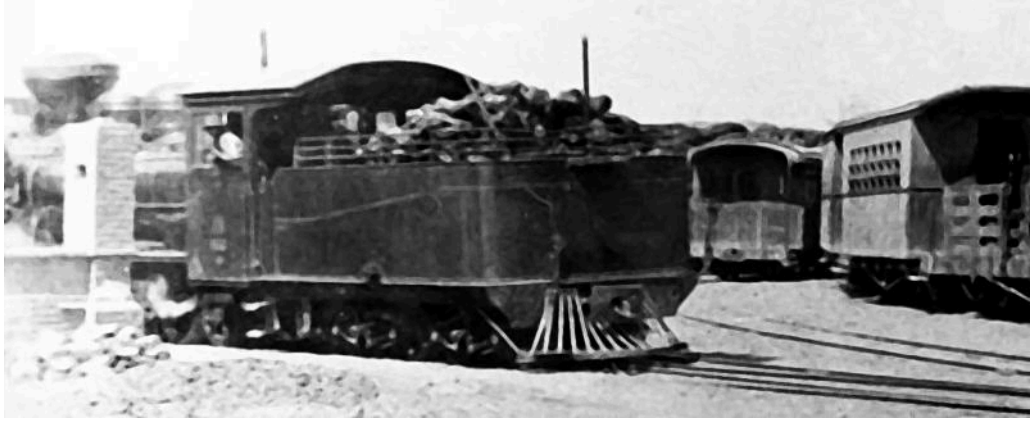
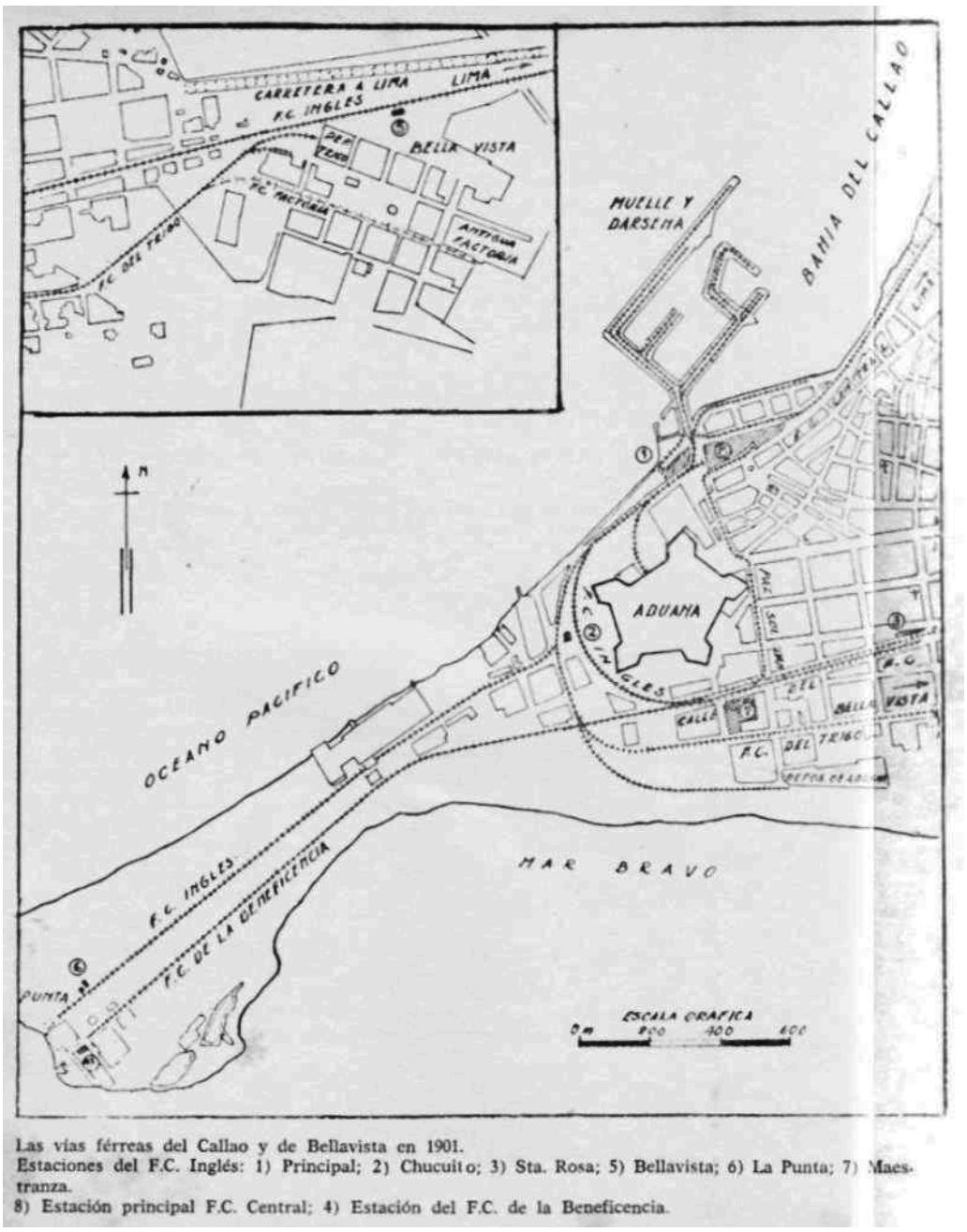


A somewhat puzzling photo, supposedly taken at Guadalupe in 1935, but showing a loco and stock that are more of narrow gauge style than standard gauge.

## 13.2 Lines from Lima

### 13.2.1 *El Ferrocarril Callao á La Punta*




Las vías férreas del Callao y de Bellavista en 1901.
Estaciones del F.C. Inglés: 1) Principal; 2) Chucuito; 3) Sta. Rosa; 5) Bellavista; 6) La Punta; 7) Maestranza.
8) Estación principal F.C. Central; 4) Estación del F.C. de la Beneficencia.

A map showing the two routes out to La Punta as they were in 1901, from source [22].

**Background**

Source [1], Costa y Laurent's 1908 paper, states: *La Sociedad de Beneficencia Pública del Callao, solicitó del Supremo Gobierno permiso para establecer una línea férrea, de tracción animal, entre la calle de Paz Soldán, de ese puerto, y el caserío y baños de La Punta, el que le fue concedido por decreto del 23 de julio de 1863, auxiliándosele con los rieles que sirvieron para las obras de la Penitenciaría de Lima y sujetándosele a las condiciones siguientes: Prohibición para introducirse con la línea y ramificarse en la población. Tarifa de dos reales por viaje de ida y regreso a los adultos y de un real a los niños. Conclusión de la obra en el término de un año a partir de la fecha del decreto de concesión.*

*Por decreto de fecha 1º de setiembre de 1869, se declaró que la Municipalidad del Callao debía ventilar sus derechos sobre los terrenos ocupados por la línea, ante el Poder Judicial, por resultar contencioso el asunto.*

*Teniendo la Empresa del ferrocarril entre Lima y el Callao, derechos de propiedad sobre la otra línea, la Beneficencia no tenía por qué obligarla a cruzar su línea, sino por loa medios que establecían las leyes. Así lo declaró el Gobierno, por decreto de fecha 30 de octubre de 1869.*

*En los años posteriores, hasta 1893, la Sociedad de Beneficencia del Callao continuó explotando este ferrocarril, ya directamente, ya mediante contratas de arrendamiento por un tanto mensual, para asegurar una renta estable y fija, que le permitiese contar con los medios precisos para atender los servicios de su instituto.*

The Callao Public Welfare Society requested permission from the Supreme Government to establish an animal-drawn railway line between Calle de Paz Soldán, in that port, and the hamlet and baths of La Punta, which was granted by decree of July 23, 1863, helping him with the rails that served for the works of the Lima Penitentiary and subjecting him to the following conditions: Prohibition to enter with the line and branch out in the population. Rate of two Reals per round trip for adults and one real for children. Conclusion of the concession within one year from the date of the concession decree.

By decree dated September 1, 1869, it was declared that the municipality of Callao had to discuss its rights over the land occupied by the line, before the Judiciary, as the matter was contentious.

Since the railroad company between Lima and Callao had property rights over the other line, the Sociedad de Beneficencia did not have to force it to cross its line, except by the means established by law. This was declared by the Government, by decree dated October 30, 1869.

In subsequent years, until 1893, the Callao Benevolent Society continued to operate this railway, either directly or through lease contracts for a monthly amount, to ensure a stable and fixed income. that would allow him to have the necessary means to attend to the services of his institute.

Whether this Beneficencia' tramway ever saw steam operation, either by its owners or by any of the lessees, is unknown, but there were locomotives in use in the Callao area which may have been use on this line; see below.

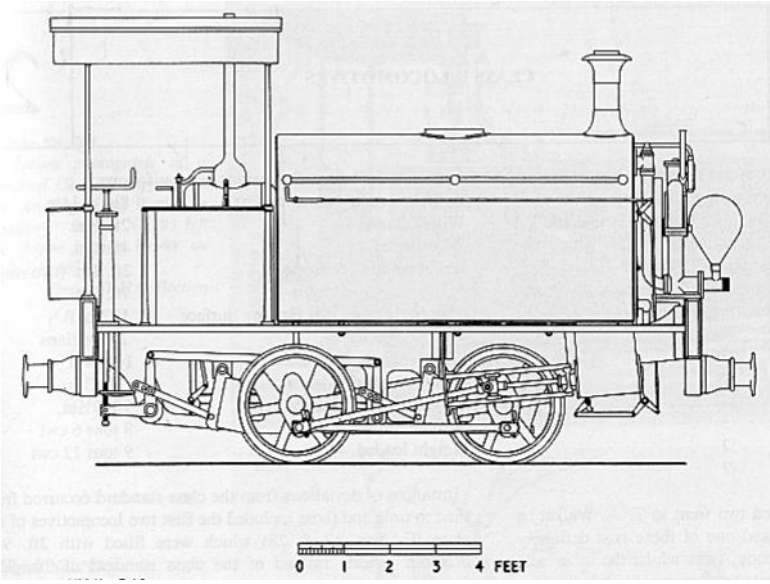
In 1895 the *FC Lima Callao y Chorrillos* (the 'English Company') opened its own railway to La Punta, but also seems to have taken responsibility for the Beneficencia line. This is explained much more fully in later paragraphs of Costa y Laurent's chapter. Certainly the map on the previous page, illustrating the situation in 1901, shows both routes as still in action.

### *0-4-0ST d/w 30", cyls. 6x12", built by Manning Wardle in 1865 and 1871*

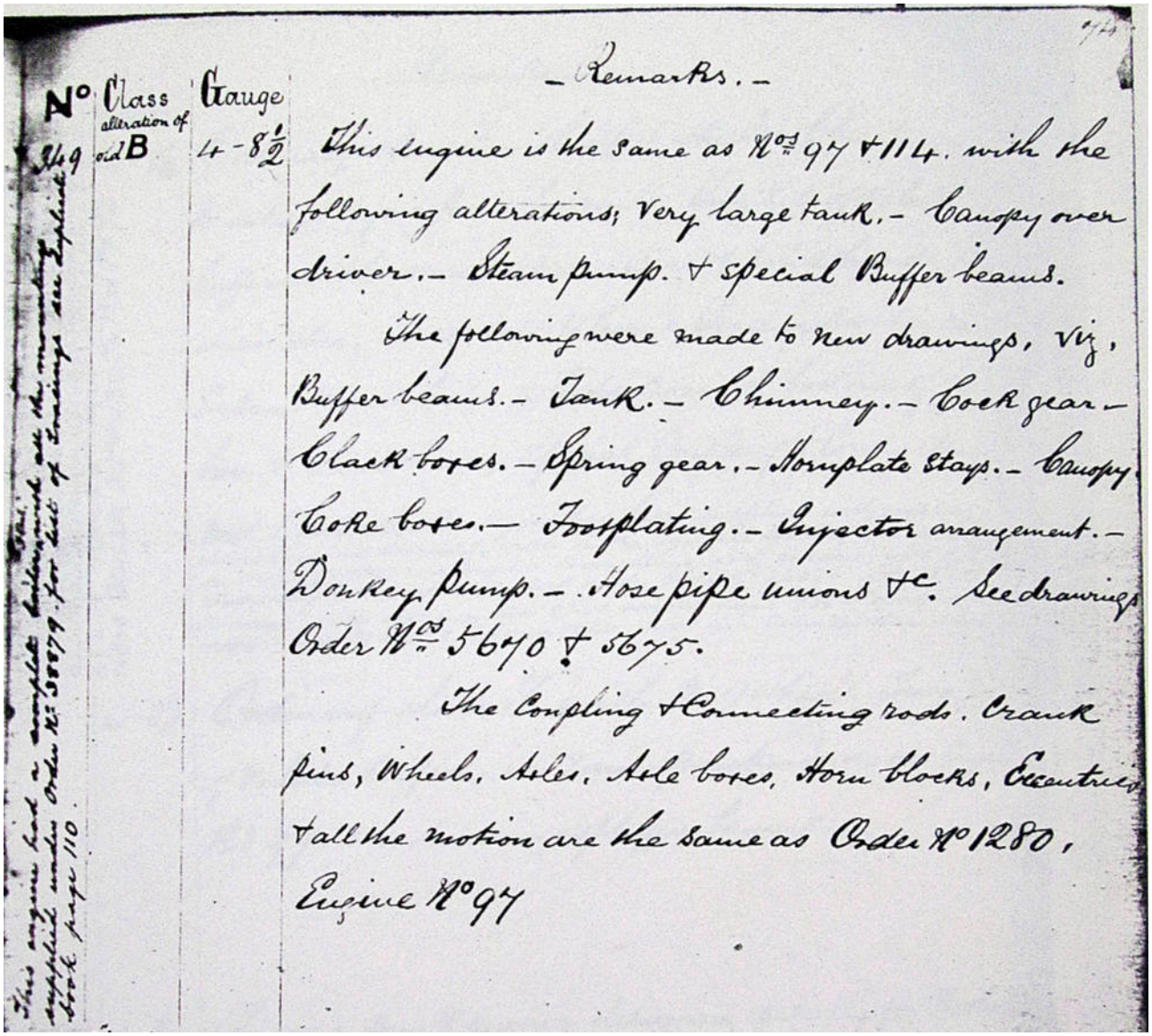
Second one ordered via Dreyfus Freres, and third via Cohen Bonas & Bros. All of MW class B. Location and use unconfirmed but probably all for this railway.

NB Both MW 322 and 349 were named **'CHUCUITO'** and arrived in Peru in 1870-1. The first was ordered by the Pacific Steam Navigation Co., and the second via Dreyfus Freres for the government. One eventually went to the *FCLCC*, probably no. 349 as no. 114 also went there.

| | | |
|---|---|---|
| **'HERMANA'** | w/n 114 | Later became *FCLCC* no. **18**[1] **'HERMANA'**. Renamed later as **'La PUNTA'**. |
| **'CHUCUITO'** | w/n 349 | Harman quotes order book as saying "As engine no. 97 but with much larger tank, canopy, steam pump and special buffer beams." Later became *FCLCC* no. **25 'CHUCUITO'**. |
| **'OLIVERA'** | w/n 389 | Harman says order book states "same as engine no. 97". |




A drawing by Fred Harman from the MW general arrangement drawing for MW no. 349, showing the very large saddle tank and the smokebox-mounted pump.



| No | Class | Gauge |
|---|---|---|
| 349 | alteration of old B | 4 - 8½ |

– Remarks. –

This engine is the same as Nos 97 & 114. with the following alterations; very large tank. – Canopy over driver. – Steam pump. & special Buffer beams.

The following were made to new drawings, viz, Buffer beams. – Tank. – Chimney. – Cock gear – Clack boxes. – Spring gear. – Firebox stays. – Canopy. Coke boxes. – Footplating. – Injector arrangement. – Donkey pump. – Hose pipe unions &c. See drawings Order Nos 5640 & 5675.

The Coupling & Connecting rods. Crank pins, Wheels. Axles. Axle boxes, Horn blocks, Eccentrics & all the motion are the same as Order No 1280, Engine No 97

This engine had a complete boilerplate on the smokebox which was Order No 58879. for list of drawings see Engine book page 110.

The Manning Wardle notes for their loco no. 349.

## Railway leased by the Lima Railways

The Railway Times of May 22nd 1880 (p418), in a Lima Railways' Directors' report, records that the Lima Railways had taken a ten year lease of the La Punta line from 1879.

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# 13.2.2 *El FC de Lima á Ancón y Chancay* aka *el FC Lima y Huacho*

***Región de Lima***

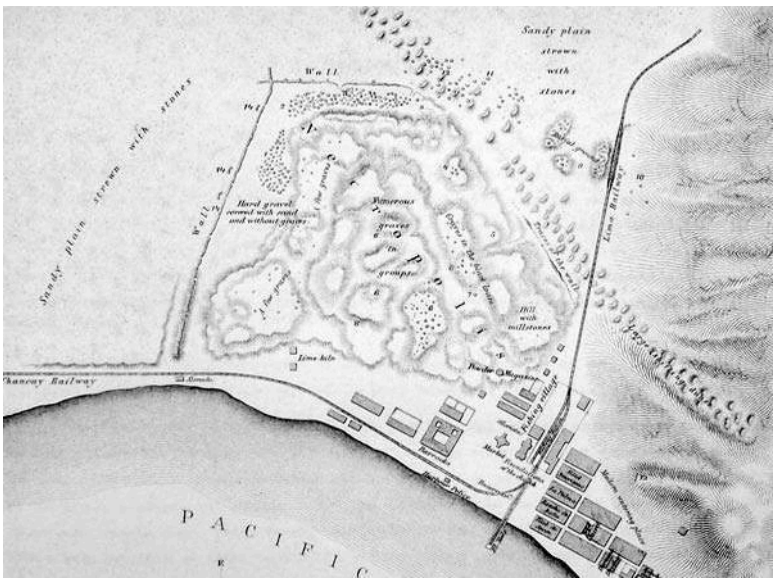
**1870-1890**

## then merged into the *FC Central*

**1890-1964**

### Background

Standard gauge. First proposed in 1867 by Don Modesto Basandre. Opened to Ancón by Waldo Grana in 1870, 42 km, and soon extended to Chancay via the vulnerable Pasamayo section which suffered from landslides. Connected at Chancay to the Ferrocarril Chancay-Huaraz-Hacienda Palpa. An extension from Huacho to Sayan was authorised but not built. The section beyond Ancón suffered during the War of the Pacific and was never reopened. In Ancón there was a branch to Arsenal of 7 km opened in 1953.




A plan of Ancón. The railway from Lima comes in at top right, and the short-lived extension onward to Chancay departed bottom left.

The Lima to Ancón section was temporarily operated by the *FC Lima á Oroya* in 1880, and became a permanent part of the *FC Central* in 1890, under the management of the Peruvian Corporation, via a bridge over the Rio Rimac to Desamparados station. Closed 1964.

Allen Copeland states that locos were initially named but not numbered, the numbers being allocated later. Certainly source [10] proves that numbers were in use by 1887.

### *?-?-? d/w ?, cyls. ?, built by ? before 1869*

File H-4 2124 in the *Archivo General de la Nacion* in Lima is a big ledger detailing payments made by the *contaduria* of this railway during the construction period, 1868-72. There are two brief mentions made of payments incurred during the transfer of a loco **'PERUANA'** from the *FC Pisco a Ica* during December 1869. Nothing is known of this, though it might well have been a small shunter/switcher used during construction of both railways. Note that it cannot have been the **'PERUANA'** later recorded on the FC Pacasmayo, Guadaalupe and Chilete as that was only built in 1871.

**'PERUANA'** w/n ?

### *4-4-0 d/w 60", cyls. 17x24", built by Rogers in 1869*

Ordered for Lima & Huacho. Rogers order no. 635.

**1 'LIMA'** w/n (1594)
Later **'VIRGINIA'**?

In 1884 (see below) a loco **1 'VIRGINIA'** was recorded as in the fleet, but not a **1 'LIMA'**. These were probably one and the same, renamed in 1880 by the *FC Callao, Lima y Oroya* during their time running the *FCLAC* so as to avoid confusion with their own engine **2 'LIMA'**. Not in service in 1887.

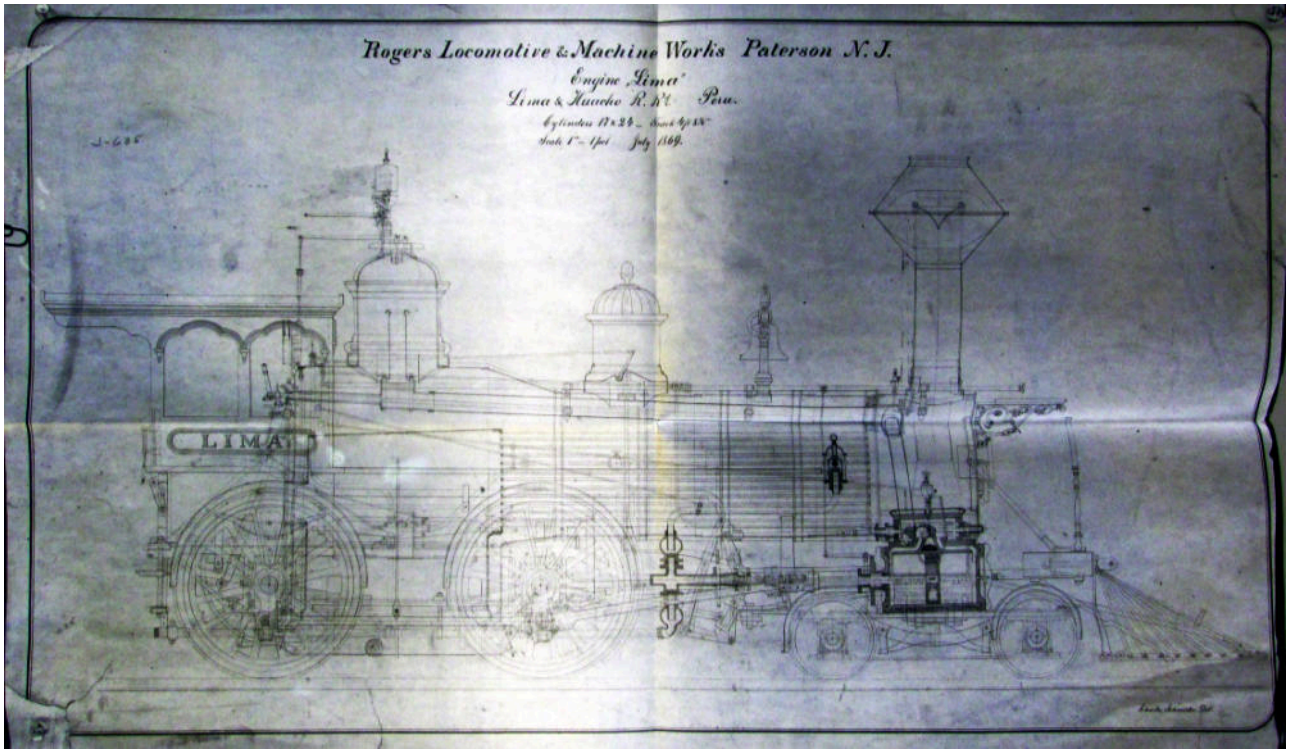



Image tonally inverted from photostats of original Rogers blue-prints in the P. C. Dewhurst collection at the NRM in York.

*FC Lima Ancón* 4-4-0 no. **1 'LIMA'** by Rogers.

## *2-6-0 d/w 49", cyls. 17x24", built by Rogers in 1869*

Ordered for Lima & Huacho. Rogers order no. 634. Shipped March 25 and March 31 1869. Driving wheelbase 14' 5" and total 21' 6". Boiler diameter at front 48".

**2 'ANCON'** w/n (1595)

Comment in 1874 [11, 1874A p118-9] that wheels (tyres meant?) had to be changed after only 40,000km owing to tighter curves than locos had been designed for, and that consequently train speeds had been reduced. In service in 1887, when budget for the loco's repair was approved [11, 1887 p146], and the following comments were made: *El movimiento todo es bueno lo mismo que los cilindros y pistones; mas tiene el fogon en mal estado, aunque sin presentar ningún riesgo, sino solo macho gasto de combustible. En efecto, 3 de los costados de la caja de fuego estan deteriorados, inclusive la plancha tubular rajada. Tiene 3 parches y necesita repararse* [11, 1887 p571].

Expenditure of up to 7,000 Soles approved in June of that year for the repair of this loco and of nos. **5 'HUACHO'** and **10 'CABALLITO'**.
Anales 1890: mention of costs of repairs to this loco and one other, January 1890 [11, 1890 p279].

**3 'CHANCAY'** w/n (1596) In service in 1887, when the Anales commented: *Se encuentra esta maquina en perfecto estado de servicio y conservacion* [11, 1887 p572].
Later became no. **26**[1] **'CHANCAY'** of the *FCCL&O/FC Central*.

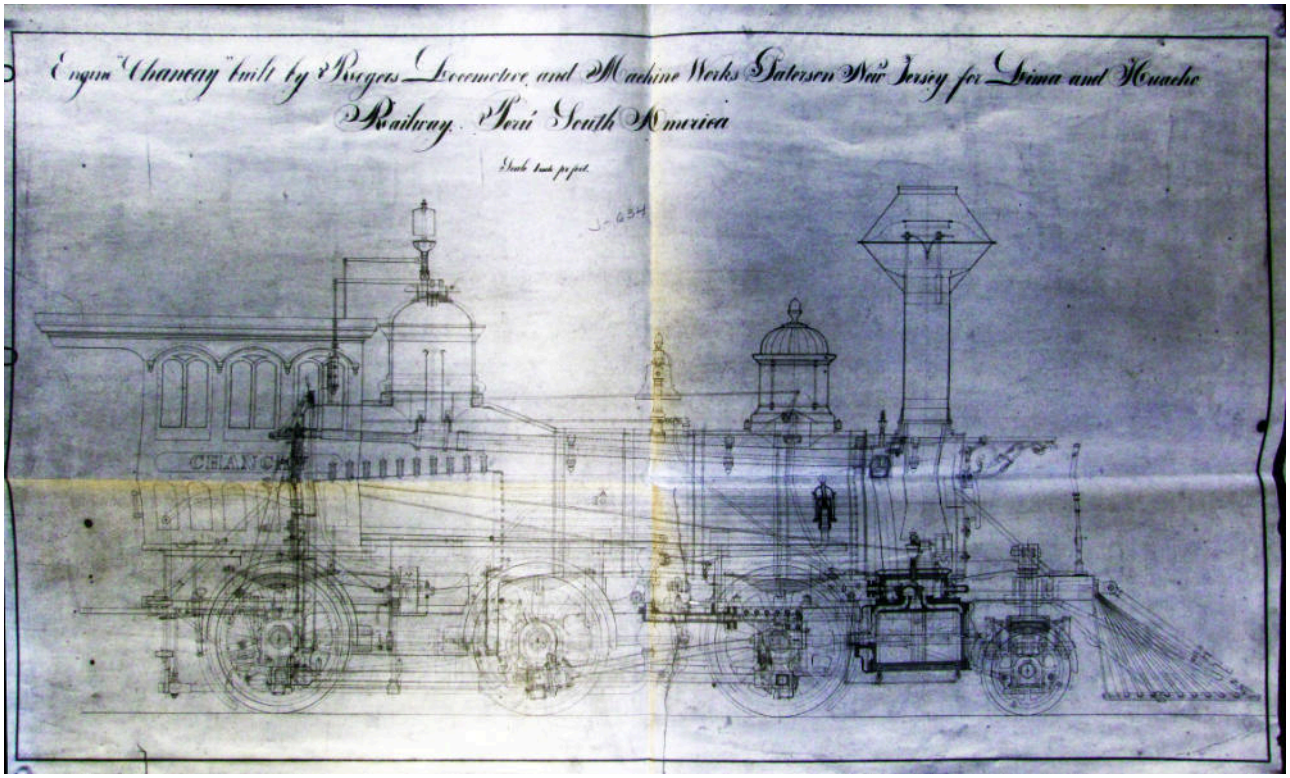



Image tonally inverted from photostats of original Rogers blue-prints in the P. C. Dewhurst collection at the NRM in York.

### *2-2-0T steam car d/w 30", cyls. 5x12", built by Rogers in 1869*

Ordered for Lima & Huacho, along with similar loco **'La JOYA'** for *FC Mejía y Arequipa*. Rogers order no. 641. Shipped Sept. 11 1869. Tank 142 gals.

**4 'CABALLITO'** w/n (1654) "*Sobre esta parte del camino ha corrido la maquina "Caballito," a razon de treinta y seis millas por hora, con perfecta seguridad y facilidad; y puedo hablar tanto mas positivamente, respecto de las condiciones del camino, cuanto que por haber yo mismo manejado la maquina, he tenido una magnifica oportunidad, no solo de ver sino de sentir todas las desigualdades que pudiera tener la via.*" [11, 1874A p333]. Possibly renumbered **6** by 1884, as in that year a different loco (**'INFANTAS'**) bore the number **4** and there was a **'CABALLITO'** numbered **6**. Not in service in 1887. Later became no. **31**[1] **'CABALLITO'** of the *FCCL&O/FC Central*, and then no. **8** of the *FC Pisco Ica* to be later renumbered **2**[2] .

Later **'INFANTAS'**?

### *2-4-0? d/w ?, cyls. ?, built by Rogers? in ?*

Ordered for ? Described as four-coupled and as being similar to the Rogers 2-4-0 no. **8 'PASAMAYO'**.

**4 'INFANTAS'** w/n ?

### *0-2-4RT d/w ?, cyls. 8x16", built by Danforth in 1871*

Ordered for Lima & Huacho.

**5 'HUACHO'** w/n 747 In service in 1887 with that number and name, when budget for the loco's repair was approved [11, 1887 p146], and these comments were made: *La plancha tubular esta deteriorada, necesitando cambiarse lo mismo que los tubos. Tanto la reparacion de esta maquina como la de la anterior han sido ya aceptadas por el Supremo Gobierno, debiendo principiarse el trabajo en estos dias* [11, 1887 p572]. Expenditure of up to 7,000 Soles approved in June of that year for the repair of this loco and of nos. **2 'ANCON'** and **10 'CABALLITO'**.
Possibly renamed **'ANCON'** at some point.
Later became no. **27**[1] **'ANCON'** of the *FCCL&O/FC Central*.

### *4-4-0 d/w ?, cyls. 16x24", built by Danforth in 1871*

Ordered for Lima & Huacho.

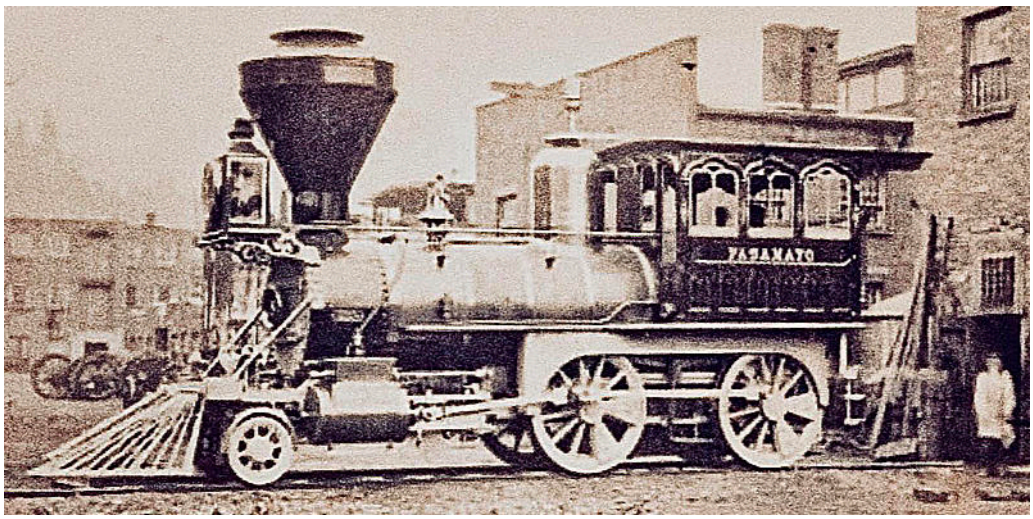
**6** w/n 748 Not in service in 1887.

### *2-4-0 d/w 54", cyls. 16x22", built by Rogers in 1871*

Ordered for Lima & Huacho. Rogers order no. 756.

**7 'CHILLON'** w/n (1878) Not in service in 1887.
Anales 1890: mention of costs of repairs to this loco and one other, January 1890 [11, 1890 p279].
Later became no. **28 'CHILLON'** of the *FCCL&O/FC Central.*

**8 'PASAMAYO'** w/n (1880) Not in service in 1887.
The 1888 Anales say: *1 Locomotora grande como la **"Infantas"** llamada **"Pasamayo"** para carga en muy mal estado tambien, fogon muy destruido, cilindros, embolos y varas respectivas en buen estado, pero falta la mayor parte de lo demas del mecanismo y el estanque. Las ruedas y la "casa" en regular estado, avaluada en S2000* [11, 1888 p399-400].




Rogers 2-4-0 no. **8 'PASAMAYO'**. Photo from the *En Tren* page on Facebook.

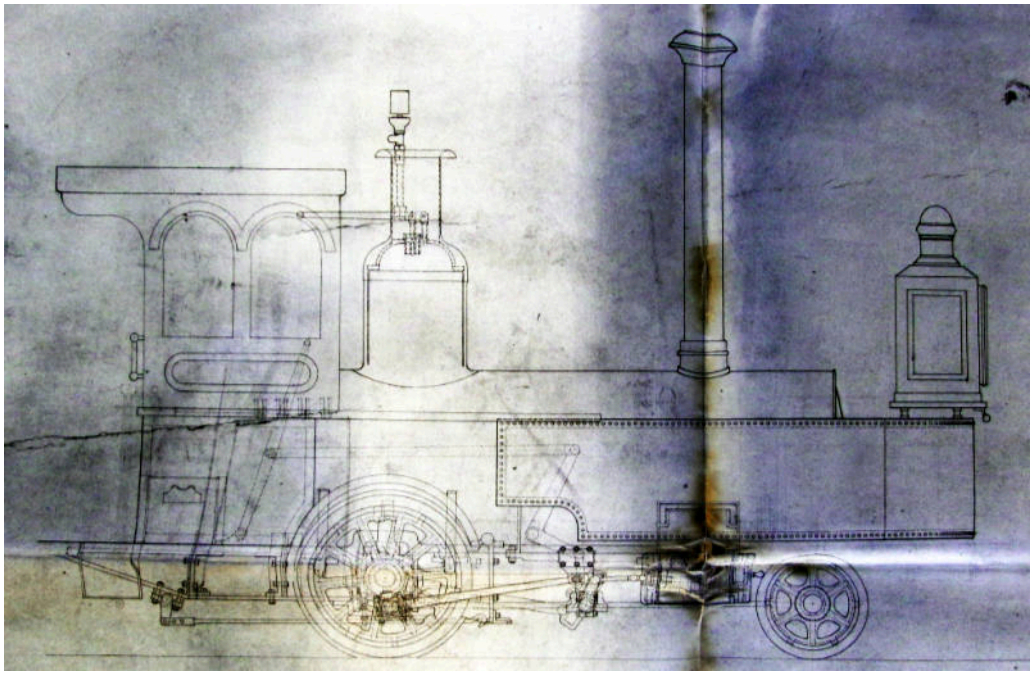
### *2-2-0T d/w 36½", cyls. 7½x14", built by Rogers in 1871*

Ordered for Lima & Huacho. Rogers order no. 757. Wheelbse 7' 8" Tank 466 gals. NB These two may both have been known by a collective nick-name as 'Caballito' in their earlier days, certainly up to 1887.

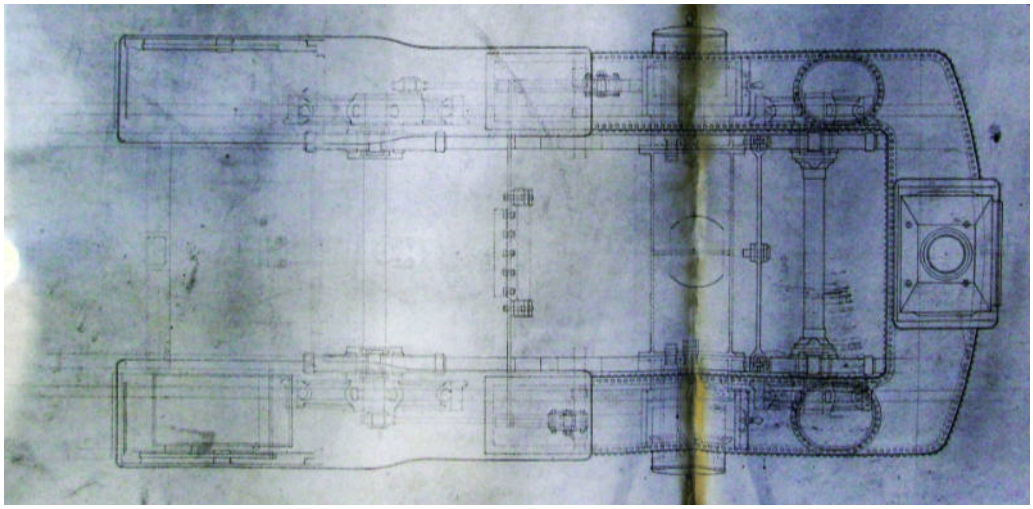
**9** later ? **'W. GRAÑA'** w/n (1888) In service in 1887, when this comment was made: *En buen estado de servicio y uso* [11, 1887 p572].

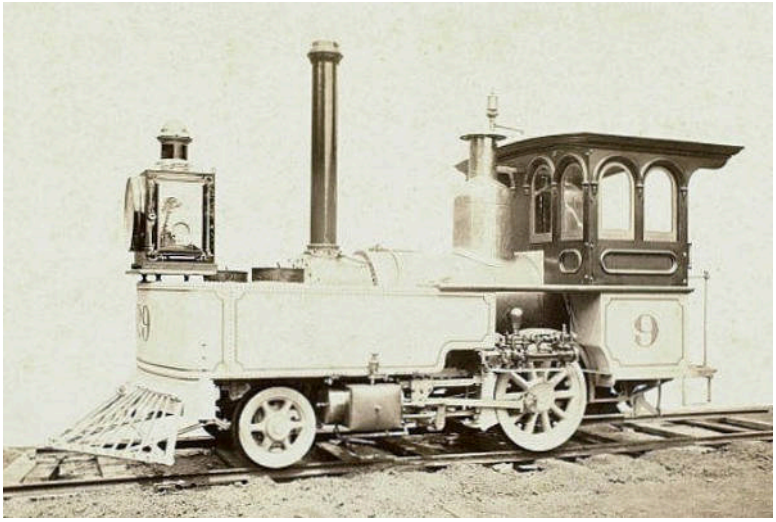
**10** later ? **'COL. PALTA'** w/n (1903) Under repair in 1887, when budget for the work was approved [11, 1887 p146], and the follwing comments were made: *Concluyen en estos dias la reparacion de la caja de fuego, que se esta actuahneute haciendo, debiendo asi quedar en buen estado* [11, 1887 p572]. Expenditure of up to 7,000 Soles approved in June of that year for the repair of this loco, identified as no. **10 'CABALLITO'**, and of nos. **2 'ANCON'** and **5 'HUACHO'** .

A loco seemingly identical to these, though with the addition of a sandbox and bell behind the chimney, was working on the Pacasmayo, Guadalupe and Chilete line early in the new century. It may well have been one of these two, either sold on or hired out.



Images tonally inverted from photostats of original Rogers blue-prints in the P. C. Dewhurst collection at the NRM in York.






### *4-4-0 d/w 60", cyls. 13x20", built by Rogers in 1865*

Ordered for the *FC de Copiapó* in Chile, as their nos. **16-18**. Rogers order number J-507 1-3, ordered August 1866. Rogers data sheets in P. C. Dewhurst archive state that special features included: a donkey pump. HT list has these sold to Peru (*FC L-A*) in 1870, and [6] says sold to *FC Lima a Huacho* in 1868, as not suited to the *FC de Copiapó* owing to wheels being too large for freight haulage. Others say sold to *FC de Lima a Ancon y Chancay* in 1870.

| | | |
|---|---|---|
| **?** | w/n (1256) | ) None of these |
| **?** | w/n (1260) | ) three were in |
| **?** | w/n (1261) | ) service in 1887. |

### *2-2-0T d/w 30", cyls. 8x10", built by Rogers in 1867*

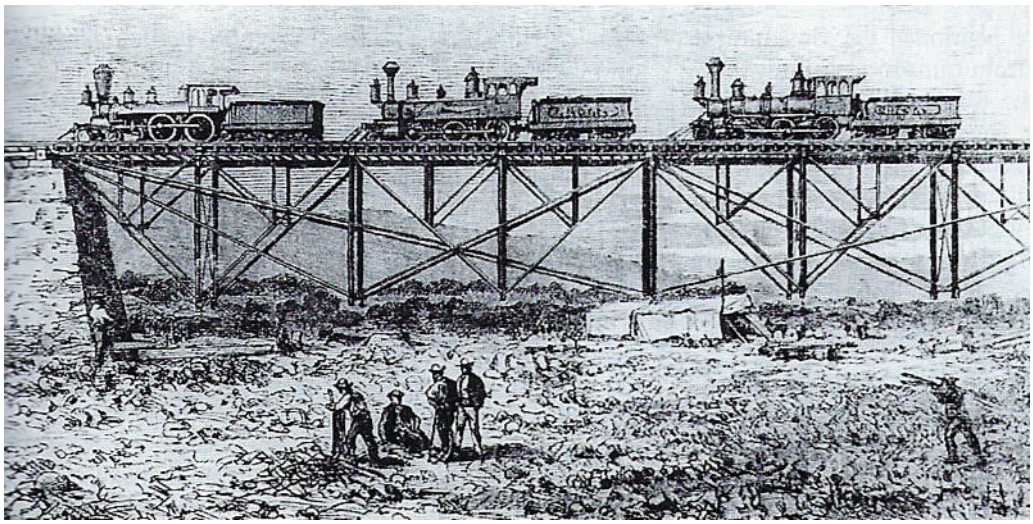
Ordered for the *FC de Copiapó* in Chile, as their no. **21**. Article in *The Engineer*, Dec 31 1869, p434, says this was the first of these small inspection cars built by Rogers. Rogers order number J-581 1. Rogers data sheets in PCD archive state that special features included: boiler radial stayed, side connecting rods [with] brass bushings. "This engine has been run fifty miles in an hour and a quarter with 270 lb. of soft coal. This seems a very high speed for so small a wheel, but we do not doubt the story, as it came to us from Mr. E. P. Gould, who was superintendent of machinery of the Copiapo Railway at the time. The company were so well pleased with its performance that the Rogers Works have since built them another one, with cylinders 4½ x 12, and 4 28in. wheels." HT list has this sold to Peru (*FC L-A* in1870, and [6] says sold to *FC Lima a Huacho* in 1868, as not suited to the *FC de Copiapó*. This suggests that, despite the good review copied above, it did not have the power and hill-climbing ability that was needed, hence the purchase of *FC de Copiapó* no. **25** with larger cylinders and smaller wheels. Sold to *FC de Lima a Ancon y Chancay* in 1870.

| | | |
|---|---|---|
| **?** | w/n (1475) | Not in service in 1887. |

## The fleet in 1884

*"Material rodante, locomotoras.* ***Virginia Num. 1****.—Necesita. 4 planchas de caldera por debajo, nuevas, pues tiene escape en todas partes, un fogon nuevo, cambiar planchas de los tubos y dar tubos nuevos, tornear ruedas, cambiar chimeneas que son gastadas, componer la garita del maquinista. Su compostura necesitara 5,000 soles plata.*
***Ancon numero 2****.—Tiene algunas rajaduras en el fondo de poca importancia. Su tanque es bueno. En general es una maquina bastante bien acondicionada. su reparation necesita como 250 soles plata.*
***Chancay numero 3****.—Se encuentra en mal estado. Necesita compostura general de Ia caldera, para lo cual habra que desarmarla por completo; ademas necesita fogon nuevo, tubos nuevos, tornear ruedas, cambiar varias planchas en el tanque y componerlo: tornar cilindros. Revision completa. Precio de su compostura alcanzara a 5o,000 soles.*
***Infantas numero 4****.—De cuatro ruedas acopladas grandes. Esta a la intemperie desde mucho tiempo; por esto todas sus piezas estan muy oxidadas. Para componerla se necesita desarmarla por completo, para poder limpiar todas sus piezas. Su caldera esta en bastante buen estado. Su fogon y plancha de tubos que es de cobre se pueden componer lo*

*mismo que los tubos que son de bronce. Cambiar la plancha de tubos en la caja de humo de fierro loomor. Todos los accesorios de la caldera y todo los bronces han sido robados; necesitan ponerlos de nuevo. Su tanque que actualmente es muy malo ha servido para llevar el agua a Ancon; hay que repararlo a fondo. Suponiendo que las ruedas del tanque son buenas, su reparacion importara 5,000 plata.*
***Huacho numero 5**.—De cuatro ruedas acupladas chicas. Se encuentra en el estado de servicio, no necesita sino algunos dias de mecanicos para ajustar algunas piezas. Su tanque necesita ser pintado y unas cosas insignificantes. Su reparacion importara 250 soles de plata.*
***Caballito numero 6**.—Esta completamente inutilizada desde el tiempo del arrendatario señor Bielich a consecuencia de un choque.*
***Chillon numero 7**,—De cuatro ruedas acupladas chicas. Necesita composturas en el fogon y cambiar como 50 tubos en la caldera. Necesita chumaceras y ajustar movimiento de valvulas. Revision completa del tanque quo sirvio para llevar agua a Ancon. Su compostura importara tres mil soles plata.*
***Pacasmayo*** (sic) ***numero 8**.—De cuatro ruedas acupladas grandes. Tiene caldera bastante buena, necesita un fogon y tubos nuevos, tornear ruedas; todas sus piezas de bronce y cobre han sido robadas. Su tanque exige una seria reparacion. Su reparacion importara seis mil soles plata.*
***Caballito num. 9** y **Caballito num. 10**.—Tienen calderas completamente malas, habria que desarmarlas por completo para componerlas y hacer revision corn pleta de estas maquinas, lo que importara cinco mil soles plata para las dos.*"
Also:
"*resulta que los, senores Stuarts y Swaliw han cumplido la parte de su contrata, concerniente la maquina **"Chancay, numero 3"** encontrandose la dicha maquina en buen estado de servicio. Ademis de lo estipulado en su contrata ha sido necesario cambiar plancha tubular de adelante y la plataforma de fierro fundido en la garita del maquinista, puesto que despues de haberse descubierto estas partes resultaron en pesimo estado y completamente inservibles.*"



FCLAC locos **'LIMA'**?, **'ANCON'** and **'CHANCAY'** deflection test
the Fink truss of the Viaducto Pacasmayo.

## The fleet in 1887

Source [10], the *Anales de las Obras Públicas del Perú* for 1887, summarises the fleet on pages 571-2:
"*Locomotoras.--Hay tres grandes y una chica (caballito) en actual servicio.*
*Locomotora N.° **2 «Ancon»**.—El movimiento todo es bueno lo mismo que los cilindros y pistones; mas tiene el fogon en mal estado, aunque sin presentar ningún riesgo, sino sólo mucho gasto de combustible. En efecto. 3 de los costados de la caja de fuego estan deteriorados, inclusive la plancha tubular rajada. Tiene 3 parches y necesita repararse.*
*Locomotora N.° **3 «Chancay»**.—Se encuentra esta maquina cn perfecto estado de servicio y conservacion.*
*Locomotora N.° **5 « Huacho»**. — La plancha tubular esta deteriorada, necesitando cambiarse lo mismo que los tubos. Tanto la reparación de esta maquina como la de la anterior han sido ya aceptadas por el Supremo Gobierno, debiendo principiarse el trabajo en estos dias.*

*Locomotora N.° **9 «Caballito»**. — En buen estado de servicio y uso.*
*Locomotora N.° **10 «Caballito»**.— Concluyen en estos dias la reparacion de la caja de fuego, que se está actualmente haciendo, debiendo asi quedar en buen estado.*
*Las demás locomotoras estan en pesimo estado, faltándole muchas piezas y á veces el movimiento entero. Su reparación sería hoy probablemente más costosa, que la compra de locomotoras nuevas.*"
And also:
"*Lima, Junio 30 de 1887.*
*Visto este expediente por el que solicita la correspondiente autorización para reparar algunas maquinas del Ferrocarril de Lima a Ancon; se resuelve:*
*1° Apruébase el adjunto presupuesto formado por el mecanico D. Manuel Lucero, para la compostura de las maquinas **«Ancon»** N.° **2**, **«Huacho»** N.° **5** y **«Caballito»** N°.**10**, ascendente a la cantidad de siete mil soles (S/ 7,000) plata y bajo las condiciones que en el se indican; y*
*2.° Autorízase al Administrador de la referida línea, para que proceda á la expresada reparación, conforme á aquel presupuesto, cubriéndose el gasto que esto demanda, con las economías de la misma linea. Regístrese, comuniquese y archivese.*
*Rubrica deS. E.*
*SOLAR.*"

## References in 1888

The anales of 1888 include an "*Inventario valorado del material que se proyecta rematar*" of this railway which includes the following:
*1 locomotora **"Infantas"** de pasajeros y carga, teniendo: caldera bastante usado, caja de fuego malograda, sin tubos, cilindros de vapor en regular estado pero sin tapas traseras con todas sus ruedas y resortes en regular estado, mecanisma muy incompleto. Falta igualmente la trompa, y la "casa" esta en mal estado avaluada en S2000.* Loco not yet definitely identified.
*1 Locomotora pequeña **"Caballito"** en mal estado, caldero malogrado pero con tubos de laton, mecanismo completo, ruedas completas; faltando "casa," estanque, chimenea y algunas piezas pequeñas accesorias S250* The name **'CABALLITO'** may refer to one of the pair of Rogers 2-2-0Ts or possibly to the Rogers 2-2-0T that came from the Copiapó railway.
*1 Locomotora grande como la **"Infantas"** llamada **"Pasamayo"** para carga en muy mal estado tambien, fogon muy destruido, cilindros, embolos y varas respectivas en buen estado, pero falta la mayor parte de lo demas del mecanismo y el estanque. Las ruedas y la "casa" en regular estado, avaluada en S2000.* **'PASAMAYO'** is clearly identified above.
[11, 1888 p399-400].

## Liveseys' report in 1889

The English language reports produced by Livesey & Co. in 1889 include the statement that this railway possessed at that time ten locomotives. Strangely, there are slightly varying versions of this report.

Rolling stock. The rolling stock of this Railway consists of 10 locomotives, which are in a bad state of repair; 25 first and second class coaches, all of which require repairs and painting; and 63 freight cars of various kinds. The whole of this stock has been allowed to run down to a low ebb. It is estimated that about £15,000 would be required to put it into a thorough state of repair.

Rolling stock. The rolling stock of this Railway consists of 10 locomotives which are in a very indifferent state of repair (four of them may be regarded as useless), 25 first and second class coaches, all of which require repairs and painting, and 63 freight cars of various kinds which have also been much neglected. The whole of this stock has been allowed to run down to a very low ebb. It is estimated that about £12,000 would be required to put such of it as is worth the expense, into a thorough state of repair.

## Inspector's report at the beginning of 1890

From page 536 of the Anales: *Senor Director: Como consta a US. la preferente atencion que he tenido que consa-grar a otras comisiones urgentes, no me habia permitido desde luego evacuar el informe a que se refiere el decreto anterior. Actualmente y como consecuencia del reconocimiento practicado en las locomotoras del ferrocarril de Ancon paso a dictaminar como sigue:*

*Nada de extraño tiene que anualmente se tenga que hacer serias reparaciones á las locomotoras de esta linea; pues el trafico que tienen durante la estacion de baños es bastante exagerado, y que ademos ni la linea, ni el mecanismo y calderos presentan por condiciones especiales, las probabilidades de buena conservation. De ahi proviene que actualmente se encuentren tres de las maquinas en circunstancias de necesitar reparaciones urgentes, y haber necesitado la 4 es decir la* ***Chillon N.° 7****, haber de antemano principiado sus reparaciones hallandose actualmente en el taller.*

*El presupuesto adjunto parece en general exagerado, habiendo en cambio una partida olvidada relativa a los bronces de repuesto para locomotoras y coches. Por lo que y en vista de que las reparaciones verdaderamente completas serian may costosas y tal vez innecesarias, opina el que suscribe porque se autorice a la administration de ese ferrocarril de Ancon a hacer los siguientes gastos, cuyos comprobantes deben presentarse oportunamente:*

| | |
|---|---|
| *Por reparation de las locomotoras* ***Chillon, Huacho, Chancay y Ancon*** | *S/. 6000* |
| *Por bronce de repuesto etc* | *500* |
| *Suma* | *S/. 6500* |

*Sea en total la suma de seis mil y quinientos soles de plata. Salvo mejor acuerdo.*
*Lima, 15 de Enero de 1890.*
*S. D. A. GUEVARA,*
*Ingeniero de Estado.* [11, 1890 p536].

Fleet absorbed into that of the *FC Callao, Lima y Oroya* in 1890.

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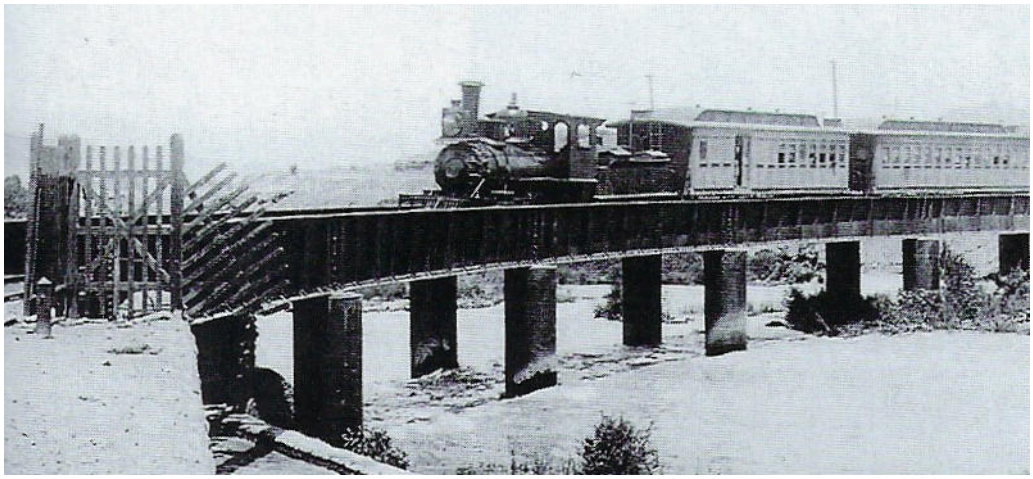


Bob Whetham reckoned that this was the *FCLAC* Danforth 2-6-0 no. **5** on the Rimac bridge near Desamparados station in Lima. However, *FCLAC* no. 5 was in fact an 0-2-4RT presumably a light inspection car.

## 13.2.3 *El FC de Lima Callao y Chorrillos*
## Lima Railways Co. or *'El ferrocarril Ingles'*

**Región de Lima**

**1851-1934**

## then merged into the *FC Central*


No. 839

THE

Lima Railways Company Limited.

£10. SHARES

Capital reduced to £400,000 in 40,000 Shares of £10 each.

INCORPORATED WITH LIMITED LIABILITY

UNDER THE COMPANIES ACT 1862

CERTIFICATE OF SHARES.

This is to Certify that Lieut. Col. Frederick Clover, R.A., of Woolwich Arsenal is the Proprietor of Eighteen Shares of £10 each fully paid up. Numbered 039391 to 039398 inclusive of The Lima Railways Company Limited, subject to the Rules and Regulations of the said Company.

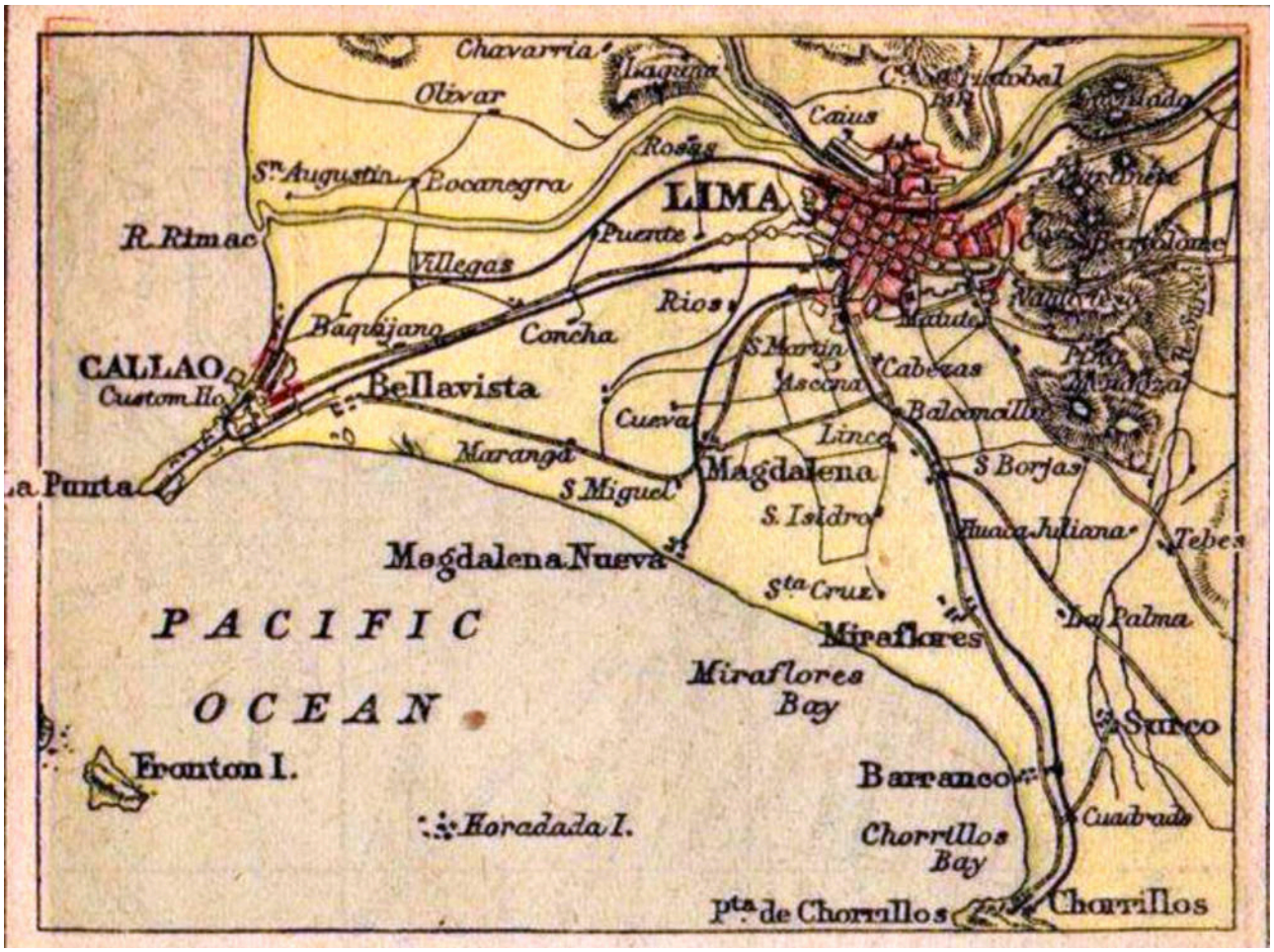
Given under the Common Seal of the said Company the 10th day of May 1872

Secretary

Director

### Background

The earliest Peruvian railway was planned between Lima and Callao as far back as 1833, though work only began in the late 1840s. Sources differ as to whether the first trains ran in 1850 or 1857. The extension line to Chorrillos had to compete with electric tramways, and was itself electrified in 1907. The *FC Central* acquired ownership in 1934, though negotiations for this had been under way as early as 1902.. In the late 1930s the Lima to Callao section closed as a railway, but may have continued to operate under the Cía. Nacional de Tranvías. The Chorrillos line continued to work until the 1950s. There had also been branches to La Punta, to La Magdalena replacing the original 3' 6" gauge railway to that point around 1901, and possibly onward to Bellavista. Some of these branches carried solely freight, under agreements with the local electric tramways.




On this map railways are represented by thick black lines. The *FC Central* (ex *FC Callao, Lima y Oroya*) snakes from Callao via Villegas to Lima and on eastward. The FCLCC route to Callao is straighter, travelling via Bellavista and with a branch in Callao out to La Punta, and a second main route southward from Lima to Chorrillos. The erstwhile *FC Lima, Ancón y Chancay* is less clear here but heads northwestward from Lima. Finally, the *FC de Lima á la Magdalena* (the one railway shown here which was not originally of standard gauge) curves west and then south from Lima, first to Magdalena and then to Magdalena Nueva on the shore. The original 3' 6" route of this final railway is shown here, not the later straighter standard gauge *FCLCC* route that replaced it.

### *2-4-0 d/w 60½", cyls. 14x22"oc, built by Robert Stephenson in 1850 and 1852*

Ordered by Callao & Lima Railway. RS description book says d/w was 60¾".

**1 'CALLAO'** w/n 755 Pulled inaugural passenger train into Lima. *"Construida en 1850, se renovaron los tubos en 1868. Se halla fuera del trafico de la linea, tiene 3 anos usandose tan solamente en la estacion"* [11, 1874A p174]. Ran 180.6 and 35895.3 km in 1886 [11, 1886 p572]. In 1886 was described as: *Esta máquina, de cuatro ruedas acopladas y de treinta y ocho toneladas de peso, en servicio activo, ha sido construida en Inglaterra por R. Stephenson and Co., en New Castle en Tyne, en 1850, y estaba fuera de servicio desde 1872 hasta 1879, como se vé de los registros; durante este tiempo fue reconstruida, recibiendo una caldera completamente nueva, y volvió á correr de nuevo desde 1879 y recorrió ciento seis mil seiscientos sesenta y cuatro kilómetros, cuando en Junio de 1885 it dieron una reparacion completa de*

*maquinaria; así como en el ténder y renovaron la plancha tubular de cobre y el juego de tubos de bronce. Desde esta última época hasta principios de Marzo último, recorrió diez y seis mil doscientos noventa y nueve kilómetros. Actualmente se encuentra en buenas condiciones de servicio, recibiendo solamente las reparaciones de costumbre en servicio* [11, 1886 p346].
In 1887 the Anales contained the following: *Construida en 1850, estaba fuera de servicio desde 1872 hasta 1879, como se ye de los registros respectivos. Durante este tiempo fue reconstruida, recibiendo una caldera completamente nueva. En 1885, recibio de nuevo una reparacion completa en su maquinaria, asi como en el tender; se renovaron la plancha tubular de cobre asi como el fuego de tubos de bronce. Ultimamente tambien ha recibido revision completa en las guias, valvulas, cilindros, pistones, ruedas y el movimiento, aparte de las reparaciones de costumbre. Descontando los siete años de 1872 a 1879 que fue fuera del servició, esta maquina tiene 36 años de existencia y 29 de trabajo, recorriendo desde 1879 hasta Marzo 1887, 155,706 tren kilometros, sea por año 19,463 tren kilometros. Como los registros no existen sino desde 1872, nada de seguro se sabe de su trabajo efectuado hasta este .tiempo, sea 21 años desde 1850 hasta 1872; suponiendo que en este periodo corrió en termino medio a razon de 20,000 tren kilometro al año durante su trabajo total avaluado en tren kilometros es 21 x 20,000 + 155,706=575,706. Actualmente esta maquina se encuentra en buen estado de servicio* [11, 1887 p563-6].
This loco ran 11079.9 km on the Lima to Trigo line in 1888 and 159.3 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].
1889 Anales report: *Construida en 1850 y por consiguiente ya muy vieja. Ha sido reparada varias veces siendo la ultima reparación general de 1889, es decir de este ano; y habiendo desde entonces recorrido 11,075 kilometros. Tiene su maquinaria en buen estado pero la hornilla mal conservada presentando ampollas y filtraciones en las costuras. Estes en regular estado pero necesita vigilancia.* [11, 1889 p424-5].
This loco ran 4661.49 km on the Lima to Trigo line in 1889 and 17411.49 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
This loco ran 9082.67 km on the Lima to Trigo line in 1890 and 2102.76 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 2741.76 km on the Lima to Trigo line in 1891 and 10019.97 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 1701.98 km on the Lima to Trigo line in 1892 and 12584.70 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 1542.62 km on the Lima to Trigo line in 1893 and 11724.48 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 30.10 km on the Lima to Trigo line in 1895 and 414.18 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected in 1896 and permitted to continue in use solely for shunting and freight train use [11, 1896 p064].
This loco ran 10824 km on the Lima to Trigo line in 1896 and 0 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Not listed in 1897 mileage table [p11, 1897 p560].
The 1904 report to shareholders listed engine no. **1** as “long since condemned

as unfit for service and beyond possibnility of repair." This was repeated in the reports for subsequent years.

Not in service 1908.

**3 'OYAGUE'** w/n 756 Name order needs confirming, as Anales 1874A gives **'CASTILLA'** as the second and this one as the third loco. "*Construida en 1850, se le hizo iguales reparaciones que a la anterior y en in actualidad la componen nuevamente, en breves dias se pondra al trafico"* [11, 1874A p174]. Ran 662.1 and 14211.5 km in 1886 [11, 1886 p572]. An 1886 description ran: *Fabricada y recibida en el mismo tiempo que las núm. 1 y núm. 2, fué reconstruida en 1879, con caldero completamente nuevo, y desde este tiempo ha recorrido ciento veinte mil ochocientos cincuenta y ocho kilómetros. Las piezas de maniobras, están todavia en buen estado, últimamente se ha reparado su maquinaria y tender, se ha colocado la plancha tubular nueva de cobre y un juego de tubos de bronce, asi como otras planchas del fogon. Actualmente principió de nuevo su servicio, encontrándose en buenas condiciones.* [11, 1886 p346].

In 1887 the Anales contained the following: *Entreó al servicio en el mismo ano que las N°. I y 2 y fue tambien reconstruida en 1879 recibiendo el caldero completamente nuevo. En 1885 y 1886, se ha reparado su maquinaria y tender, se ha colocado plancha tubular de cobre, un juego de tubos nuevos de bronce, planchas del fogon y otras reparaciones de consideracion. Su vida en tiempo es de 36 anos. Desde 1872 hasta Marzo de 1887 recorrio 257,183 tren kilometros, sea al ano 17,146 tren kilometros. Suponiendo que desde 1850 a. 1872, sea durante 22 años corrio a razon de 17,000 tren kilometros al año resulta que su trabajo se mide por — 257,183 + 22 x 17,000 = 631,183 tren kilometros. Actualmente esta maquina se encuentra en buen estado de servicio* [11, 1887 p563-6].

This loco ran 752.4 km on the Lima to Trigo line in 1888 and 28550.5 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].

1889 Anales report: recorded as under repair. [11, 1889 p424-5].

This loco ran 517.04 km on the Lima to Trigo line in 1889 and 11867.85 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].

Anales 1990: Inspection requested but no later mention of this loco authorised for use on public trains. [11, 1890 p262].

This loco ran 270.90 km on the Lima to Trigo line in 1890 and 17730.09 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].

This loco ran 346.15 km on the Lima to Trigo line in 1891 and 7757.91 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].

This loco ran 421.40 km on the Lima to Trigo line in 1892 and 8665.92 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].

This loco ran 15.05 km on the Lima to Trigo line in 1893 and 31.86 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].

This loco ran 150.50 km on the Lima to Trigo line in 1894 and 9621.72 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].

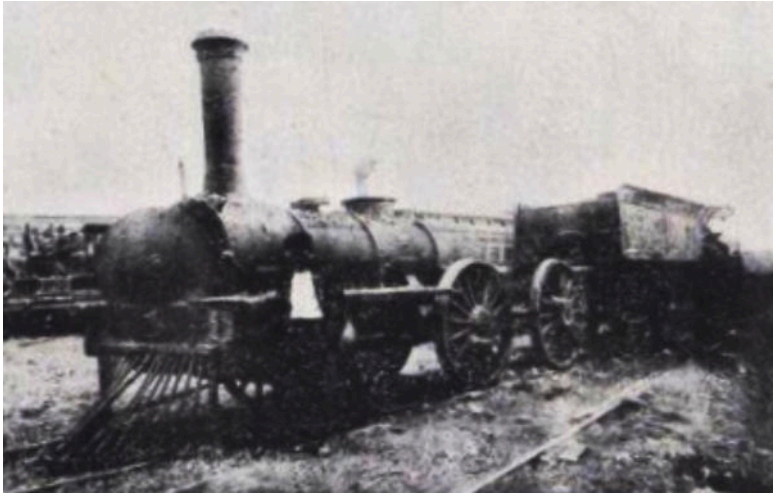
This loco ran 0 km on the Lima to Trigo line in 1895 and 6069.33 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].

Inspected in 1896 and permitted to continue in use solely for shunting and freight train use [11, 1896 p064].

This loco ran 3533.35 km on the Lima to Trigo line in 1896 and 2007.18 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 12771.75 km. on the Trigo line in 1897 [p11, 1897 p560].
The 1904 report to shareholders listed engine no. **3** as "long since condemned as unfit for service and beyond possibnility of repair." This was repeated in the reports for subsequent years.
Not in service 1908.

**4 'CASTILLA'** w/n 757 "*Construida en 1850, se renovo el fogon y tubos en 1867. Compuesta despues de la inspeccion de los mecanicos, ordenada por el Prefecto del Callao. Se halla en buen estado*" [11, 1874A p174].
Not mentioned in 1886 list, but described then as: *Construida por R. Stephenson en 1850, se encuentra fuera de servicio desde 1881, y está considerada en las listas como material viejo.* [11, 1886 p346].
The 1887 Anales note: *Construida en 1850 esta fuera del servicio desde 1881 y figura en los registros como material viejo* [11, 1887 p563-6].
Confirmed out of service by inspector's report in 1896, see below [11, 1896 p062].
The 1904 report to shareholders listed engine no. **4** as "long since condemned as unfit for service and beyond possibnility of repair." This was repeated in the reports for subsequent years.

**2 'LIMA'** w/n 817 One list says d/w of this loco were 61".
"*Construida en 1852, tambien se le hicieron las mismas reparaciones en 1868. En la actualidad necesita reparos*" [11, 1874A p174]. Ran 7524.4 km in 1886 [11, 1886 p572]. Described in 1886 thus: *Construida en 1850 en la misma fabrica que la "Callao" num. 1, está todavía en condiciones de trabajo; pero solamente en los cambios y la línea del Trigo, y siempre a baja presion. Por ahora no se puede contar entre las máquinas de servicio de la línea principal, y medidas deben tomarse pars reemplazarla* [11, 1886 p346].
In 1887 the Anales contained the following: *Construida en 1850, está. todavia trabajando pero solamente en los cambios y en el ramal desde el Callao a, los depositos de trigo en Bellavista y siempre a baja presion. Actualmente la Empresa trata de reemplazarla.* [11, 1887 p563-6].
1889 Anales report: recorded as withdrawn from service in 1884 [11, 1889 p424-5].
Confirmed out of service by inspector's report in 1896, see below [11, 1896 p062].
The 1904 report to shareholders listed engine no. **2** as "long since condemned as unfit for service and beyond possibnility of repair." This was repeated in the reports for subsequent years.
Not in service 1908.



Supposedly the remains of one of these original 2-4-0s, possibly no. **1 'CALLAO'**, as still surviving in the 1930s.


A Peruvian postage stamp from 1936, mistakenly showing the loco **1 'CALLAO'** as a 4-4-0.

### *0-4-2 d/w 60", cyls. 16x22", built by R. &W. Hawthorn in 1858*

Ordered by Callao & Lima Rly. ½¾¼

**6 'CHORRILLOS'** w/n 1022

"*Construida en 1858, igual reparacion que a las otras se le ha hecho en este ano y a mas se le han puesto algunas planchas en la caldera, se encuentra en buen estado*" [11, 1874A p175]. Ran 9142.4 and 6914.6 km in 1886 [11, 1886 p572]. Described in 1886 as: *Construida en la misma fabrica y e1 mismo año que su compañera número 5, recorrió desde 1872 hasta 1880, los ciento cincuenta y cinco mil, seiscientos ochenta y dos kilómetros, cuando fué retirada del servicio, y ha recibido una reparacion completa de maquinaria, caldera y tender, incluso caja de fuego de fierro, plancha tubular de adelante y juego de tubos de fierro, concluyéndose su reparacion en Octubre 1885; desde este tiempo ha recorrido solamente once mil, quinientos cincuenta y siete kilómetros, y se encuentra en regular estado de servicio.* [11, 1886 p346].

The 1887 Anales note: *Construida en el mismo ano que su compañera No. 5, estaba fuera de servicio reparandose durante los 5 años, desde 1880 hasta 1885 recibiendo una renovacion completa de maquinaria, caldero y tender,*

*incluso caja de fuego, plancha tubular y un juego de tubos de fierro, su vida en tiempo de trabajo activo es 24 anos, suponiendo que en el primer periodo desde 1858 hasta 1872 ha trabajado constantemente. Su trabajo en tren kilometros aplicando el promedio del periodo registrado at periodo no registrado es: 179,972 + 251,960 = 431,932 tren kilometros. Esta es la unica maquina que tiene la caja de fuego y tubos de caldero de fierro, pues todas las demas maquinas tienen fogones de cobre y tubos de bronze. La maquina se encuentra en regular estado de servicio* [11, 1887 p563-6].

This loco ran 1408.3 km on the Lima to Trigo line in 1888 and 5082.3 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].

1889 Anales report: *Construida en 1858 y reparada por última vez en 1885, desde cuya epoca ha recorrido 42,580 kilometros. La maquinaria se encuentra bastante gastada y el caldero en muy mal estado; por lo que, y en uso de las atribuciones que me confiere el Reglamento General de ferrocarriles, he notificado al Gerente de la Empresa suspen-da esta locomotora de todo uso hasta reparation general y pruebas consiguientes.* [11, 1889 p424-5].

This loco ran 1128.75 km on the Lima to Trigo line in 1889 and 3170.07 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].

Not listed in mileage tables for 1890, 1891, 1892, 1893, 1894 or 1895.

Confirmed out of service by inspector's report in 1896, see below [11, 1896 p062].

The 1904 report to shareholders listed engine no. **6** as "long since condemned as unfit for service and beyond possibnility of repair." This was repeated in the reports for subsequent years.

Not in service 1908.

**5[1] 'MIRAFLORES'** w/n 1023 "*Construida en 1858, se le reparo igualmente en 1866 y se le pusieron algunos tubos nuevos en 1868. En este intervalo no sirvio, pues la tuvieron guardada en el taller. Se encuentra con un parche, y dicen que fue puesto para asegurarla por medida de precaution, mas no por necesidad. Se halla en buen estado*" [11, 1874A p174]. Note from Sept. 1886 noting that this loco was in a satisfactory condition to be put into use [11, 1886 p71-2]. Ran 568.2 and 20775.6 km in 1886 [11, 1886 p572]. Described that year as: *Salió de los talleres de R. and W. Hawthorn en New Castle on Tyne, Inglaterra, en 1858; su peso en servicio activo es 41 toneladas. Desde el año 1872, en que han principiado á apuntar el recorrido kilométrico hasta 1879, esta maquina recorrió ciento cincuenta y ocho mil, cuatrocientos sesenta y un kilómetros. Desde 1879 hasta 1883, estaba fuera de servicio y recibió en este tiempo una reparacion completa de maquinaria y caldera. Las planchas exteriores de la caja de fuego fueron renovadas, así como recibió tambien el juego de tubos de bronce y caja de fuego de cobre. Desde este tiempo ha recorrido ochenta y tres mil, doscientos cincuenta y seis kilómetros, y ha tenido setenta tubos de bronce, renovados en el sitio mas expuesto al fuego. Aunque actualmente se encuentra en regulares condiciones de servicio, segun el articulo 76 del Reglamento, debe ser revisada por completo y sometidas á las pruebas del caso.* [11, 1886 p346].

The 1887 Anales note: *Entro en servicio en 1858, siendo inactiva desde 1879 hasta 1883, tiempo en que recibio una reparacion completa de maquinaria y*

*caldera asi como renovacion de las planchas exteriores de la caja de fuego y la interior de cobre. En 1886 a indicacion mia, ha sido de nuevo reparada radicalmente y sometida a las pruebas conforme el articulo 73 del Reglamento de los Ferrocarriles, y resultando en condiciones satisfactorias se le ha puesto en servicio. Su vida en tiempo es de 29 anos, de los cuales 4 paso reparandose, segun los registros existentes, en el periodo desde 1872. En este periodo recorrio 254,019 tren tros en 11 anos de servicio sea 23,100 tren kilometros al año. Suprimiendo que desde que entre, al servicio hasta 1872 sea durante los 14 anos corrio en termino medio a razon de 20,000 tren metros al año, su trabajo se representa por 254,019 + 20,000 x 14 =534,019 tren kilometros. Actualmente se encuentra en buenas condiciones de servicio* [11, 1887 p563-6].

This loco ran 1264 km on the Lima to Trigo line in 1888 and 25539.3 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].

1889 Anales report: *Construida en 1858 y reparada por ultima vez en 1889; habiendo recorrido desde que volvio al servicro 5,410 kilómetros. Su maquinaria y caldero estan en regular estado.* [11, 1889 p424-5].

This loco ran 8834.35 km on the Lima to Trigo line in 1889 and 6356.07 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].

This loco ran 13177.617 km on the Lima to Trigo line in 1890 and 2501.01 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].

This loco ran 7509.95 km on the Lima to Trigo line in 1891 and 0 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].

This loco ran 301.00 km on the Lima to Trigo line in 1892 and 0 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].

This loco ran unspecified km on the Lima to Trigo line in 1893 and 0 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].

This loco ran 3370.35 km on the Lima to Trigo line in 1894 and 0 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].

Confirmed out of service by inspector's report in 1896, see below [11, 1896 p062].

The 1904 report to shareholders listed engine no. **5** as "long since condemned as unfit for service and beyond possibnility of repair." This was repeated in the reports for subsequent years.

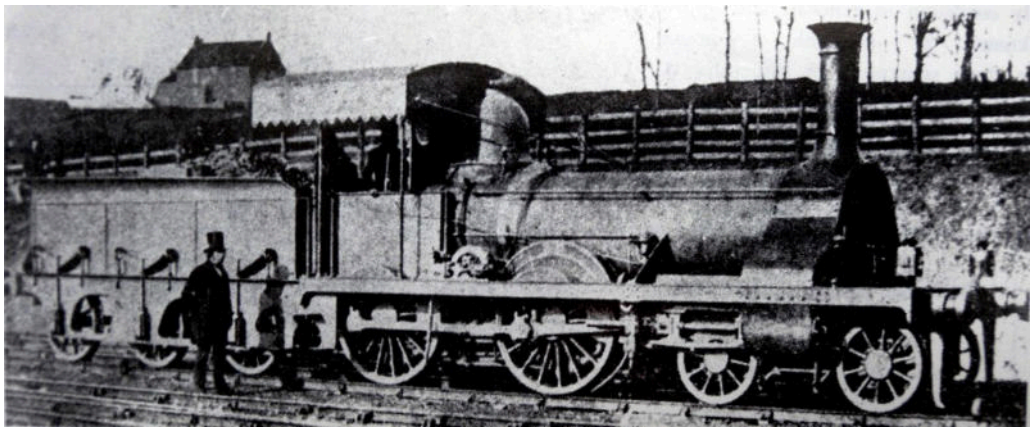
Not in service 1908.

### *4-4-0 d/w 60", cyls. 16x22", built by Robert Stephenson in 1861-2*

Ordered by ? Stephenson description book no. 11 (item ROB/2/4/11 in the archives at the NRM in York) says that this loco was built to the same spec. as nos. 1201-1210 for the Smyrna & Aidin Railway and the London Chatham & Dover Railway. Some of those engines had been supplied by R. & W. Hawthorn & Co. as agents, even though they had been built by Stephensons.

**7² 'SURCO'** w/n 1408 "*Construida en 1861, se le cambiaron tubos en 1868. Se encuentra en el taller reparandose los remaches, que la comision de mecanicos dijo era indispensable"* [11. 1874A p175]. Described in 1886 as: *Esta maquina construida en 1861, por R. Stephenson and C.°, ha recorrido desde 1871 hasta 1881, los ciento cincuenta y tres mil, quinientos ochenta y tres kilómetros, en cuyo tiempo entró á los talleres donde permanece reparándose.* [11, 1886 p346].

In 1887 the Anales noted: *Construida en 1861 entro a los talleres en 1881 en donde permanece reparandose hasta ahora. Su vida en tiempo activo es de 20 anos y trabajo aproximativo es 152,691 + 11 x 15,269 = 320,650 tren kilometros* [11, 1887 p563-6].
This loco ran 173.4 km on the Lima to Trigo line in 1888 and 0 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].
1889 Anales report: *Construida en 1861 habiendo recibido la última reparación en 1872 desde cuya época ha recorrido 37,385 kilometros. Su maquinaria se encuentra en buen estado, pero el fogon de acero y tubos de fierro presentan filtraciones. Apesar de ello se encuentra en regular estado.* [11, 1889 p424-5].
This loco ran 8954.75 km on the Lima to Trigo line in 1889 and 13460.85 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
This loco ran 1158.85 km on the Lima to Trigo line in 1890 and 0 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 887.95 km (+ 7449.75 on separate line of table) on the Lima to Trigo line in 1891 and 0 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 3732.40 km on the Lima to Trigo line in 1892 and 0 km on the Lima to Chorrillos line [11, 1892 pp440 and 442], and was noted as burning oil, which may have been the meaning of the additional line in the 1891 table referred to above.
This loco ran 13048.35 km burning oil on the Lima to Trigo line in 1893 and 0 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This oil-burning loco ran 3280.90 km on the Lima to Trigo line in 1894 and ? km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 1143.80 km, and 225.75 km burning oil, on the Lima to Trigo line in 1895 and 0 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected in 1896 and permitted to continue in use solely for shunting and freight train use [11, 1896 p064].
This loco ran 23718.80 km on the Lima to Trigo line in 1896 and 0 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 16103.50 km. on the Trigo line and 31.86 km. on Chorrillos line in 1897 [11, 1897 p560].
**7 'BOLOGNESI'** This number and name in service 1898 and 1908, which is a puzzle.



This is one of the Robert Stephenson locos built for the Smyrna and Aidin

Railway in Turkey, to which spec. *FCLCC* no. **7** was built. The photo, kindly provided by Chris West, shows the engine under test on the Stockton & Darlington Railway. Whether this particular machine reached Turkey or was one of those that actually ended up on the London, Chatham & Dover Railway is not known. Also uncertain is whether *FCLCC* no. **7** was delivered with the same Indian/Egyptian-style cab roof.

### *4-4-0 d/w 60", cyls. 16x22", built by R. & W. Hawthorn in 1859*

Ordered by Lima Callao Railway. Name is as given in Hawthorn order book.

**9 'La MAGDALENA'** w/n 1073

References to the loco **'MAGDALENA'** in 1874, 1886 and 1887 clearly refer to it having been built in 1867 by Robert Stephenson. Those references and other later ones have therefore been located under RS engine no. 1816, below. This remains a puzzle. However, there was a close relationship between Hawthorns and Stephensons, with some sub-contracting of work. It may well be that the engine was ordered through Hawthorns but actually built by Stephensons.

### *2-4-0 or 4-4-0 d/w 60", cyls. 16x22", built by Robert Stephenson in 1867*

Ordered by Lima & Callao Railway Co. Six-wheeled tender. Info from RS order book at NRM, which contains very detailed notes. Ordered Feb. 26th 1867. Order book states the locos were to be similar to no. 1408, which see above. NB [11, 1886] says that no. **8** was by Hawthorn. Chris West points out that there was at least one instance when RS sub-contracted construction of locos to R. & W. Hawthorn. Perhaps this occurred in this case but the topic needs further investigation. Taller chimneys than no. 1408. See specification in Appendix 7.

**8 'CANDAMO'** w/n 1815

In 1874 referred to as: *Construida en 1864, se vendio al Gobierno para el monitor "Victoria" y la compro la Empresa nuevamente en 1870. Se reparo toda ella y se puso al trafico el ano pasado. En la actualidad se encuentra en el taller, poniendoles tubos nuevos y haciendoles una refaccion general* [11. 1874A p175]. NB No running nos. given in 1874.

Described in 1886 as: *Salió de los talleres de R. and W. Hawthorn en 1858; ha recorrido desde 1872 hasta 1882, : los ciento noventa y tres mil, doscientos dos kilómetros, cuando recibió una reparacion general de maquinaria y tender, varios estayes de la caja de fuego y veintiun tubos fueron renovados; desde entónces ha recorrido treinta y cuatro rail, setenta y ocho kilómetros. En 1885 ha sido retirada del servicio, hasta recibir una reparacion completa.* [11, 1886 p346].

The 1887 Anales commented: *Entro en servicio en 1858 retirandose a los talleres en 1885 donde permanece hasta recibir una reparacion completa. Su vida activa en tiempo es 27 años y trabajo aproximativo 469,294 tren kilometros* [11, 1887 p563-6].

1889 Anales report: recorded as withdrawn from service in 1885 [11, 1889 p424-5].

Not listed in mileage tables for 1890, 1891, 1892, 1893, 1894 or 1895.

Confirmed out of service by inspector's report in 1896, see below [11, 1896 p062].

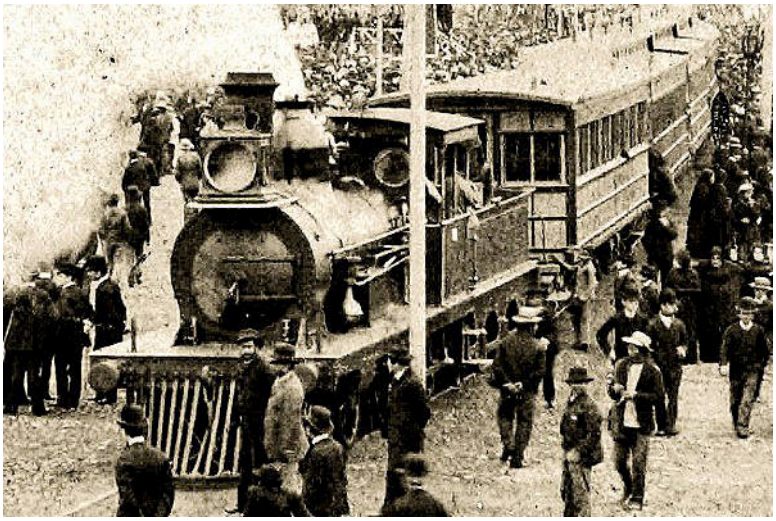
The 1904 report to shareholders listed engine no. **8** as "long since condemned as unfit for service and beyond possibnility of repair." This was repeated in the reports for subsequent years.

Not in service 1908.

**9 'MAGDALENA'** w/n 1816

"*Construida on 1868. Reparada y puesta al trafico esta semana. En buen estado*" [11, 1874A p175].
Ran 2091.5 km in 1886 [11, 1886 p572].
Described in 1886 thus: *Construida en 1867 por R. Stephenson y Co., su peso en el estado de trabajo es de 47.17 toneladas. Desde 1872 hasta 1884, ha recorrido trescientos dos mil, doscientos sesenta y seis kilómetros. Aunque su maquinaria está en buen estado, pero necesita una caja de fuego y una plancha tubular, en la caja de humo, nueva; mientras tanto está de reserva en la estacion del Callao, pero no se puede considerar apta para el servicio de la línea por lo pronto.* [11, 1886 p346].
The Anales commented in 1887: *Construida en 1867, esta fuera del servicio desde 1884 hasta que reciba una reparación completa. Su vida activa es 17 años y trabajo aproximativo 301,682 + 5 x 23,000 =416,682 tren kilometros [11, 1887 p563-6].*
The 1888 Anales say: *Despues de haber examinado la locomotora numero 9 perteneciente al ferrocarril ingles de Lima Callao y Chorrillos, a frio y encendida, asi como verificado las demos pruebas del caso, resulta que en la maquina referida se han efectuado ultimamente las reparaciones si-guiente: La maquina: cilindros torneados y pistones reservados. Ruedas torneadas en los ejes y sunchos. Cajas de ejes renovadas con sus bronces. Todas las piezas de movimiento exentricas, valvulas y bielas renovadas y reparadas. La caldera renovada en su mayor parte de su casco, caja de fuego y tubos de cobre nuevos, caja de humo renovadas. El tender ha recibido tambien una reparación general: tanque de agua y bastidores, asi como los sunchos de ruedas renovados. Todas estas reparaciones tanto en los detalles como en su conjunto resultaron buenas, y por consiguiente soy de opinión que la maquina en cuestion puede de nuevo entrar con provecho en el servicio activo de la linea.* [11, 1888 p399].
Similarly, from the admin. section of the 1888 Anales: *Lima, Diciembre 7 de 1888. Visto el anterior recurso del Gerente de la Compaftia Inglesa de los ferrocarriles de Lima, Callao y Chorrillos; y resultando del ante-rior informe del Ingeniero del Estado D. Francisco J. Wakulski, quo las reparaciones heches en la maquina N.° 9 perteneciente a dicha linea son buenas, asi en los detalles, como en su conjunto, pudiendo, por lo tanto, entrar de nuevo al servicio del ferrocarril; habiendose llenado los requisitos que exige el articulo 73 del Reglamento General de ferrocarriles; autorizase a la enunciada Empresa, para poner en servicio la expresada locomotora. Registrese. DENEGRI.* [11, 1888 p081].
This loco ran 3355.3 km on the Lima to Trigo line in 1888 and 0 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].
1889 Anales report stated: *Construida en 1867 y reparada por última vez en 1888, habiendo recorrido desde entonces 5,422 kilómetros. Se encuentran la maquinaria y el caldero en buen estado de servicio.* [11, 1889 p424-5].
This loco ran 316.05 km on the Lima to Trigo line in 1889 and 18861.12 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
This loco ran 30.10 km on the Lima to Trigo line in 1890 and 30951.99 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 15.05 km (+ 11407.90 on separate line of table) on the Lima to

Trigo line in 1891 and 1736.37 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 16434.60 km on the Lima to Trigo line in 1892 and 0 km on the Lima to Chorrillos line [11, 1892 pp440 and 442], and was noted as burning oil, which may have been the meaning of the additional line in the 1891 table referred to above.
This loco ran 22755.60 km burning oil on the Lima to Trigo line in 1893 and 31.86 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 3431.40 km on the Lima to Trigo line in 1894 and 1338.12 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 11272.45 km, and 11034.32 km burning oil, on the Lima to Trigo line in 1895 and 0 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
This loco ran 6336.05 km on the Lima to Trigo line in 1896 and 0 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Withdrawn from service in 1896 owing to poor state of boiler, until a replacement boiler can be procurred from England. See below [11, 1896 p062].
Ran 5974.85 km. on the Trigo line in 1897 [p11, 1897 p560]. under the number and name **9 'GRAU'.** Not yet certain that this was the same engine but probable. Almirante Miguel Grau died in 1879.
Still in service 1898 and 1908.



This photo was taken on the occasion of the funeral of Admiral Grau in 1879. It shows the funeral train being hauled along the '*FC Ingles*' by a 4-4-0, probably by Robert Stephenson. The precise identity of the engine is unknown, though the fact that a Stephenson 4-4-0 was later named **'GRAU'** may be more than a coincidence. Note the side buffers used by the *FCLCC*.

### *? d/w ?, cyls. ?, built by Hawthorn? in 1868?*

Ordered by ? Source [22] says that this engine was by Thomas Green.

**10 'BELLAVISTA'** w/n ? Described 1874 as: *Construida en 1868, recientemente se le han puesto tubos nuevos y caja de fogon. En buen estado.*" [11, 1874A p175]. Twelve locos total that year and two more on order, "*Dos maquinas nuevas tiene la Empresa en camino, pero esta Junta cree que son insuficientes y que*

*deberian pedirse cuatro mas.*" Ran 466.5 and 764.7 km in 1886 [11, 1886 p572]. Described in 1886 as: *Construida por el mismo fabricante y en el mismo año que la núm. 9, se encuentra tambien en las mismas condiciones, es decir, esperando una reparation completa, miéntras tanto no puede ser empleada en servicio activo de la línea. Desde 1872 hasta 1884, ha recorrido esta máquina 269,719 kilómetros. Desde esta época trabaja solamente algunas veces en los cambios, esperando una reparacion general, una caja de fuego nueva, así como plancha tubular en la caja de humo.* [11, 1886 p346].

The 1887 Anales said: *Construida en el mismo año que el No. 9, se encuentra en las mismas condiciones, es decir, esperando una reparacion completa. Retirada del servicio activo desde 1884, su vida puede apreciarse en 17 años del servicio activo y en 269,091 + 5 x 20,000 = 369,091 tren kilometros* [11, 1887 p563-6].

This loco ran 526.6 km on the Lima to Trigo line in 1888 and 726.9 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].

1889 Anales report: recorded as withdrawn from service in 1885 [11, 1889 p424-5]. This is incompattible with comments immediately above.

This loco ran 15.05 km on the Lima to Trigo line in 1892 and 0 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].

Not listed in mileage table for 1893, 1894 or 1895.

Confirmed out of service by inspector's report in 1896, see below [11, 1896 p062].

The 1904 report to shareholders listed engine no. **10** as "long since condemned as unfit for service and beyond possibnility of repair." This was repeated in the reports for subsequent years.

Not in service 1908.

### *0-4-0ST d/w 48", cyls. 10x16", built by Manning Wardle in 1870*

Ordered by Lima Railway Co. MW class F altered. Dispatched 14-01-1870.

**11 'NIÑA'** w/n 288

"*Construida en 1869, maquina de estacion y puesta al trabajo en 1870 en muy buen estado"* [11, 1874A p175]. Ran 2363.3 km in 1886 [11, 1886 p572]. Described that year as: *Entró en servicio en 1867, siendo construida por Manning and Wardle, en Leeds, Inglaterra: máquina tanque. Sufrió un accidente en 1881, y en este tiempo recibió una reparacion. Se usa tan solo para hacer los cambios en la estacion del Callao. Se peso en el estado de trabajo, y alcanza 16 T 7.* [11, 1886 p346].

The 1887 Anales stated: *maquina tanque, entro en servicio en 1867. Se usa tan solo para los cambios en la estacion del Callao* [11, 1887 p563-6].

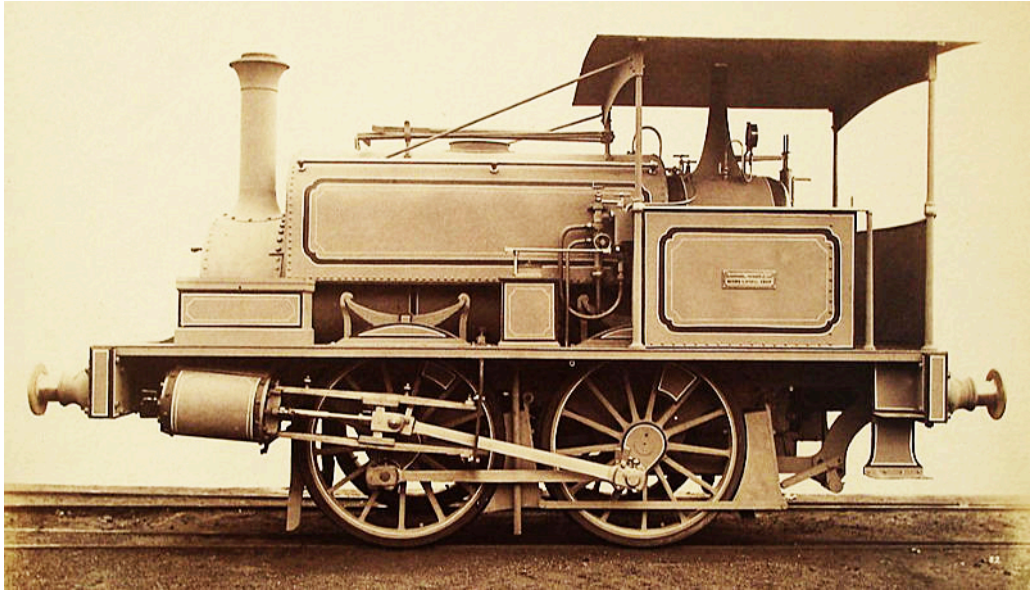
This loco ran 1970.3 km on the Lima to Trigo line in 1888 and 0 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].

1889 Anales report: *Construida en 1867 y reparada por última vez en 1887, habiendo desde entonces sido empleada para efectuar los cambios de estación. Se encuentra en regular estado.* [11, 1889 p424-5].

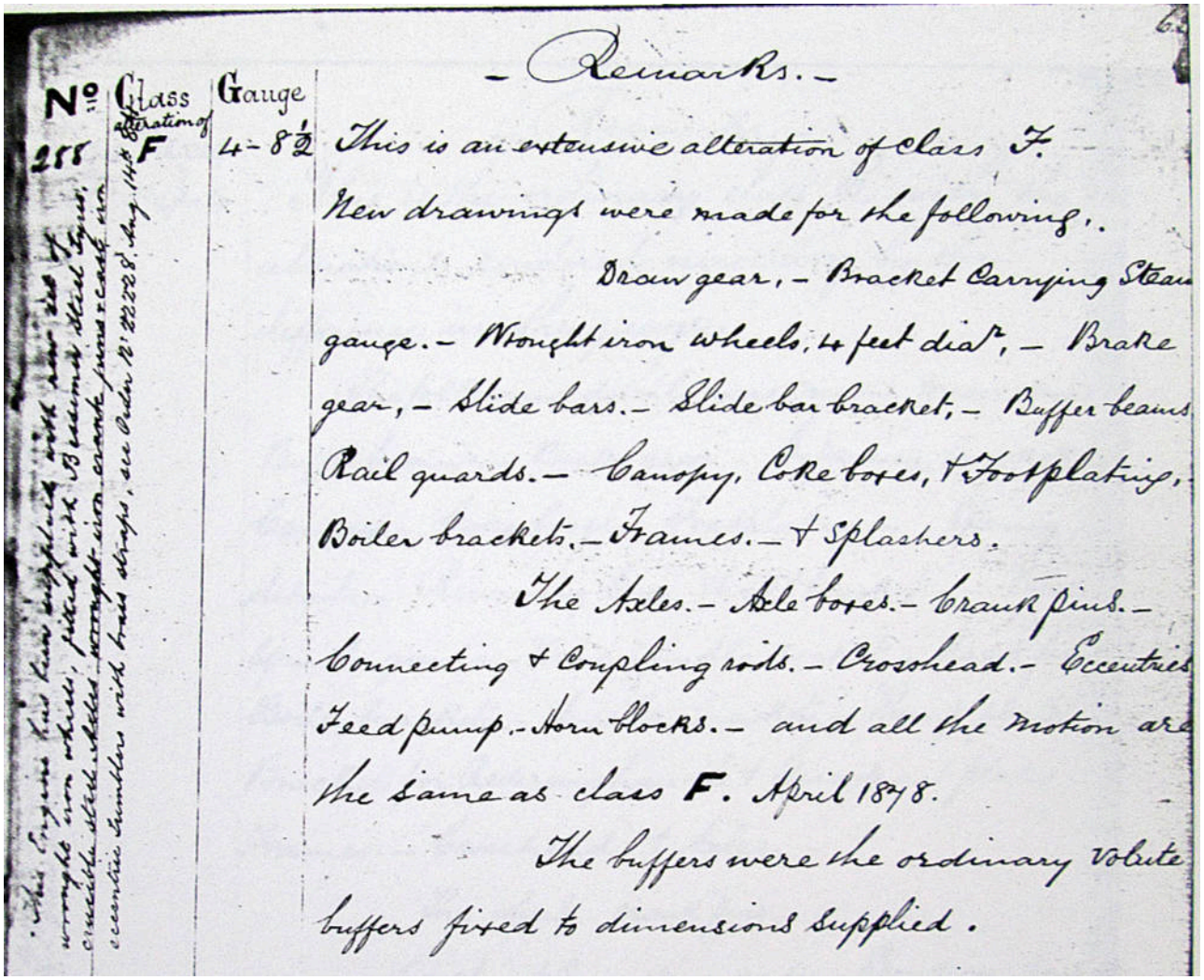
This loco ran 1037.47 km on the Lima to Trigo line in 1888 and 0 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].

This loco ran 686.47 km on the Lima to Trigo line in 1890 and ? km on the Lima to Chorrillos line [11, 1890 pp730 and 732].

This loco ran 647.63 km on the Lima to Trigo line in 1891 and 0 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 150.50 km on the Lima to Trigo line in 1892 and 47.79 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 540.64 km on the Lima to Trigo line in 1893 and 286.74 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 351.61 km on the Lima to Trigo line in 1894 and 270.81 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 240.80 km on the Lima to Trigo line in 1895 and 175.23 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected in 1896 and permitted to continue in use solely for shunting and freight train use [11, 1896 p064].
This loco ran 155.31 km on the Lima to Trigo line in 1896 and 143.37 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 45.15 km. on the Trigo line and 15.93 km. on Chorrillos line in 1897 [11, 1897 p560].
The 1906 report to shareholders listed engine no. **11** as "condemned in the year 1905 as unfit for service and beyond possibility of repair." This was repeated in the reports for subsequent years.



MW no. 288.



| No | Class | Gauge | Remarks. |
|---|---|---|---|
| 255 | F | 4-8½ | This is an extensive alteration of Class F. New drawings were made for the following. Draw gear, – Bracket Carrying Steam gauge. – Wrought iron wheels, 4 feet diaᵗ, – Brake gear, – Slide bars. – Slide bar bracket, – Buffer beams Rail guards. – Canopy, Coke boxes, + Footplating, Boiler brackets. – Frames. – + Splashers. The Axles. – Axle boxes. – Crank pins. – Connecting + Coupling rods. – Crosshead. – Eccentrics Feed pump. – Horn blocks. – and all the motion are the same as class F. April 1878. The buffers were the ordinary volute buffers fitted to dimensions supplied. |

### *4-4-0? d/w 60", cyls. 16x22", built by R. & W. Hawthorn in 1870*

Ordered by Lima Callao Railway. Hawthorn lists in SLS files WL8723 and WL10320 both say this was an 0-4-0, but the dimensions given in both make it seem likely that it was another 4-4-0, and Hawthorn order book shows that it had a bogie and a tender.

**12[1] 'DOS de MAYO'** w/n 1500

"*Construida en 1871. En buen estado*" [11, 1874A p175]. Ran 29049.7 km in 1886 [11, 1886 p572]. Described in 1886 thus: *Salió de la factoria de R. and W. Hawthorn, Inglaterra, en 1871. Desde 1872 hasta 1873, esta locomotora ha recorido 262,787 kilómetros, en cuyo tiempo recibió la plancha tubular de cobre nueva, 62 tubos nuevos, y 162 reparados de bronce. Desde 1883 ha recorrido 44,783 kilómetros. Acaba de recibir una reparacion general de maquinaria y ténder, consistiendo esta en cilindros, pistones, valvulas, ruedas motrices, la de rastro, cajas de ejes, bronces de bielas y zapatas guiadoras de crucetas nuevas, etc. Actualmente se encuentra en buenas condiciones de servicio.* [11, 1886 p346].

In 1887: *Construida en 1871. Recibio en 1886 una reparacion general y radical en su maquinaria y tender. Su vida es de 15 anos de servicio y trabajo activo aproximadamente es 339,352 + 20,000 = 359,352 tren kilometros, actualmente se encuentra en buen estado de servicio* [11, 1887 p563-6].

This loco ran 24587 km on the Lima to Trigo line in 1888 and 16.1 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].

1889 Anales report: *Construida en 1871 y recien reparada en este año,*

*habiendo solo recorrido desde entonces 2,316 kilometros. La reparacion hecha se ha refaccionado especialmente con la maquinaria pero poco con el caldero, cuyo fogon no esta, bien conservado. La locomotora en general esta, en buen estado.* [11, 1889 p424-5].
This loco ran 29061.55 km on the Lima to Trigo line in 1889 and 0 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
Anales 1990: *Segun el libro de Registros de la Empresa de los ferrocarriles referidos, salio en 1871 de la factoria de R. W. Hawthorn (Inglaterra) con el nombre '2 de Mayo' y despues de un trabajo bien sostenido por algunos años, acaba de recibir en el Callao una reparation general en sus articulaciones, caldera y tender: consiste—en pistones y valvulas nuevas, reajuste de la corredera con dados y pernos nuevos de acero regularizando la distribucion del vapor; las chumaceras de los ejes de ruedas con sus guias y armaduras en bronce renovados, las articulaciones de las bielas renovadas, las guias de los pistones renovadas con sus ajustes perfectos. Las ruedas han sido torneadas igualando su de gaste; se han renovado 93 tubas en bronce, de la caldera, y el tender ha recibido un buen ajuste de las chumaceras con coginetes de metal de primera clase y remiendos en las planchas del estanque. Asi, su estado para el servicio es completamente satisfactorio.* [11, 1890 p534], Inspection requested and then this loco authorised for use on public trains. [11, 1890 p262].
This loco ran 20513.15 km on the Lima to Trigo line in 1890 and 0 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 6772.50 km on the Lima to Trigo line in 1891 and 4396.68 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 11061.75 km on the Lima to Trigo line in 1892 and 31.86 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 5688.90 km on the Lima to Trigo line in 1893 and 0 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 15290.80 km on the Lima to Trigo line in 1894 and 0 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 7053.23 km on the Lima to Trigo line in 1895 and 0 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected and tested in 1896 and permitted to continue working with a normal BP of 150psi. See below [11, 1896 p063].
This loco ran 30.10 km on the Lima to Trigo line in 1896 and 10466.01 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 26322.45 km. on the Trigo line and 4269.24 km. on Chorrillos line in 1897 [11, 1897 p560].

### *4-4-0 d/w ?, cyls. 16x22", built by R. & W. Hawthorn in 1872 and 1874*

Ordered by Lima Callao Railway.

**13 'PARDO'** w/n 1589 Ran 13691.1 and 63.7 km in 1886 [11, 1886 p572]. Probably built around 1872. Described 1886: *Construida en 1872, por R. and W. Hawthorn. Entró en servicio en 1873, y desde este tiempo hasta 1880, recorrió 169,228 kilómetros. En 1880, los cilindros fueron renovados y la plancha tubular reparada. Desde 1880 hasta 1883, recorrió 43,156 kilómetros, cuando fué necesario cambiar la plancha tubular de la caja de fuego, colocar 176 tubos*

*nuevos y 44 reparados de bronce, la maquinaria tambien ha side reparada. Desde este tiempo recorrió 52,863 kilómetros, cuando últimamente se renovaron los sunchos de las ruedas motrices y traseras. Actualmente se encuentra en buen estado de servicio, recibiendo tan solo reparaciones corrientes de costumbre.* [11, 1886 p346].
In 1887: *Construida en 1872 entro al servicio activo en 1873. En 1880 sus cilindros fueron renovados y en 1883 recibio una reparacion en su maquinaria, la plancha tubular nueva asi como los tubos. Su vida es de 14 años y su trabajo en tren kilometros es 263,712 se encuentra en talleres reparandose* [11, 1887 p563-6].
This loco ran 11064.9 km on the Lima to Trigo line in 1888 and 10212.5 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].
1889 Anales report: *Construida en 1872 y reparada por vez última en 1887 habiendo desde entonces recorrido 46,915 kilometros. Su examen detallado demuestra que la maquinaria esta, algo gastada y que el caldero se encuentra en muy mal estado, pues la plancha tubular esta rajada en varias partes necesitando renóvarse. En tales condiciones he notificado tambien su suspensión del servicio lo mismo que para la locomotora N.° 6.* [11, 1889 p424-5].
This loco ran 2373.55 km on the Lima to Trigo line in 1889 and 12122.73 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
Anales 1990: Locomotora N.° 13.— *Salio de la misma factoria que la anterior en 1872. siendo ambas de igual estructora, y esta denominada "Pardo." Ha estado en servicio desde dicho año hasta 1889 y acaba de recibir en el Callao una prolija reparacion, consistente en: cilindros con sus pistones y valvulas nuevos, un perfecto ajuste en el mecanismo de distribucion del vapor, collares, de exentricos ajustados, con anillos y pernos nuevos, chumaceras de los ejes de ruedas con sus guias y coginetes en bronco renovadas, las articulaciones en bronce de las bielas enovadas, los vastagos de los pistones ajustados con zapatillas nuevas, y los sunchos de las ruedas torneados. Se han renovado tres planchas en el cilindro de la caldera. y lo mismo se ha hecho con la plancha tubular, los tubos en cobre, la caja de humo y caja de fuego. El tender ha recibido una reparacion general de las planchas del estanque, las ruedas, chumaceras, los resortes y barras de acoplamiento. Se puede decir que esta maquina ha sido reconstruida, y su caldera en la prueba tecnica, ha soportado muy bien un exceso de presion sobre la ordinaria que garantiza el servicio.* [11, 1890 p535]. This loco authorised for use on public trains. [11, 1890 p262].
This loco ran 1234.10 km on the Lima to Trigo line in 1890 and 0 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 75.25 km on the Lima to Trigo line in 1891 and 11405.88 km on the Lima to Chorrillos line [11, 1891 pp418 and 420]., NB one list said **13 'PRADO'** presumably by mistake.
This loco ran 1188.95 km on the Lima to Trigo line in 1892 and 12951.09 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 4530.05 km on the Lima to Trigo line in 1893 and 13652.01 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 225.75 km on the Lima to Trigo line in 1894 and 17459.28 km

on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 3175.55 km on the Lima to Trigo line in 1895 and 8028.72 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
This loco ran 240.30 km on the Lima to Trigo line in 1896 and 7025.13 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Boiler exploded at Barranco station in April 1896, see report below. [11, 1896 p64-65]. Confirmed out of service by inspector's report in 1896, see below [11, 1896 p062].
Not listed in mileage table in 1897 [p11, 1897 p560].
The 1904 report to shareholders listed engine no. **13** as "long since condemned as unfit for service and beyond possibnility of repair." This was repeated in the reports for subsequent years.
In service 1898 and 1908 with **12**[2] **'MIRAFLORES'** number and name; another puzzle.

**14 'PRADO'** w/n 1590

Ran 41483.1 km in 1886 [11, 1886 p572]. In 1886 described as: *Construida por los mismos fabricantes y en el mismo tiempo que la número 13. Su peso en servicio activo es de 48 T. 10. Entró en servicio junto con el número 13, en 1873, y hasta 1884 recorrió 248,195 kilómetros; en cuyo tiempo recibió una reparacion completa en su maquiaria y ténder, incluyendo cilindros nuevos, así como sunchos de ruedas, plancha tubular de cobre y juego de tubes de bronce. Entrando at servicio desde esta última reparacion, recorrió hasta el mes de Marzo último 38.161 kilómetres, encontrándose actualmente en buenas condiciones de servicio.* [11, 1886 p346].
In1887 the Anales said: *Entro al servicio activo junto con el No. 13 en 1873. En 1884 recibio una reparacion completa en su maquinaria y tender incluyendo cilindros nuevos, asi como sunchos de ruedas plancha tubular de cobre y un juego de tubos de bronce. En Octubre de 1886 recibio tambien reparaciones en sus bielas, pistones, guias de pistones, bomba inyector etc. Su vida es de 14 años de tiempo y de 321,712 tren kilometros recorridos. Esta en buen estado de servicio* [11, 1887 p563-6].
This loco ran 13978.8 km on the Lima to Trigo line in 1888 and 0 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].
1889 Anales report: *Construida en 1872 habiendo recibido su ultima separación general en 1888. Desde entonces ha recorrido 1,513 kilometros. La maquinaria está buena pero el fogon se encuentra ampollado; lo que no obsta no existiendo riesgo para que se la considere en buen estado de servicio.* [11, 1889 p424-5].
This loco ran 24937.85 km on the Lima to Trigo line in 1889 and 0 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
This loco ran 28354.20 km on the Lima to Trigo line in 1890 and 0 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 11453.05 km on the Lima to Trigo line in 1892 and 0 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 9737.35 km on the Lima to Trigo line in 1893 and 31.86 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 9948.05 km on the Lima to Trigo line in 1894 and 0 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 16630.25 km on the Lima to Trigo line in 1895 and 0 km

on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected and tested in 1896 and permitted to continue working with a BP of 120psi. See below [11, 1896 p063].
This loco ran 24907.75 km on the Lima to Trigo line in 1896 and 3456.81 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 2678.90 km. on Trigo line in 1897 [p11, 1897 p560].
In service 1908 with this number and named **'CHORRILLOS'.**

**15** later **'CANDAMO'** w/n 1640

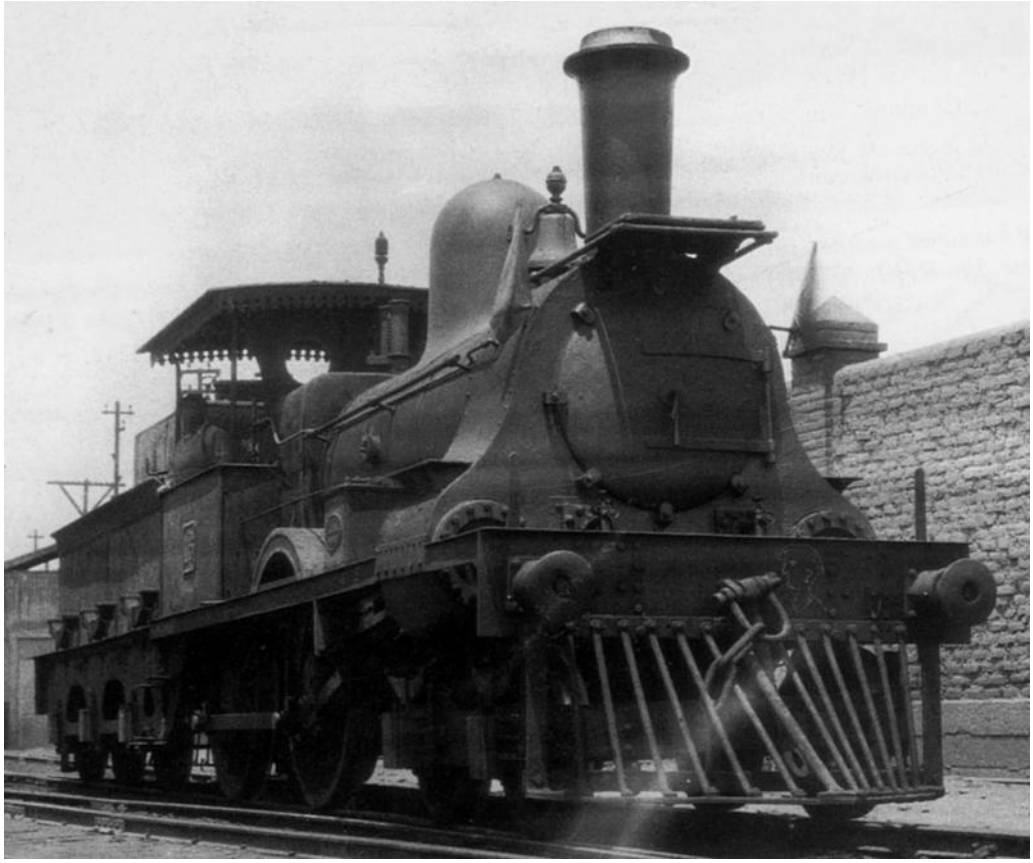
Ran 19407.2 km in 1886 [11, 1886 p572] unnamed. Described in 1886 as: *Salió de los talleres de R. and W. Hawthorn, en 1876, y desde este año hasta 1881, recibiendo tan solo las reparaciones corrientes, efectuó 151,000 kilómetros de viaje. En 1881 fué puesta en reparacion general de maquinaria y caldera: desde la conclusion de esta reparacion, recorrió 60,857 kilómetros, recibiendo últimamente 20 tubos nuevos y 33 reparados. Actualmente necesita algunas reparaciones.* [11, 1886 p346].
In 1887 the Anales said: *Construida en 1876. En 1881, fue puesta en reparacion general de maquinaria y caldero; por fin en Mayo ultimo recibio otra reparacion general en la maquinaria y su tender. Su vida es de 10 años durante los cuales recorrio 214,487 tren kilometros* [11, 1887 p563-6].
This loco ran 0 km on the Lima to Trigo line in 1888 and 223 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].
1889 Anales report: *Construida en 1876 y acabada de reparar actualmente. La maquinaria esta en muy buen estado pero el caldero no habiendo recibido mayor reparación, no esta en perfecto estado. Sin como locomotora se puede en general decir que esta en buen estado de servicio, como resulta de las pruebas especiales a que la he sometido y por las que queda autorizada la Empresa a ponerla en servicio.* [11, 1889 p424-5]
This loco ran 8262.45 km on the Lima to Trigo line in 1889 and 382.32 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
Anales 1990: Inspection requested but no later mention of this loco authorised for use on public trains. [11, 1890 p262].
This loco ran 150.50 km on the Lima to Trigo line in 1890 and 31127.22 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 2347.80 km on the Lima to Trigo line in 1891 and 1338.12 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 571.90 km on the Lima to Trigo line in 1892 and 3377.16 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
In service 1891 but still unnamed.
This loco ran 90.30 km on the Lima to Trigo line in 1893 and 17076.96 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 135.45 km on the Lima to Trigo line in 1894 and 16774.29 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 1008.35 km on the Lima to Trigo line in 1895 and 7311.87 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
This loco ran 135.45 km on the Lima to Trigo line in 1896 and 7375.59 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Withdrawn from service in 1896 owing to poor state of boiler, until a replacement boiler can be procurred from England. See below [11, 1896 p062].

Ran 10670.45 km. on the Trigo line and 19291.23 km. on Chorrillos line in 1897 [11, 1897 p560].
In service 1908 with this number and name.

**16** later **'OYAGUE'** w/n 1641

Ran 1895.9 km in 1886 [11, 1886 p572] unnamed. Described 1886 as: *Igual á la número 15, y como ella, entró en servicio en 1876, y hasta 188o habia recorrido los 137,934 kilómetros, cuando recibió una reparacion general, y todos los tubos renovados. Despues de esta reparacion, corrió 55,274 kilómetros. En 1884 recibió otra reparacion de maquinaria y ténder: la plancha tubular fué reparada, 124 tubos y 100 reparados, fueron puestos. Actualmente se encuentra en la Factoría, habiendo sido malograda por descuido de un fogonero de noche. Su plancha tubular debe ser reemplazada.* [11, 1886 p346].
The 1887 Anales stated: *Igual al numero 15 entro junto con ella al servicio. En 1880 recibio una reparación general y renovacion de todos sus tubos. En 1884 tambien fue reparada de nuevo por completo, recibiendo caja de fuego de cobre nuevo, asi como un juego de tubos de bronce nuevos, de modo que se puede decir que es casi nueva. Su servicio activo es 9 años y trabajo efectuado se avalua en 217,000 tren kilometros. Actualmente se encuentra en muy buenas condiciones de servicio* [11, 1887 p563-6].
This loco ran 10727.7 km on the Lima to Trigo line in 1888 and 14100.1 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].
1889 Anales report: recorded as under repair. [11, 1889 p424-5].
This loco ran 918.05 km on the Lima to Trigo line in 1889 and 5862.24 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
This loco ran 21957.95 km on the Lima to Trigo line in 1890 and 31.86 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 7735.70 km on the Lima to Trigo line in 1891 and 31.86 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
In service 1891 but still unnamed.
This loco ran 1444.80 km on the Lima to Trigo line in 1892 and 14384.79 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 30.10 km on the Lima to Trigo line in 1893 and 17698.23 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 496.65 km on the Lima to Trigo line in 1894 and 3855.06 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 60.20 km on the Lima to Trigo line in 1894 and 16869.87 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
This loco ran 15.05 km on the Lima to Trigo line in 1896 and 15850.35 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Withdrawn from service in 1896 owing to poor state of boiler, until a replacement boiler can be procurred from England. See below [11, 1896 p062].
Ran 361.20 km. on the Trigo line and 23098.50 km. on Chorrillos line in 1897 [11, 1897 p560].
In service 1908 with this number and name.

*FCLCC* no. **16 'OYAGUE'** before and after conversion to oil-firing by the *FCC*. Binns [23] says that this loco was to have been transferred to Paita but that they rejected the offer.



***? d/w ?, cyls. ?, built by ? in ?***

Ordered by ? Arrived on this railway in 1878 together with the line to La Punta [11, 1886].

**17**[1] **'BENEFICENCIA'** w/n ? Ran 165.5 and 79.7 km in 1886 [11, 1886 p572] named **'BENEFICENCIA'**. Described in 1886 as: *Esta maquinita, que pertenece ála línea de la Punta, ha sido entregada á la Empresa junto con la línea en 1878. Ha sido reparada recien completamente, con caja de fuego de cobre, tubos de bronce, pistones nuevos y toda la maquinaria renovada. Actualmente se encuentra en muy buenas condiciones de servicio.* [11, 1886 p346].

The 1887 Anales stated: *Nos. 17 y 18.—Son maquinas chicas de cambios; se encuentran en buen estado* [11, 1887 p563-6].
This loco ran 165.5 km on the Lima to Trigo line in 1888 and 207.1 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].
1889 Anales report stated: *Construida en 1²864 y reparada en 1888, habiendose la empleado desde entonces en cambios do estaciones. Estes en regular estado de servicio.* [11, 1889 p424-5]
This loco ran 316.05 km on the Lima to Trigo line in 1889 and 143.37 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
This loco ran 385.11 km on the Lima to Trigo line in 1890 and 95.58 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 135.45 km on the Lima to Trigo line in 1891 and 0 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 65.84 km on the Lima to Trigo line in 1892 and 0 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
Not listed in mileage table for 1893, 1894 or 1895.
Confirmed out of service by inspector's report in 1896, see below [11, 1896 p062].
Probably withdrawn in early 1890s.

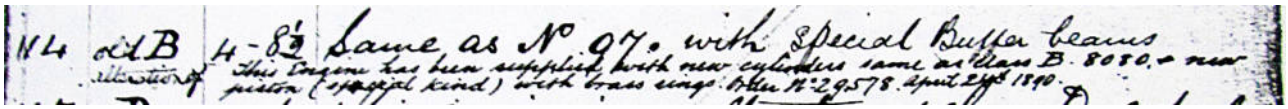
### *0-4-0ST d/w 30", cyls. 6x12", built by Manning Wardle in 1867*

Ordered by the Peruvian government probably for the *FC Callao á La Punta*. MW class B. Originally named **'HERMANA'**. MW records say was a class B loco identical to a number of others supplied to UK customers. Arrived on this railway in 1878 together with the line to La Punta [11, 1886].

**18[1] 'HERMANA'** w/n 114 (not 231)

Ran 300.9 km in 1886 [11, 1886 p572], but described as: *lgual as la Núm. 17: se encuentra actualmente en buenas condiciones de servicio. [11, 1886 p346].*
The 1887 Anales stated: *Nos. 17 y 18.—Son maquinas chicas de cambios; se encuentran en buen estado* [11, 1887 p563-6].
This loco ran 466.4 km on the Lima to Trigo line in 1888 and 302.7 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].
1889 Anales report: recorded as under repair. [11, 1889 p424-5].
This loco ran 240.80 km on the Lima to Trigo line in 1889 and 0 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].
This loco ran 634.77 km on the Lima to Trigo line in 1890 and 79.65 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 468.55 km on the Lima to Trigo line in 1891 and 31.86 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 45.15 km on the Lima to Trigo line in 1892 and 0km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
Possibly named **'La PUNTA'** for a while as was under that name in an 1891 list.
This loco ran 107.17 km on the Lima to Trigo line in 1893 and 111.51 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 90.30 km on the Lima to Trigo line in 1894 and 207.09 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 5464.10 km on the Lima to Trigo line in 1894 and 31.86 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].

This loco ran 5393.36 km on the Lima to Trigo line in 1896 and 0 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Inspected and tested in 1896 and withdrawn from use owing to its dangerous condition. See below [11, 1896 p063].
Ran 11049.50 km. on the Trigo line in 1897 [p11, 1897 p560].
This number and name in service 1898 and 1908, which is a puzzle.




## Number of locos in fleet during the 1880s

The company's annual reports to shareholders are very brief and contain no detail about the loco fleet. However, each year they did give the number of locos and tenders available. At the ends of 1879 anmd 1880 the totals were 16 for engines and 15 for tenders. The engine total gerew by one in 1881 and both figures then remained steady until the end of 1888 when the engine total again grew by one to 18. These figures, of 18 and 15, remained the same into 1890.

## The fleet in 1886

Source [11, 1886], the *Anales de las Obras Públicas del Perú* for 1886, summarises the fleet on pages 346-350:
*LOCOMOTORAS Y MATERIAL RODANTE.*
*"Los registros de locomotoras exiten desde 1872, aunque redactados en inglés; de su exámen, asi como de la misma inspeccion, se puede formar la description siguiente:* See descriptions above.
The fleet was then summarised as: *Resumiendo lo dicho en la lista de locomotoras que antecede, resulta que actualmente existen 7 locomotoras grandes, á saber: las números* ***I, 3, 5, 6, 12, 13 y 14****, así como las tres chicas numeros* ***11, 17 y 18****, en condiciones de servicio. Aunque los registros de recorrido kilométrico y de las reparaciones, principian á apuntarse desde el año 1872; se puede sin embargo, concluir de los años de servicio, que las máquinas números* ***1 y 3*** *se encuentran en el último periodo de su vida, pries sus compañeras números* ***2 y 4****, puestas en servicio en el mismo año que ellas, I850, ya están fuera de servicio. Casi lo mismo se puede decir de las números* ***5 y 6****. Las números* ***12, 13 y 14*** *se encuentran mas que en su media vida; de modo que hay que temer que muy pronto el material locomotor será insuficiente para hacer frente á las exigencias del trafico, si no se desplega la actividad necesaria en reparacion de las máquinas que se encuentran en mal estado, ó no se adquieren nuevas.* "
A letter on p72:
"*Lima, Setiembre 23 de 1886. Visto este expediente, en que el Prefecto del Departamento de Lima eleva la peticion del Gerente de la Compañía de los ferrocarriles de Lima, Callao y Chorrillos, para que sea reconocida la locomotora* ***N.° 5*** *con el fin de ponerla en servicio, de conformidad con el artículo 73 del Reglamento General de ferrocarriles; y apareciendo del informe del Ingeniero D. Francisco J. Wakulski que dicha locomotora se halla en condiciones satisfactorias, autorizase a la mcncionada Compañía para que pueda poner en use la locomotora reconocida. Trascríbase en contestacion at Prefecto oficiante; regístrese y archívese . -Solar.*"

## The fleet in 1887

Along with the 1887 notes for each loco displayed above, source [11], the *Anales de las Obras Públicas del Perú* for 1887, summarises the fleet on pages 563 and 5666:
*Locomotoras y material rodante. —Como se sabe, el estado de locomotoras y material rodante en general de un ferrocarril, depende no solamente de la calidad del material de que esta construido, del sistema de su construction y de su conservation mas menos esmerada, sino ademas del servicio activo que ha prestado. La practica enseña que generalmente la vida de una locomotora se espresa no solamente por el tiempo sino tambien por el número de kilometros recorridos, llevando un tren ó tren kilometros, asi como por su trabajo que ha efectuado durante este tiempo, que se mide por el número de toneladas trasladadas a la distancia de un kilometro o toneladas kilometricas. Estos numeros constituyen la vida de una locomotora. La practica enseria tambien que las distintas piezas de una*

*locomotora tienen tambien vidas distintas. Asi mientras que el bastidor, los ejes, las barras de bielas y manivelas etc. pueden servir hasta que la ma-quina recorra l,000,000 de tren kilometros o durante 30 anos de tiempo de su vida activa; los cilindros, los resortes etc. no pueden servir sino por la mitad de estos numeros, ó durante los 15 años; la caldera, los principales bronces, etc., sirven tan solo por el tercio de este numero ó los 10 años; los tubos de bronce de la caldera por 5 años etc. De esto se desprende la importancia para la inspeccion y para las empresas mismas, de tener registros bien llevados de cada maquina donde debian apuntarse con esmero todos los accidentes y todo el trabajo que ha esperimentado cada maquina desde su nacimiento o su construccion. El reglamento general de los ferrocarriles, del Peru que principió a regir desde el 1.° de Marzo de 1876 ha previsto esta necesidad y ordena llevar los libros semejante.*

*De los datos anotados en los libros de registro de locomotoras que existen desde el año 1872 en la Empresa de los Ferrocarriles de Lima, Callao y Chorrillos y de los recojidos por mi, el material rodante de este Ferrocarril se presenta como sigue:* (See individual engine comments above)

*La Factoria esta bien prevista de útiles y materiales y capaz de efectuar cualquier trabajo de reparación ó nuevo que pueden requerir sus maquinas ó carros de la linea.*

*"De lo dicho sobre las locomotoras, resulta que actualmente los ferrocarriles de Lima, Callao y Chorrillos, tienen en servicio activo ocho locomotoras grandes, á saber: Nos.* ***1, 3, 5, 6. 12, 14, 15 y 16*** *y tres chicas, Nos.* ***11, 17 y 18*** *para efectuar los cambios; mas cinco máquinas grandes que se reparan o esperan reparaciones, a saber: Nos.* ***7, 8, 9, 10 y 13****. Del estado de servicio de estas máquinas, resulta que las locomotoras Nos.* ***1 y 3****, aunque actualmente en buen estado, se encuentran ya en el último periodo de su vida como edad y trabajo que efectuaron; sus compañeras Nos.* ***2 y 4****, que principiaron a trabajar junto con ellas, ya se encuentran inservibles. Las Nos.* ***5, 6 y 8*** *pasaron tambien su media vida, pero no hay por eso razon de retirarlos del trabajo de la linea, con tal que se desplegue siempre la vigilancia debida prevista en los articulos 75 y 76 del Reglamento; vigilancia necesaria por lo demás con cada máquina las mas nueva. Los Nos* ***12, 13, 14 15, y 16*** *se encuentran en buen estado y pueden prestar el servicio útil por mucho tiempo con las mismas restricciones.*

*Hechas las investigaciones sobre las causas que han ocasio nado el retardo de los trenes de Chorrillos el dia 7 y 8 de Febrero último, retardos que han iniciado este informe. resulta que estos no han sido motivados por el mal estado de las maquinas Nros.* ***3 y 5*** *que han conducido estos convoyes las que se enconban y se encuentran en buen estado de servicio, sino tan solo por la negligencia del maquinista conductor de estas máquinas, que se descuidó de llevar bien el fuego, faltándole de repente el vapor por cuya negligencia fue suspendido y separado completamente del servicio de la Empresa.*

*He verificado también que la circunstancia que las maquinas tiros.* ***15 y 16*** *que han corrido en la linea de Chorrilos en los dias 11, 12 y 14 de Febrero último, con el tender por adelante. ha sido motivada por la reparacion que ha sido necesario verificar en la tornamesa de Chorrillos a saber levantarla y cambiar el cimiento respectivo.*

*Reasumiendo lo espuesto mas arriba resulta:*

*1o. Que la via de los Ferrocarriles de Lima a Callao y Chorrillos se encuentran en muy buen estado de conservacion resistencia y seguridad.*

*2o. Que aunque algunas maquinas son viejas, no por esto debe separarseles completamente del servicio, con tal que se desplegue la vigilancia constante en su conservación prevista en los articulos 73, 75 y 76 del Reglamento de los Ferrocarriles, vigilancia necesaria por lo demas con cada maquina la mas nueva. Mientran tanto según mi conocimiento, estos articulos no han lido observados por la Empresa, pues generalmente las maquinas se reparan, se renuevan, sufren cambios, sin que el Gobierno este avisado oportunamente, para poder asistir sus agentes a las pruebas del caso, colnolo exigen los mencionados articulos del Reglamento vigente.*

*3o. Que los atrazos de los trenes en la Linea de Chorrillos en los dias 7 y 8 de Febrero ultimo han tenido por causa el descuido del maquinista yaunque este ha sido separado de su puesto, sin embargo la empresa debia observar mas estrictamente el articulo 104 del Reglamento que exige conferir el cargo de maquinista tan solo a las personas que han dado pruebas suficientes de capacidad y conocimiento de la via."*

### *0-6-0ST d/w 42", cyls. 12x20", built by Manning Wardle in 1888*

Ordered by Lima Railway Co., Peru. MW class Special.

**19 'El COMERCIO'** w/n 1044

Acceptance mentioned in 1888 Anales as: *Lima, Octubre 4 de 1888. Visto este expediente y resultando del anterior informe del Ingeniero del Estado D. Francisco J. Wakulski que la nueva locomotora N.° 19 nombrada "El Comercio" perteneciente a la compañia Inglesa de los ferrocarrriles de Lima, Callao y Chorrillos, que se ha mandado reconocer y esta, destinada al servicio de dichas lineas, reune todas las condiciones exigidas para este caso por el Reglamento General de ferrocarriles; autorizase a la enunciada Empresa para poner en servicio la expresada locomotora. Registrese. — DENEGRI.* [11, 1888 p081].

This loco ran 2990.8 km on the Lima to Trigo line in 1888 and 5194.0 km on the Lima to Chorrillos line [11, 1888 pp486 and 488].

1889 Anales report: *Construida en 1887 pero en servicio solo desde Agosto de 1888. Es una maquina nueva que se encuentra en excelentes condiciones.* [11, 1889 p424-5]

This loco ran 13865.72 km on the Lima to Trigo line in 1889 and 79.65 km on the Lima to Chorrillos line [11, 1889 pp512 and 514].

This loco ran 10735.31 km on the Lima to Trigo line in 1890 and 0 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].

This loco ran 8826.52 km on the Lima to Trigo line in 1891 and 0 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].

This loco ran 13707.45 km on the Lima to Trigo line in 1892 and 0 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].

This loco ran 15068.02 km on the Lima to Trigo line in 1893 and 31.86 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].

This loco ran 15207.78 km on the Lima to Trigo line in 1894 and ? km on the Lima to Chorrillos line [11, 1894 pp400 and 402].

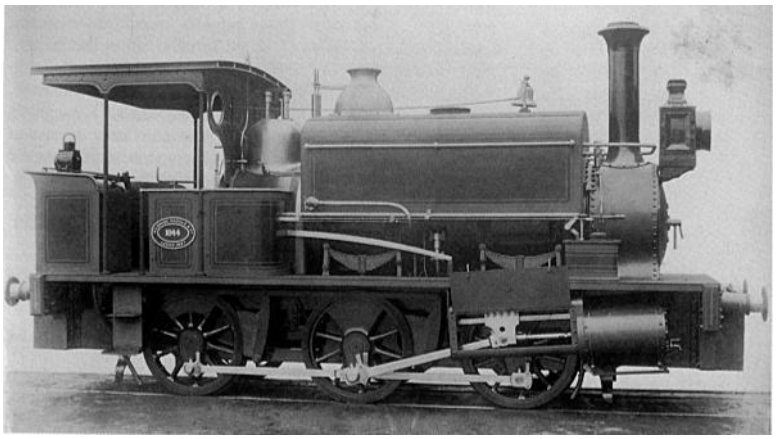
This loco ran 10616.21 km on the Lima to Trigo line in 1895 and ? km on the Lima to Chorrillos line [11, 1895 pp226 & 228].

Inspected in 1896 and permitted to continue in use solely for shunting and freight train use [11, 1896 p064].

This loco ran 6443.10 km on the Lima to Trigo line in 1896 and 860.22 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].

Ran 602.97 km. on the Trigo line and 4986.09 km. on Chorrillos line in 1897 [11, 1897 p560].

In service 1898 and 1908.



MW 1044, an unusual design from this maker.

Sent away Jan 1888.

Remarks.

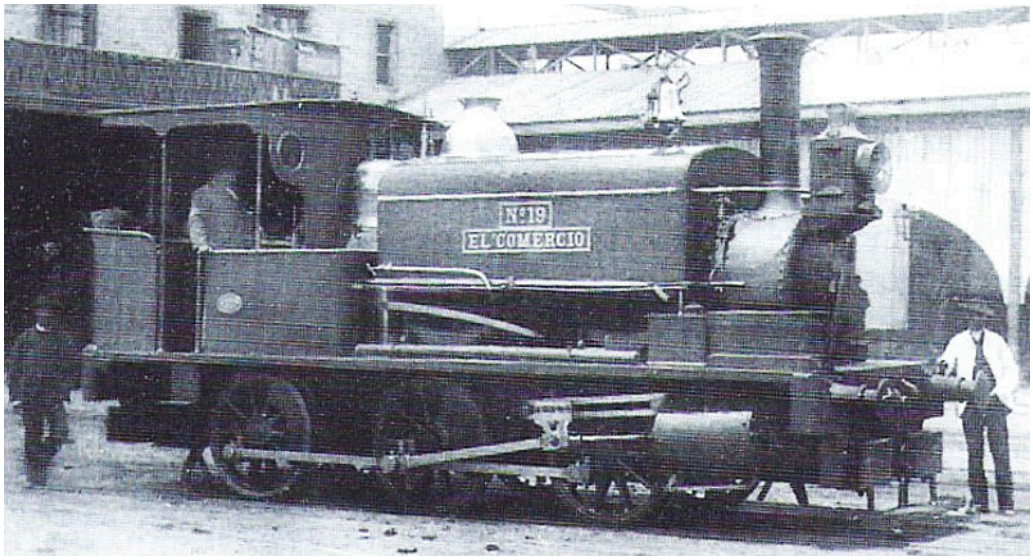
This is a special 12 x 20" outside cylinder Loco Saddle Tank Engine, on six coupled wrought iron wheels 3'6" diam. having Bessemer steel Tyres. (During 7" tread & without flanges), wheel base 10'6". A.S = 500 sq feet, viz 46 feet in Box & 454 o feet in 94 Tubes 2" out diam. Capacity of Saddle Tank 600 gallons. The Tubes in this Boiler are Everetts patent hardened Copper No 10 & No 13 w.g. The Boiler Fire box shell & Smoke box Tube plate are steel & have all the longitudinal joints double rivetted. A dome is fixed on the boiler barrel & a manhole on fire box shell. This Engine is also fitted with an ordinary safety Valve on dome & a Ramsbottoms Safety Valve on the Manhole ferruled to 150 lbs pressure per □ inch. The Axles & Frames are Siemen Martin steel. Axle boxes are Stones Patent Bronze No 1 solid with bearings; & having adjusting wedges for taking up the wear between horn blocks. All the Coupling & Connecting rod brasses are also Stones Patent Bronze No 1 & the Slide Valves, same Metal in No 2. The coupling & connecting rod brasses are enclosed over crank pins to prevent dust getting to them. The slide bars are also enclosed with a covering of sheet iron. This Engine has 2 Roscoe Lubricators, 1 Bell American head lamp, also one each Tail & gauge lamps. Block Piston with gunmetal rings, Cast iron Centre Steps, 1 No 5 M.F. & Co Injector & one Feed pump (Springs & plates special) for further particulars see drawings & full list of Tracings. Order No 26100.

Buffer beam fitted with block buffers, also the ordinary class K wrought iron spring buffers. (special draw gear)

Safety Valve spring balances same as class O.

Name EL COMERCIO. No 19. Sale No 26100.

Notes from the Manning Wardle archive about this locomotive.



This photo shows an engine looking very much like no. **19**, though with a much larger bell and a slightly shortened chimney. The scene appears to be at the site of an accident, though no details are known.

## A report by a government loco inspector in 1889

*MATERIAL RODANTE.*

*Comprende las locomotoras y los carros y coches.*

*Locomotoras: He dado preferente atención al examen de las locomotoras y especialmente a todo lo que en ellas pueda relacionarse con la seguridad del publico. Para el minucioso examen de los calderos y particularmente de las hornillas y tubos de fuego, he sido asistido por el antiguo jefe mecanico de la extinguida Escuela de Artes, señor E. Rosell, nombrado a petition mia por decreto de 17 del pasado. y quien, me es grato hacerlo constar, ha sabido cumplir con su deber.*

*El reconocimiento de cada locomotora calificada por la Empresa en estado de servicio, se ha hecho primero a frio para poder apreciar el estado del caldero y organos mecanicos; y en seguida bajo presión de vapor que ha variado de 120 a 160 libras pp² y haciendo la prueba arrastrando un tren y haciendo funcionar los diferentes aparatos como freno, niveles de aqua, bombas, inyectores y valvulas de segu-ridad. Tambien se ha comprobado la graduación de dos manometros tomados indistintamente usando al efecto el aparato de prueba y el manómetro tipo. Se ha podido asi notar en general que los calderos y aparatos anexos, casi todos ya viejos, no estan ademas perfectamente conservados; pudiendo verse por ejemplo en algunos fogones paredes ampolladas que sin indicar riesgo prueban el descuido; y lo mismo el poco uso que se hace de los aparatos de nivel y de los inyectores con el objeto de mantenerlos siempre corrientes y en buenas condiciones. Debe suponerse que estos defectos provienen del empleo de corredores incompetentes, falta imputable a la Empresa.*

*Hechas estas observaciones generales, voy a pasar al examen par-ticular de cada una de las diez y nueve locomotoras que en total posee la Empresa y consideradas por ella divididas de este modo:*

*En servicio—Números **1, 5, 6, 7, 9, 11, 12, 13, 14, 17, 19**.*

*Lista, despues de reparacion—Numero **15**.*

*En actual reparation—Numeros **3, 16, 18**.*

*Fuera de todo uso —Numeros **2, 4, 8, 10**.*

*En servicio:—Activo ó posible—Once maquinas.*

There then followed notes about each operational engine which have been located in the appropriate places in the loco list above.

*Num. **1**:—*

*Núm. **5**:—*

*Num. **6**:—*

*Num.* **7**:—
*Num.* **9**:—
*Num.* **11**: --
*Num.* **12**:--
*Num.* **13**:—
*Núm.* **14**:—
*Num.* **17**:---
*Núm.* **19**:—
*Locomotora recien reparada:—Una sola.*
*Num.* **15**:— (See above).
*En actual reparacion:—Tres locomotoras.*
*Num.* **3**:— *Construida en 1850.*
*Num.* **16**;— " *1876.*
*Num.* **18**:— "
*Locomotoras fuera de uso:—Cuatro.*
*Num.* **2**:—*Construida en 1850 y retirada en 1887.*
*Num.* **4**:— " " " " " " *1884.*
*Num.* **8**:— " " *1858* " " " *1885.*
*Num.* **10**:— " " *1867* " " " *1885.*
*En resumen cuenta la Empresa actualmente no considerando los numeros* **6** *y* **13** *suspendidas, diez locomotoras en uso, que son:*
*En buen estado numeros* **9, 12, 14, 15, 19**.
*En regular estado numeros* **1, 5, 7, 11, 17**.
*Carros y coches:—Del reconocimiento de los carros y coches en uso resulta que se encuentran en bueno y regular estado de uso. Resumen:—Del detalle anterior resulta:*
*1.° Que el material fijo se encuentra en buenas condiciones y es-pecialmente la via. Solo debe hacerse notar la existencia inconveniente de algunas curvas reversas, y la falta de cercos en muchos lugares de la linea adonde serian necesarios.*
*2.° Que el material rodante está en general en bueno y regular estado, una vez separadas del servicio las dos locomotoras malas* **6** *y* **13**. *Que en cuanto a las locomotoras mandadas particularmente examinar, sus maquinas estan en buen estado pero que sus calderos no se encuentran been conservados, mereciendo recomendar a la Empresa una vigilancia especial, sin perjuicio de la Inspeccion fiscal que debería hacerse cada año; y recomendarle ademas el empleo de corredores de reconocida competencia y sobriedad.*
*Añadiendo por ultimo, que la Empresa lleva corrientes los registros de locomotoras que ordena el Reglamento, me es honroso participar a US. ser esto todo lo que al respecto tengo que informar.*
*S. M.*
*A. GUEVARA,*
*Ingeniero de Estado.*

## *0-6-0ST d/w 48", cyls. 14x20", built by Sharp Stewart in 1890*

Ordered by ?, Lima. SS order E954. These four engines authorised for use on public trains, presumably after inspection, December 1890 [11, 1890 p262], also [11, 1890 p533].

**20 'El PRESIDENTE'** w/n 3611

This loco ran 285.95 km on the Lima to Trigo line in 1890 and 3249.72 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 30.10 km on the Lima to Trigo line in 1891 and 30438.16 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
A loco **'PRESIDENTE'** recorded in service in 1891 but numbered **29** which may be a mistake.

This loco ran 30.10 km on the Lima to Trigo line in 1892 and 25918.11 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 75.25 km on the Lima to Trigo line in 1893 and 26427.87 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 30.10 km on the Lima to Trigo line in 1894 and 27224.37 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 30.10 km on the Lima to Trigo line in 1895 and 26619.03 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected and tested in 1896 and permitted to continue working with a BP of 150psi. See below [11, 1896 p063].
This loco ran 150.50 km on the Lima to Trigo line in 1896 and 23576.40 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 210.70 km. on the Trigo line and 18399.15 km. on Chorrillos line in 1897 [11, 1897 p560].
Correctly designated **20** in 1908.

**21 'El CONGRESO'** w/n 3612

This loco ran 240.80 km on the Lima to Trigo line in 1890 and 2883.33 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 60.20 km on the Lima to Trigo line in 1891 and 27813.78 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 0 km on the Lima to Trigo line in 1892 and 23863.14 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 15576.75 km burning oil on the Lima to Trigo line in 1893 and 9382.77 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 15606.85 km on the Lima to Trigo line in 1894 and another 16163.70 km after conversion to oil-burning, also 0 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran16871.05 km, and 7525 km. burning oil, on the Lima to Trigo line in 1895 and 0 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected and tested in 1896 and permitted to continue working with a BP of 150psi. See below [11, 1896 p063].
This loco ran 31334.10 km on the Lima to Trigo line in 1896 and 127.44 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 26638.50 km. on the Trigo line and 509.76 km. on Chorrillos line in 1897 [11, 1897 p560].
In service 1908.

**22 'La REPÚBLICA'** w/n 3613

This loco ran 3822.70 km on the Lima to Trigo line in 1890 and 0 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 24952.90 km on the Lima to Trigo line in 1891 and 31.86 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 30220.40 km on the Lima to Trigo line in 1892 and 0 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 6697.25 km on the Lima to Trigo line in 1893 and 5575.50 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 30.10 km on the Lima to Trigo line in 1894 and 28546.56 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 0 km on the Lima to Trigo line in 1895 and 28705.86 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected and tested in 1896 and permitted to continue working with a BP of

150psi. See below [11, 1896 p063].
This loco ran 4168.85 km on the Lima to Trigo line in 1896 and 26523.45 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 13951.35 km. on the Trigo line and 9844.74 km. on Chorrillos line in 1897 [11, 1897 p560].
In service 1908.

**23 'La PERUANA'** or **'El PERUANO'** w/n 3614

This loco ran 3446.45 km on the Lima to Trigo line in 1890 and 0 km on the Lima to Chorrillos line [11, 1890 pp730 and 732].
This loco ran 26969.60 km on the Lima to Trigo line in 1891 and 0 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 29994.65 km on the Lima to Trigo line in 1892 and 12584.70 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 4937.85 km on the Lima to Trigo line in 1893 and 31.86 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 24877.65 km on the Lima to Trigo line in 1894 and another 2919.70 km. after conversion to oil-burning, also 0 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 15140.30 km., and 9255.75 km burning oil, on the Lima to Trigo line in 1895 and 0 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected and tested in 1896 and permitted to continue working with a BP of 150psi. See below [11, 1896 p063].
This loco ran 19399.45 km on the Lima to Trigo line in 1896 and 7232.22 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 33877.55 km. on the Trigo line and 31.86 km. on Chorrillos line in 1897 [p1, 1897 p560].
1890, 1893 mileage tables and 1908 list give name as **'El PERUANO'**.

This cropped image came from an undated photo showing coffins being unloaded from an *FCLCC* train. The semi-elliptical saddle-tank and the chimney both have a Sharp Stewart feel to them and thus the loco might well be from this batch of 0-6-0STs.

## Inspector's report 1890

After reviewing in detail two overhauled locos nos. **12** and **13**, which comments are displayed above in each engine's respective history, the inspector went on to say: *El dia 12 ultimo se peso al servicio de carga en un tren de prueba compuesto de 12 carros ingleses y un furgon: el peso en globo fue de 182 toneladas inglesas. El tren salio de la*

*estacion principal del Ca-llao a las 6 h 3' p.m. y llego a la estacion de San Juan de Dios en Li-ma a las 6 y 42' empleando 39' en el trayecto. La velocidad en las calles del Callao ha sido muy reducida no solo por reglamento sino tambien precautoriamente, pero despues de pasar Bella-Vista se acelero hasta dar un termino medio de 81 km por hora entre esta estacion y "La Salud" de Lima. La caldera ha sostenido una presion de 140 libras por pulgada inglesa.*

*Esta fue la primera de mis expediciones de via total entre Callao y Lima con las maquinas examinadas, y como las seis han sido sometidas, una por una, a experimentos analogos, (despues de sus respectivos reconocimientos y en la factoria), ya en parte de la via, ya en toda la longitud do ella y recorriendo todas las gradientes de un ex-tremo al otro, es decir, del Callao a Chorrillos, para la mayor garantia del público, no me detendre en seguir el pesado relato de las refe-ridas pruebas y expediciones, siendo bastante para el objeto de la inspection, que US. tenga conocimiento de los siguientes resultados:*

*1.° Las seis maquinas referidas están perfectamente expeditas para al servicio público y US., si lo tiene a bien, puede autorizarlas definitivamente para el trafico diario o para el servicio ordinario de la Empresa.*

*2.° Habiendo sido formalmente ejecutada la refaccion de las dos locomotoras antiguas (Números **12** y **13**,) el servicio de ellas no debe estimarse precarlo, sino de duración.*

*3.° Las numeros **20, 21, 22** y **23** han sido mandadas construir ad hoc por la Empresa con las especificaciones remitidas de Lima, para una, y estas para todas las otras, pues son exactamente iguales entre ellas; y sus condiciones son calculadas justamente para el objeto de su aplicacien. Las principales dimensiones de cualquiera de ellas son como sigue:*

| | | *Pies* | *Pulgds.* | |
|---|---|---|---|---|
| *Cilindros* | | *1* | *2* | *diam.* |
| *Carrera de pistones* | | *1* | *8* | |
| *Ruedas, seis* | | *4* | *0* | *diam.* |
| *Base* | | *11* | *6* | |
| *Ca1dera* | *9 pies 0" x* | *3* | *5¼* | diam. |
| *Caja de fuego* | *4 pies 0" x* | *3* | *8* | |
| *Tubes en número de 128* | | *0* | *1¾* | diam. |
| *Presion de vapor, media* | | *150 lbs. por in.²* | | |

*Los bastidores, ruedas, ejes, guias de pistones, chumaceras son de acero. La caja de fuego y tubos son de cobre; y los coginetes de bielas y chumaceras son de bronce preparado (phosphor-bronce).*

*4.° En las pruebas preliminares solo la número **20** dió motivo de pequeños reparos indicados por mi al senor Ingeniero de la Empresa, quien con la major voluntad y atención personal se ha servido asistir constantemente a mi comision.*

*Esas reparaciones de detalle, por haber sido consecuencia de un extremo de la caldera, han quedado pronto y perfectamente ejecuta-das seem el exito satisfactorio de la anima prueba practicada el dia de ayer, haciendo funcionar la maquina en toda la longitud de la via. Lima. Diciembre 3 de 1890.*

*S. D. AUGUSTO BENAVIDES.* [11, 1890 p535].

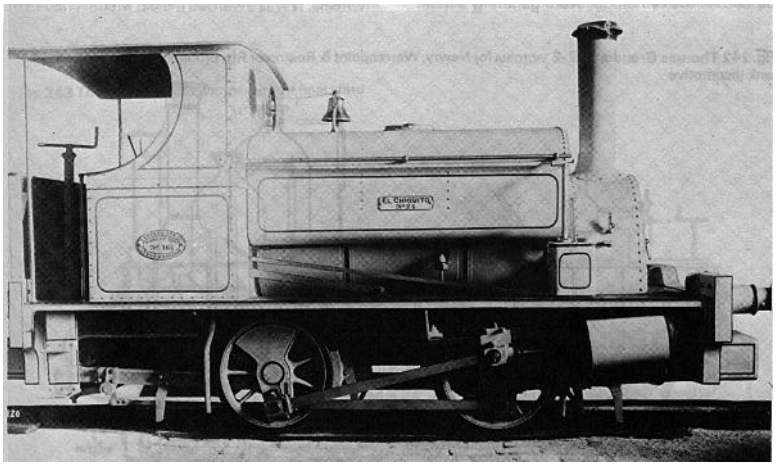
## *0-4-0ST d/w ?, cyls. 10x18", built by Thomas Green in 1891*

Ordered by Mr. Mathewson for ?

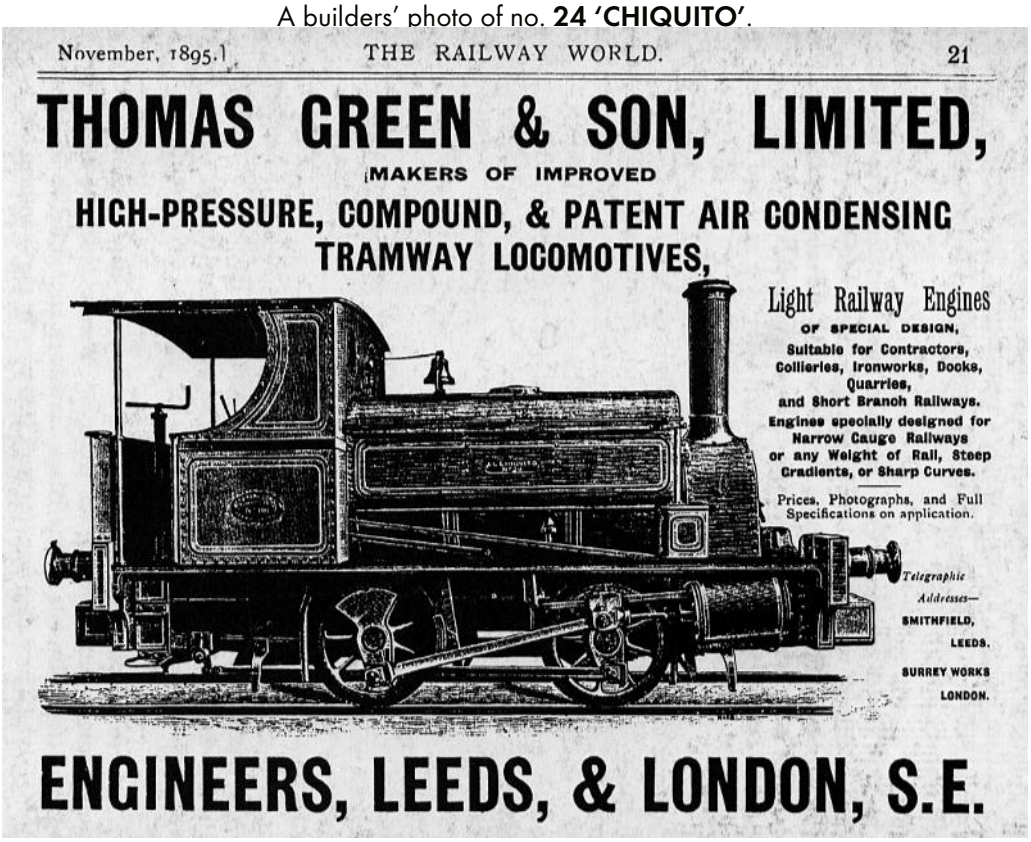
**24 'El CHIQUITO'** w/n 161

This loco ran 323.33 km on the Lima to Trigo line in 1891 and 0 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 2114.57 km on the Lima to Trigo line in 1892 and 0 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 2616.62 km on the Lima to Trigo line in 1893 and 31.86 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 3249.56 km on the Lima to Trigo line in 1894 and ? km on the Lima to Chorrillos line [11, 1894 pp400 and 402].

This loco ran 2213.74 km on the Lima to Trigo line in 1895 and 0 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
Inspected and tested in 1896 and permitted to continue working with a normal BP of 150psi. See below [11, 1896 p063].
This loco ran 20?7.54 km on the Lima to Trigo line in 1896 and ? km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 1694.90 km. on the Trigo line and 175.23 km. on Chorrillos line in 1897 [11, 1897 p560].
After 1898 was renamed **'SANTA ROSA'**, and recorded as that in 1908.



A builders' photo of no. **24 'CHIQUITO'**.



November, 1895.] THE RAILWAY WORLD. 21

THOMAS GREEN & SON, LIMITED,

MAKERS OF IMPROVED

HIGH-PRESSURE, COMPOUND, & PATENT AIR CONDENSING TRAMWAY LOCOMOTIVES,

Light Railway Engines

OF SPECIAL DESIGN,

Suitable for Contractors, Collieries, Ironworks, Docks, Quarries, and Short Branch Railways.

Engines specially designed for Narrow Gauge Railways or any Weight of Rail, Steep Gradients, or Sharp Curves.

Prices, Photographs, and Full Specifications on application.

*Telegraphic Addresses—*

SMITHFIELD, LEEDS.

SURREY WORKS LONDON.

ENGINEERS, LEEDS, & LONDON, S.E.

This Thomas Green advert from 1895 illustrates this particular engine, and was almost certainly drawn from the photo above.


A Brian Fawcett photo showing no. **24** with its later name **'SANTA ROSA'**.

It seems likely that this is the same locomotive, in this case seen in the station of Magdalena del Mar.

### *0-4-0ST d/w ?, cyls. ?, built by Manning Wardle in 1870*

Ordered by Peruvian Government. Probably acquired by railway around 1891, or possibly acquired along with the line to La Punta and loco **18** but did not enter fleet immediately perhaps until overhauled. NB Both MW 322 and 349 were named **'CHUCUITO'** and arrived in Peru in 1870-1. Whilst both this and MW no. 349 had been built to MW's class B, no. 322 had a larger than normal saddle tank which dropped right down to running plate level on each side. Incidentally, Chucuito is the name for the isthmus joining Callao to the La Punta headland.

**25 'CHUCUITO'** w/n 322 This loco ran 150.50 km on the Lima to Trigo line in 1891 and 0 km on the Lima to Chorrillos line [11, 1891 pp418 and 420].
This loco ran 177.08 km on the Lima to Trigo line in 1892 and 31.86 km on the Lima to Chorrillos line [11, 1892 pp440 and 442].
This loco ran 369.33 km on the Lima to Trigo line in 1893 and 47.79 km on the Lima to Chorrillos line [11, 1893 pp416 and 418].
This loco ran 131.93 km on the Lima to Trigo line in 1894 and 15.93 km on the Lima to Chorrillos line [11, 1894 pp400 and 402].
This loco ran 4893.49 km on the Lima to Trigo line in 1895 and 0 km on the Lima to Chorrillos line [11, 1895 pp226 & 228].
This loco ran 8059.87 km on the Lima to Trigo line in 1896 and ? km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Withdrawn from service in 1896 owing to poor state of boiler, until a replacement boiler can be procurred from England. See below [11, 1896

p062].
Ran 15399.40 km. on the Trigo line and 79.65 km. on Chorrillos line in 1897 [11, 1897 p560].
Not listed in 1908.

## Several inspectors' reports from 1896

**1**

*Lima, Agosta 3 de 1896.*

*Apareciendo del anterior informe del ingeniero don Juan J. Grieve, Presidente de la Comision encargada de inspeccionar el estado de las locomotoras de los ferrocarriles de Lima al Callao y Chorrillos;*

*1o. Que de las veinticinco locomotoras que tenia la Empresa desde que se fundó, han sido eleminadas del servicio por distintas causas las numeros **2, 4, 5, 6, 8**, **10**, **13** y **17**;*

*2o. Que la Comision por una parte y la Empresa por otra, han separa-do del servicio las signadas con los numeros **15, 16, 9** y **25** por la debilidad de sus calderos;*

*3o. Que probadas las locomotoras números **20, 21, 22** y **23**, resulta que ellas pueden trabajar con la presión maxima de 150 libras por pulgada cuadrada y que de la inspection practicada en la número **14**, aparece que esta puede funcionar con 120 libras de presión, todo to cual ha autorizado el ingeniero informante;*

*4o Que no debe autorizarse por motivo alguno el uso de las locomotoras números **9, 15, 16** y **25**, hasta que no reciban los calderos nuevos que la Empresa ha pedido a Inglaterra; y*

*5o. Que faltando por examinarse los calderos de las números **1, 3, 7, 11, 18, 19** y **24**, cuya operación debe verificarse en el dia, se hace necesario otorgar un plazo fijo con tal objeto;*

*Se resuelve: Aprobar en todas sus partes el informe del ingeniero Grieve, y otorgar a la Empresa de los ferrocarriles de Lima at Callao y Chorrillos el plazo maximun de 40 dias, para poner las locomotoras, a que se refiere el considerando 5o. de esta resolución, en estado de ser debidamente examinadas por el ingeniero inspector, a fin de que sean eritregadas at tráfico, si reunen las condiciones de reglamento; siendo entendido que si Ia Empresa no cumple con esta disposition, seran separadas de hecho del servicio, las locomotoras que no hubiesen sido inspeccionadas dentro del mencionado plazo. Registrese, cornuniquese y publiquese.—ROMAÑA.* [11, 1896 p62-63].

**2**

*Lima, /3 de Octubre de 1896.*

*Visto el recurso del Gerente de la Empresa de los ferrocarriles de Lima al Callao y Chorrillos por el cual pide que se le autorice para continuar usando hasta fines del presente ano, las locomotoras números **15** y **16** y se entienda hasta igual techa el plazo de cuarenta dias que se le concedio por resolucion de 3 de Agosto ultimo, para poner en estado de ser debidamente inspeccionadas las locomotoras a que se refiere Ia misma resolucion;*

*Visto igualmente el anterior informe del Ingeniero D. Juan J. Grieve, comisionado especial del Gobierno para inspeccionar el estado de las locomotoras de los ferrocarriles mencionados; y apareciendo de ese documento.*

*1o. Que solo han sido examinadas las locomotoras números **12** y **24**, cuyo uso, con una presion normal de ciento cincuenta libras, ha autorizado dicho Ingeniero, retirando a la vez del servicio la número **18** por las peligrosas condiciones en que se encuentra;*

*2o. Que por ningún motivo puede permitirse que continuer en el servicio publicó las locomotoras números **15** y **16**, separadas del trafico hasta que reciban los nuevos calderos pedidos a Inglaterra por la Empresa; y siendo conveniente dar aún mayores facilidades a la citada Empresa para el fiel cumplimiento de Ia resolucion ministerial de 3 de Agosto último; se resuelve: 1o Reconsiderar en parte el decreto ministerial de 3 de Agosto del presente alto, en el sentido de conceder a la Empresa de los ferrocarriles de Lima al Callao y Chorrillos un último improrrogable plazo de cuarerita dias contados desde la fecha de esta reso lucion, para que cumpla con poner las locomotoras números **1, 3, 7, 11** y **19** en estado de ser inspeccionadas por el Ingeniero Inspector de esas lineas D. Felipe Arancivia, a fin de*

*que sean entregadas al servicio si reunen las condiciones de reglamento; no pudiendo emplearse por ahora dichas locomotoras sino únicamente en el servicio interior de las estaciones y para conducir trenes de carga bajo la responsabilidad de la Empresa y la vigilancia del antedicho Ingeniero, siendo entendido que no podran usarse por ningun motivo las números **15** y **16**, mientras no sean renovados sus calderos y sujetas a las pruebas que determine el Ingeniero Inspector para la seguridad del trafico; y*

*2° Declarase terminada la comisión especial conferida al Ingeniero D. Juan J. Grieve por resolucion ministerial de 9 de Abril del presente alio, para examinar el estado de las locomotoras de los ferrocarriles referidos, y manifiestesele que este Despacho ye con agrado, la manera satisfactoria con que ha llenado su cometido. Registrese y publiquese con el informe de su referenda, que desde lue-go se aprueba. CUADROS.* [11, 1896 p63-64].

**3**

*Accidente ferroviario ocurrido en la estacion del Barranco, del ferrocarril de Lima á Chorrillos.*

*Lima. 17 de Abril de 1896.*

*Visto el oficio informativo del Subprefecto de esta Provincia, elevado por el Prefecto del Departamento, en el cual se da cuenta del accidente ocurrido el 8 de los corrientes en la estacion del Barranco del ferrocarril de Lima a Chorrillos. Visto igualmente el anterior informe del ingeniero del Estado don Felipe Arancivia; y*

*Considerando:*

*1o. Que la locomotora número **13**, cuyo caldero hizo explosion, fue reparada en Diciembre de 1890 y aprobada su refección por resolucion ministerial de 10 del propio mes y alio;*

*2o. Que en Noviembre de 1895 y Febrero del presente alio, dicha locomotora ha sufrido diversas composturas sin conocimiento del Gobierno, y por tanto, sin su autorizacion para que reingresase al servicio, infringiendose asi el articulo 73 del Reglamento General de Ferrocarriles;*

*3.° Que es igualmente manifiesta la infracción del articulo 76 del propio Reglamento, puesto que la locomotora en referenda, ha servido 5 años sin que se la revise por completo, y sin ser sometida a las pruebas que determina el enunciado artículo 73; reagravandose esta falta con la circunstancia de hacer sido desatendidas las observaciones hechas por el maquinista que la conducia, relativas al weal estado del caldero;*

*4.° Que consta asi mismo, por declaraciones de los empleados de la empresa, que la locomotora antedicha tenia en el dia que ocurrió el accidente, mucha mayor presion que la que asegura el jefe inmediato de los mecanicos era permitido usar en las maquinas viejas, en cuya condicion estaba considerada la número **13**;*

*5.° Que aunque del informe tecnico se desprende, en parte, la respon-sabilidad en que han incurrido algunos empleados de la empresa, esto no la excusa de responder directamente al Gobierno, según el articulo 1,649 del Codigo Civil, por las faltas que cometan sus operarios y demas personas que emplee por si; y*

*6.° Que el juicio instaurado ante el Poder Judicial con arreglo al articulo 112 del supradicho Reglamento General de Ferrocarriles, con el fin de esclarecer si ha habido delito y hacer efectiva la responsabilidad criminal con arreglo al Codigo de la materia, no obsta para que el Gobierno ejerza las funciones administrativas que el mismo articulo le atribuye, para reprimir y evitar los abusos de este genero, quedando en todo caso sujeta la Empresa a las responsabilidades en que por este respecto esti incursa, del mismo modo que a las que reclamen los particulares en el order civil, para alcanzar la consiguiente reparation;*

*Se resuelve:*

*Impónese a la Empresa del ferrocarril de Lima a Chorrillos una multa de cinco mil soles (S/ 5000) que se hara efectiva por la Caja Fiscal de Lima, sin perjuicio de las acciones que competan a los particulares contra dicha Empresa, las cuales podran entablar en el modo y forma que vieren convenirles.*

*Registrese, comuniquese y publiquese. — Rúbrica de S. E.—ROMARA* [11, 1896 p64-65].

A much more comprehensive report about this accident was printed in [11, 1896 pp472-477].

**4**

*Lima, Abril 29 de 1896.*

*A fin de que US. tenga cabal conocimiento del estado general en que estan hoy las locomotoras con que cuenta el ferrocarril ingles para el movimiento de sus trenes de pasajeros y carga, tengo la honra, de acuerdo con mis compañeros de comision, de elevar el cuadro adjunto como fundamento de la medida que proponemos como indispensable para que se pueda establecer un servicio bien organizado en las lineas de Lima, Callao v Chorrillos.*
*Como verá US., el número total de locomotoras que dispone la empresa respectiva, es de diez y ocho. Si de este numero se deducen dos quo se necesitan en el servicio de la linea del Callao a la Punta, dos para los cambios y formation de convoyes en las estaciones de Lima y Callao, tres para carga, una para Ia linea del trigo y tres que generalmente estan en la Factoria recibiendo composturas parciales o generales, solo quedarian libres para el servicio de pasajeros siete*
*locomotoras incluyendo en este número a la* ***Callao No 1*** *y* ***Oyague No 3****, las que bien pudieran, como sus compañeras, de construction .****Lima No 2*** *y* ***Castilla No 4*** *ser puestas fuera de servicio por tener 46 años de use constante.*
*No quedan pues en rigor mis que seis locomotoras para los trenes de pasajeros, número a todas luces insuficiente para el movimiento de dos lineas de tanto tráfico como son las de Lima at Callao y Lima a Chorrillos en las que ciertos trenes se cruzan, to que exije dos locomatoras que trabajen simultaneamente.*
*En el cuadro adjunto queda tambien demostrado que las locomotoras números* ***7, 11, 14*** *y* ***15*** *deberian entrar inmediatamente a Ia factoria a sufrir una revision y compostura general por tener mis de tres años en servicio desde la última compostura completa, debiendo hacerse lo mismo con la* ***20, 21, 22****, y* ***23*** *que han recorrido con exceso los cincuenta mil kilómetros, todo en conformidad con to dispuesto en el articuto 76 del Reglamento de Ferrocarriles.*
*Como el cumplimiento de esta disposición paralizaria el movimiento de las dos lineas ó por lo menos el de una, he creido conveniente antes de proceder, dar al senor Ministro cuenta de estas circunstancias como to hago por el digno conducto de US.*
*Creyendo que con to expuesto queda bien probada la deficiencia de los elementos de traccion de que dispone la Empresa, Ia comision opina que el Supremo Gobierno debe ordenar que la Empresa pida a donde le convenga cuatro locomotoras nuevas de superior fuerza a las actuales, capaces de arrastrar cada una el convoy mas largo que sea de costumbre formar, las que deberan estar listas y funcionando el 31 de Diciembre proximo, y que, si la la Empresa no cumple con esta disposición se le suspenda el tráfico, pues no es posible consentir que, como ha sucedido el Domingo 25, los convoyes de la noche sean conducidos por dos maquinas, to que puede ocasionar, por falta de acuerdo é inteligencia indispensable entre los dos conductores de las maquinas, desgracias parecidas a la que sucedio en Enero del 81 en la estacion de la Encarnación con un convoy que entró a ella arrastrado por dos locomotoras.*
*Dios guarde a US.*
*S. D. JUAN C. GRIEVE.*
*Ingeniero.*
**5**
*Lima, Mayo 27 de r896.*
*Sefior Director de Obras PUblicas.*
*S. D.*
*En la fecha he dirijido un oficio al senor Gerente de los Ferrocarriles de Lima, Callao y Chorillos, cuyo tenor es el siguiente:*
*Senor Gerente:*
*• Del examen practicado el dia de ayer en la locomotora número* ***15****, resulta que la parte inferior del casco cilindrico del caldero ha experimentado en los veinte años que tiene de servicio un notable desgaste, pues la plancha en algunas partes tiene un octavo de pulgada menos y en otras hasta un cuarto, que es la mitad del espesor primitivo.*
*• Esta circunstancia, los veinte años de use y el haber sido parchada ya en epoca muy anterior la caldera en cuestion, obligan a la Comision que presido a suspenderla del servicio activo en las lineas de la Empresa que Ud. administra,*

*asi como en el servicio de las estaciones ó en cualquiera otro uso.)*
*• Siendo este caldero de la misma provenencia que el de la locomotora numero **13**, asi como las locomotoras números **14** y **16**, sirvase Ud. disponer que estas últimas ingresen inmediatamente a la factoria, para examinar el estado de sus planchas, para resolver en vista del resultado lo que sea conveniente sobre el particular.*
*Lo que tengo la honra de participar a US. para su conocimiento y demas fines.*
*Dios guarde a US.*
*Sefior Director.*
*S. D. JUAN C. GRIEVE, Ingeniero.*
**6**
*Señor Director.*
*De las veinticinco locomotoras que desde su extreno ha hecho venir la Compañia de los ferrocarriles de Lima al Callao y Chorrillos, se han eliminado del servicio, por distintas causas, las que llevan los números **2, 4, 5, 6, 8, I0, 13** y **17**. La Comisión que tengo la honra de presidir ha hecho retirar del servicio por debilidad de sus calderos a las signadas con los números **15** y **16** y la Empresa por su parte y por identica causa, ha retirado las que llevan los numeros **9** y **25**. De las trece restantes se han probado los calderos relativamente nuevos de las locomotoras números **20, 21, 22** y **23** que se han timbrado para que puedan trabajar con una presion maxima de ciento cincuenta libras por pulgada cuadrada.*
*Como con posterioridad a la prueba de la número **14** la comisión se apercibiese que las miquinas gemelas números **15** y **16** tenian sus planchas sumamente desgastadas, no obstante haber resistido satisfactoriamente a Ia prueba por presion hidraulica, dispuso que Ia número **14** regresara nuevamente a la factoria y como constara de los libros de la Empresa que en 1892 se puso a dicho caldero una nueva caja de fuego y planchas nuevas a la parte inferior del casco cilindrico, se limitó a hacer algunas perforaciones en la parte superior encontrandose la plancha casi intacta, por lo que ha autorizado su uso timbrandola para que pueda trabajar con 120 libras de presión.*
*La locomotora número **12** recibe actualmente un caldero nuevo y entre pocos dias sera entregada al trafico. Quedan aún por examinarse los calderos de las locomotoras números **1, 3, 7, 11, 18, 19** y **24**. operación que la Comision podria practicar facilmente en una semana si la Empresa le entrega una locomotora cada dia, lo que la obligaria quiza a suspender parcialmente el tráfico. Punto es este que la Comision no se cree autorizada a resolver por si misma y que so-mete a la superior autoridad de US. Despues de esta exposición que permitira a US. conocer el estado actual del material de traccion de que dispone actualmente la Empresa de los ferrocarriles, creo llegado el caso de manifestar a US. que por motivo alguno se debe autorizar el uso de las locomotoras números **9, 15, 16** y **25** hasta que reciban los calderos nuevos que la Empresa ha pedido a Inglaterra. En resumen, falta por examinarse el estado de los calderos de siete locomotoras, se han examinado nueve, de las cuales se ha autorizado el uso de cinco y se han suspendido cuatro y se trabaja en la número **12** que saldra pronto al servicio con un caldero nuevo, despues de haber experimentado una compostura general. Lima, Julio 31 de 1896.*
*S. D. JUAN C. GRIEVE, Ingeniero.*
**7**
*Senor Director de Obras P6blicas:*
*El senor don Alejando Prentice, Gerente de la Empresa de los Ferro-carriles de Lima al Callao y Chorrillos, pide al Supremo Gobierno, la re-consideraciOn de la resolucion ministerial de 3 de Agosto del presente, en la que, aprobandose todos los procedimientos de la Comisión que tengo la honra de presidir, se dispone, entre otras cosas, que queden en receso las locomotoras números **15** y **16** y se senala un termino maximo de cuarenta dias para que se examinen las otras siete a fin de saber si pueden ó no continuar en servicio activo. Concretandome de pronto al primer punto, debo decir que, por ingrato que sea, la Comisión no puede autorizar, ni aun provisionalmente, que las citadas locomotoras numeros **15** y **16** continuen un momento mas en el ser-vicio pnblico. Como el senor Gerente de la Empresa de los ferrocarriles de Lima, Callao y Chorillos cree que no debe soportar en silencio las consecuencias del*

*ecxesivo celo de la Comisión inspectora, forzoso me es tener que demostrar que la determinación de privar a la Empresa de los sevicios de dos de sus mas poderosas locomotoras en la embarazosa situación en que la coloco la catistrofe del Barranco, fue tomada muy a nuestro pesar, no por demostrar excesivo celo, sino en cumplimiento de un deber muy sagrado que at no ser cumplido, podia y debla en el caso desgraciado de un nuevo siniestro, hacer recaer sobre nosotros el abrumador peso de agenas responsabilidades.*

*En el examen practicado por la Comisión en las locomotoras de la Empresa, su primer cuidado ha sido de formarse cabal concepto de la calidad de las planchas de que estan fortnadas sus calderas. A pesar el prolijo reconocimiento practicado por el propio Superintendente de locomotoras de la Empresa y por el jefe de su factoria solo se ha encontrado la marca Low-Moor en los domos pero no se ha encontrado marca alguna en ninguna de las planchas de los cue' pos cilindricos de todas las calderas examinadas. En consecuencia, pues, la Comision no podia saber, ni sabe ahora mismo, si ellas estan fabricadas como es de estilo con planchas de caldero de Stafordshire marca Best, Best, cuya fuerza tensil maxima es de 57,000 libras por pulgada cuadrada ó de fierro de Stafordshire corriente que solo tiene una resistencia a la tracción de 50,000 libras. Ante este primer elemento de duda la Comisión tenia que proceder con la mayor mesura y desconfianza dadas las graves consecuencias que podrian sobrevenir por cualquiera lijereza de su parte y sobre todo porque tratandose de calderos ya hechos no le era posible tomar de los mismos, como lo hacen los fabricantes acreditados, tiras de prueba para determinar la resistencia de las planchas a la traccion, su alargamiento bajo la accian de determinada carga y su mayor ó menor agriedad.*

*En segundo Lugar el examen atento de las planchas del caldero de la locomotora número **13** hace ver que ellas han sufrido una fuerte accion corrosiva que las ha adelgazado considerablemente, con especialidad en la parte inferior que es donde, de un modo natural, se deposita el sedimento y las concreciones calcareas. Era logico presumir que en la locomotora numero **14**, gemela y construida at mismo tiempo que la **13**, y que en las numeros **15** y **16** identicas a las anteriores, pero construidas en 1876, cuatro años despues, se hubiera efectuado algo parecido; y como eh los informes semestrales del Superintendente de Locomotoras consta que at caldero de la número **14** se le pusieron planchas nuevas en toda la parte inferior del cuerpo cilindrico, esa fundada presuncion se hacia casi una verdad que era necesario evidenciar; para lograrlo habia dos caminos, sacar todos los tabor: para que fuera posible que un hombre entrase al caldero y examinara sus paredes interiores sobre las cuales se verifica la acción corrosiva, o abrir unos cuantos pequeños huecos para poder apreciar el espesor de las planchas. Lo primero hubiera sido costoso para la Empresa, le hubiera privado por considerable tiempo de sus locomotoras, y no permite apreciar rigurosamente el grueso de las planchas, elemento esencial é indispensable para poder calcular la presion que con seguridad puede soportar un caldero de cualquier tipo. Lo segundo es sencillo, rapido, no origina gastos de nin-guna clase y permite determinar rigurosamente el espesor de las planchas sin debilitarlas en lo menor, pues, es evidente que un solo hueco abierto en el centro de una cualquiera de ellas, la debilitará muchisimo menos que una hilera de los mismos abiertos proximamente a sus bordes como tiene que hacerse para roblar unas planchas con otras.*

*Ve, pues, el senor Gerente del Ferrocarril Ingles que lo que ha hecho la Comisión es favorecer los intereses de la Compañia que administra buscando los procedimientos que le fueron menos onerosos. Culpa nuestra no es por cierto, que esa investigación que lo lleva a uno at conocimiento exacto, matemático de un elemento esencial de la cuestion haya sido adverso a la Empresa. La culpa de todo esto, si es que existe, debe el senor Prentice buscarla por otra parte y con un poco de meditation no le sera dificil qui encontrar donde esta. Para concluir con esta faz de la cuestion promovida, solo tengo que decir, ya que el senor Prentice lo olvida, lo que es estraño en quien es ingeniero de profesión, es que el sistema de taladros es el único que permite apreciar en determinados casos, aún tratandose de calderos nuevos, el espesor de ciertas partes y que asi esta prescrito a los inspectores de calderos del Board of Trade y demos instituciones de su genero.*

*Insiste mucho el senor Prentice en afirmar que la Comisión ha debido limitarse únicamente a someter los calderos a la presion hidraulica con el recargo por ella misma propuesto. Pero parece que olvida que ese detalle solo tenia por objeto fijar una regla que resguardara la responsabilidad de la Comisión en el caso desgracia Jo y muy posible de un*

*siniestro posterior que despues podria explicarse diciendo, los unos que las tales pruebas habian sido una broma, pues la presion que debió emplearse, según autoridades respetables, es el doble de la efectiva con que se trabaja; y otros, entre los que estaria la Empresa, afirmarian que la causa de la explosion provenia de la excesiva presion que se habia empleado en las pruebas, la que habia fatigado innecesariamente el metal dejandolo debilitado y en condiciones inaparentes para soportar esfuerzos posteriores.*

*Si el senor Gerente de la Empresa de los ferrocarriles ingleses lee con detencion el oficio de Abril 15 en que se propuso el valor de la sobrecarga que se emplearia, vera que exigimos vie los calderos se nos presentaran desnudos de todo forro a fin de poder juzgar el estado y calidad de las planchas y remachado.*

*Por lo expuesto vera US. que la Comisión jamas pensó en limitarse probar los calderos con presion hidraulica, si tan cosa hubiera pensado hacer habria faltado al cumplimiento de la delicada y grave comision que se le encomendo, de practicar una inspección formal del material rodante del Ferrocarril Ingles y muy especialmente de sus locomotoras, y esto en momentos en que toda la Sociedad estaba conmovida por una catastrofe que al suceder en distinta hora hubiera enlutado muchos hogares.*

*Tratandose en este informe de una cuestion harto grave, tanto para la Empresa cuyos intereses estan seriamente comprometidos y que naturamente se defienden, como las gravisimas responsabilidades que desgraciadamente pesan sobre nosotros, y a fin de dejar bien deslindada esta cuestion probandole al senor Prentice que lo que la Comisión ha hecho es to extrictamete correcto, traduzco de la obra de Hutton sobre construction de calderos, edition de 1891, lo siguiente para terminar esta parte del presente informe. Los calderos viejos cuyas planchas tienen variaciones cónsiderables en su espesor soportan a menudo satisfactoriamente la prueba de la presión hidraulica y aunque sean estancos son inseguros. Asi ha sucedido a que un caldero viejo que soportó satisfactoriamente una presión hidraulica de 120 libras por pulgada cuadrada, fue declarado seguro y suficientemente resistente para trabajar con 60 libras. Despues de vaciado fue a inspeccionado y reconocido golpeandolo con un martillo y asi se encontró un sitio en el fondo en que la plancha estaba delgada y que atravesó facilmente el martillo, no siendo su espesor en ese punto mas que de 1/16 de pulgada. Se encontró igualmente que la accion corrosiva habia adelgasado las planchas en otros dos sitios, que el caldero era inseguro cualquiera que fuera la presión con que trabajara posteriormente por estar en peligrosas condiciones de debilidad..*

*Sucede a menudo que los calderos revientan despues de haber sido probados por presión hidraulica con una de vapor sumamente inferior a la del agua que soportaron satisfactoriamente. En un caso un caldero se desgarró con una presión de vapor de casi la mitad de la hidráulica con que poco antes fue probado.*

*El mismo autor cita cuatro casos en los que a consecuencia de grietas formadas por la accion corrosiva reventaron otros tantos calderos siendo de notar que en el examen de uno de ellos un taladro (test-hole) que se abrió cerca de una grieta no Ilegó a revelar su existencia.*

*Por lo expuesto vera US. que, tratandose de calderos viejos, ni la pre-sion hidraulica ni los taladros suministran elementos suficientes de criterio para asegurar que un caldero que ha resistido una presión hidraulica satisfactoriamente esta en buenas condiciones, ni que cuatro huecos, que acusen cierto espesor den el minimo que quiza esta a pequeña distancia. Las pruebas de este genero en estos casos no son, pues, tan concluyentes en favor de la seguridad como fuera de desear.*

*Pero si ellas descubren elementos de debilidad, ya lo son, y seria un crimen no darles la debida importancia.*

*Por todo lo expuesto la comision insiste en manifestar a US. que por motivo alguno se autorice el uso de las locomotoras números **15** y **16** hasta que no hayan recibido nuevos calderos.*

*He retardado intencionalmente este informe por la circunstancia de que cuando US. lo pidió estaba ya por vencerse el plazo que a la Empresa se le concedió por el decreto ministerial de 3 de Agosto*

*Desde esa fecha hasta hoy la Comisión ha probado los calderos de las locomotoras números **12** y **24** autorizando el uso de ambas con una presion normal de 150 libras, y se ha retirado del servicio hasta que reciba nuevo caldero la numero 18 que estaba en peligrosisima condition.*

*Recapitulando el estado general de las locomotoras de los terrocarriles de Lima al Callao y Chorrillos es el siguiente:*

*Retiradas del servicio antes de Abril de 1896:*

*Las signadas con los números* ***2, 4, 5, 6, 8, 10, 13, y 17****. . . 8*

*Id. id. despues números* ***9, 15, 16, 18 y 25*** *5*

*Aprobadas numeros* ***12, 14, 20, 21, 22, 23 y 24*** *7*

*No examinadas por no haber sido puestas a disposition de la Comision las numeros* ***1, 3, 7, 11 y 19*** *5*

*Total 25*

*El que suscribe despues de seis meses en los que se ha esforzado en union de sus estimables compañeros, los senores ingenieros don Felipe Arancibia y don Enrique E. Silgado por dar termino a Ia parte mas delicada y peligrosa de Ia comision que les encomendo, cree que con este informe termina la existencia de la que preside tanto al tenor de la resolution ministerial de 3 de Agosto que obra en este expediente, como por la ausencia de uno de sus miembros el senor Silgado y tambien porque habiendo desaparecido la causal que determinó su nombramiento, al senor Arancivia, inspector de esos ferrocarriles, corresponde la linea é inspection tecnica de su material.*

*Agrego a este expediente una corta contestaci6n de la Empresa de los Ferrocarriles que suministra alguna luz sobre la materia de este informe.*

*Lima, Setiembre 23 de 1896,*

*S. D.*

*JUAN C. GRIEVE, Ingeniero.*

**Cuadro demostrativo de las locomotoras**

DE QUE DISPONE EN LA ACTUALIDAD LA COMPAÑÍA DE FERROCARRILES DE LIMA, CALLAO Y CHORRILOS, Y CALLAO Á LA PUNTA PARA EL SERVICIO DE SUS LÍNEAS.

| Núm. | Año | Nombre | Peso — toneladas | Destino | Fecha de la última compostura | Kilóms. recorridos | Observaciones |
|---|---|---|---|---|---|---|---|
| 1 | 1850 | Callao . . . | 38 | Pasajeros . . . . | Abril de 1895 | | |
| 3 | 1850 | Oyague. . . | 38 | Carga . . . . . | Febrero de 1894 | | |
| 5 | 1857 | Miraflores. . | 43 | Id . . . . . | Setiembre de 1893 | | |
| 7 | 1861 | Surco . . . | 44 | Pasajeros . . . . | Principios de 1891 | 29.768 | Esta locomotora ha estado en servicio más de 5 años después de la última compostura general. |
| 9 | 1867 | Magdalena . | 47 | Id . . . . . | 1er. semestre 1894 | | |
| 11 | 1867 | Niña . . . . | 16 | Shunter (cambios) | Diciembre de 1891 | 2.063 | Más de 4 años de servicio después de la última compostura general. |
| 12 | 1871 | 2 de Mayo . | 49 | Pasajeros . . . . | Setiembre de 1893 | | |
| 14 | 1872 | Prado . . . | 49 | Id . . . . . | Enero de 1892 | 47.800 | |
| 15 | 1876 | . . . . . | 49 | Id . . . . . | Setiembre de 1892 | 42.396 | Más de 3 años en servicio después de la última compostura. |
| 16 | . . . | . . . . . | 49 | Id . . . . . | Nvmbre. de 1894 | | |
| 18 | 1881 | La Hermana. | 9 | La Punta . . . . | Junio de 1893 | | |
| 19 | 1888 | El Comercio. | 25 | Trigo. . . . . | Junio de 1895 | | |
| 20 | 1890 | El Presidente | 29 | Pasajeros . . . . | Agosto de 1893 | 80.406 | Se ha excedido en el recorrido reglamentario. |
| 21 | 1890 | El Congreso . | 29 | Id . . . . . | Abril de 1893 | 57.281 | Id. id. id. id. |
| 22 | 1890 | La República | 29 | Id . . . . . | Diciembre de 1893 | 60.000 | Id. id. id. id. |
| 23 | 1890 | El Peruano . | 29 | Id . . . . . | Diciembre de 1893 | 55.000 | Id. id. id. id. |
| 24 | 1891 | El Chiquito . | 16 | Shunter (cambios) | | | |
| 25 | 1891 | Chucuito . . | 9 | La Punta . . . . | Octubre de 1895 | | |

Lima, Abril 28 de 1896.

JUAN C. GRIEVE,
Ingeniero

## Locos on hire in 1896 after the boiler explosion

The 1896 mileage table includes two previously unknown engines. One seems likely to have been the *FC Central*'s no. **1 'OROYA'**. The second is unknown but appears to have the number **1** and the name **'MARIO ALLEON'**.

### *4-6-0 d/w 56", cyls. 18x24", built by Rogers in 1869*

Ordered for *FC Mejía y Arequipa.* This engine had been built as *FC Mejía y Arequipa* no. **10**[1] **'VITOR'**[1] but went directly to the *FC Lima á Oroya*. Presumably hired in.

**1**[2] **'OROYA'** w/n (1639) This loco ran 1324.40 km on the Lima to Trigo line in 1896 and 7025.13 km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Not listed in the mileage tables in 1897 [p11, 1897 p560], but was back on *FC Central* [11, 1897 p566].

### *? d/w ?, cyls. ?, built by ? in ?*

Ordered for ? Presumably hired in. The name Mario Alleon was that of a government engineer who certainly had been active in the 1860s, so perhaps this engine was from a government-owned railway and possibly it was quite old.

**1 'MARIO ALLEON'** w/n ? This loco ran 4809.39 km on the Lima to Trigo line in 1896 and ? km on the Lima to Chorrillos line [11, 1896 pp668 & 670].
Ran 354.40 km. on the Trigo line in 1897 [p11, 1897 p560].

### *0-6-0ST d/w 48", cyls. 15x20", built by Hawthorn Leslie in 1896*

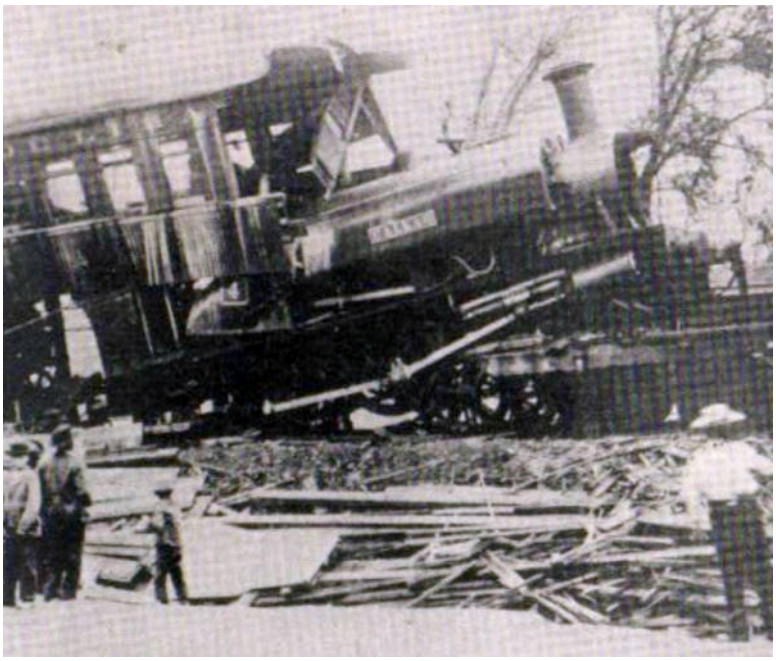
Ordered by Lima Railway.

**2**[2] **'LIMA'** w/n 2355 Ran 90.30 km. on the Trigo line and 24468.48 km. on Chorrillos line in 1897 whilst still unnamed [11, 1897 p560].

**4**[2] **'CALLAO'** w/n 2356 Ran 120.40 km. on the Trigo line and 19848.78 km. on Chorrillos line in 1897 whilst still unnamed [11, 1897 p560]. Involved in collision at Balconcillo in October 1901. Sr. Galessio comments: *Un recordado accidente se produjo a la una y veinte cinco minutos de la tarde del 15 de octubre de 1901 en la línea Lima-Chorrillos de propiedad de Lima Railways. El convoy que viajaba con dirección a Lima, se descarriló en la curva de Balconcillo (cerca a la actual plaza México), la locomotora, la Callao (el mismo nombre de la primera máquina del Perú pero no la misma locomotora) número 4, tipo 0-6-0ST, marca Leslie Hawthorn inglesa de 1896 y el primer coche terminaron totalmente destrozados, pero no hubo pérdida de vidas; sin embargo el movimiento de pasajeros disminuyó considerablemente durante algún tiempo ya que los usuarios volvieron a transportarse en carretas. El servicio de tranvías entró en servicio recién en 1904.* [ http://trenesdelperu.blogspot.com/2012/01/el-accidente-de-balconcillo-1901.html ]
*Railway & Locomotive Engineering*, an American journal, included in its 14th volume in 1901 [17] a short report on this accident: "We have received the following letter from F. T. Crosby, Lima, Peru. concerning the accident represented in the annexed engraving: "Thinking it might be of interest. I enclose a photograph of a railroad accident that took place on the Chorrillos line of the Lima Railway Company. Limited, in September last. There is about 2 per cent. grade between Lima and Chorrillos, and the accident was caused by the escape of two flat cars, one loaded with rails and the other with lumber, from the Lima station at 7.20 P. M. The cars have no brakes, and in changing them in the station, they broke away and ran down the track about a mile, meeting the up passenger train from Chorrillos. Fortunately, in the first car (it being dinner time) there was not a single passenger, and in the second only the conductor; so that the only person killed was the engineer, whose body was found at his post, with his hand on the lever, which was reversed.

The fireman jumped and escaped. and the conductor was shaken up. but not hurt. Two brakemen were badly injured, but have not died. Only first two cars suffered, as shown in photograph, and passengers in the other cars (two) were not hurt."

*'FC Ingles'* no. **2 'LIMA'**.



Whilst not a good view of the loco, this cropped image taken after the 1901 collision does at least show that the engine had outside cylinders. The number **4** can seen on a plate on the cabside, whilst the name **'CALLAO'** is similarly on a plate but on the saddle tank.

### *0-4-0ST d/w ?, cyls. 10x18", built by Thomas Green in 1896, 1897, 1902 and 1912*

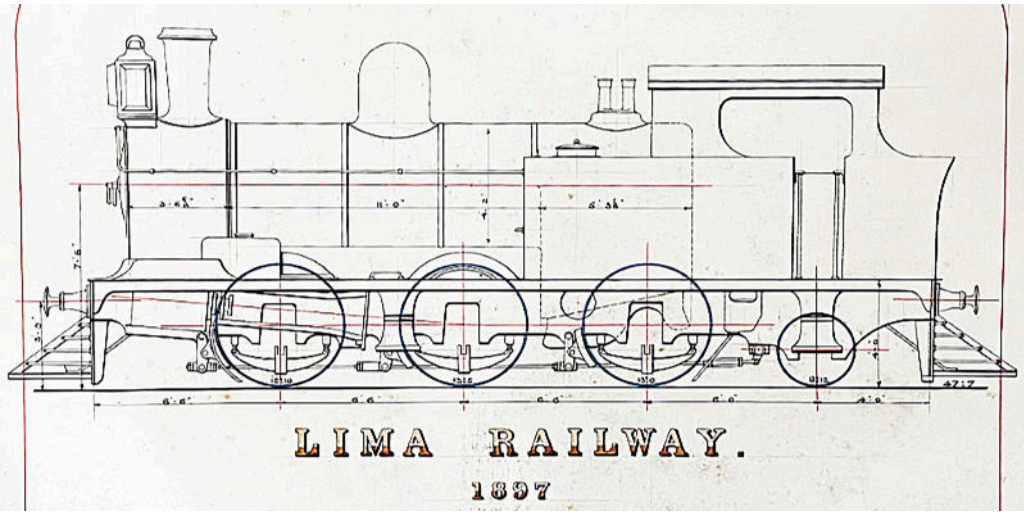
Ordered by ?

| | | |
|---|---|---|
| **17[2] 'BELLAVISTA'** | w/n 223 | Ran 5957.10 km. on the Trigo line and 63.72 km. on Chorrillos line in 1897 [11, 1897 p560]. |
| **26 'BARRANCO'** | w/n 224 | Ran 3961.02 km. on the Trigo line in 1897 [p11, 1897 p560], when still unnamed.<br>In service 1908. |
| **27 'La LEGUA'** | w/n 277 | In service 1908.<br>Later became Callao Harbour Board no **5**. |
| **?** | w/n 300 | Later became Callao Harbour Board no **2**. |

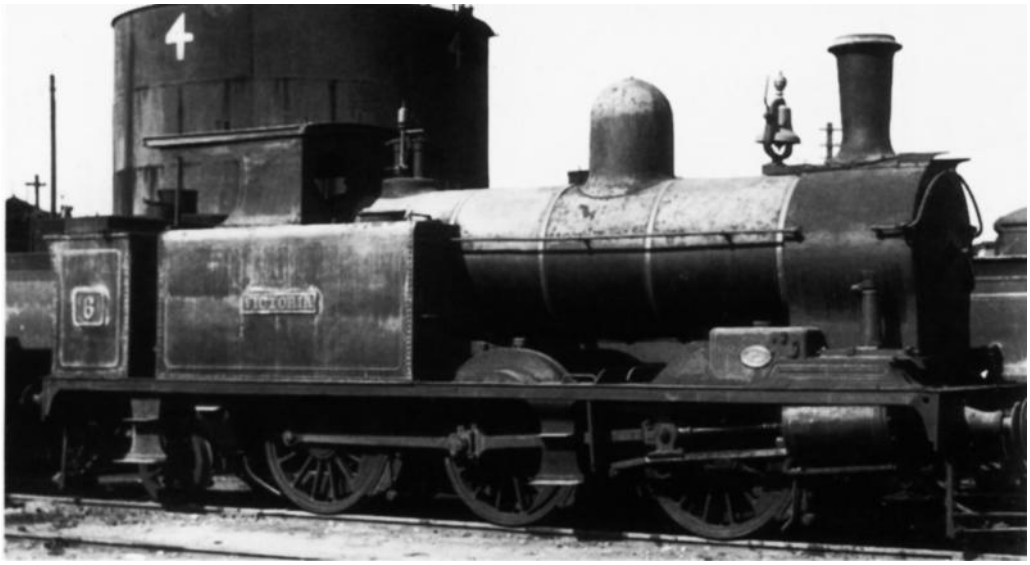
### *0-6-2T d/w 55", cyls. 17x24", built by Kitson in 1897 and 1925*

Ordered by Lima Railway. 1925 engines had cyl. diameter of 19½".

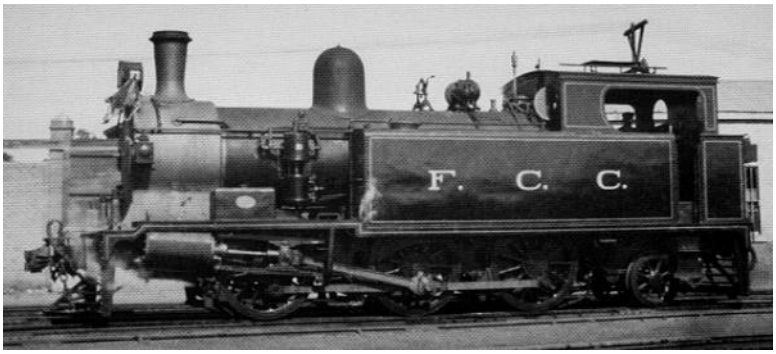
| | | |
|---|---|---|
| **5**[2] **'JUBILEE'** | w/n 3695 | Ran 105.35 km. on the Trigo line and 13142.25 km. on Chorrillos line in 1897 [11, 1897 p560]. |
| **6**[2] **'VICTORIA'** | w/n 3696 | Ran 15.05 km. on the Trigo line and 1768.23 km. on Chorrillos line in 1897 [11, 1897 p560]. |
| **7**[2] **'?'** | w/n 5393 | ) One of these two supposedly became *FC Central* no. **72**[3], |
| **8**[2] **'?'** | w/n 5394 | ) and the other was sold to the *FC Paita Piura* as a 2-6-2T no. **10**. |




A Kitson diagram of the first 0-6-2Ts for this railway, from the Kitson albums in the SLS Library.




*FCLCC* Kitson 0-6-2T no. **6 'VICTORIA'** [23].



Almost certainly ex *FCLCC* no. **7** after its transfer to the *FCC* fleet.
Note various small differences from the earlier loco pictured above,
eg. the step in the running plate, the more substantial cab, and the longer tanks.

## Discussions with NBL

Lists surviving at the Mitchell Library in Glasagow suggest that North British produced at least outline drawings for possible 4-6-2 and 4-6-4 designs for the Lima Railway during 1904. These were probably to be tank locomotives.

## The fleet in 1908

The fleet list published in Costa y Laurent's 1908 paper [1] is displayed on the following page, albeit slightly distorted during the scanning process at Harvard University. It seems likely that this list was rather out of date even when first published, for as recorded earlier locomotrives **1** to **6, 8, 10** and **13** were recorded throughout that decade as long since having been withdrawn, and no. **11** joined them in 1905. Incidentally the fleet still had fifteen tenders in service during that fiest decadse of the new century, despite only having about half that number of tender engines. This suggests not only that a number of old tenders long outlasted their original owning locos, but that tenders weere regarded as exchangeable.

# FERROCARRIL DE LIMA, CALLAO Y CHORRILLOS

## LOCOMOTORAS

| N.° | NOMBRE | Fabricante | Tipo | Fecha en la que entró al servicio por la vez. | Servicio que hace | PESOS Equipada para el servicio de la locomotora | PESOS Equipada para el servicio del tender | Pares de ruedas acupladas | Presión normal de la caldera | Estado de conservacion. |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Lima | Hawthorn | Tanque | 1896 | Ps. y Cr. | 36 | — | 3 | 150 | Bueno |
| 4 | Callao | — | — | 1896 | — | 36 | — | 3 | 150 | — |
| 5 | Jubilee | Kitson & Co. | — | 1897 | — | 42 | — | 3 | 150 | — |
| 6 | Victoria | — | — | 1897 | — | 42 | — | 3 | 150 | — |
| 7 | Bolognesi | Stephenson Co. | Tanque | 1861 | — | 37 | 10 | 2 | 150 | — |
| 9 | Grau | — | — | 1867 | — | 37 | 10 | 2 | 150 | — |
| 11 | Niña | Maning Nerdle | Tanque | 1867 | C. de .T | 16 | — | 2 | 150 | — |
| 12 | Miraflores | R.W. Hawtho | Tender | 1871 | P. y C. | 39 | 10 | 2 | 150 | — |
| 14 | Chorrillos | — | — | 1872 | — | 39 | 10 | 2 | 150 | — |
| 15 | Candamo | — | — | 1875 | — | 39 | 10 | 2 | 150 | — |
| 16 | Oyague | — | — | 1875 | — | 39 | 10 | 2 | 150 | — |
| 17 | Bellavista | Thomas Green | Tender | 1896 | C. de .T | 16 | — | 2 | 150 | — |
| 18 | La Punta | Maning Nerdle | — | 1864 | — | 9 | — | 2 | 150 | — |
| 19 | El Comercio | — | — | 1888 | P. y C. | 25 | — | 3 | 150 | — |
| 20 | El Presidente | Sharp Stewart | — | 1890 | P. y C. | 29 | — | 3 | 150 | — |
| 21 | El Congreso | — | — | 1890 | — | 29 | — | 3 | 150 | — |
| 22 | La República | — | — | 1890 | — | 29 | — | 3 | 150 | — |
| 23 | El Peruano | — | — | 1890 | — | 29 | — | 3 | 150 | — |
| 24 | St. Rosa | Thomas Green | — | 1891 | C. de T. | 16 | — | 2 | 150 | — |
| 25 | Chucuito | Maning Nerdle | — | 1864 | — | 9 | — | 2 | 150 | — |
| 26 | Barranco | Thomas Green | — | 1897 | — | 16 | — | 2 | 150 | — |
| 27 | La Legua | — | — | 1902 | — | 16 | — | 2 | 150 | — |

### The state of the fleet in 1913

It is clear that the '*Compañía Ingles*' was struggling during the first decades of the 20th century. Assets were being sold, and some managerial staff in Lima were definitely not up to their jobs. *The Railway Times* of June 14th 1913 reported comprehensively on the 47th AGM held in the City of London earlier that month, and whilst there is only a

single reference to locomotives it is not one to inspire confidence.

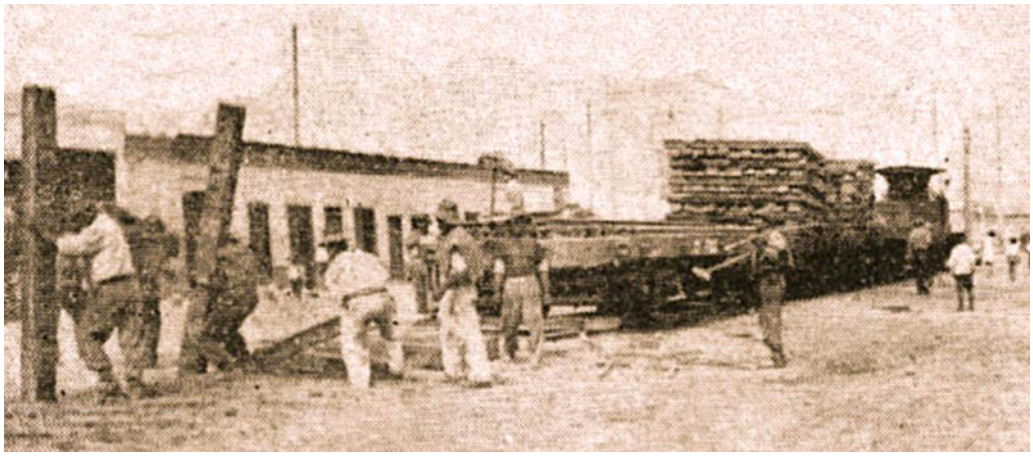
In reply to further questions,

The CHAIRMAN said the company's new representative in Peru was Mr. B. J. Smith, who had certified that the company's locomotives and carriages, with few exceptions, had not been maintained in good working order during the past year, but that the whole of the permanent way, main lines and sidings had been maintained in serviceable condition. It was impossible to estimate the value of the company's assets, as several very low offers had been made for some of them, and the board valued them at much higher figures.

Mr. HEDGES said that the disclosures called for further investigation, for the directors had got the business into a queer state; they had leased the company's property on promises

## The end of the railway's separate existence

Presumably all locos in existence in 1934 came into the hands of the *FC Central.*



The *FCLCC* route between Callao and Lima being lifted in March 1939.
At a guess, the cab of the locomotive might well have been built by Manning Wardle, and thus might have been one of nos. **11, 18, 19** or **25**.

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## 13.2.4 *La Cía. Lima y Oroya*

***Regiónes de Lima y Junín***

**1870-1872**

## *El FC Callao Lima y Oroya*

**1872-1890**

## The Central Railway of Peru

**1890-1972**

## *ENAFER*

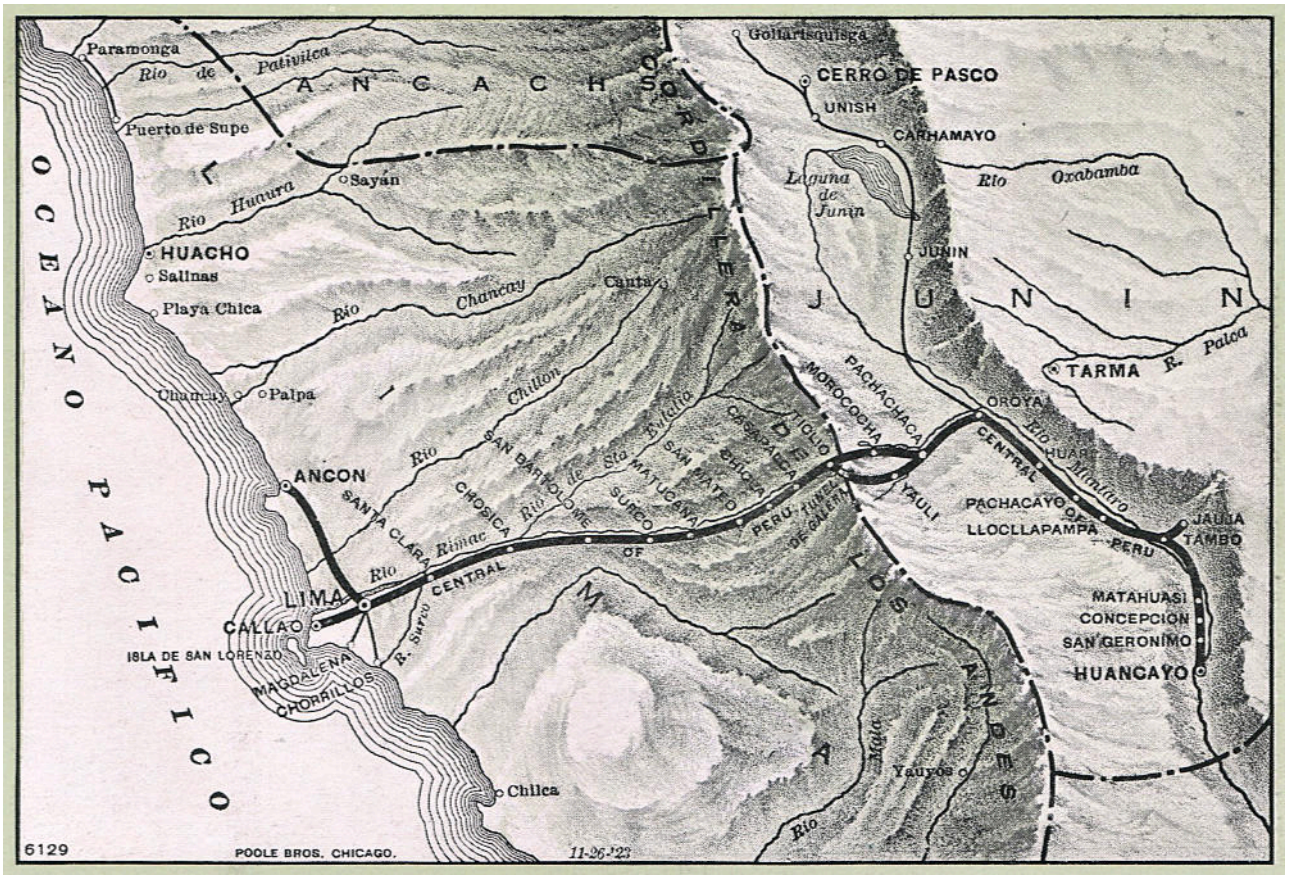
### Background

Standard gauge, from Callao and Lima up to La Oroya in the high Andes, where it divides into routes south to Huancayo and north to Cerro de Pasco.

The earliest proposals were put forward in 1859, but it was not until 1869 that Henry Meiggs signed the contract for the construction. Work began in 1870, reaching Chicla in 1875, 142 km. from Callao.

In 1889 the Grace contract was signed and the railway eventually taken over by the new Peruvian Corporation. This was a way of financing post-War-of-the-Pacific reconstruction in Peru.

In 1893 the railway reached La Oroya, and in 1908 it arrived in Huancayo. Later the Peruvian Corporation took over all the other state-owned railways in 1928.




The map was taken from an undated 20th century English language booklet about the FCC.

## 1 Locomotives purchased by La Cía. Lima y Oroya 1870 to 1872

An 1869 document in source [19] gives the following as the intended loco fleet:

oficina.

[D] *Material rodante.*

1.° Diez locomotoras de primera clase, capaces de arrastrar de subida cien toneladas de peso bruto, no comprendiendo en ello el ténder, á razon de trece kilómetros por hora, sobre gradientes de cuatro por ciento combinados de trescientos metros [300 m. 00] de radio.

Diez locomotoras, capaces de arrastrar de subida cien toneladas de peso bruto, no comprendiendo en ello el ténder, á razon de treinta y cuatro kilómetros por hora, sobre gradientes de uno y medio por ciento.

Dos locomotoras–ténder para el servicio de las estaciones de Lima y el Callao.

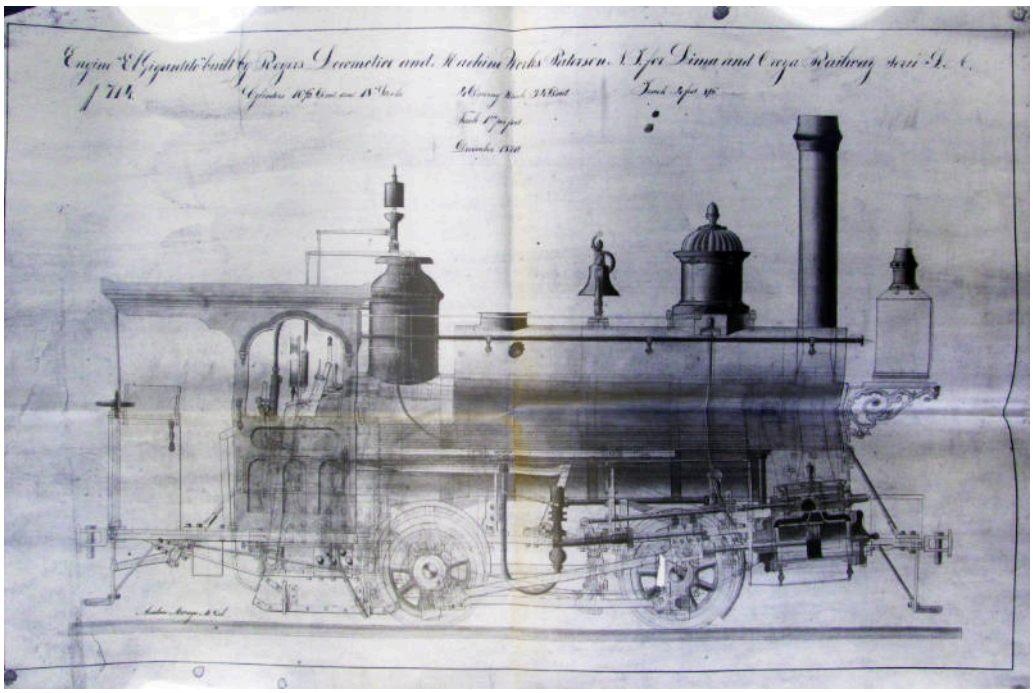
2.° Veinte coches para pasageros de primera clase

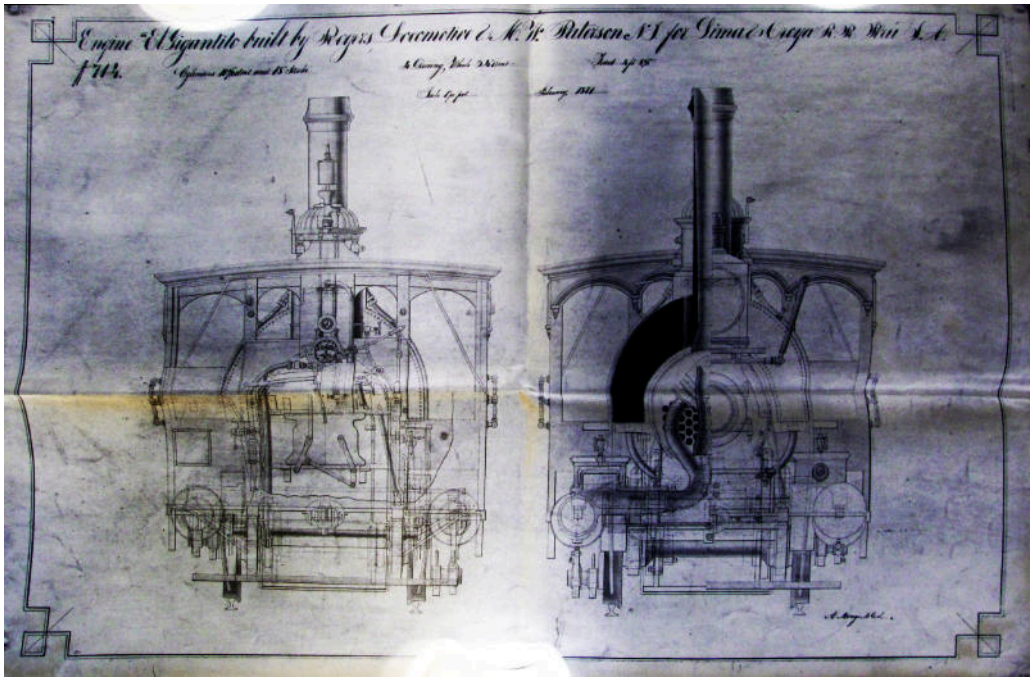
"Ten first class locomotives, capable of pulling one hundred tons of gross weight uphill, not including the tender, at the rate of thirteen kilometres per hour, over gradients of four per cent in conjunction with (curves of) three hundred meters [300 m. 00] radius.
Ten locomotives, capable of pulling up to one hundred tons of gross weight, not including the tender, at a rate of thirty-four kilometers per hour, on gradients of one and a half percent.
Two tank locomotives for the service of the Lima and Callao stations." [page 24, digital page 472].

### *0-4-0T d/w 34", cyls. 10½x18", built by Rogers in 1870*

Rogers order no. 714. Ordered by Lima & Oroya. Wheelbase 6' 6".

**1[1] 'El GIGANTITO'** w/n (1764) Renumbered **22 'El GIGANTITO'**. Whilst the number 22 was only reached in the contiguous list in 1876, the arrival of a replacement no. **1[2]** occurred in 1869. This is a puzzle. See under no. **22** for later history.



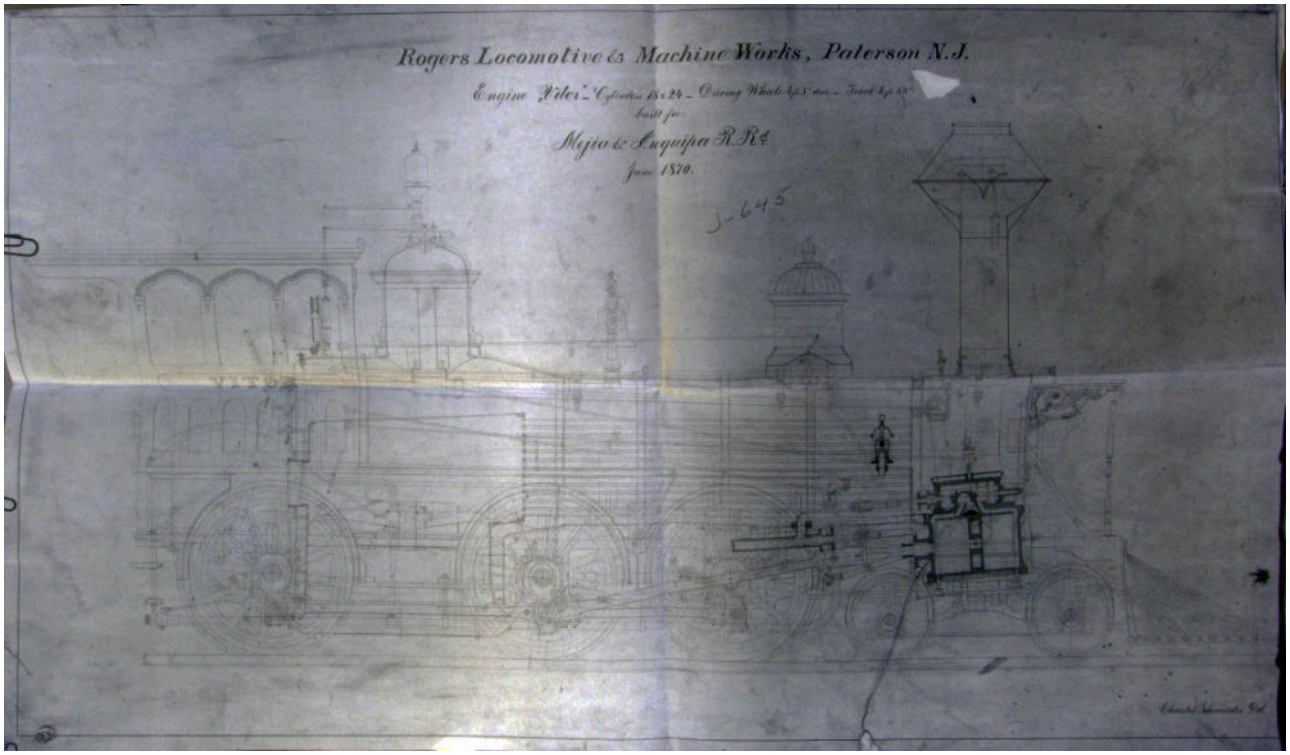


Images tonally inverted from photostats of original Rogers blue-prints in the P. C. Dewhurst collection at the NRM in York.

### *4-6-0 d/w 56", cyls. 18x24", built by Rogers in 1869*

Ordered for *FC Mejía y Arequipa.* This engine had been built as *FC Mejía y Arequipa* no. **10**[1] **'VITOR'**[1] but came directly here. The order number J-645 has been pencilled in on the sheet. Fawcett says that by the 1920s this was a mogul rather than a 4-6-0.

**1**[2] **'OROYA'** w/n (1639) Ran 3431 km on Oroya section in 1886 [11, 1886 p580].
Ran 9223 km on Oroya section in 1888 [11, 1888 p494].
Ran 10871 km on Oroya section in 1889 [11, 1889 p520].
Ran 17633 km in 1890 (section unspecified) [11, 1890 p736].
Ran 25475 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 14623 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 20850 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 14395 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 22367 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 17125 km in 1896 (*Sección de Callao á Oroya*) and 5914 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Seemingly on hire to the *FC Lima, Callao y Chorrillos* during part of 1896, probably as a consequence of that railway's boiler explosion and subsequent reduction in the number of available engines, see [11, 1896 p668].
Ran 16086 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].
In service 1908.




This Rogers drawing from the P. C. Dewhurst archive at the National Railway Museum in York, England, is in the form of a blueprint, which has been tonally-inverted here for clarity.

No **1 'OROYA'** after a derailment. Note the later cab and boiler. Photo apparently from Ian Button collection as reproduced in the late Bob Whetham's book [5] vol.2.

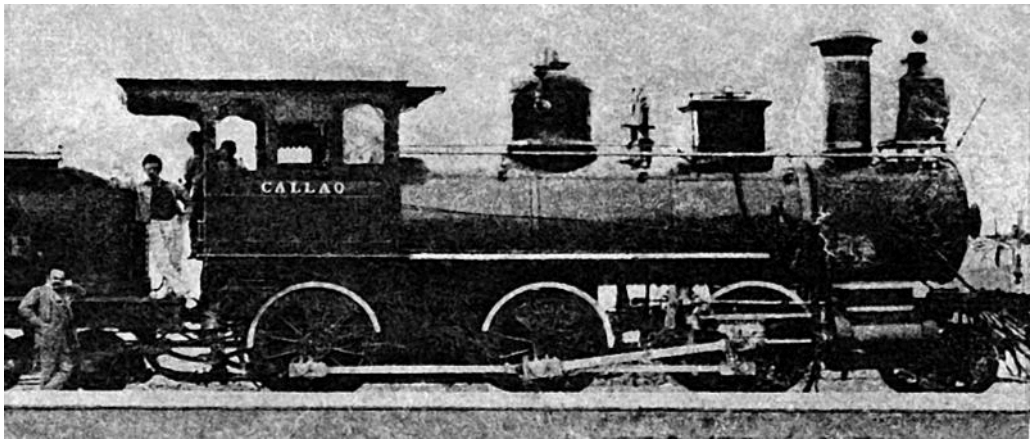
### *4-6-0? d/w 56"?, cyls. 18x24", built by Rogers in 1870*

The first was ordered for this railway but was sent direct to the *FC Mejía y Arequipa* as a replacement for the loco above. Rogers list of Peruvian locos in PCD archive has it down for Mejía & Arequipa. Fawcett has the actual *FCC* no. **2** as having cylinders of 17x22: and d/w of 49". Note that a photo below shows **'CALLAO'** as a mogul rather than a 4-6-0.

| | | |
|---|---|---|
| (**2**[1] **'LIMA'**[1] | w/n (1813) | Became *FC Mejía y Arequipa* no. **10**[2] **'VITOR'**[2].) Rogers order no. 724. |
| **2**[2] **'LIMA'**[2] | w/n (1832) | Rogers order no. 745. |
| | | Ran 13315 km on Oroya section in 1886 [11, 1886 p580]. |
| | | Ran 15729 km on Oroya section in 1888 [11, 1888 p494]. |
| | | Ran 12771 km on Oroya section in 1889 [11, 1889 p520]. |

Ran 21030 km in 1890 (section unspecified) [11, 1890 p736].
Ran 17737 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424] and 275 km. on *Sección de Ancón* [11, 1891 p426].
Ran 17972 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 13674 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 20139 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 17110 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 29523 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
In service 1908.

**3 'CALLAO'** w/n (1851) Rogers order no. 724.
Ran 15798 km on Oroya section in 1886 [11, 1886 p580].
Ran 10634 km on Oroya section in 1888 [11, 1888 p494].
Ran 4824 km on Oroya section in 1889 [11, 1889 p520].
Ran 12506 km in 1890 (section unspecified) [11, 1890 p736].
Ran 1303 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 17060 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 15725 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 10259 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 12625 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 26809 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 22676 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].
In service 1908.




This image bears the loco name **'CALLAO',** suggesting that it was these earlier Rogers moguls that carried the big rectangular sandboxes rather than the more common sand-domes.

Probably another early Rogers 2-6-0, albeit with a different style of cab.
The original image seemed to show a very long painted name on the
cabside, but the letters could not be made out.

### *2-6-0 d/w 48", cyls. 17x22", built by Rogers in 1871*

Ordered for Lima & Oroya, Rogers order no. 763.

**4 'COCACHACRA'** w/n (1887) Ran 11006 km on Oroya section in 1886 [11, 1886 p580].
Ran 11169 km on Oroya section in 1888 [11, 1888 p494].
Ran 26530 km on Callao section in 1889 [11, 1889 p520].
Ran 18906 km in 1890 (section unspecified) [11, 1890 p736].
Ran 8675 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424] and 12619 km. on *Sección de Ancón* [11, 1891 p426].
Ran 9729 km in 1892 (*Sección de Callao á Casapalca*) and 3373 km on Ancón section [11, 1892 pp446 & 448].
Ran 5677 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622] and 9698 km on Lima to Ancón section [11, 1893 p624].
Ran 5694 km in 1894 (*Sección de Lima á Ancón*) [11, 1894 p406].
Not mentioned in 1895 mileage lists [11, 1895 p232-4].
In 1895-6 was renamed **'CASAPALCA'**.
Ran 37499 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 25690 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].
In service 1908.

### *0-4-4T d/w 36½", cyls. 7½x14", built by Rogers in 1871*

Ordered by Lima & Oroya. Rogers order no. 762 along with similar loco **'EXPLORADOR'** for *FC Arequipa y Puno*. Driving whelbase 4' 0", total 15' 2½". Tanks 460 gals.

**5[1] 'SURCO'** w/n (1896) Redesignated **'FAVORITA'** before entering service, and then renumbered **24** later. Rogers data sheet in PCD archive shows name **'FAVORITA'**. Whilst the number 24 was only reached in the contiguous list in 1876, the numbering of a replacement no. **5** occurred in 1871. This is a puzzle.

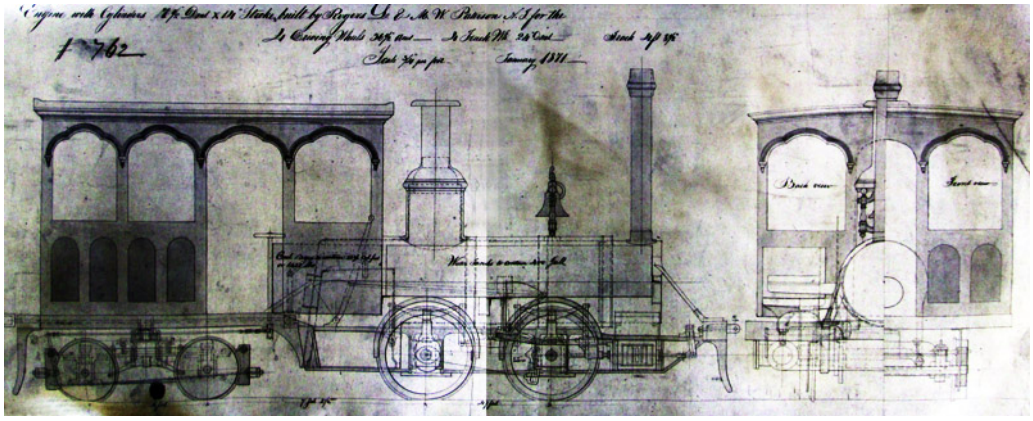


Image inverted from photostat of original Rogers blue-print in
the P. C. Dewhurst collection at the NRM in York.

### *2-6-0 d/w 48", cyls. 17x22", built by Cooke in 1871*

Ordered by Lima & Oroya, but diverted before delivery. Rogers list of Peruvian locos in PCD archive shows first two as for Arequipá & Puno.

**(?)** w/n (752) Diverted to *FC Arequipa y Puno* where it became no. **3 'CANAGUAS'**.

**(?)** w/n (753) Diverted to *FC Arequipa y Puno* where it became no. **4 'COLCA'**.

(**?**) w/n (754) Diverted to *FC Arequipa y Puno* where it became no. **7 'TAYATAYA'**.

### *0-4-0T d/w 34", cyls. 10½x18", built by Rogers in 1872*

Ordered by Lima & Oroya.

**'TIGRECITO'** w/n (2039) Rogers order no. 798, and note that unusually no running number was listed.
Redesignated **23 'TIGRECITO'** before 1886.
See under no. **23** for later info.

### *2-6-0 d/w 48", cyls. 17x22", built by Cooke in 1871 and 1872*

Ordered by Lima & Oroya.

**5² 'SURCO'** w/n 771
Not listed in 1886 mileage table.
Not listed in 1888 mileage table.
Not listed in 1890 mileage table.
Not listed in 1891 mileage table.
Not listed in 1892 mileage table.
Ran 11938 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 13146 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 23165 km in 1895 (*Sección de Callao á Oroya*) and 2166 km (*Sección Lima á Ancón*) [11, 1895 p234].
Ran 13591 km in 1896 (*Sección de Callao á Oroya*) and 16134 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Ran 11789 km in 1897 (*Sección de Callao á Oroya*) and 10026 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].
In service 1908.

**6 'MATUCANA'** w/n 795
Not listed in 1886 mileage table.
Not listed in 1888 mileage table.
Not listed in 1890 mileage table.
Not listed in 1891 mileage table.
Ran 5924 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 15369 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622] and 7279 km on Lima to Ancón section [11, 1893 p624]
Ran 17579 km in 1894 (*Sección de Callao á Oroya*) and 5628 km (*Sección Lima á Ancón*) [11, 1894 p406-8].
Ran 6280 km in 1895 (*Sección de Callao á Oroya*) and 15270 km (*Sección Lima á Ancón*) [11, 1895 p232-4].
Ran 1556 km in 1896 (*Sección de Callao á Oroya*) and 13392 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Not listed in mileage tables in 1897 [11, 1897 p564-6].
In service 1908.

**7 'SAN MATEO'** w/n 801
Not listed in 1886 mileage table.
Not listed in 1888 mileage table.
Not listed in 1890 mileage table.
Not listed in 1891 mileage table.
Ran 8982 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 3691 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622] and 4283 km on Lima to Ancón section [11, 1893 p624].
Ran 2823 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 18116 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p408].
Ran 12081 km in 1896 (*Sección de Callao á Oroya*) and 1517 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Ran 8016 km in 1897 (*Sección de Callao á Oroya*) and 113 km. (*Sección*

*Lima á Ancón*) [11, 1897 p564-6].
OoS by 1905 (?). In service 1908.

**8 'PARAC'** w/n 802 Not listed in 1886 mileage table.
Not listed in 1888 mileage table.
Not listed in 1890 mileage table.
Ran 2146 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 24572 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 24461 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 20744 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 13984 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 8518 km in 1896 (*Sección de Callao á Oroya*) and 17274 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Ran 20139 km in 1897 (*Sección de Callao á Oroya*) and 11974 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].
In service 1908.

### *2-6-0 d/w 45", cyls. 17x22", built by Rogers in 1872*

Ordered by Lima & Oroya. Rogers order no. 799.

**9 'JUNIN'** w/n (2078) Not listed in 1886 mileage table.
Ran 1745 km on Oroya section in 1888, and 19185 on Callao section [11, 1888 p494].
Ran 26918 km on Callao section in 1889 [11, 1889 p520].
Ran 9698 km in 1890 (section unspecified) [11, 1890 p736].
Ran 16252 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424] and 5599 km. on *Sección de Ancón* [11, 1891 p426].
Ran 16746 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 16441 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 19923 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Not shown in mileage table for 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 20235 km in 1896 (*Sección de Callao á Oroya*) and 209 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Ran 16618 km in 1897 (*Sección de Callao á Oroya*) and 6679 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].
In service 1908.

**10 'TARMA'** w/n (2081) Not listed in 1886 mileage table.
Ran 1071 km on Oroya section in 1888 and 18836 on Callao section [11, 1888 p494].
Ran 9460 km on Oroya section in 1889 and 4524 km on Callao section [11, 1889 p520].
Ran 3730 km in 1890 (section unspecified) [11, 1890 p736].
Ran 19139 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424] and 3193 km. on *Sección de Ancón* [11, 1891 p426].
Ran 12672 km in 1892 (*Sección de Callao á Casapalca*) and 1127 km on Ancón section [11, 1892 pp446 & 448].
Ran 3400 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622] and 2572 km on Lima to Ancón section [11, 1893 p624].
Ran 8682 km in 1894 (*Sección de Callao á Oroya*) and 356 km *(Sección Lima á Ancón*) [11, 1894 p406-8].
Ran 19132 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 15958 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].

Ran 27881km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].
In service 1908.

### *2-6-0 d/w 45", cyls. 18x22", built by Rogers? in (1871? acc. to 1908 list)*

Ordered by ? Not shown in Rogers list of Peruvian locos in PCD archive.

**11 'RIMAC'** w/n ? Ran 6687 km on Oroya section in 1886 [11, 1886 p580].
Ran 17010 km on Oroya section in 1888 [11, 1888 p494].
Ran 20778 km on Oroya section in 1889 [11, 1889 p520].
Ran 17398 km in 1890 (section unspecified) [11, 1890 p736].
Ran 9205 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 24239 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 26460 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 19519 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 22454 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 28900 km in 1896 (*Sección de Callao á Oroya*) and 1260 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Ran 21823 km in 1897 (*Sección de Callao á Oroya*) and 452 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].
In service 1908.

### *2-6-0 d/w 45", cyls. 18x24", built by Rogers in 1872*

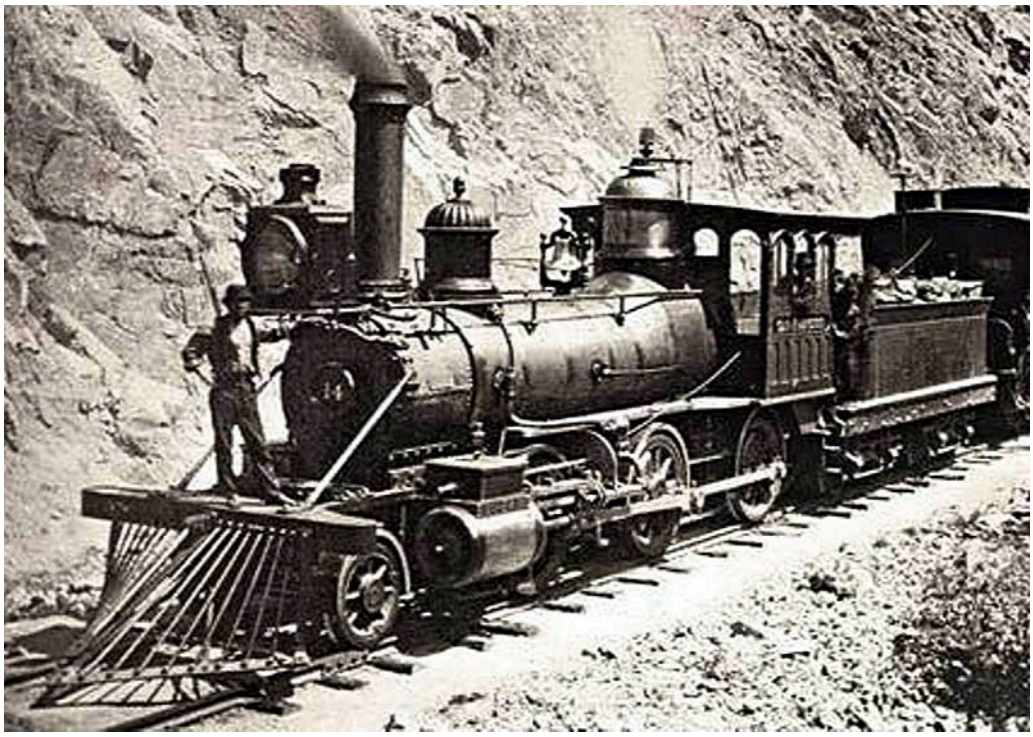
Ordered by Lima & Oroya. Rogers order no. 837. Copeland says cylinder stroke was 22", but Rogers list of Peruvian locos in PCD archive confirms 24".

**12 'SAN LORENZO'** w/n (2109) Ran 26040 km on Oroya section in 1886 [11, 1886 p580].
Ran 18982 km on Oroya section in 1888 [11, 1888 p494].
Ran 23809 km on Oroya section in 1889 [11, 1889 p520].
Ran 7461 km in 1890 (section unspecified) [11, 1890 p736].
Ran 22804 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424] and 250 km. on *Sección de Ancón* [11, 1891 p426].
Ran 22911 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 17836 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 16361 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 22528 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 21171 km in 1896 (*Sección de Callao á Oroya*) and 300 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Ran 21088 km in 1897 (*Sección de Callao á Oroya*) and 2786 km. (*Sección Lima á Ancón*) [11, 1897 p564-6] but numbered **18**.
In service 1908.

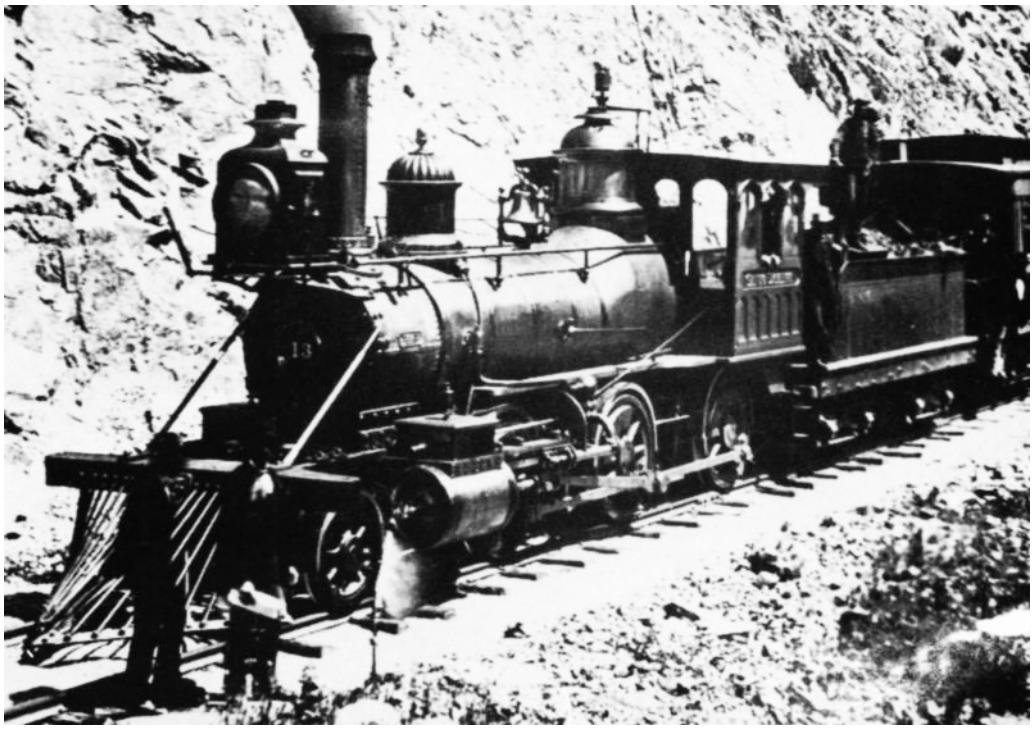
**13 'SANTO DOMINGO'** w/n (2110) Ran 13594 km on Oroya section in 1886 [11, 1886 p580].
Ran 15819 km on Oroya section in 1888 [11, 1888 p494].
Ran 5262 km on Oroya section in 1889 [11, 1889 p520].
Ran 13240 km in 1890 (section unspecified) [11, 1890 p736].
Ran 14664 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 19232 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 10774 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 1655 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 5157 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 4774 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Not shown in mileage charts in 1897 [11, 1897 p564-6].
Renumbered **25 a**fter 1896 and later became **'SAN DOMINGO'.**

**14 'SAN FRANCISCO'** w/n (2113) Not listed in 1886 mileage table.

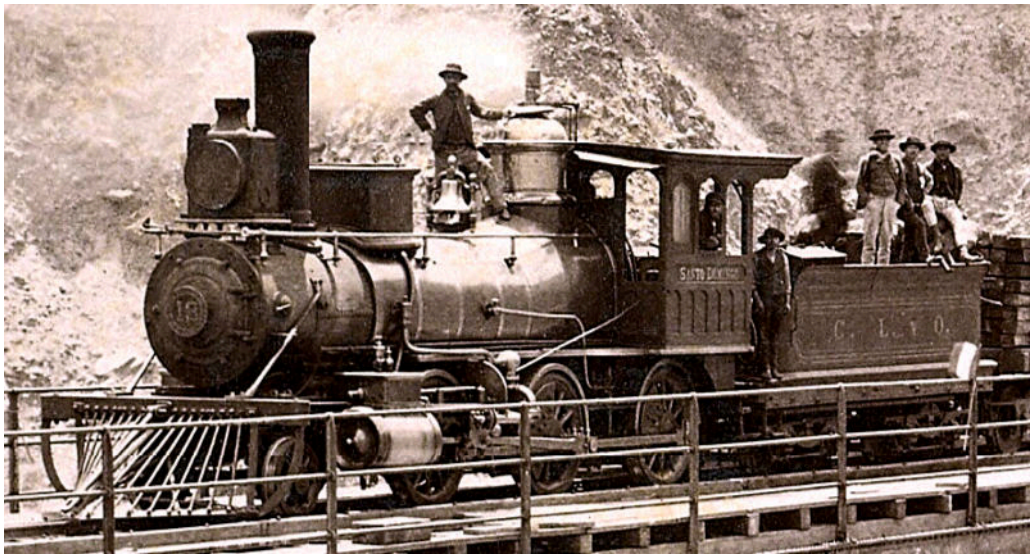
| | | |
|---|---|---|
| | | Not listed in 1888 mileage table.<br>Not listed in 1890 mileage table.<br>Ran 23958 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].<br>Ran 26267 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].<br>Ran 20619 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].<br>Ran 12752 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].<br>Ran 18536 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].<br>Ran 20232 km in 1896 (*Sección de Callao á Oroya*) and 13932 km (*Sección Lima a Ancón*) [11, 1896 p674-6].<br>Ran 20542 km in 1897 (*Sección de Callao á Oroya*) and 82 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].<br>In service 1908. |
| **15 'SAN FELIPE'** | w/n (2116) | Ran 13691 km on Oroya section in 1886 [11, 1886 p580].<br>Ran 13530 km on Oroya section in 1888 [11, 1888 p494].<br>Ran 13248 km on Oroya section in 1889 [11, 1889 p520].<br>Ran 14654 km in 1890 (section unspecified) [11, 1890 p736].<br>Ran 19548 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].<br>Ran 12522 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].<br>Ran 13095 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].<br>Ran 5023 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].<br>Not shown in mileage table for 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].<br>Ran 137 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].<br>Ran 17071 km in 1897 (*Sección de Callao á Oroya*) and 1790 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].<br>In service 1908. |
| **16 'SAN JUAN'** | w/n (2117) | Ran 10691 km on Oroya section in 1886 [11, 1886 p580].<br>Ran 22960 km on patio and 'extraordinarias' duties in 1888 [11, 1888 p494].<br>Ran 12640 km on patio and 'extraordinarias' duties in 1889 [11, 1889 p520].<br>Not listed in 1890 mileage table.<br>Ran 19215 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].<br>Ran 18999 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].<br>Ran 22249 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].<br>Ran 14112 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].<br>Ran 21289 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].<br>Ran 12247 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].<br>Ran 21671 km in 1897 (*Sección de Callao á Oroya*) and 113 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].<br>In service 1908. |



The smokebox number plate identifies this engine as no.**14 'SAN FRANCISCO'**.



Brian Fawcett's book shows a very similar though not identical view of no. **13 'SANTO DOMINGO'**, seemingly at precisely the same spot and with no obvious differences between the locos.




A photo from [23] showing no. **13 'SANTO DOMINGO'** on the Verrugas bridge. Note the square sandbox, in contrast to the dome in the picture above. Also the extended smokebox and slightly tthicker chimney. The tender sides bear the initials 'C. L. y O.' meaning *Callao, Lima y Oruro*.

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## 2 Locomotives purchased by the FC Callao Lima y Oroya 1872 to 1890

All of the *Cía. Lima y Oroya* locomotives initially retained their original numbers and names under the new management.

### *4-4-0T d/w 60", cyls. 18½x22", built by Rogers in 1876*

Rogers order no. 950. Ordered by *FC Callao Lima y Oroya*. Shipped Oct. & Nov. 1876. Tank on engine 400 gall. Boiler diameter at front 50". Wheelbase 8'6" driving and 22' 1" total. Most Rogers lists show these as tender engines. However, the typed spec. sheet provided by ALCo to P. C. Dewhurst clearly states that they had a small 400 gallon water tank/s on each engine. See drawings below.

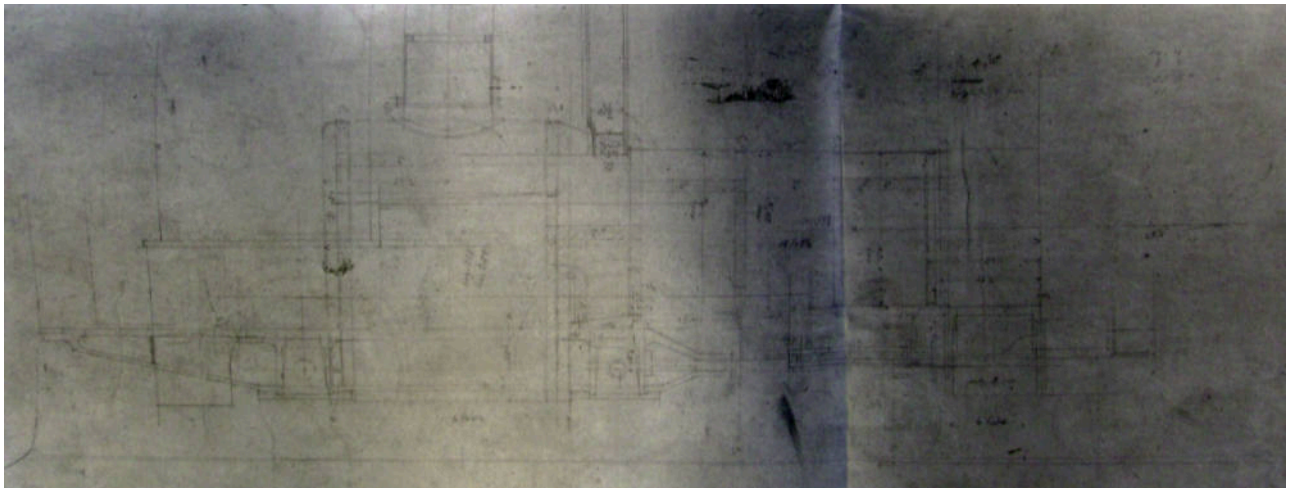
| | | |
|---|---|---|
| **17 'MANCO CAPAC'** | w/n 2441 | Ran 30721 km on Callao section in 1886 [11, 1886 p580], but named **'GUADALUPE'** by that time.<br>Ran 11537 km on Callao section in 1888 [11, 1888 p494].<br>Not listed in 1890-97 mileage tables.<br>OoS by 1891. [5] says that one of these locos was transferred to the *FC Pisco á Ica*, becoming their no. **3 'ICA'**. It may well have been this engine. |
| **18 'ATAHUALPA'** | w/n 2442 | Ran 27747 km on Callao section in 1886 [11, 1886 p580], but renamed **'VILLEGAS'** by that time.<br>Ran 3690 km on Callao section in 1888 [11, 1888 p494].<br>Not listed in 1890-97 mileage tables.<br>In service 1908. |
| **19 'LA PALMA'** | w/n 2444 | Not shown in 1886 mileage table.<br>Not listed in 1888 mileage table.<br>Ran 11106 km in 1890 (section unspecified) [11, 1890 p736].<br>Ran 28219 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].<br>Ran 14514 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].<br>Ran 53251 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].<br>Ran 32583 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].<br>Ran 16525 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].<br>Ran 25445 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].<br>Ran 13373 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].<br>In service 1908. |

**20**[1] **'MONSERRATE'** w/n 2446

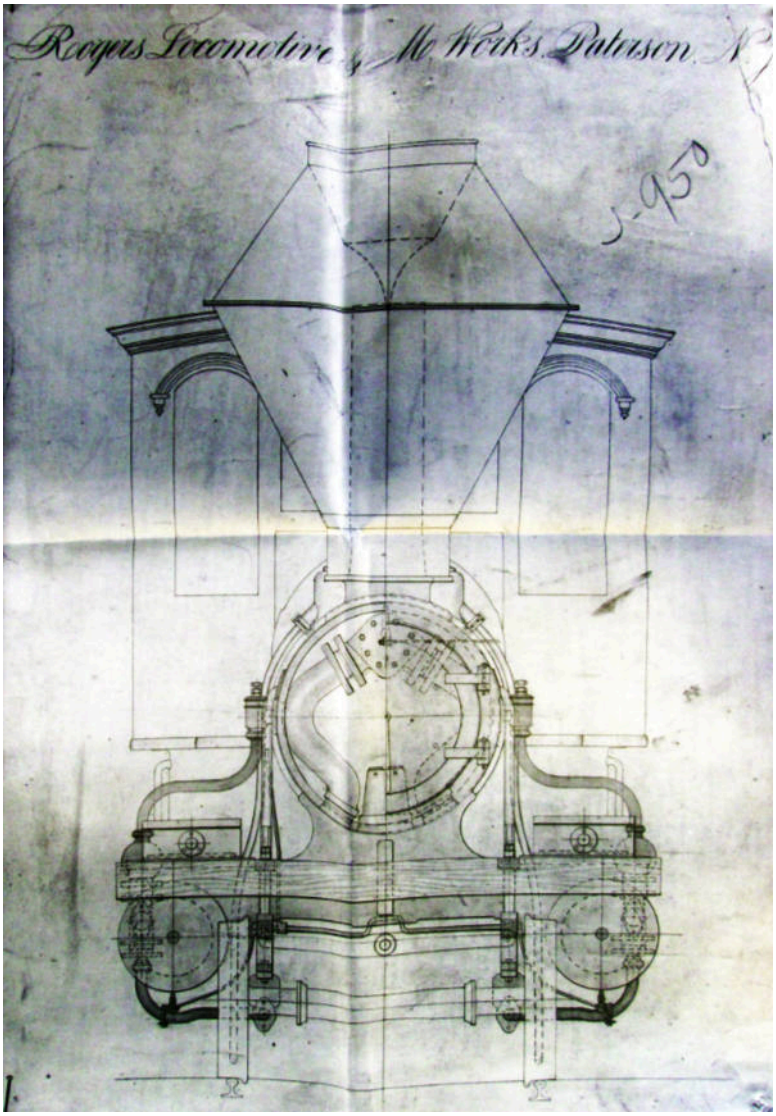
Ran 14771 km on Callao section in 1886 [11, 1886 p580].
Ran 31213 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Not listed in 1888 mileage table.
Not listed in 1890 mileage table.
Not listed in 1891 mileage table.
Ran 29368 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 9823 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 22303 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 15120 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 7501 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6] but shown as no. **30**.
In service 1908.

**21**[1] **'VITERBO'** w/n 2447

Ran 852 km on Callao section in 1886 [11, 1886 p580].
Not listed in 1888 mileage table.
Ran 16932 km in 1890 (section unspecified) [11, 1890 p736].
Ran 28774 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 25993 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 25773 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 30806 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 10013 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 37299 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6] but shown as no. **31**.
In service 1908.



Images tonally inverted from photostats of original Rogers blue-prints in the P. C. Dewhurst collection at the NRM in York. Although this image is difficult to interpret, a close examination reveals that there were water tanks over the rearmost pair of driving wheels, with the top panel of each tank below the boiiler centre line and probably serving as seat bases for the driver and fireman.




## *Cía. Lima y Oroya* locomotives renumbered, probably in 1876

Full details above. These small steamcars were a Peruvian speciality, and were specifically acknowledged in the government's agreements to pay for special trains. Eg. in 1890 a single loco would cost S2 per km. to hire, a loco and one or two cars was to cost S3, a loco and three of four cars was S4 per km, S1 more for each extra car, but for a single '*máquina chica*' only S1 would be paid. [11, 1890 p93-94].

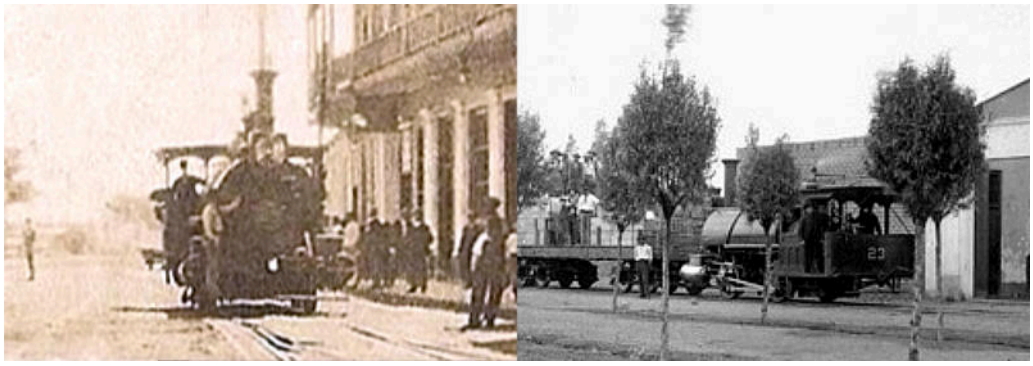
**22[1] 'EL GIGANTITO'** 0-4-0ST Rogers ? of 1870. Had originally been no. **1**[1].

Ran 21678 km on patio and 'extraordinarias' duties in 1886 [11, 1886 p580].
Ran 19720 km on patio and 'extraordinarias' duties in 1888 [11, 1888 p494].
Ran 4080 km on patio and 'extraordinarias' duties in 1889 [11, 1889 p520].
Ran 18958 km in 1890 (section unspecified) [11, 1890 p736].
Ran 24009 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 23352 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 16823 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 22083 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 12308 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 9262 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 22957km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6] but shown as no. **28**.
In service 1908.

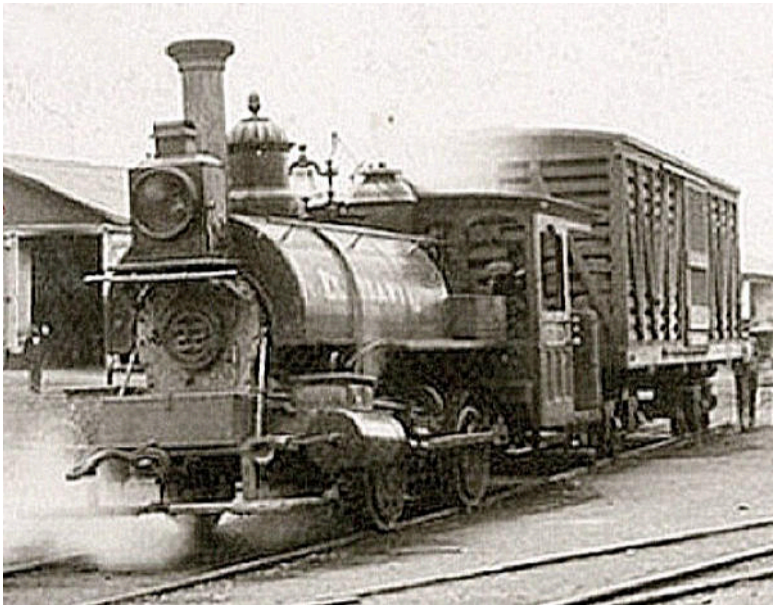
**23 'TIGRECITO'** 0-4-0ST Rogers 1992 of 1872. Original number not known. May only have been named.

Ran 22626 km on patio and 'extraordinarias' duties in 1886 [11, 1886 p580].
Ran 11453 km on patio and 'extraordinarias' duties in 1888 [11, 1888 p494].

Ran 21840 km on patio and 'extraordinarias' duties in 1889 [11, 1889 p520].
Ran 25607 km in 1890 (section unspecified) [11, 1890 p736].
Ran 21454 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 23502 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 18839 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 12979 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 19398 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 14093 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 7852 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].



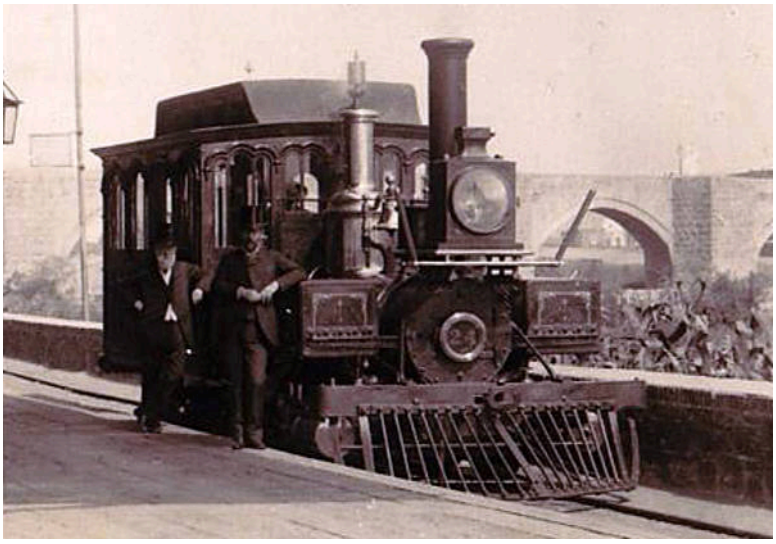
Two photos of FCC Rogers 0-4-0STs in Callao. The one on the right is no. **23 'TIGRECITO'**. The left hand one, seen in the Calle Lima (now the Avenida Saenz Peña) on a postcard from 1908, might be the same engine or perhaps no. **22**, but the photos are not clear enough to permit a thorough analysis.



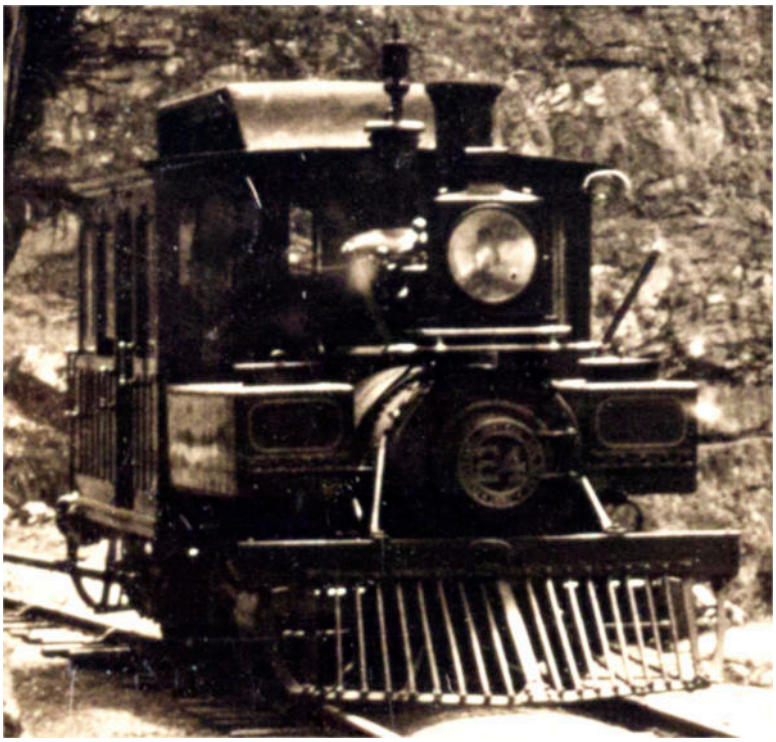
No. **22** at Monserrate station in 1900 as photographed by Fernand Garreaud.

**24 'FAVORITA'** 0-4-4T Rogers 1874 of 1871. Had originally been ordered as no. **5**[1] **'SURCO'**[1].

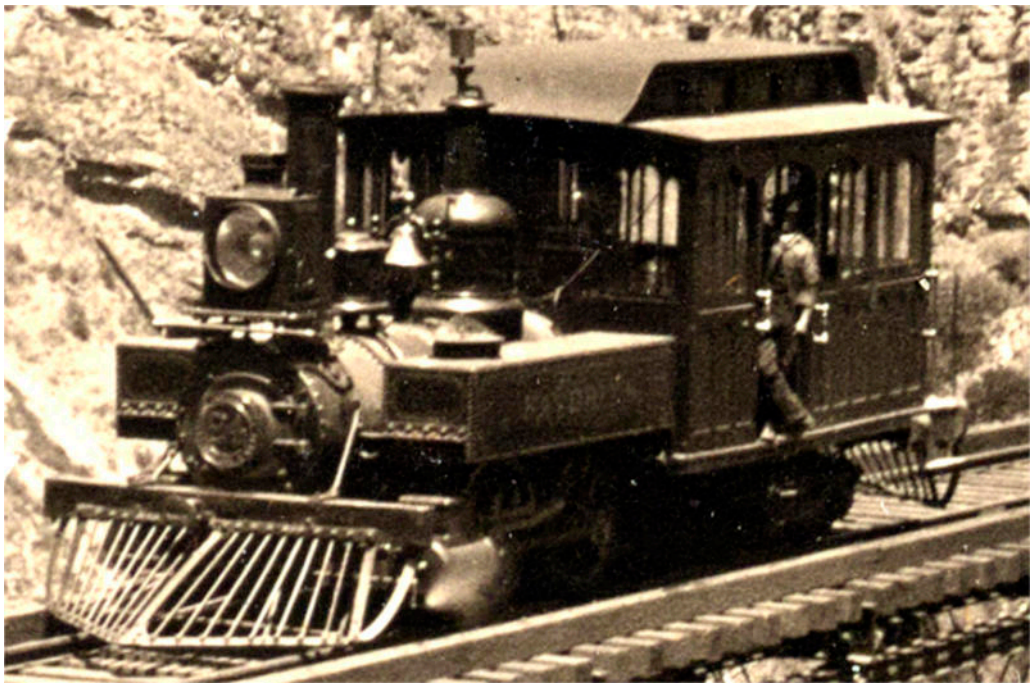
Ran 10652 km on patio and 'extraordinarias' duties in 1886 [11, 1886 p580].
Ran 22960 km on patio and 'extraordinarias' duties in 1888 [11, 1888 p494].
Ran 7935 km on patio and 'extraordinarias' duties in 1889 [11, 1889 p520].
Ran 1168 km in 1890 (section unspecified) [11, 1890 p736].
Ran 9977 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 20656 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 16415 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 3944 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 1262 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 1703 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 5062 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].
In service 1908.



No. **24 'FAVORITA'** at the Desamperados main station in Lima. Date unknown.



Two more views of *FCC* no. **24 'FAVORITA'** out along the line
probably on the same day around 1908, the second taken at the Cofa Bridge.
These images come from stereoscopic pairs in the US Library of Congress collections.



**25 'SAN DOMINGO'** 2-6-0 Rogers 2064 of 1872. Had originally been no. **13** at least until 1889.
Not listed in 1892, 1893, 1894 or 1895 mileage tables.
Scrapped by 1905(?) but in service 1908.

The suspicion must be that the first three tank locos were renumbered to get them out of the way of the mainline loco list, whilst number **13** may have been redesignated to placate superstitious loco crews.

## An apocryphal Fairlie

Robert Fairlie's 1876 article in *Technische Mitteilungen* lists forty-three railways using Fairlie locomotives. One of them was supposedly the Lima to Oroya line., with a 64 ton 0-6-6-0T. Like a number of Fairlie's other claims, this may have been wishful thinking rather than an actual sale.

## The fleet in 1886

Source [11, 1886], the *Anales de las Obras Públicas del Perú* for 1886, summarises the fleet:
P358 says 25 locos.
P360 says two locos on *FC Cerro de Pasco* of which one under repair.

## Liveseys' report in 1889

The English language reports produced by Livesey & Co. in 1889 include the statement that this railway possessed at that time twenty-five locomotives of which eight were laid up.

Condition of rolling stock.

ROLLING STOCK.—This, having regard to present traffic requirements, is in a fair condition; future requirements will, however, necessitate considerable expenditure. There are twenty-five locomotives of various types, of which eight are laid up; from forty to fifty 1st and 2nd class passenger cars, nearly all of which are running; and two hundred freight cars of various classes.

## Surviving FC Lima Ancón Chancay locomotives absorbed after 1890

### *2-6-0 d/w 48", cyls. 17x24", built by Rogers in 1869*

Ordered for Lima & Huacho. Was their no. **3 'CHANCAY'**.

**26[1] 'CHANCAY'.** w/n (1596) Ran 484 km in 1890 (section unspecified) [11, 1890 p736].
Ran 15189 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424] and 2223 km. on *Sección de Ancón* [11, 1891 p426].
Ran 11748 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].

Renamed **'CHOSICA'** for 1893.
Ran 13649 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 20764 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 12129 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 34869 km in 1896 (*Sección de Callao á Oroya*) and 113 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Ran 6284 km in 1897 (*Sección de Callao á Oroya*) and 1113 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].
In service 1908.

### *0-4-4RT d/w ?, cyls. 8x16", built by Danforth in 1871*

Ordered for Lima & Huacho. Was their no. **5 'HUACHO'**.

**27[1] 'ANCON'** w/n 747 Ran 389 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424] and 8171 km. on *Sección de Ancón* [11, 1891 p426].
Ran 552 km in 1892 (*Sección de Callao á Casapalca*) and 21230 km on Ancón section [11, 1892 pp446 & 448].
Ran 26 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622] and 28494 km on Lima to Ancón section [11, 1893 p624].
Ran 758 km in 1894 (*Sección de Callao á Oroya*) and 29392 km (*Sección Lima á Ancón*) [11, 1894 p406-8].
Ran 363 km in 1895 (*Sección Callao á Oroya*) [11, 1895 p408].
Ran 10979 km in 1896 (*Sección Lima a Ancón*) [11, 1896 p674-6].
Ran 2021 km in 1897 (*Sección de Callao á Oroya*) and 31025 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].
In service 1908.

### *2-4-0 d/w 54", cyls. 16x22", built by Rogers in 1871*

Ordered for Lima & Huacho. Was their no. **7 'CHILLON'**.

**28 'CHILLÓN'** w/n (1878) Ran 2146 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424] and 12727 km. on *Sección de Ancón* [11, 1891 p426].
Ran 624 km in 1892 (*Sección de Callao á Casapalca*) and 19998 km on Ancón section [11, 1892 pp446 & 448].
Ran 4389 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622] and 14269 km on Lima to Ancón section [11, 1893 p624].
Ran 1109 km in 1894 (*Sección de Callao á Oroya*) and 21268 km (*Sección Lima á Ancón*) [11, 1894 p406-8].
Ran 0 km in 1895 (*Sección de Callao á Oroya*) and 18752 km (*Sección Lima á Ancón*) [11, 1895 p232-4].
Ran 13864 km in 1896 (*Sección de Callao á Oroya*) and 7091 km (*Sección Lima a Ancón*) [11, 1896 p674-6].
Ran 13278 km in 1897 (*Sección de Callao á Oroya*) and 3278 km. (*Sección Lima á Ancón*) [11, 1897 p564-6].
In service 1908.

### *2-2-0T steam car d/w 30", cyls. 5x12", built by Rogers in 1869*

Ordered for Lima & Huacho. Was their no. **4 'CABALLITO'**. Given that this engine received the running number **31**, ie. above nos. **29** and **30** received in 1890, it may only have returned to traffic after that year.

**31[1] 'CABALLITO'** w/n (1654) Ran 7552 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424] and 8797 km. on *Sección de Ancón* [11, 1891 p426].

Ran 12142 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 10647 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 3635 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 2003 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 663 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 6080 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].
In service 1908.
Later became no. **8** of the *FC Pisco Ica* to be later renumbered **2**[2].

### *0-4-2T later 0-4-4Td/w 36", cyls. 9x15", built by Rogers in 1890*

Ordered via W. R. Grace & Co. for *FC Callao Lima y Oroya*. NB Weber, Lehmuth and Connelly's Rogers lists suggest that this was no. **27** before being renumbered **29**.

**29 'La CHALACA'** w/n 4414

Ran 5794 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 7905 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 3515 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 414 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 456 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 1665 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 7079 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].
In service 1908.


Given that no. **29 'La CHALACA'** started life as an 0-4-2T but was later rebuilt to 0-4-4T configuration, I think we can assume that the long bunker/rear tank seen here was a modification.

### *4-4-0 d/w 48", cyls. 13x18", built by Rogers in 1890*

Ordered via W. R. Grace & Co. for *FC Callao Lima y Oroya*. NB Weber, Lehmuth and Connelly's Rogers lists suggest that this was no. **26** before being renumbered **30**.

**30**[1] **'La LIMEÑA'** w/n 4413 Ran 2629 km in 1891 (*Sección de Callao y Chicla*) [11, 1891 p424].
Ran 21054 km in 1892 (*Sección de Callao á Casapalca*) and 6977 km on

Ancón section [11, 1892 pp446 & 448].
Ran 31668 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 35482 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 37590 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 30044 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 37502 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].
In service 1908.

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## A puzzle loco purchased second-hand?

The 1889 Anales mileage table [11, 1889 p520] shows an engine **'PACIFIC'** as running 85 km on '*patio y extraordinarias*' duties that year. The guess must be that it had been Manning Wardle 0-4-0ST no. 231 originally of the Pacific Steam Navigation Co. as that had carried the name **'PACIFIC'**.

### *0-4-0ST d/w 30", cyls. 6x12" and 7½x12", built by Manning Wardle in 1868*

Ordered by Pacific Steam Co., Callao.

**'PACIFIC'** w/n 231 — Later sold to Lima Railway Co. or possibly direct to the FCC where it was working in 1889.
Ran 1160 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].

## Three Locomotives purchased by the Central Railway of Peru from 1890 onward

### *0-4-0ST d/w 36", cyls. 12x18", built by Baldwin in 1890*

Ordered by W. R. Grace & Co. for Oroya Rly. BLW class 04-18C no. 40. Spec. is in vol. 16 p179. No mark on tank

**1[3] 'CONSTRUCTORA'** w/n 11475 — Renumbered **32**[1] on arrival.
Ran 8404 km in 1892 (*Sección de Callao á Casapalca*) [11, 1892 p446].
Ran 18628 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 17033 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 20217 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Ran 25560 km in 1896 (*Sección de Callao á Oroya*) [11, 1896 p674-6].
Ran 20044 km in 1897 (*Sección de Callao á Oroya*) [11, 1897 p564-6].
In service 1908.

### *? d/w ?, cyls. ?, built by ? in ?*

Ordered for ?

**33 'GALERA'** w/n ? — Source unknown.
Ran 5065 km in 1893 (*Sección de Callao á Oroya*) [11, 1893 p622].
Ran 344 km in 1894 (*Sección de Callao á Oroya*) [11, 1894 p408].
Ran 624 km in 1895 (*Sección de Callao á Oroya*) [11, 1895 p232-4].
Not in mileage charts in 1896-7 [11, 1897 p564-6].

## The inspection of boilers 1896

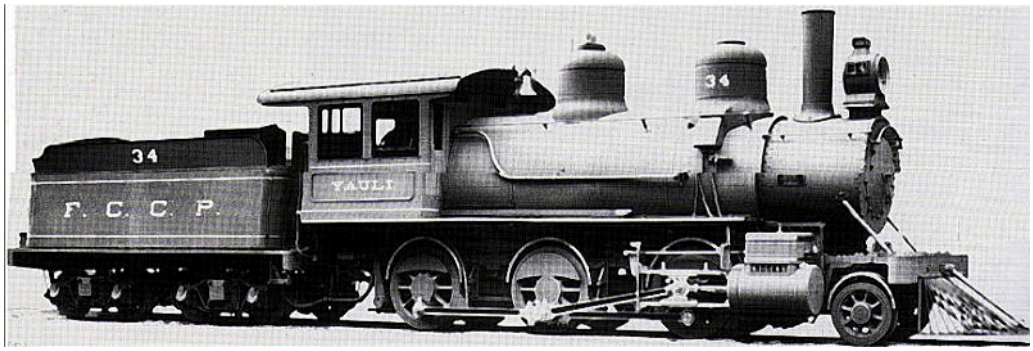
*Inspeccion de locomotoras del ferrocarril Central.*
*Lima, Julio 2 de 1896.*
*Señor Director de Obras Públicas:*

*A peticion del senor Superintendente del ferrocarril de la Oroya, he probado dos máquinas, la num. 8 y la num. 9, que habian estado en reparacion general en el segundo semestre de 1895, y que debian salir nuevamente al tráfico.*
*Las pruebas hechas en dichas maquinas han sido conpresión hidrauli-ca y con agua caliente en las calderas, Ilegando en la num. 8 llamada Parac a 250 libras, y en la num. 9, llamada Junin a 275 libras de presión. En virtud del buen resultado obtenido con estas presiones he otorgado dos certificados por dichas maquinas, para que la locomotora Junin pueda funcionar en marcha con 175 libras, y la Parac con 150 libras, declarandolas en buen estado de servicio, despues de haber hecho tambien un recorrido de algunos kilometros, durante eI cual he constitado que han conservado bien su presión.*
*He convenido con el señor Superintendente hacer pruebas con todas las maquinas que se vayan reparando, y no permitir que haya maquinas en servicio sobre las cuales haya el menor temor.*
*Lo que comunico a US. para su conocimiento.*
*Dios guarde a US.*
*MANUEL A. VIÑAS,*
*Ingeniero del Estado.*

### *2-6-0 d/w ?, cyls. 18x24", built by Rogers in 1900*

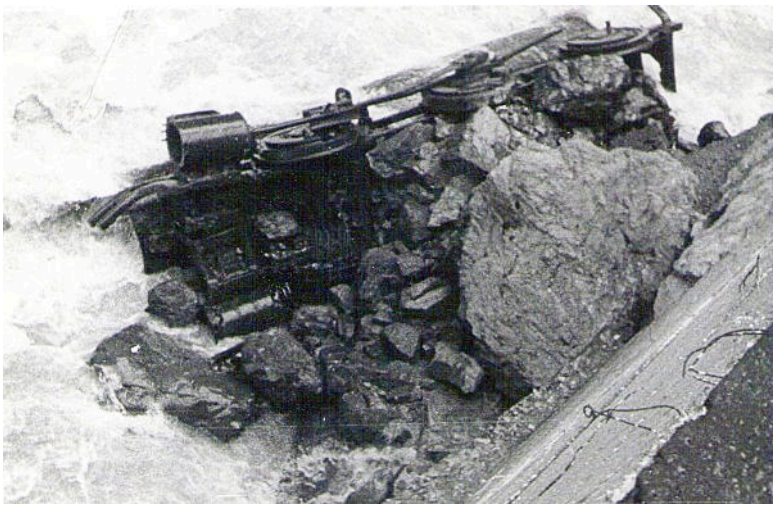
Ordered by Peruvian Corporation. Connelly's Rogers list says these were lettered *FCCP* for *FC Cerro de Pasco*, but those initials could equally well stand for *FC Central del Perú*.

| | | |
|---|---|---|
| **33**[1] **'TORITO'** | w/n ? | Withdrawn after crash in 1909. This was the loco that ran away and hit a crane on the Chaupichaca bridge. The remains lay in the river there for decades. Not in 1908 list so accident may actually have happened by then. |
| **34**[1] **'YAULI'** | w/n 5550 | This loco fell from the Rio Blanco bridge on 12th April 1902, after rails had been removed for replacement. An accident report is in Appendix 3 of this file. However, the bridge was not a large one and it would appear that the engine was rescued and rebuilt. It was in service between Lima and Chosica in 1909, see table at tail end of Appendix 4. In service 1908. |
| **35**[1] **'CERRO de PASCO'** | w/n 5552 | In service 1908. In service between Lima and Chosica in 1909, see table at tail end of Appendix 4. |




A Rogers builders' photo of 2-6-0 no. **34 'YAULI'**.

The remains of no. **33**, together with parts of the bridge that it brought down.



The boiler was still there some years later, though the other parts have gone.
The photo was from the collection of Garth Samuel, by courtesy of Richard Pelham.

### *0-6-0ST d/w 45"?, cyls. 16x22"?, built by Hunslet in ?*

Ordered by ?

**35**[2] w/n ?

1495 of 1927 or 3690 of 1950?

### *2-6-0 d/w 46", cyls. 18x24", built by Baldwin in 1901*

Ordered by *FC Central del Peru*. BLW class 08-30D nos. 607 and 608. Spec. is in vol. 24 p145. Le Chatelier water brake. Mark on tank 'F. C. C.'.

**36**[1] **'MOROCOCHA'** w/n 19878 In service 1908.

**37 'TICLIO'** w/n 19941 Copeland suggests numbers may have been swopped and it might have been this engine which fell from the Chaupichaca bridge in 1909 rather than no. **33**. In service 1908. In service between Lima and Chosica in 1909, see table at tail end of Appendix 4.

### *0-4-0T d/w 33", cyls. 11x16", built by Baldwin in 1901*

Ordered by Central del Peru. BLW class 04-16C no. 128. Spec. is in vol. 23 p233. Frame iron extra strong solid. Straight stack.

**38 'GUADALUPE'** w/n 18793 In service 1908.


This image is from Baldwin negative 01442 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.

### *2-6-0 d/w 47", cyls. 18x24", built by Rogers in 1903*

Ordered by Peruvian Corporation.

**39 'SALTACUNA'** w/n 6000 In service 1908. In service between Lima and Chosica in 1909, see table at tail end of Appendix 4.

**40**[1] **'OCTARA'** w/n 6001 In service 1908. In service between Lima and Chosica in 1909, see table at tail end of Appendix 4.

**41**[1] **'CHAUPICHACA'** w/n 6002 In service 1908.

**42**[1] **'HUANCAYO'** w/n 6003 In service 1908. Withdrawn by 1920.

### *2-6-0 d/w 46", cyls. 18x24", built by Baldwin in 1904*

Ordered by ? BLW class 08-30D nos. 616-619. Spec. is in vol. 24 p145. Le Chatelier water brake. Mark on tank '*F. C. C. P.*'.

**43**[1] **'DESAMPARADOS'** w/n 23829 In service 1908. In service between Lima and Chosica in 1909, see table at tail end of Appendix 4.

**44**[1] **'VERRUGAS'** w/n 23830 In service 1908. In service between Lima and Chosica in 1909, see table at tail end of Appendix 4. Fawcett says was in active use until 1925, the very last of these, as a yard engine and stand-in power for the Chosica *rapido*.

**45**[1] **'INFIERNILLO'** w/n 23877 In service 1908. In service between Lima and Chosica in 1909, see table at tail end of Appendix 4.

**46**[1] **'GALERA'** w/n 23878 In service 1908. In service between Lima and Chosica in 1909, see table at tail end of Appendix 4.


This image is from Baldwin negative 01830 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.

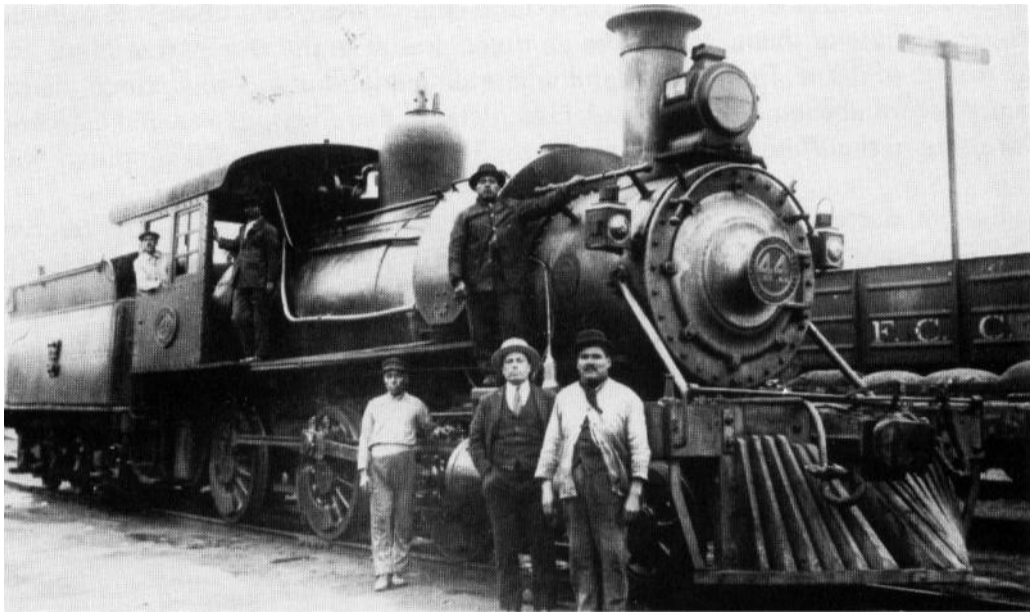


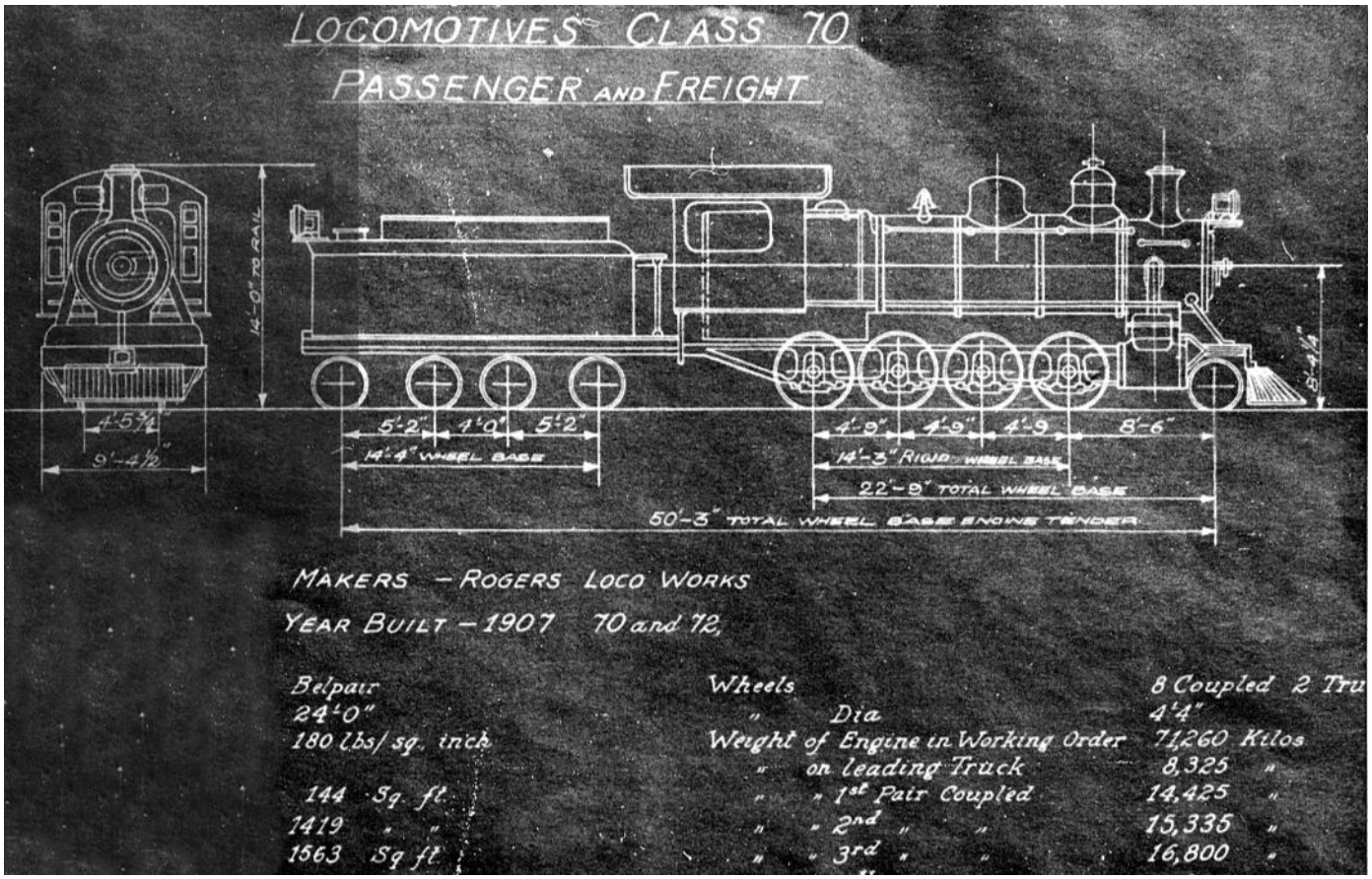

Photo by Brian Fawcett, taken between 1923 and the late 1930s.

### *2-8-0 d/w 52", cyls. 20x28", built by ALCo Rogers in 1906*

Ordered via W. R. Grace & Co. for Southern Railway of Peru as their numbers **60** to **84**, ALCo 41185-41209. Ten transferred to *FC Central* on arrival. Precise order of works numbers not known. The 1909 accident report includes a table on its final page listing locomotives than in use between Lima and Chosica, see Appendix 4 to this file. These included Rogers eight-coupled engines **49-58**. These may well have been from those listed here, but if so then a number **49** should be added at the head of the list.

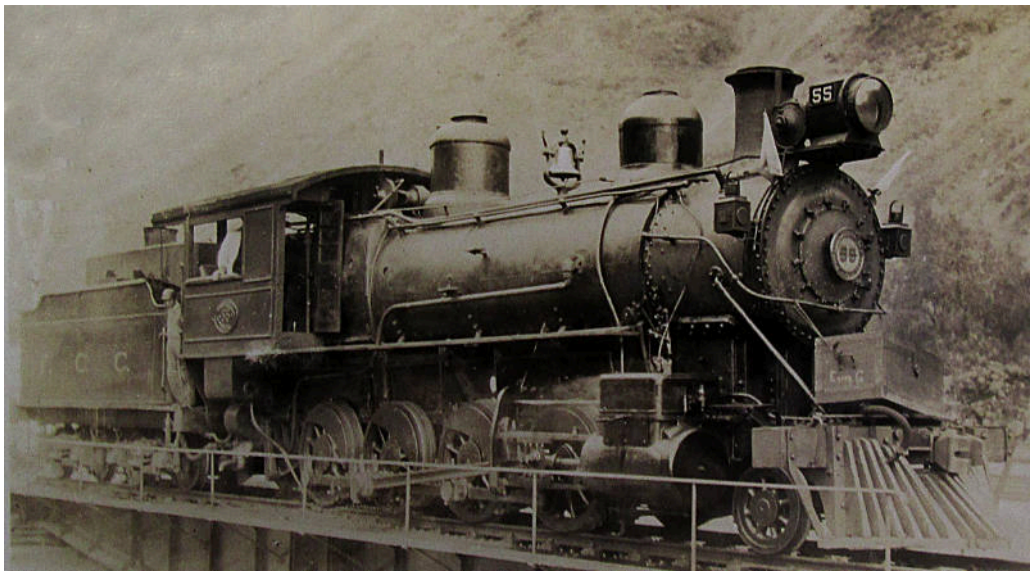
| | | |
|---|---|---|
| **50**[2] | w/n ? | Rebuilt with Hunslet boiler and anglicised appearance 1925. |
| **51**[2] | w/n ? | |
| **52**[2] | w/n ? | |
| **53**[2] | w/n ? | Rebuilt with Hunslet boiler and anglicised appearance 1925. |
| **54**[2] | w/n ? | Later became *Cerro de Pasco* no. **20**[2]. |
| **55**[2] | w/n ? | |
| **56**[2] | w/n ? | Rebuilt with Hunslet boiler and anglicised appearance 1925.Renumbered **76**[2]. |
| **57**[1] | w/n ? | |
| **58**[1] | w/n ? | Rebuilt with Hunslet boiler and anglicised appearance 1925. Renumbered **78**. |
| **59**[1] | w/n ? | Rebuilt with Hunslet boiler and anglicised appearance 1925. Renumbered **79**. |
| **70**[2] | w/n ? | Fitted with piston valves, in 1943?, according to diagram sheet reproduced in [23]. |
| **71**[2] | w/n ? | |
| **72**[2] | w/n ? | |
| **73**[2] | w/n ? | Fitted with piston valves, in 1939, according to diagram sheet reproduced in |

| | | |
|---|---|---|
| | | [23]. |
| **74**[2] | w/n ? | Fitted with piston valves, in 1938, according to diagram sheet reproduced in [23]. |
| **90** | w/n ? | Copeland says ordered for *FCC* but delivered to *FCS*, then transferred to *FCC* possibly in 1913. Rebuilt with anglicised appearance 1924-5. |
| **91** | w/n ? | Copeland says ordered for *FCC* but delivered to *FCS*, then transferred to *FCC* possibly in 1913. Rebuilt with anglicised appearance. |
| **92** | w/n ? | Copeland says ordered for *FCC* but delivered to *FCS*, then transferred to *FCC* possibly in 1913. |

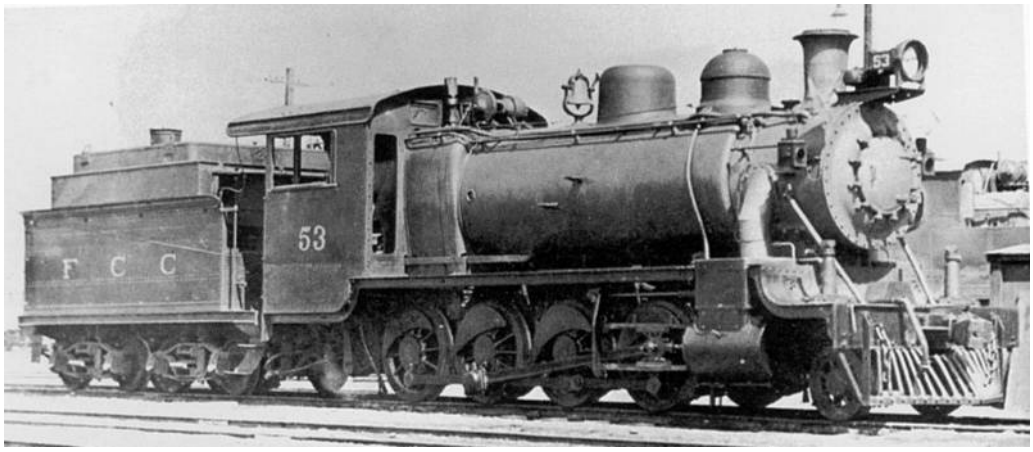



An *FCC* diagram for these 2-8-0s, by courtesy of Garth Samuel and Richard Pelham.
The external steam pipes and the fact that only two surviving engines are listed, suggests that this diagram dates from near the end of the engines' lives.

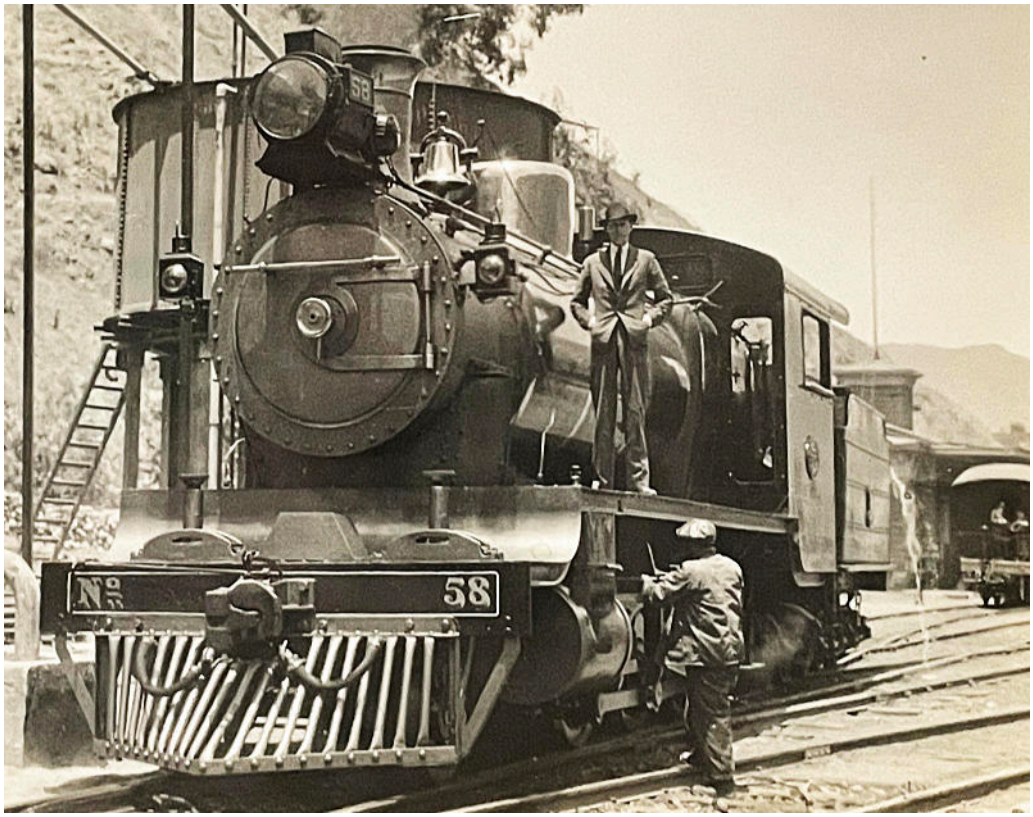

No. **56** stands at the head of a passenger train at Huancayo station.



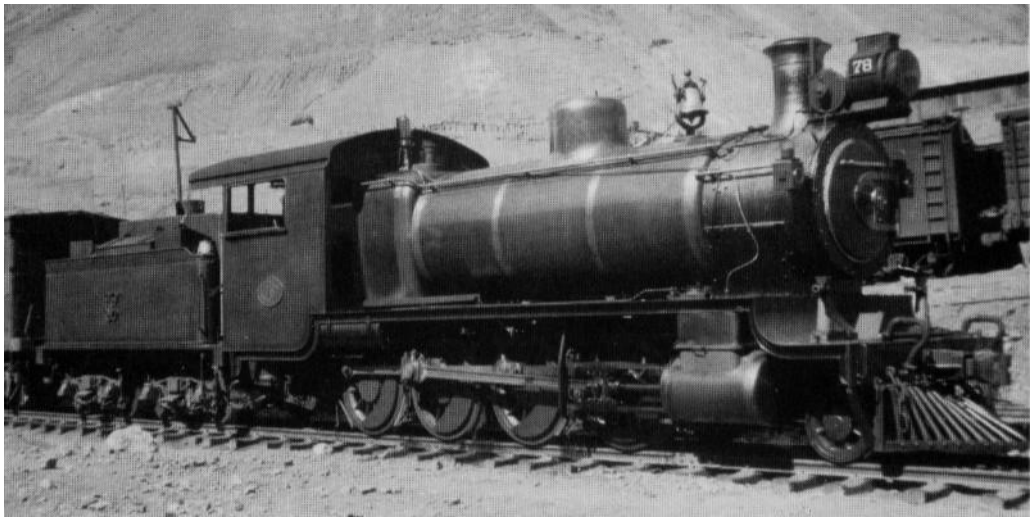

No. **55** on a turntable, possibly at San Bartolome.



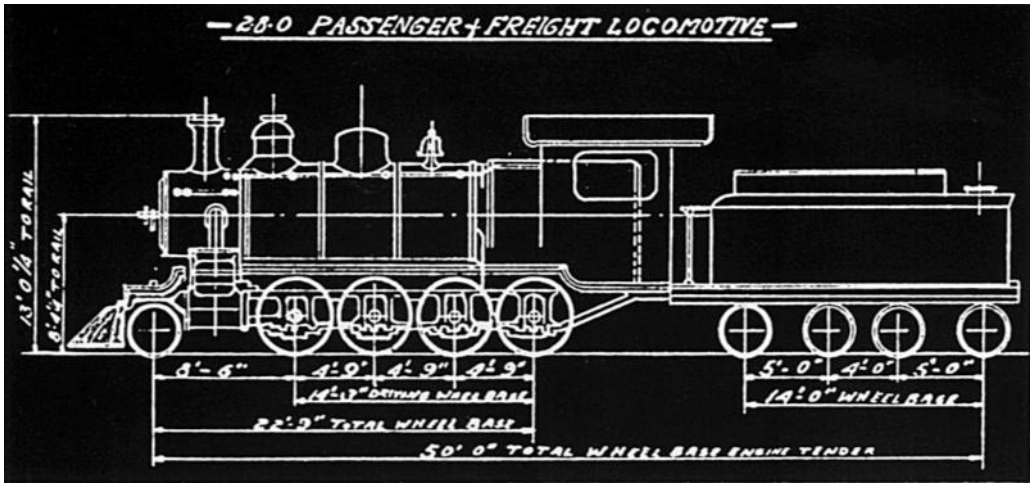

A Brian Fawcett photo of no. **53** after its rebuild to a British style and with a Hunslet boiler.



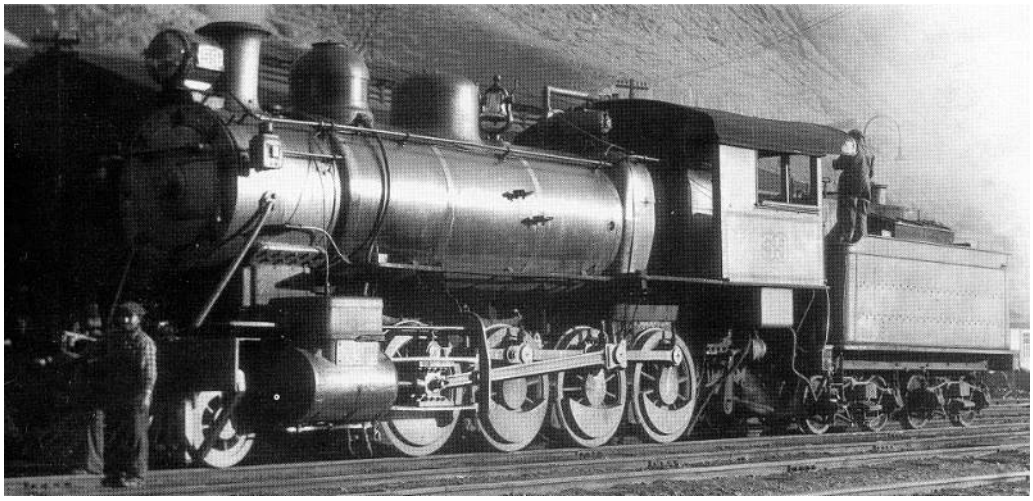

No. **58** after rebuilding.




A Brian Fawcett view of no. **78** on a train at Casapalca in 1926.




A diagram of the rebuilt locos, sourced via [23].



A Brian Fawcett photo of no. **59**, rebuilt with a Hunslet boiler but not restyled as radically as those illustrated above.

## Unidentified locos in 1909

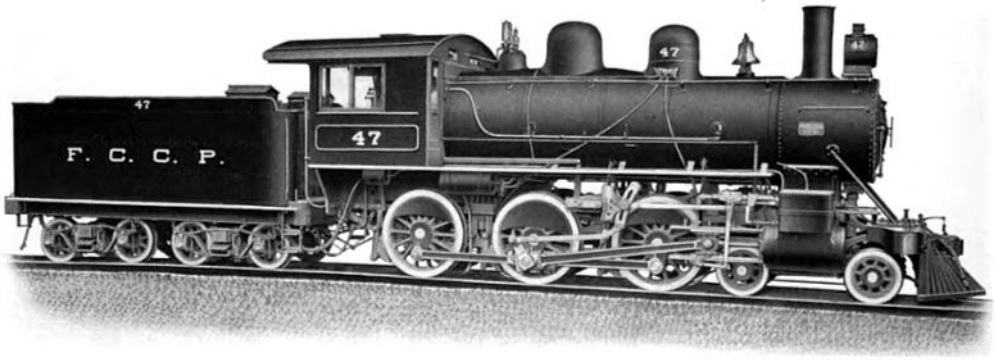
The table at the end of the 1909 accident report (see Appendix 4) lists locos numbered **47** and **49**, the former being a six-coupled engine by Baldwin and the latter eight-coupled and by Rogers. These have not yet been matched to identities in this list.

### *4-6-0 d/w 58", cyls. 19x26", built by ALCo in 1907*

Ordered by Central Railway of Peru according to Connelly's ALCo list, though Reimar Holzinger shows them as originally for *FC Sud* (nos. **80-89**). Copeland says ordered for *FC Central* but diverted to *FC Sud* before delivery. Connelly's list says d/w 58", whilst Copeland says d/w 68" which seems unlikely. Known as class 90, which presumably means that they were renumbered at some point. This is supported by the numbers displayed on the photos which follow, but details of the number range have not yet been found. None listed in 1908 list for *FCC*.

| | | |
|---|---|---|
| **47**[1] | w/n 41509 | |
| **48**[1] | w/n 41510 | |
| **49**[1] | w/n 41511 | |
| **50**[1] | w/n 41512 | |
| **51**[1] | w/n 41513 | Later became *Cerro de Pasco* **20**[2]. |
| **52**[1] | w/n 41514 | |
| **53**[1] | w/n 41515 | |
| **54**[1] | w/n 41516 | |
| **55**[1] | w/n 41517 | |
| **56**[1] | w/n 41518 | |

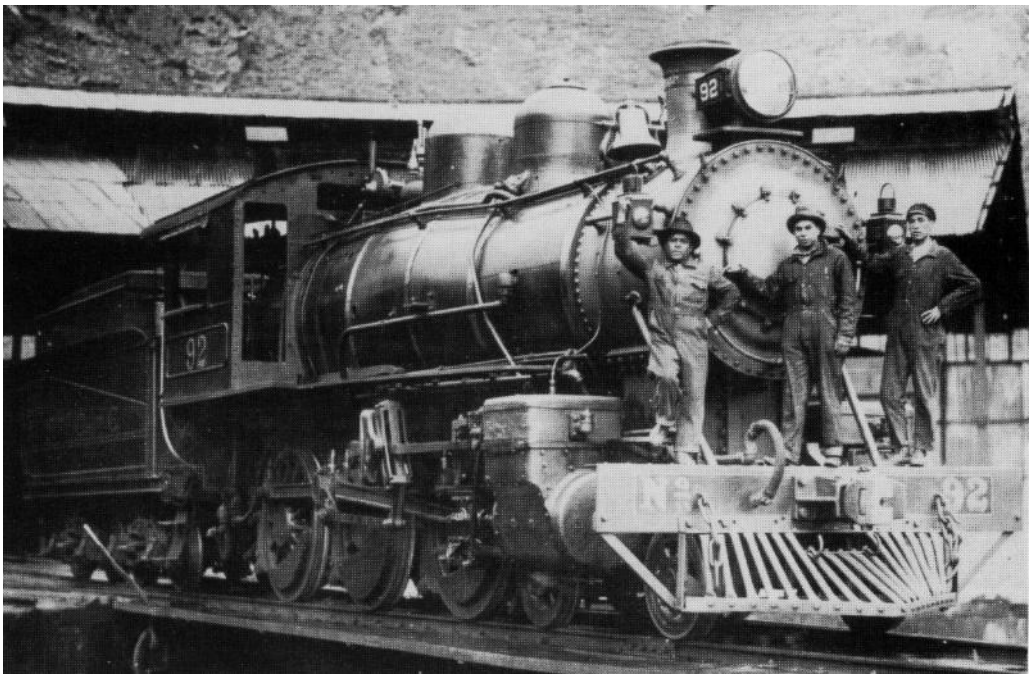
In 1925 three of these were in the *FCC* fleet, wirth the running numbers **90-92**. Had they been returned from the *FCS* perhaps?



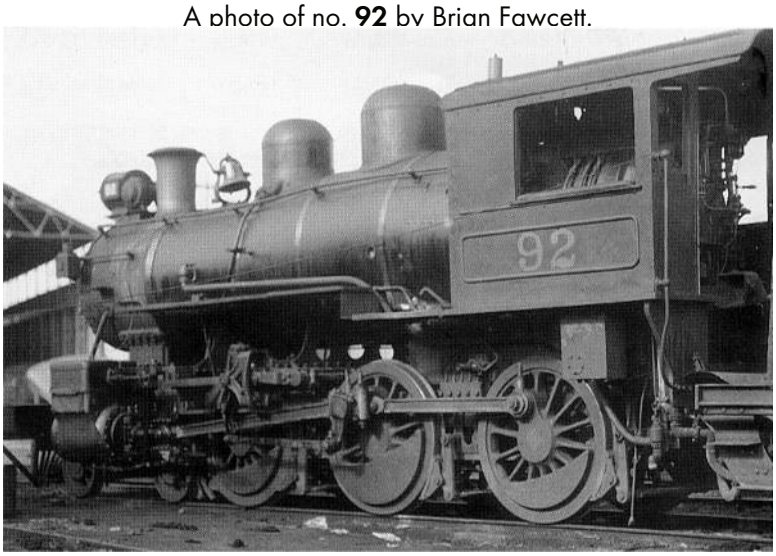

460 TYPE LOCOMOTIVE
Built for the "Ferrocarril Central del Perú"

LOCOMOTORA DEL TIPO 460
Construida para el Ferrocarril Central del Perú

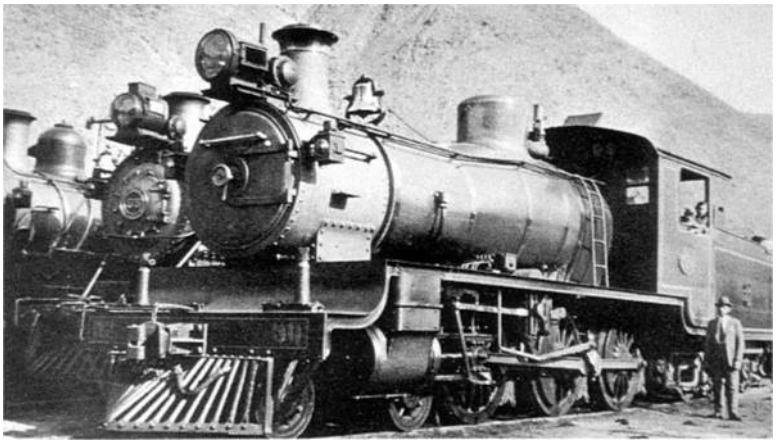
An illustration from an ALCo catalog showing the first of these 4-6-0s.




A photo of no. **92** by Brian Fawcett.




No. **92** as seen from the fireman's side.



This image of no. **90** suggests that some of these 4-6-0s had also received the anglicisation treatment.

## A very critical report in 1909

A number of serious accidents during the first years of the new century eventually led to an enquiry and an inspectors' report published in 1909. This was published in source [21], *Informaciones y memorias de la Sociedad de Ingenieros*, 1913, pp271-298, available at https://babel.hathitrust.org/cgi/pt?id=uc1.b2870093&view=1up&seq=1&skin=2021 The sections examining topics related to locomotives are attached at the tail end of this file as Appendix 4.

### *2-6-0 d/w 52", cyls. 18x24", built by Baldwin in 1907*

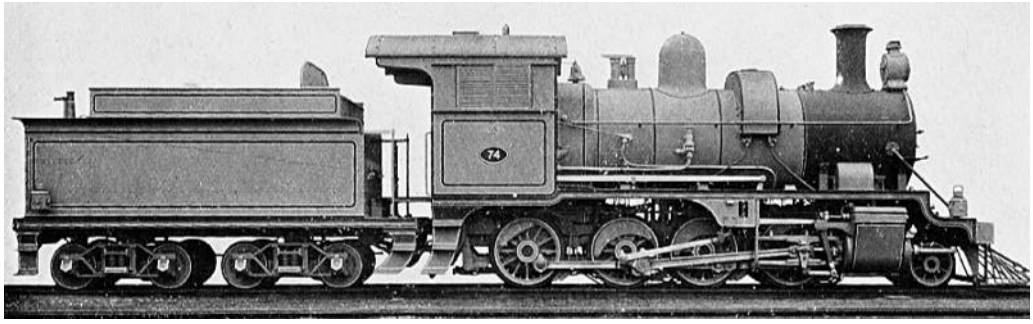
Ordered by *FC Cerro de Pasco* as their no. **40**. Later came to the *FC Central*.

| | | |
|---|---|---|
| **47**[2] | w/n 30129 | |

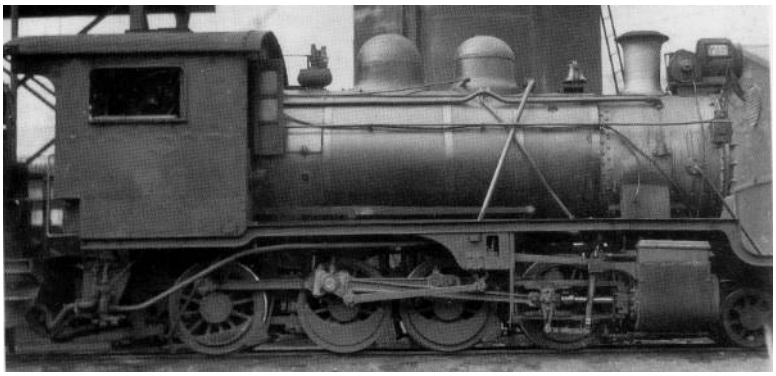
### *2-8-0 d/w 48", cyls. 19¾x24", built by NBL in 1908*

Ordered by 'Peru Central Ry.'. Fawcett says these had to be fitted with bigger boilers before they could enter service, but this has not been confirmed. He also says that one from the final 2-cylindered batch "dropped overboard in the Caribbean on the way out", but even if true in general terms it was not likely to have been in the Caribbean as the Panama canal had not been completed when these were built. Finally he says that those three cylinder locos were converted to 2-cylindered machines.

| | | |
|---|---|---|
| **59**[2] | w/n 18602 | |
| **60** | w/n 18603 | |
| **61** | w/n 18604 | |
| **62** | w/n 18605 | |
| **63** | w/n 18606 | |
| **64** | w/n 18607 | |
| **65** | w/n 18608 | |
| **66** | w/n 18609 | |
| **67** | w/n 18610 | |
| **68** | w/n 18611 | Later rebuilt as 2-8-0TT with side tanks used for fuel oil. |
| **69** | w/n 18612 | Later rebuilt as 2-8-0TT with side tanks used for fuel oil. |
| **70**[1] | w/n 18613 | |
| **71**[1] | w/n 18614 | |
| **72**[1] | w/n 18615 | |
| **73**[1] | w/n 18616 | |
| **74**[1] | w/n 18617 | Three cyls. |
| **75**[1] | w/n 18618 | Three cyls. New boiler by 1930. |
| **76**[1] | w/n 18619 | Three cyls. |



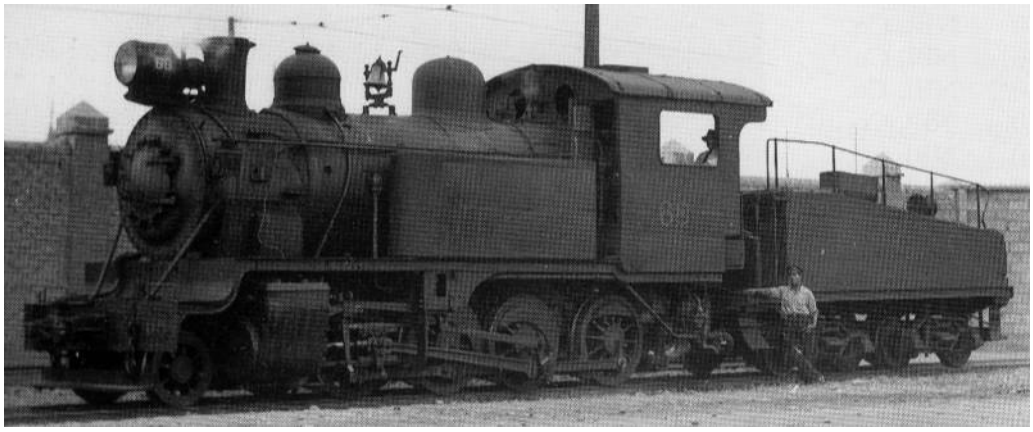

This is no. **74**, one of the final three which possessed three cylinders.



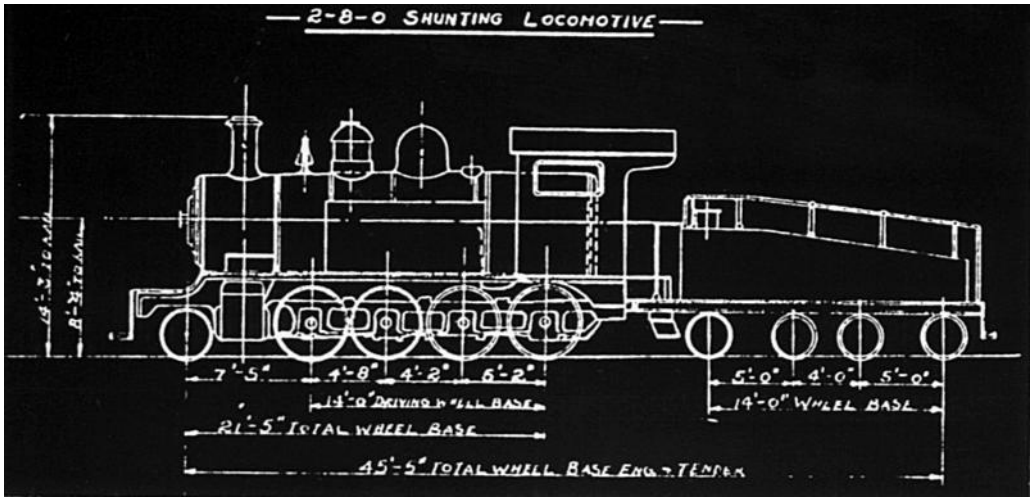
Comparing this image with the builder's photo above, This engine does appear to have a larger boiler with a round-topped firebox and with top feed rather than side-mounted clacks. It also has a conventional sand dome rather than a saddle sandbox.


On the other hand, no. **67** was carrying buffer-beam-mounted sandboxes when see at the head of a short passenger train at Morococha in 1936.

One of these NBL 2-8-0s appears to have met with an accident. Details unknown. Rather strangely, the engine seems to have a rectangular boiler-mounted sandbox, rather than the original saddle style or the dome on the previous page.



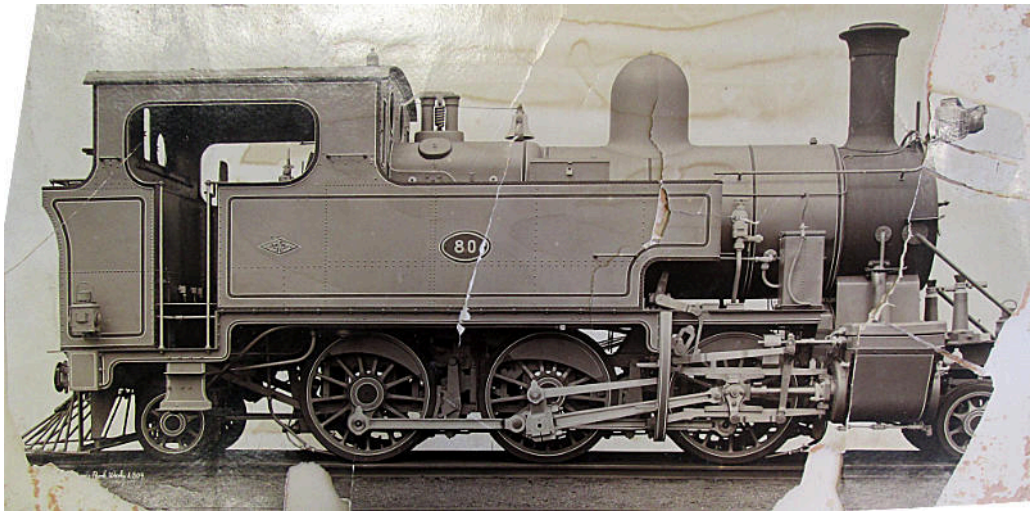
Fawcett states that the two best NBL 2-8-0s, nos. **68** and **69**, were saved when the remainder were scrapped and were converted to 2-8-0 heavy shunters. Note that the side tanks contained solely oil fuel, with the water being held in the tender.



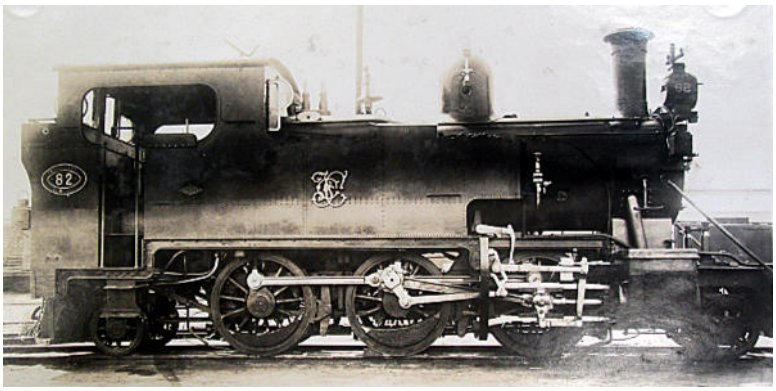
An FCC diagram of these shunters, from source [23].

### *2-6-2T d/w 55½", cyls. 18x24", built by NBL in 1908*

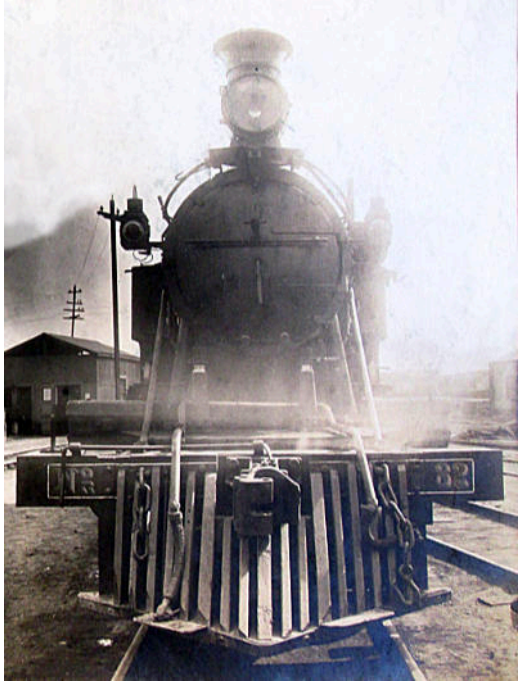
| | |
|---|---|
| Ordered by ? | Used on Lima to Callao suburban service. All retired 1937. |
| **80**[1] | w/n 18620 |
| **81**[1] | w/n 18621 |
| **82**[1] | w/n 18622 |
| **83**[1] | w/n 18623 |
| **84**[1] | w/n 18624 |
| **85**[1] | w/n 18625 |

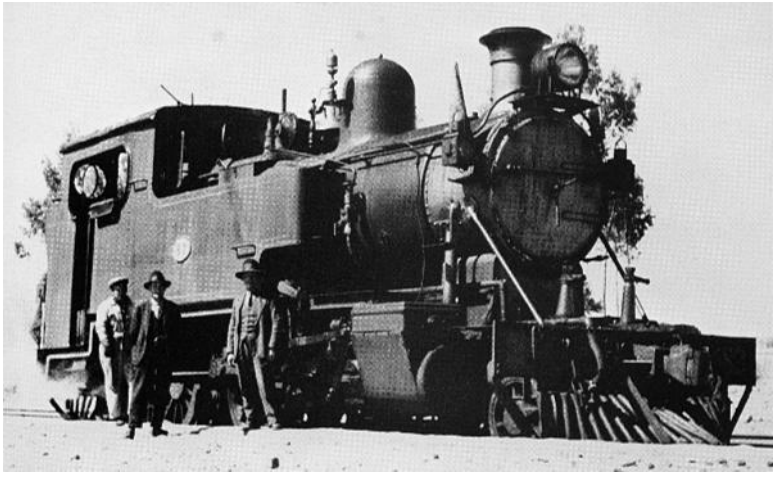



From an extremely fragile builder's photo of no. **80**.

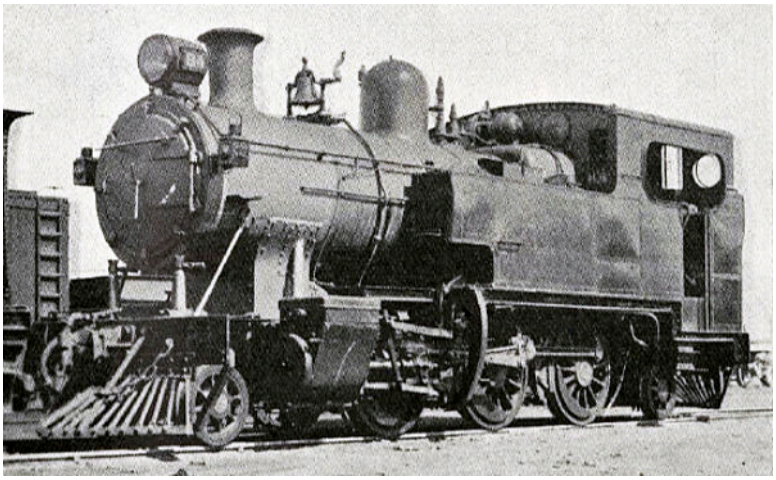



No. **82** side view (above) and front view (beneath) showing short smokebox, incomplete running plate over cylinders, and the bunker over a short 'running plate' and a thick rear buffer beam.

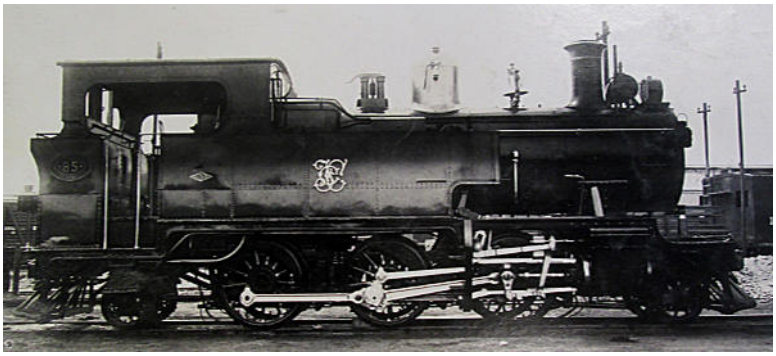




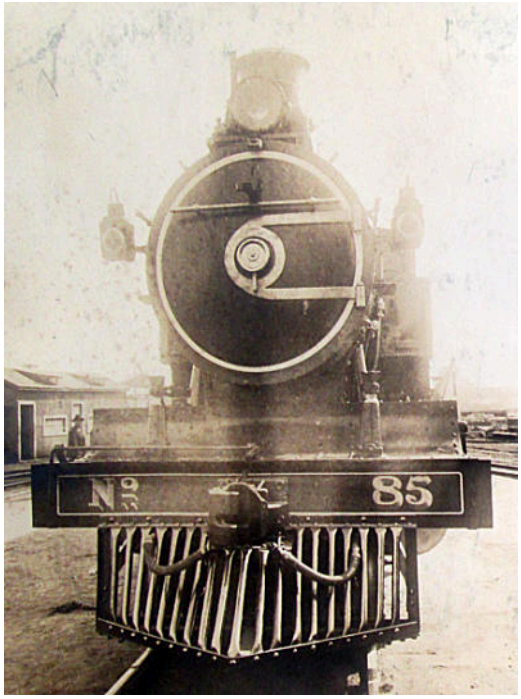
NBL 2-6-2T no. **83**, as seen by Brian Fawcett.

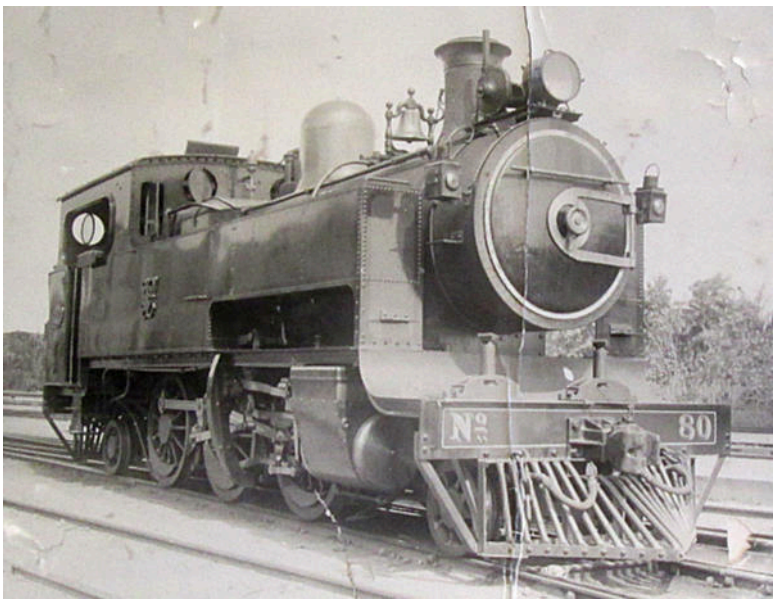


No. **84**, with an added bell between chimney and dome.



No. **85** side view (above) and front view (below) showing a long smokebox, complete running plate over cylinders, safety valves ahead of belpaire firebox, and rear buffer beam out at full extent of bunker.




No. **83** with extended tanks, presumably a later modification.

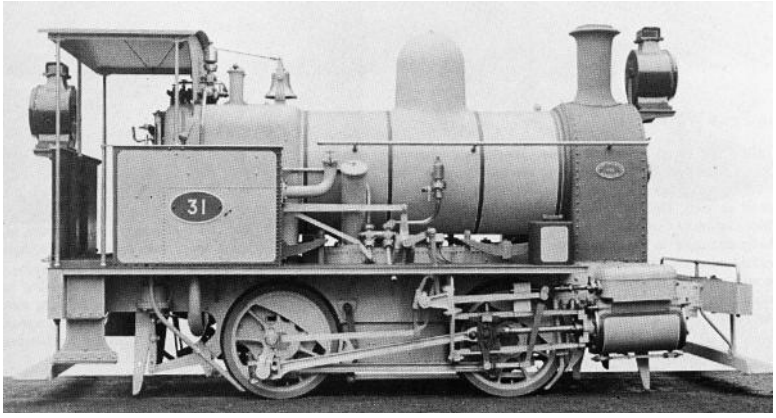
### *0-4-0T d/w 39½", cyls. 13x21", built by Beyer Peacock in 1909 and 1913*

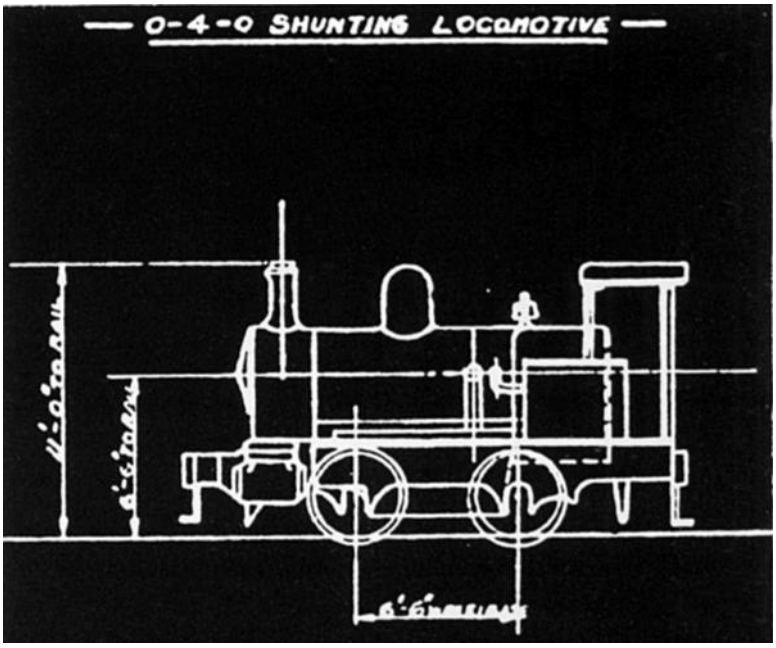
Ordered by ? ITN in *LI* issue 38 of May-June 1997 [7] states that three were numbered **25-27** in 1928, with

another numbered **29**.

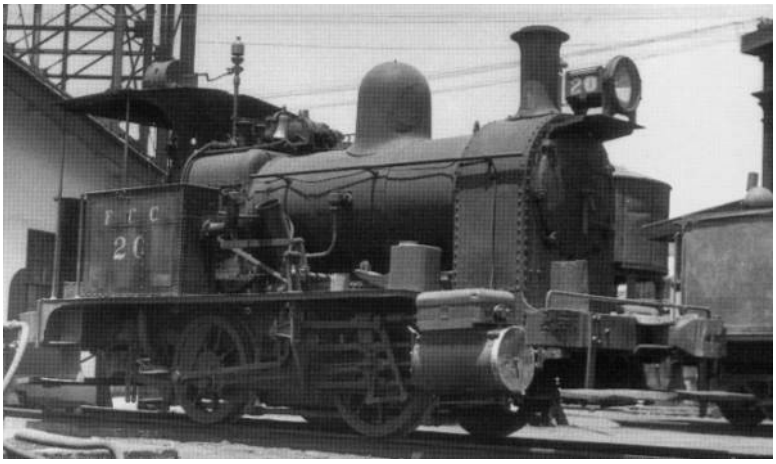
| | | |
|---|---|---|
| **31**[2] | w/n 5182 | Later became PGM no. **14**. Copeland says sold to *FC Pacasmayo*. |
| **32**[2] | w/n 5183 | Later became PGM no. **16**. Copeland says sold to *FC Pacasmayo*. |
| **33**[2] | w/n 5184 | Renumbered **22**[2]. Sold to *FC Pacasmayo*, date unknown [7]. |
| **25**[2] | w/n 5680 | Renumbered **20**[2]. Sole survivor by 1964 and kept going until early 1970s [7]. Plinthed nowadays in the friendship park in Surco. |
| **26**[2] | w/n 5681 | Renumbered **21**[2]. Sold to *FC Pacasmayo* in 1961 [7]. |

In 1941 loco **29** was in use as a stationary boiler supplying steam to the railway's sleeper creosoting plant. Pacasmayo also acquired one of these numbered **15**, see section 13.1.3.




An *FCC* diagram of these locos, dating from the period when they were numbered **20-22**.



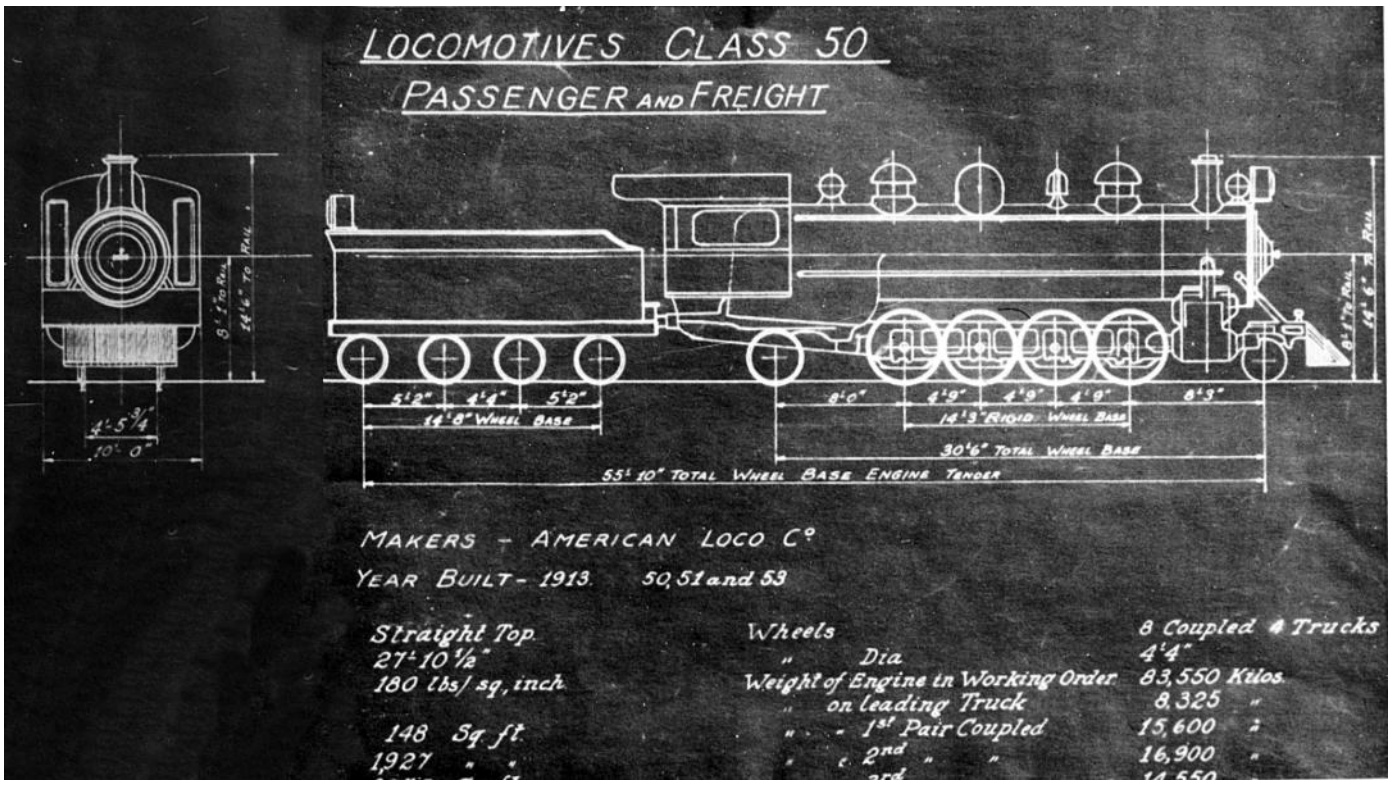

A Brian Fawcett photo of *FCC* no. **20** , ex no. **25**, and eventually the last survivor of the class.

No. **20** as currently plinthed in a park in Surco.
Photo by kind permission of Sr. Julio Gamboa.

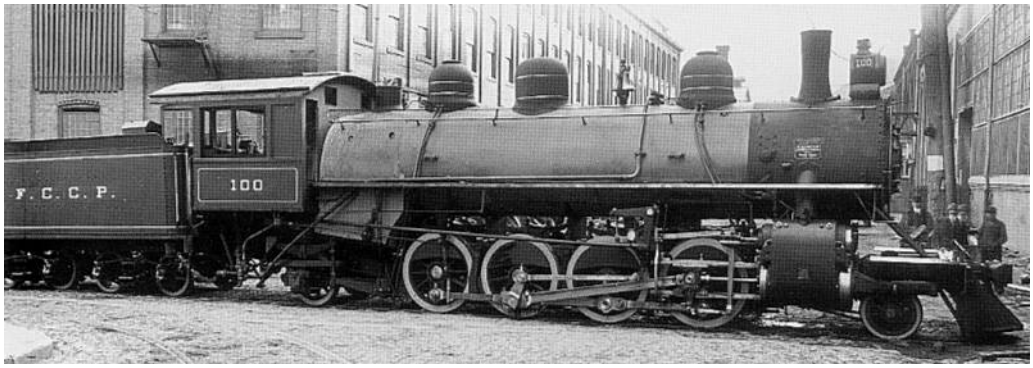
### *2-8-2 d/w 52", cyls. 20x28", built by ALCo in 1913*

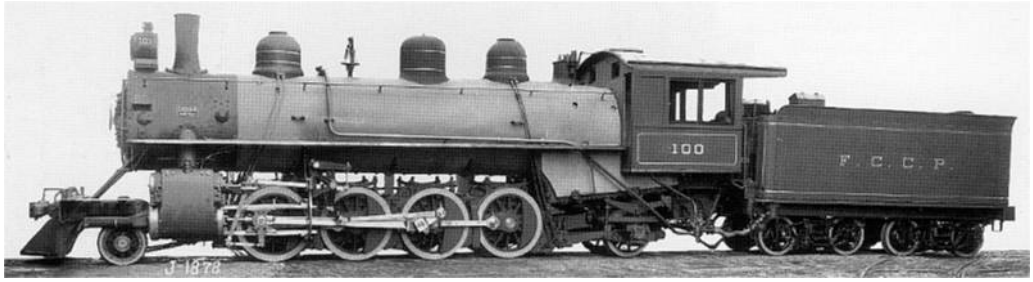
Ordered by ?

| | | |
|---|---|---|
| **100**[1] | w/n 52817 | Withdrawn after crash, date unknown. Ran off end of Saltacuna Chicla zigzag. |
| **101**[1] | w/n 52818 | Renumbered **50**[4]. |
| **102**[1] | w/n 52819 | Withdrawn 1935 after explosion. |
| **103**[1] | w/n 52820 | Renumbered **52**[4]. |
| **104**[1] | w/n 52821 | Renumbered **53**[4]. |
| **105**[1] | w/n 52822 | Renumbered **102**[2] and then to **51**[4]. |




An FCC diagram for these Mikados, by courtesy of Garth Samuel and Richard Pelham.




CJW 2270

AMERICAN LOCOMOTIVE COMPANY
NEW YORK.

Class 282 S181 — Road Number, 100

BUILT FOR THE CENTRAL RY OF PERU.

| GAUGE OF TRACK | CYLINDERS | | DRIVING WHEEL DIAMETER | BOILER | | FIRE BOX. | | TUBES | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Diam. | Stroke | | Diameter | Pressure | Length | Width | Number | Diameter | Length |
| 4′–8½ | 20″ | 28″ | 52″ | 66⅜″ | 180 lbs. | 95⅝″ | 65⅛″ | 148<br>21 | 2″<br>5¾″ | 18′-0″ |

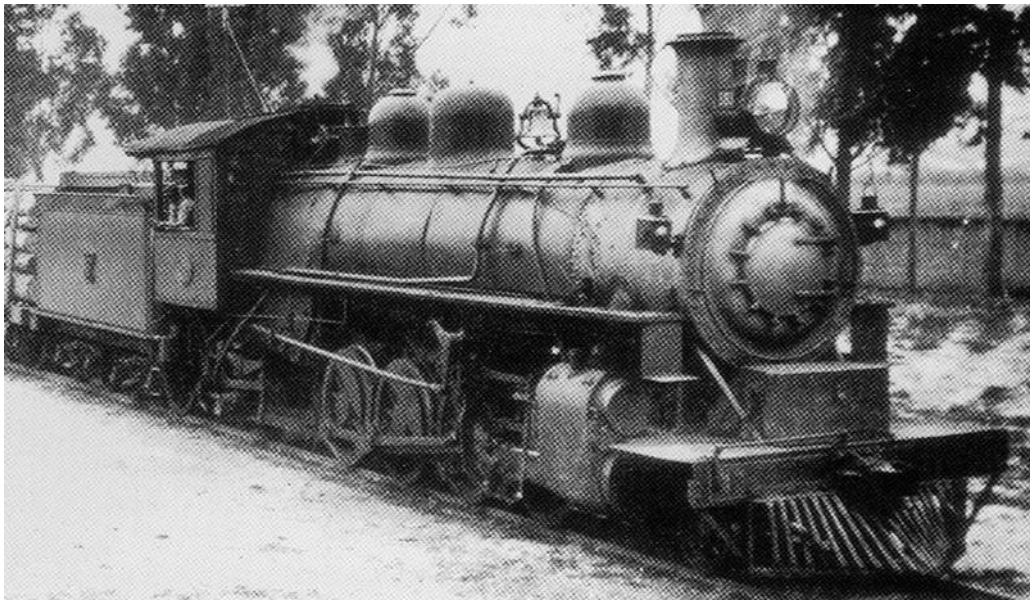
| WHEEL BASE | | | WEIGHT IN WORKING ORDER—POUNDS | | | | |
|---|---|---|---|---|---|---|---|
| Driving | Engine | Engine & Tender | Leading | Driving | Trailing | Engine | Tender |
| 14′–3″ | 30′–6″ | 55′–10″ | 19000 | 133000 | 29000 | 181000 | 89300 |

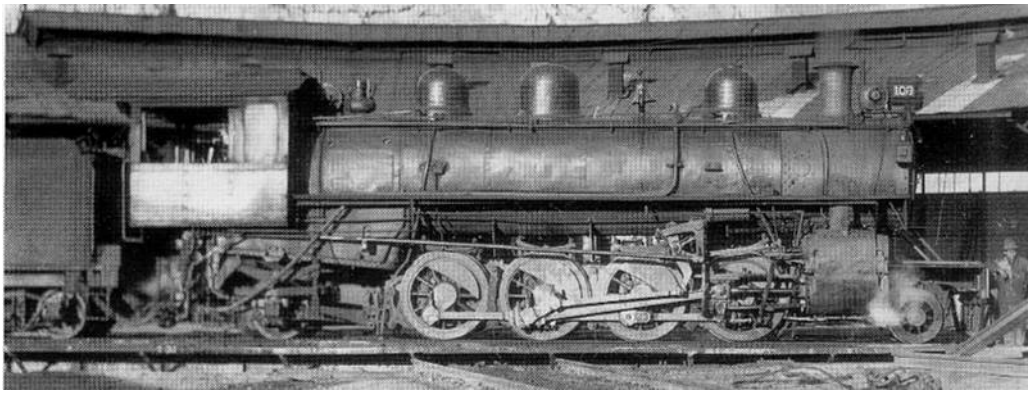
| FUEL | HEATING SURFACES, SQ. FT. | | | | GRATE AREA SQ. FT. | MAXIMUM TRACTIVE POWER | FACTOR OF ADHESION |
|---|---|---|---|---|---|---|---|
| Kind | Tubes | Fire Box | Total | Superheater | | | |
| Oil | 1917 | 148 | 2065 | 427 | 43.25 | 32950 lbs. | 4.03 |

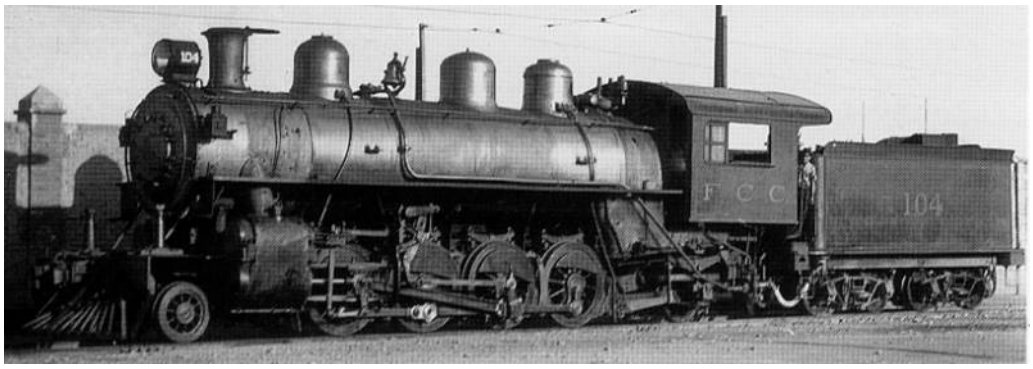
Tender, Type 8-Wheeled — Capacity, Water, 4000 Gals. — Fuel, 2000 Gals.

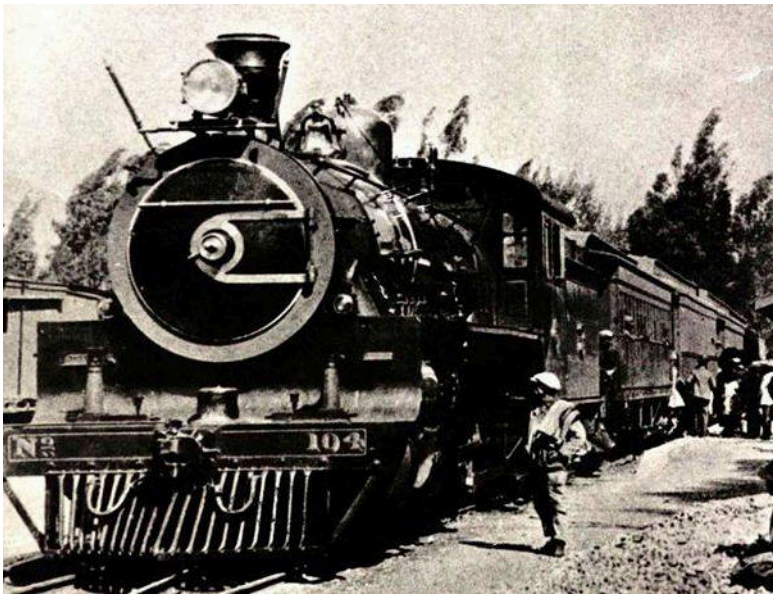
NEGATIVE No. J-111

FCC no. **100** ALCo publicity card details.







This loco numbered **104** would appear to be one of the ALCo 2-8-2s after undergoing the Anglicisation treatment seen earlier.

## A 1913 report

Source [21], the annual volumes of the *Sociedad de Ingenieros del Peru*, contains a report in volume 15 from 1913, which considers the management of the railway after a series of recent accidents. The section on their locomotives (pp277-281) is attached below as Appendix 4.

## The fleet in 1925 and 1927

Fifty nine standard gauge locomotives were recorded on the *FC Central* on 30 June 1925 [2]:

| No. in class | Wheels | Builder | Cyls. | Total weight in kilos | Loco numbers |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1 | 0-4-0ST | Rogers | 10x18 | 19,920 | Either **22** or **23** |
| 1 | 0-4-0ST | Baldwin | 10x16 | 22,000 | **32** |
| 5 | 0-4-0WT | Beyer Peacock | 13x21 | 22,640 | **25, 26, 31-33** |
| 1 | 0-4-4T | Rogers | 8x14 | 22,723 | **24** |
| 1 | 0-4-4T | Rogers | 12x18 | 30,070 | Possibly **30** |
| 5 | 2-6-0 | Rogers | 18x24 | 89,294 | Unknown, but from locos numbered up to **42**. |
| 4 | 2-6-0 | Baldwin | 18x24 | 89,294 | **43-47** |
| 12 | 2-8-0 | Rogers | 20x28 | 104,620 | **50-59** plus two more? |
| 11 | 2-8-0 | NBL | 19.5x24 | 105,194 | From **60-73** batch |
| 3 | 2-8-0 | NBL | 19.5x24 | 110,794 | **74-76** |
| 3 | 4-6-0 | ALCo-Rogers | 19x26 | 63,635 | **90-92** |
| 6 | 2-6-2T | NBL | 18x24 | 64,000 | **80-85** |
| 6 | 2-8-2 | ALCo-Rogers | 20x28 | 122,640 | **100-105** |

Source [18] published in 1927, included the following table:

**Cuenta también con 56 locomotoras y 780 vehículos, distribuídos asi:**

| Locomotoras | | Coches | | Carros | |
|---|---|---|---|---|---|
| Para inspección | 1 | De servicio interno | 26 | Diversas formas. | 678 |
| „ maniobras | 5 | De pasajeros | 76 | | |
| „ pasajeros. | 15 | | | | |
| „ carga | 35 | | | | |
| Total | 56 | Total | 102 | Total | 678 |

### *0-6-2T d/w ?, cyls. ?, built by Kitson in 1925*

Ordered by the *FC Lima Callao y Chorillos*, and taken over on the absorption of that railway by the *FC Central* in 1934. This was one of the final two Kitson 0-6-2Ts purchased by the *FCLCyC* in 1925. They were Kitson 5393 and 5394, running numbers **7** and **8**, but it is not known which came to the *FC Central* and which went modified as a 2-6-2T to the *FC Paita á Piura*.

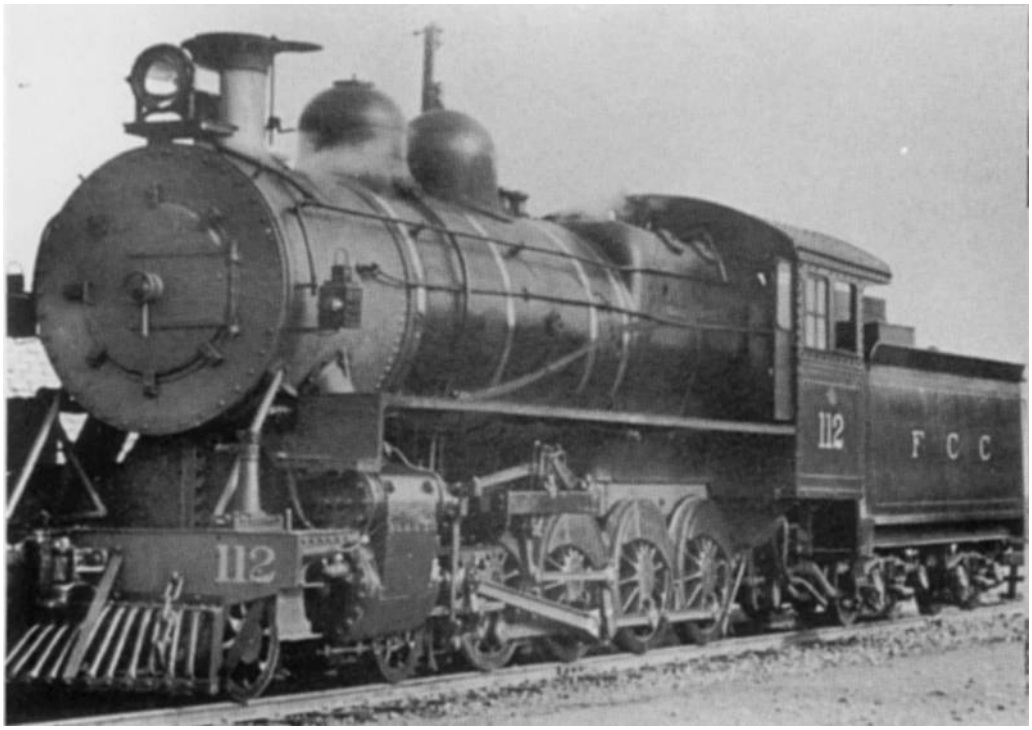
**72**[3] w/n 5393/5394 Renumbered **82**[2] by 1945.

### *4-8-2 d/w 52", cyls. 20x28", built by Yorkshire Engine in 1925*

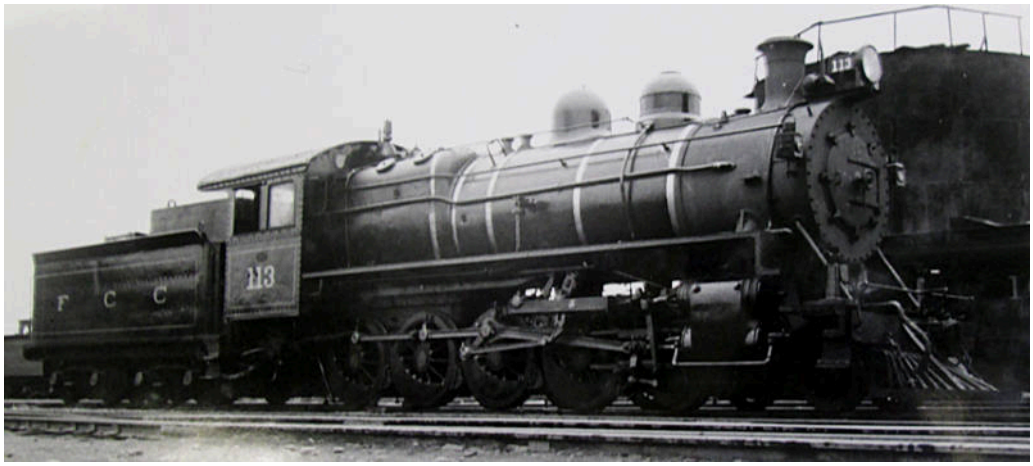
Ordered by Central Railway of Peru.

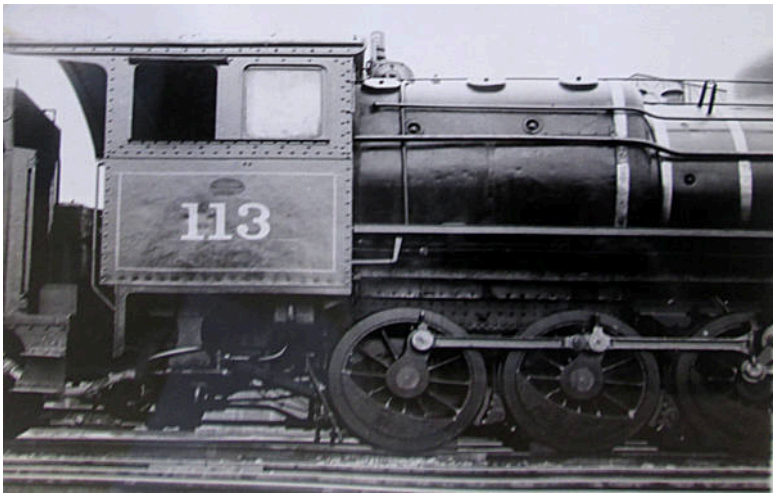
| | | |
|---|---|---|
| **110** | w/n 2038 | May have been shortened to become a 4-8-0, but Copeland says in service 1945 as a 4-8-2. |
| **111** | w/n 2039 | Shortened in 1939 to become a 4-8-0. |
| **112** | w/n 2040 | Shortened in 1939 to become a 4-8-0. |
| **113** | w/n 2041 | Shortened in 1939 to become a 4-8-0. |
| **114** | w/n 2042 | Shortened in 1939 to become a 4-8-0. |

A YECo builder's photo of no. **114**, the last of the batch.




A Brian Fawcett photo of no. **112** after it had been cut short to a 4-8-0 configuration to prevent weight transfer off the driving wheels when starting.

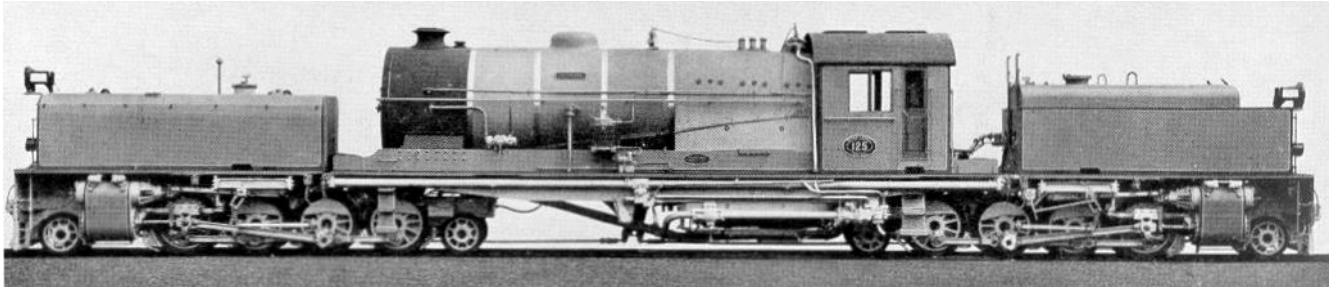


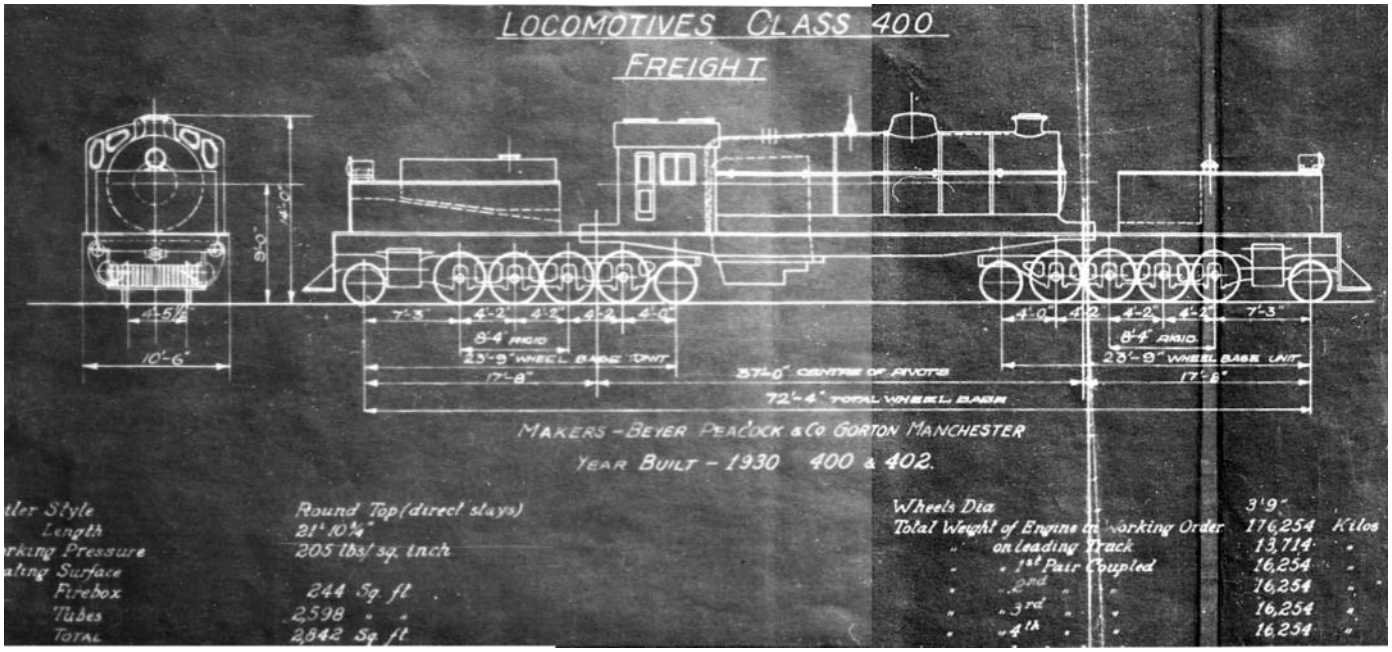

***2-8-2+2-8-2 Garratt d/w 45", cyls. 19½x24", built by Beyer Peacock in 1929, 1930 and 1931***

Ordered by Peruvian Corporation for the *FC Central*.

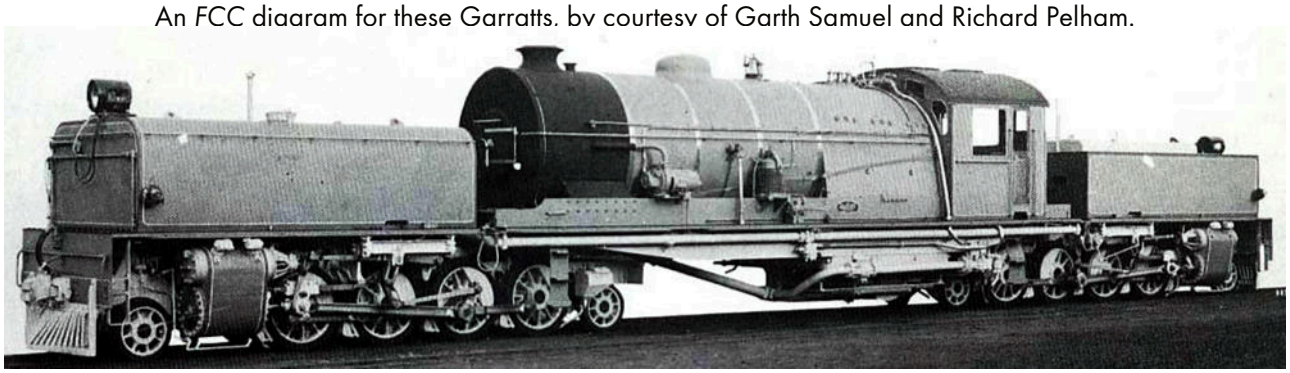
| | | |
|---|---|---|
| **122** | w/n 6626 | Renumbered as **400**. |
| **123** | w/n 6627 | Renumbered as **401**. Transferred to *FCS*. |
| **124** | w/n 6628 | Renumbered as **402**. |
| **125 'COCHRANE'** | w/n 6730 | Renumbered as **403**. Transferred to *FCS*. |



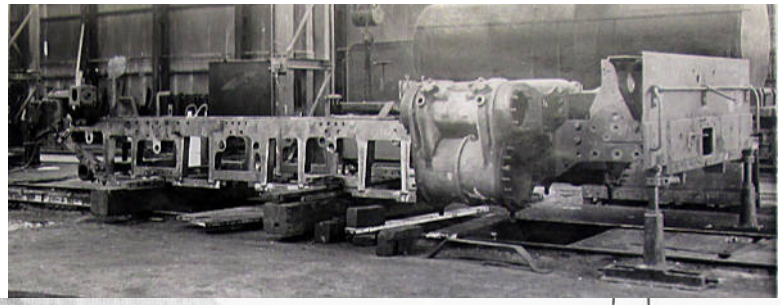
*FC Central* Garratt locomotive no. **125 'COCHRANE'**, as seen in a builder's photo.

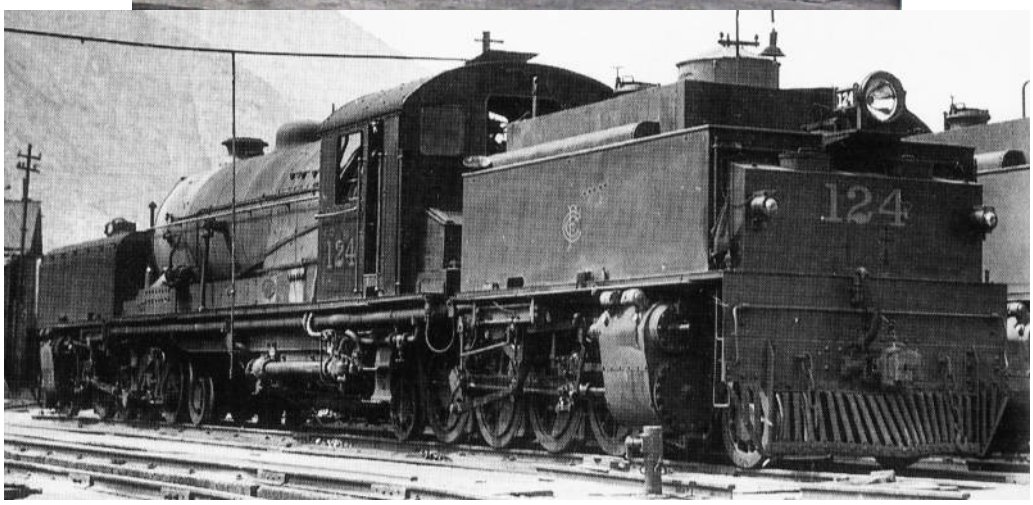



An FCC diagram for these Garratts, by courtesy of Garth Samuel and Richard Pelham.



Another BP builders photo, this one supposedly of no. **122**. It is noticeable that there are minor differences between this and the previous works picture, notably the design of the headlights.







FCC Garrats nos. **400** and **402** after their renumbering.

### *Bogie steam railcars d/w ?, cyls. ? , built by Sentinel in 1929, 1934 and 1936*

Ordered for ? Apparently most had a Doble-designed 2 cylinder double-acting compound engine, though the first was fitted with a six cylinder horizontal single-acting engine. The Doble engines might well have been difficult to get parts for during the Second World War, hence the rapid conversion of those machines to diesel power.

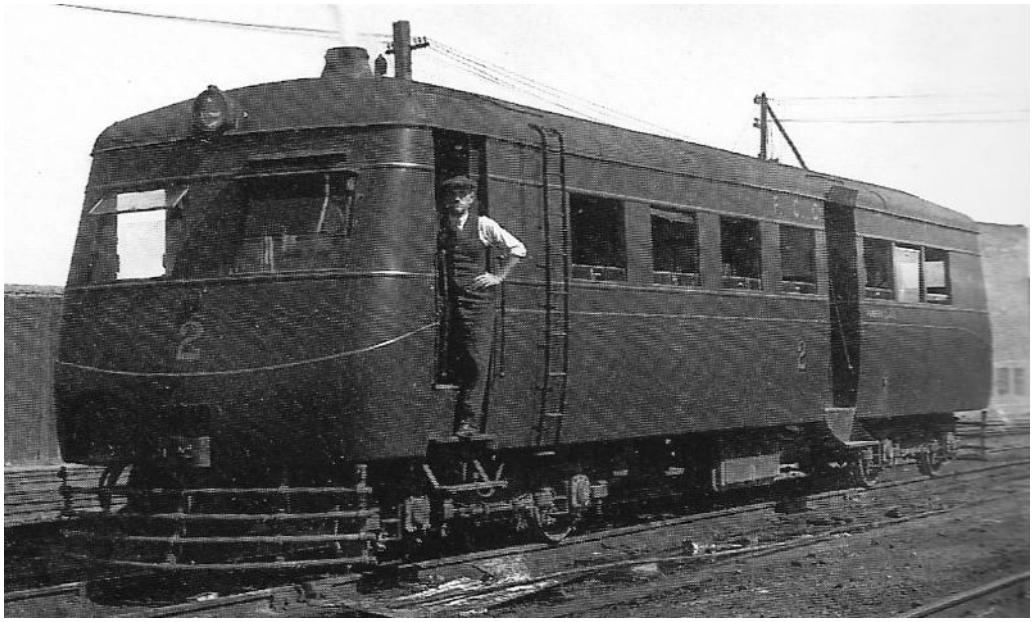
| | | |
|---|---|---|
| **1** | w/n 7779 | 100hp, or maybe 150hp. 2nd class 80 seats, or one source says 73 seats. Bodywork by Birmingham RCW. ITN suggests was still steam-powered in 1963. |
| **2** | w/n 8983 | 200hp. 1st class 51 seats. Converted to 200hp Saurer diesel engine. Later went to the *FC Tacna Arica* and became no. **0251**. |
| **3** | w/n 8984 | 200hp. 1st class 51 Converted to 200hp Saurer diesel engine. |
| **4** | w/n 8985 | 200hp. 1st class 51 Converted to 200hp Saurer diesel engine. Later went to the *FC Tacna Arica* and became no. **0252**. |
| **5** | w/n 8986 | 200hp. 1st class 51 Converted to 200hp Saurer diesel engine. Later went to the *FC Tacna Arica* and became no. **0260**. |
| **6** | w/n 9098 | 200hp. 2nd class 92 seats. Converted to 200hp Saurer diesel engine. Later |

went to the *FC Tacna Arica* and became no. **0257**.

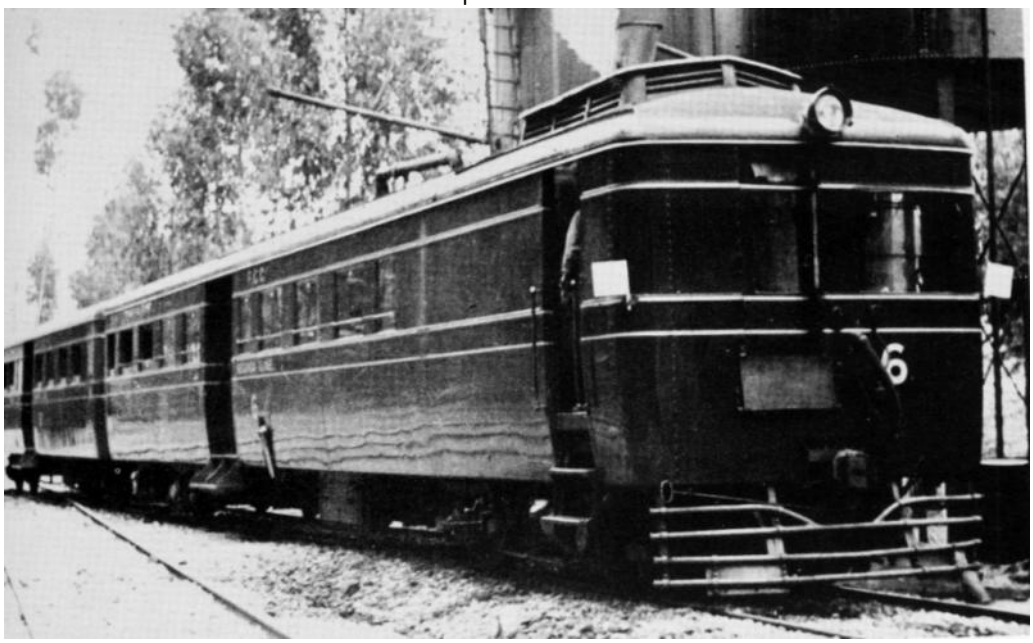
**7** w/n 9099 Freight railcar. Went to the *FC Tacna Arica* and became no. **0261**.

*FC Central* Sentinel railcar no. **1**.

Sentinel no. **1** in 1956, a D. Ibbotson photo from source [23].



Sentinel railcar no. **2**, from the second batch of four. A Brian Fawcett photo from 1934.




*FC Central* railcars nos. **6** and **7** were rather more modern looking in appearance, and were designed to pull a single trailer car.

Ex-FCC Sentinel freight railcar no. **7**, running on the FC Arica Tacna

as diesel car no. **0261** before its later rebuild. Note the small number of (barred) windows in comparison with the passenger cars.

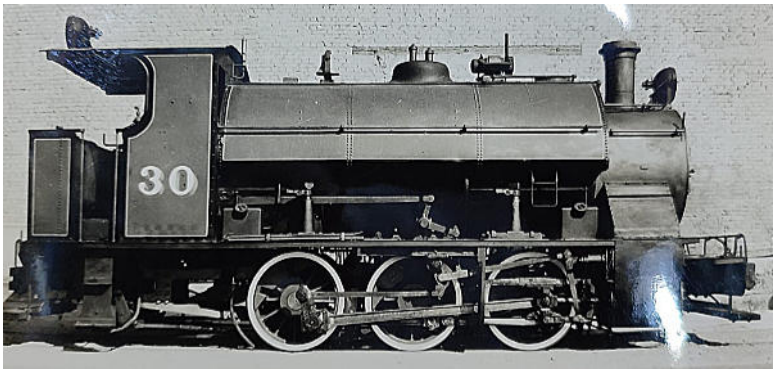
### *0-6-0ST d/w 48", cyls. 18½x24", built by Bagnall in 1930*

Ordered by ?

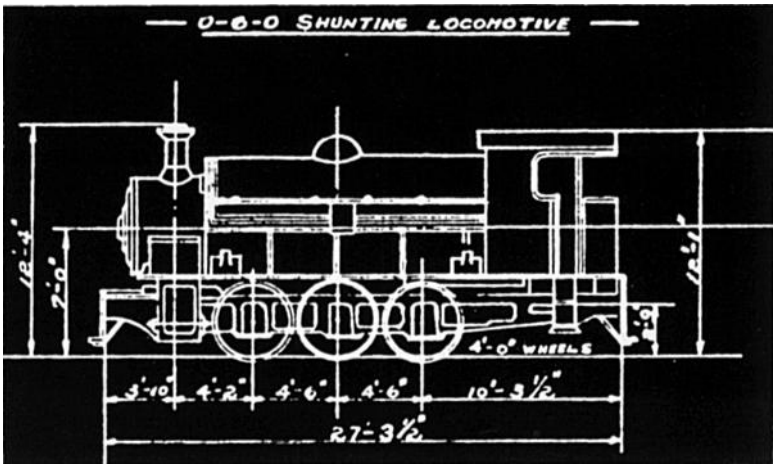
| | | |
|---|---|---|
| **32**[3] | w/n 2355 | Renumbered **30**[2]. *Listed in World of South American Steam* in 1974. |
| **33**[3] | w/n 2356 | Renumbered **31**[3]. |
| **34**[2] | w/n 2357 | Renumbered **32**[3]. |


Above: the first Bagnall 0-6-0ST as seen on a Bagnall publicity card, and numbered **32**. Below: the same loco later in its life after renumbering as **30**. Photos provided by courtesy of Richard Pelham.

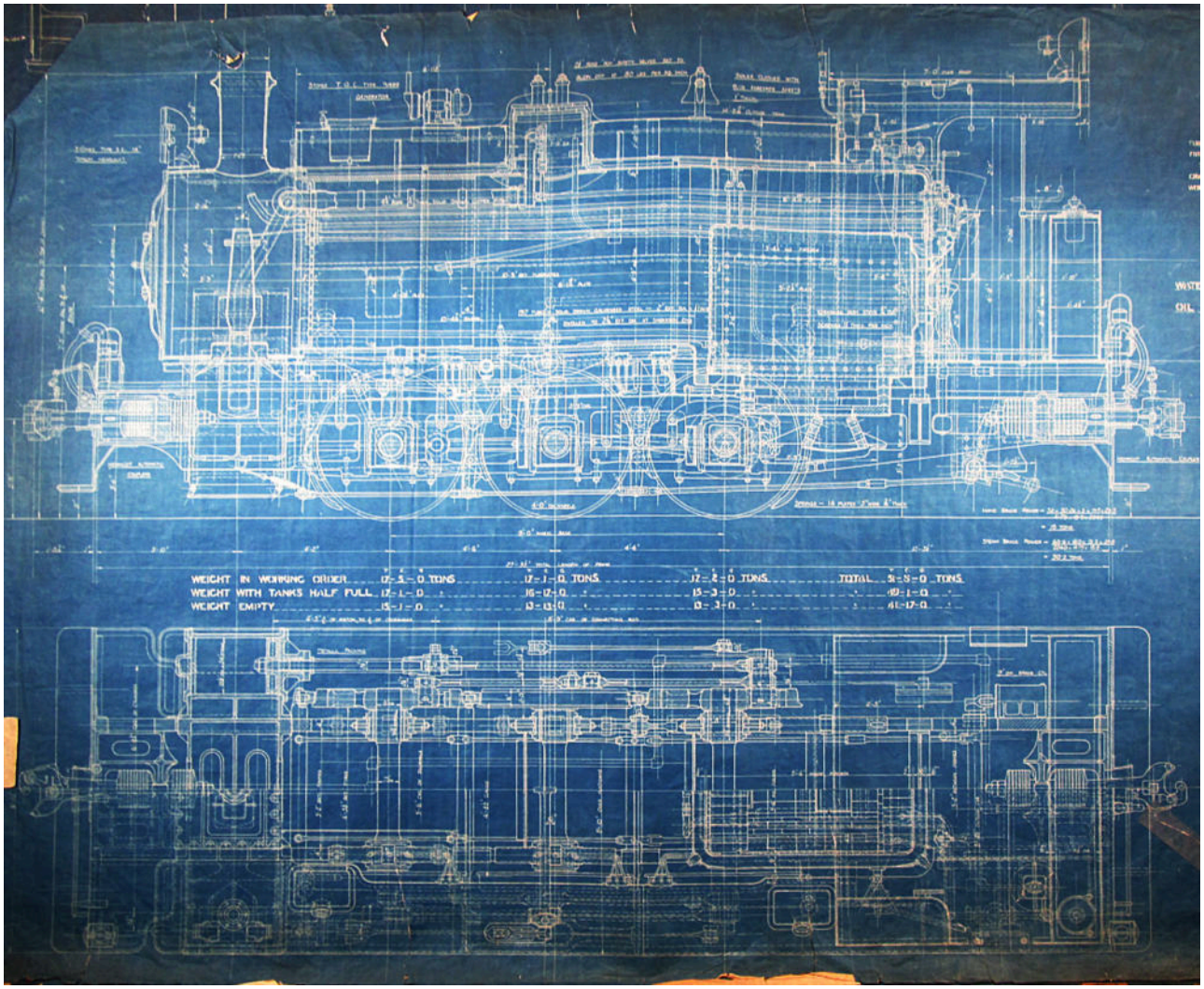

A Brian Fawcett photo of Bagnall 0-6-0ST no. **30**, by courtesy of Richard Pelham.



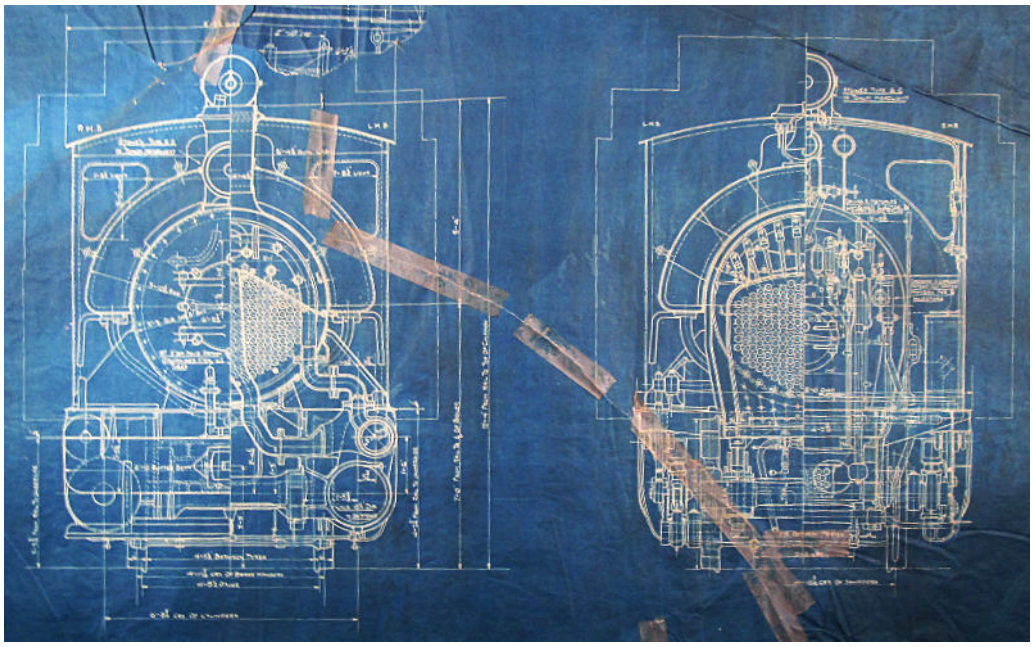

No. **30** again, an official FCC photo after repainting.




An FCC diagram of these Bagnall 0-6-0STs, dating from after they had been renumbered **30-32**. Source [23].




Drawings found in the Hunslet archive at Statfold Barn Farm in Staffordshire, UK. The Hunslet Engine Company took over the assets and goodwill of a number of defunct British loco builders over the decades.



### *2-8-0 d/w 52", cyls. 20x28", built by Beyer Peacock in 1934, 1935, 1937 and 1946*

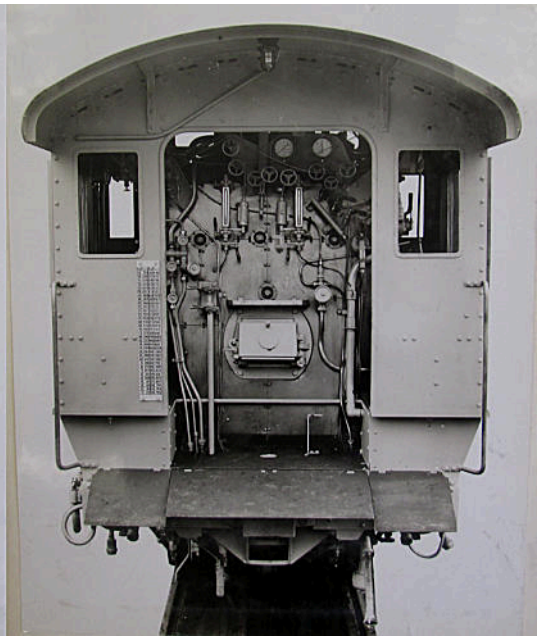
Ordered by ? Fawcett says combined dome and sandbox came in with the third batch, and from his initiative.

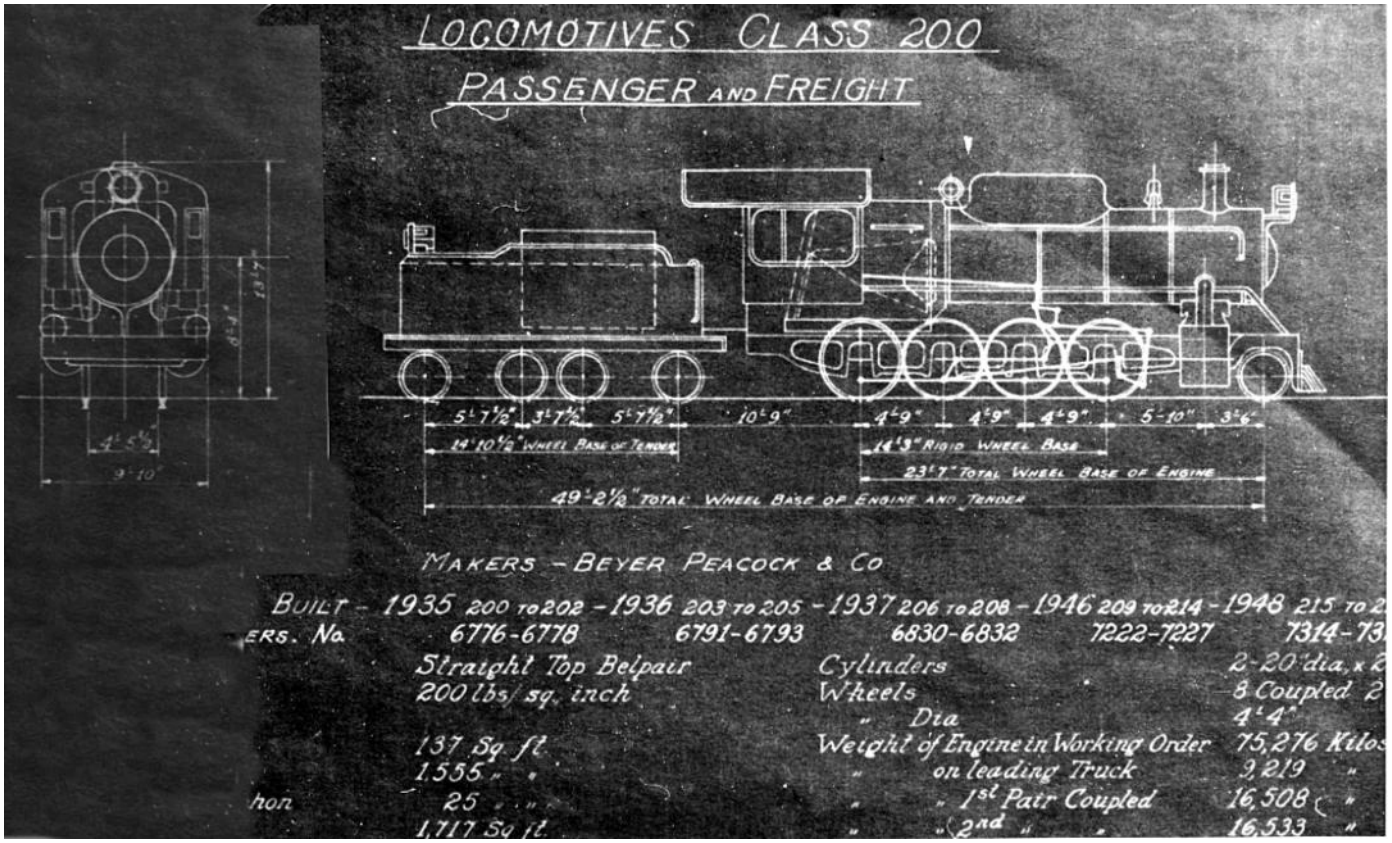
| | | |
|---|---|---|
| **40**[2] | w/n 6776 | Renumbered **200**. |
| **41**[2] | w/n 6777 | Renumbered **201**. |
| **42**[2] | w/n 6778 | Renumbered **202**. |
| **43**[2] | w/n 6791 | Renumbered **203**. |
| **44**[2] | w/n 6792 | Renumbered **204**. |
| **45**[2] | w/n 6793 | Renumbered **205**. |
| **46**[2] | w/n 6830 | Renumbered **206**. Still in service late 1980s. May actually be no. **203** in disguise [7]. |
| **47**[3] | w/n 6831 | Renumbered **207**. |
| **48**[2] | w/n 6832 | Renumbered **208**. |
| **49**[2] | w/n 7212 | Renumbered **209**. |
| **50**[3] | w/n 7213 | Renumbered **210**. |
| **51**[3] | w/n 7214 | Renumbered **211**. |
| **52**[3] | w/n 7215 | Renumbered **212**. |
| **53**[3] | w/n 7216 | Renumbered **213**. |
| **54**[3] | w/n 7217 | Renumbered **214**. |

Query over works numbers and running numbers here. BP 7218-23, and maybe 7222-7, but others also went to *FC del Sud*.

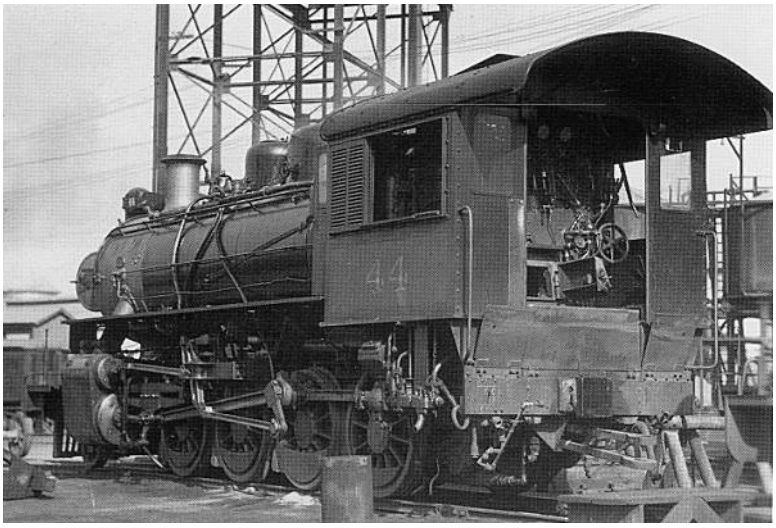

Beyer Peacock builders' photos of the earlier and later type locos.



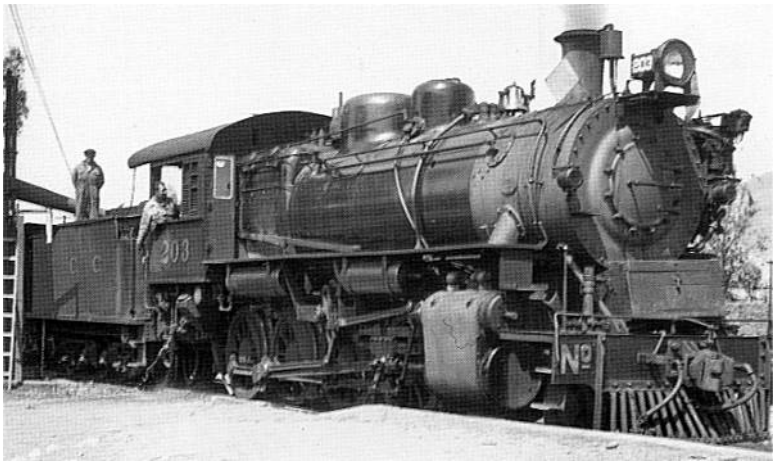





An FCC diagram for the pre-1950 Andes class locos, though showing the later pattern combined dome and sand-dome, by courtesy of Garth Samuel and Richard Pelham.




Views of 1935-built Andes locos from opposite directions,
and before and after their renumbering.



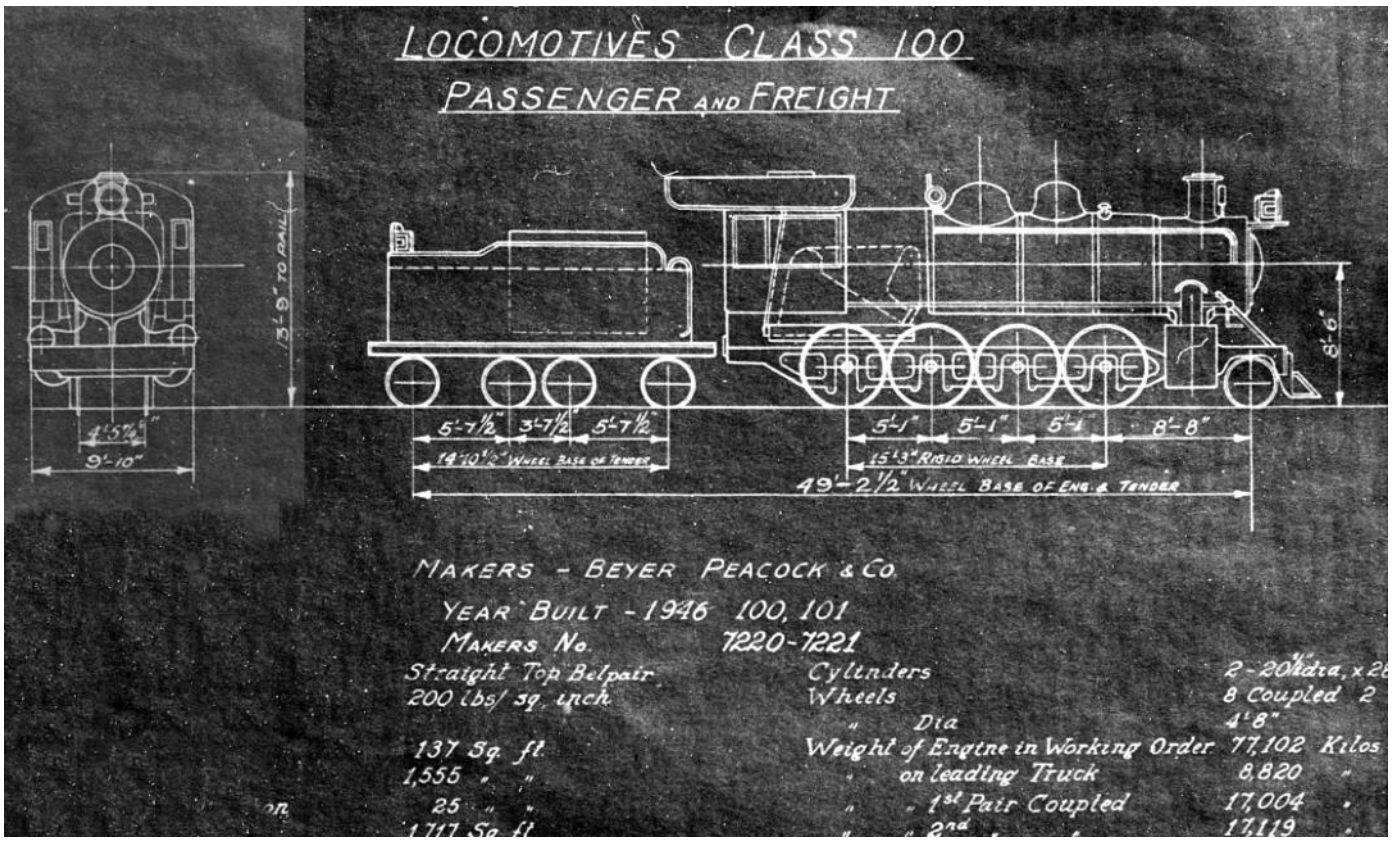


### *2-8-0 d/w 56", cyls. 20½x28", built by Beyer Peacock in 1937*

These had been *FC del Sud* locos nos. **80** and **81**, later **105** and **106**, before transfer to the *FCC*. Note the larger driving wheels than normally fitted to Andes locos on the Central.

**100**[2] w/n 6833

**101**[2] w/n 6876




An FCC diagram for the two Andes engines that came from the *FC del Sud*, by courtesy of Garth Samuel and Richard Pelham.

### *0-6-0ST d/w 45", cyls. 16x22"IC, built by Hunslet in 1938 and 1937*

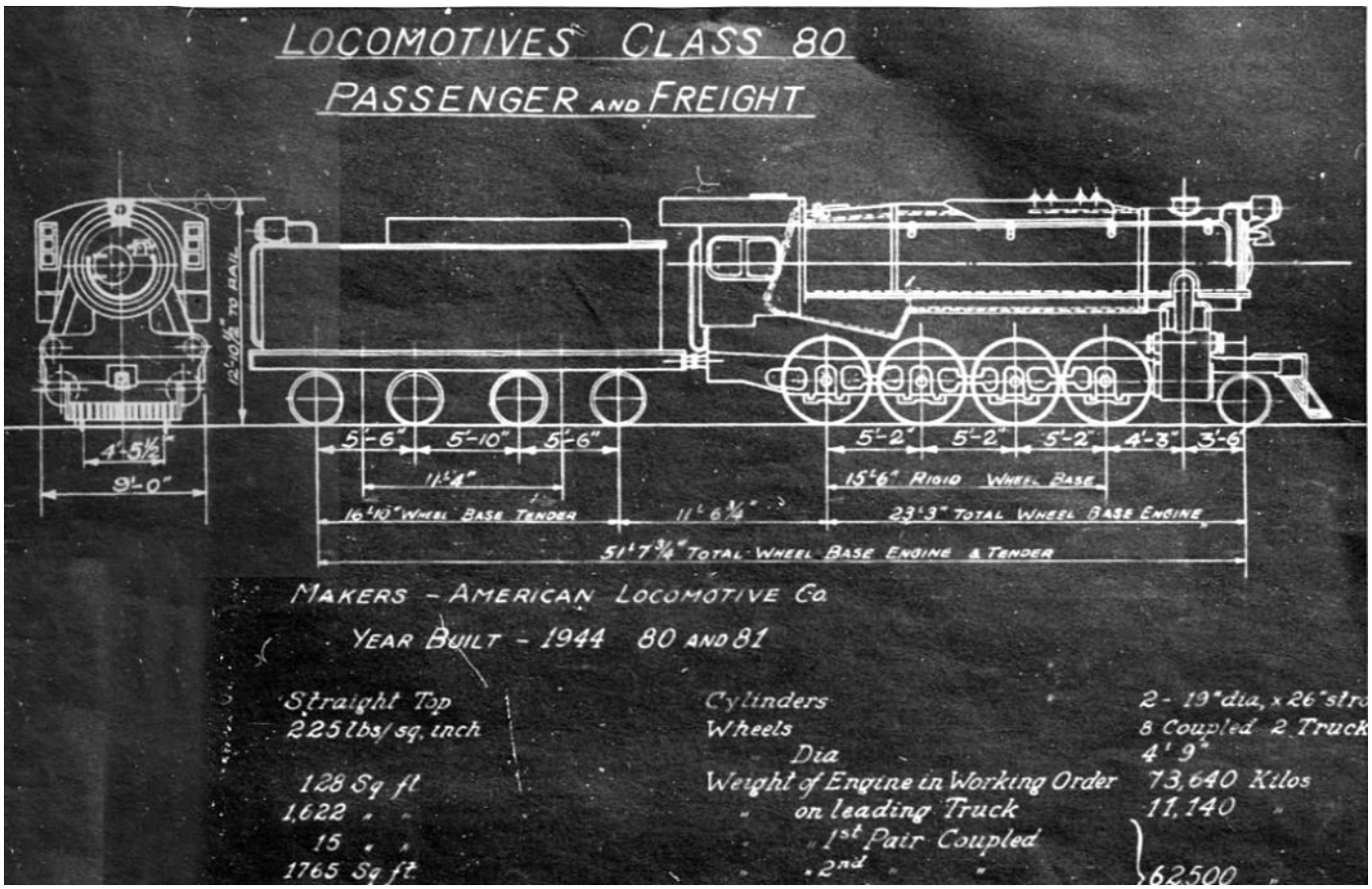
Ordered by Peruvian Corporation for Southern Railway. Works number order not confirmed.

| | | |
|---|---|---|
| **44**[2] | w/n 1651 | ) One of these was listed as no. **35**, |
| **45**[2] | w/n 1652 | ) ex *FC del Sur* no. **23** in *World* |
| **46**[2] | w/n 1495 | ) *of South American Steam* in 1974. |

### *2-8-0 d/w 57", cyls. 19x26", built by ALCo in 1944*

Ordered by Peruvian Corporation. These were wartime USATC S160 locos, known in the UK as USA 2-8-0s, and according to Fawcett as 'Gypy Rose Lees' out on the Central. Much information about these widely-used machines is available, not least because examples are still in heritage operation in a number of countries. See, for example, the Facebook pages of 'USATC S160 fans' and '557 Restoration Company'.

| | | |
|---|---|---|
| **55**[3] | w/n 71331 | Renumbered **80**[2]. |
| **56**[3] | w/n 71332 | Renumbered **81**[2]. |




An FCC diagram for this pair of engines, by courtesy of Garth Samuel and Richard Pelham.


An ALCo builder's photo of no. **55**.

JW 2274

**AMERICAN LOCOMOTIVE COMPANY**
NEW YORK

Class, 280 S 161 — Road Number, 55

BUILT FOR THE CENTRAL RAILWAY OF PERU.

| GAUGE OF TRACK | CYLINDERS | | DRIVING WHEEL DIAMETER | BOILER | | FIRE BOX | | TUBES | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Diam. | Stroke | | Inside Dia. | Pressure | Length | Width | Number | Diameter | Length |
| 4′-8½″ | 19″ | 26″ | 57″ | 70″ | 225 lbs. | 84⅛″ | 70¼″ | 150<br>30 | 2″<br>5⅝″ | 13′-6″ |

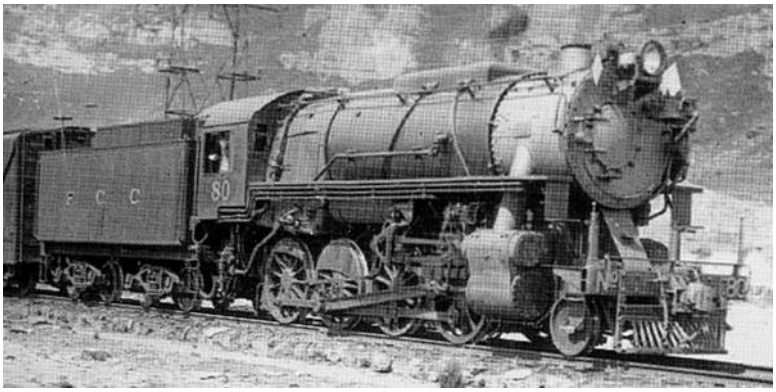
| WHEEL BASE | | | WEIGHT IN WORKING ORDER—POUNDS | | | |
|---|---|---|---|---|---|---|
| Driving | Engine | Engine & Tender | Leading | Driving | Engine | Tender |
| 15′-6″ | 23′-3″ | 51′-7¾″ | 24500 | 137500 | 162000 | 110900 |

| FUEL | EVAPORATING SURFACES. SQUARE FT. | | | | | SUPERHEATING SURFACE SQUARE FT. | GRATE AREA SQ. FT. | MAXIMUM TRACTIVE POWER | FACTOR OF ADHESION |
|---|---|---|---|---|---|---|---|---|---|
| Kind | Tubes | Flues | Fire Box | Arch Tubes | Total | | | | |
| Oil | 1055 | 567 | 128 | 15 | 1765 | 471 | 41 | 31500 lbs. | 4.36 |

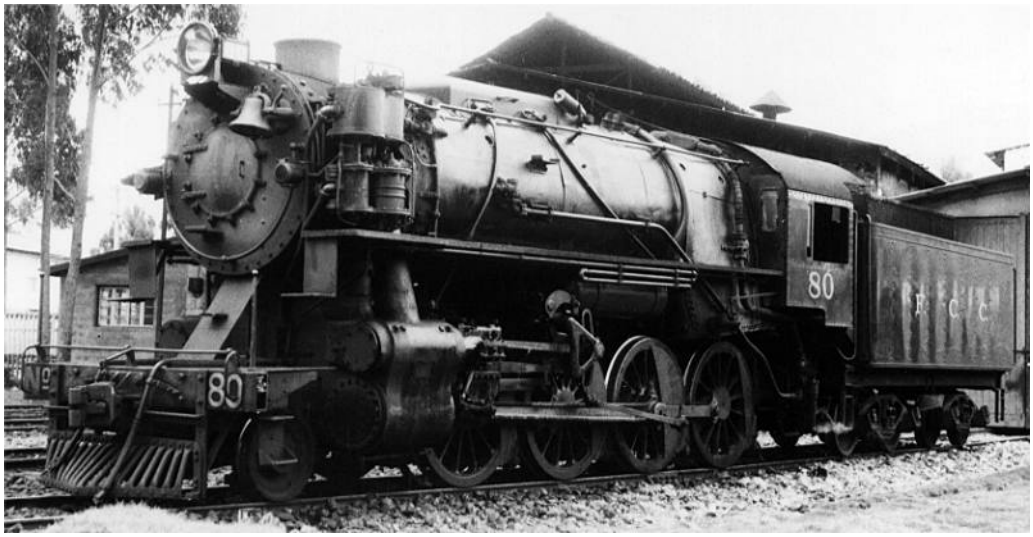
Tender Type 8-Wheeled — Capacity, Water, 6500 Gals. — Fuel, 1800 U. S. Gals

ORDER No. S-1925
October 1943

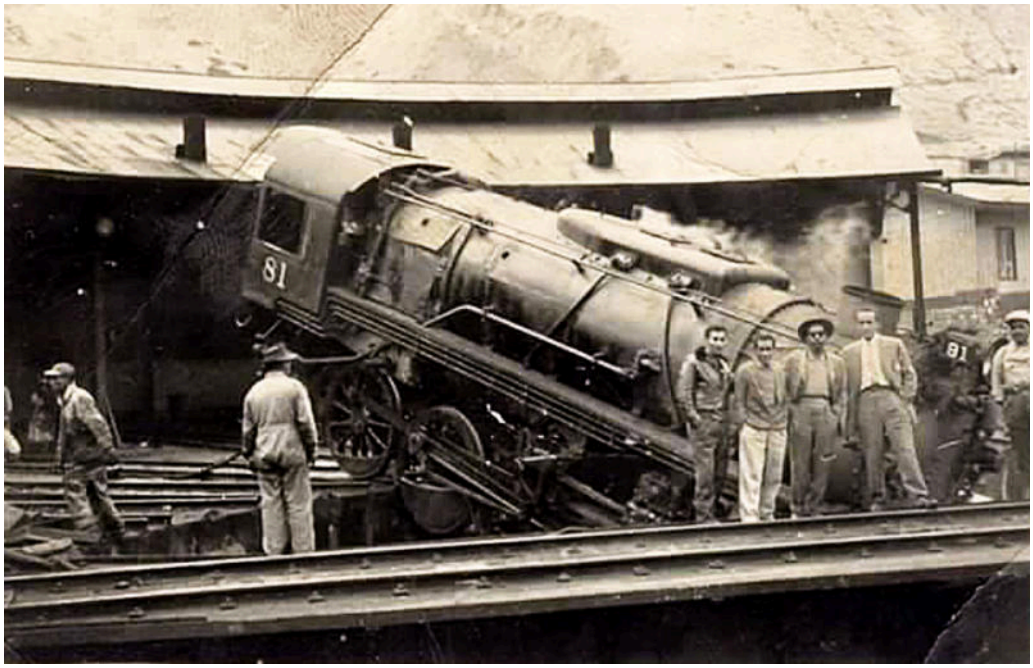
FCC S160 no **55** ALCo publicity card details.




Comparing the photos above and below with the builder's image that is displayed first, the viewer can see that a sloping box has been added beneath the smokebox, certainly facilitating access to the smokebox and maybe for other reasons too.




A photo from Garth Samuel 's collection, by courtesy of Richard Pelham. The photo was labelled as having been taken at Huancayo. Whilst the loco might well have worked in the high Andes, one cannot easily imagine that it was ever in revenue-earning service between there and Chosica owing to its large driving wheels.




No. **81** takes a dive into the turntable pit at La Oroya in 1958.

## The fleet in 1949

The Peruvian Corporation archive held by University College, London, and housed at The National Archives in Kew, contains the following fleet list dated 1949. Note that this has been cropped from larger pages, but that no important information has been lost.

FERROCARRIL CENTRAL DEL PERU

**DEPARTAMENTO** DE LOCOMOTORAS.

**INVENTARIO**

**SECCION** FACTORIA DE GUADALUPE

DESCRIPCION

LOCOMOTORAS A VAPOR - COMBUSTIBLE: PETROLEO

Steam Locomotives

| No. | FABRICANTES Maker | Fecha de Construccion Date of Construction | Servicio Service | TIPO Type | Traccion en lbs. al 75% P. del C. |
|---|---|---|---|---|---|
| 25 | Beyer & Peacock | 1913 | Maniobras | 0-4-0 Saturado | 10781 |
| 26 | " " " | 1913 | " | 0-4-0 " | 10781 |
| 29 | " " " | 1909 | " | 0-4-0 " | 10781 |
| 32 | W. G. Bagnall Ltd. | 1929 | " | 0-6-0 " | 23102 |
| 33 | " " " " | 1929 | " | 0-6-0 " | 23102 |
| 34 | " " " " | 1929 | " | 0-6-0 " | 23102 |
| 40 | Beyer & Peacock | 1935 | Pasajeros y carga | 2-8-0 Sobrecalentado | 32308 |
| 41 | " " " | 1935 | " | 2-8-0 " | 32308 |
| 42 | " " " | 1935 | " | 2-8-0 " | 32308 |
| 43 | " " " | 1936 | " | 2-8-0 " | 32308 |
| 44 | " " " | 1936 | " | 2-8-0 " | 32308 |
| 45 | " " " | 1936 | " | 2-8-0 " | 32308 |
| 46 | " " " | 1937 | " | 2-8-0 " | 32308 |
| 47 | " " " | 1937 | " | 2-8-0 " | 32308 |
| 48 | " " " | 1937 | " | 2-8-0 " | 32308 |
| 49 | " " " | 1947 | " | 2-8-0 " | 32308 |
| 50 | " " " | 1947 | " | 2-8-0 " | 32308 |
| 51 | " " " | 1947 | " | 2-8-0 " | 32308 |
| 52 | " " " | 1947 | " | 2-8-0 " | 32308 |
| 53 | " " " | 1947 | " | 2-8-0 " | 32308 |
| 54 | " " " | 1947 | " | 2-8-0 " | 32308 |
| 68 | North British | 1908 | Maniobras | 2-8-0 Saturado | 26329 |
| 69 | " " | 1908 | " | 2-8-0 " | 26329 |
| 70 | Rogers Loco. Works | 1907 | Pasajeros y carga | 2-8-0 Sobrcalentado | 29076 |
| 71 | " " " | 1907 | " | 2-8-0 " | 29076 |
| 72 | " " " | 1907 | " | 2-8-0 " | 29076 |
| 73 | " " " | 1906 | " | 2-8-0 " | 29076 |
| 74 | " " " | 1907 | " | 2-8-0 " | 29076 |

FERROCARRIL CENTRAL DEL PERU

**DEPARTAMENTO** DE LOCOMOTORAS

**INVENTARIO**

**SECCION** FACTORIA DE GUADALUPE

DESCRIPCION

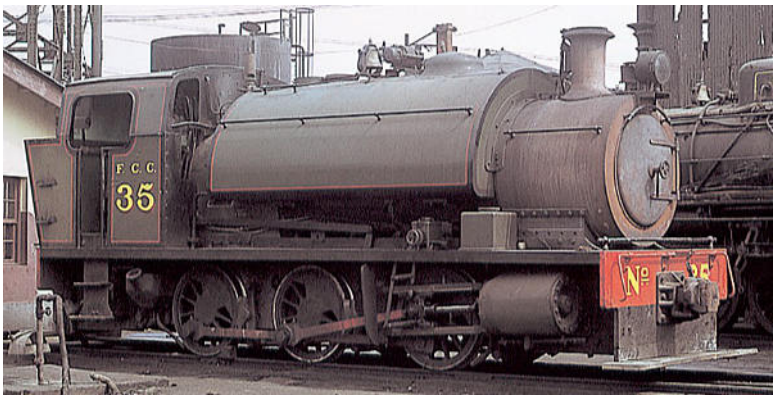
LOCOMOTORAS A VAPOR - COMBUSTIBLE: PETROLEO (Contin.)

| No. | FABRICANTES | Fecha de Construccion | Servicio | TIPO | Traccion en lbs. al 75% P. del C. |
|---|---|---|---|---|---|
| 75 | Rogers Loco. Works | 1907 | Pasajeros y carga | 2-8-0 Sobrecalentado | 29076 |
| 80 | American Loco. | 1944 | " | 2-8-0 " | 27787 |
| 81 | " " | 1944 | " | 2-8-0 " | 27787 |
| 90 | Rogers Loco. | 1907 | " | 4-6-0 Saturado | 29076 |
| 101 | American Loco. | 1913 | " | 2-8-2 Sobrecalentado | 29076 |
| 102 | " " | 1913 | " | 2-8-2 " | 29076 |
| 103 | " " | 1913 | " | 2-8-2 " | 29076 |
| 104 | " " | 1913 | " | 2-8-2 " | 29076 |
| 105 | Beyer & Peacock | 1936 | " | 2-8-0 " | 31518 |
| 106 | " " | 1936 | " | 2-8-0 " | 31518 |
| 110 | Yorkshire Engine Co. | 1924 | " | 4-8-0 " | 29884 |
| 111 | " " " | 1924 | " | 4-8-0 " | 29884 |
| 112 | " " " | 1924 | " | 4-8-0 " | 29884 |
| 113 | " " " | 1924 | " | 4-8-0 " | 29884 |
| 122 | Beyer & Peacock | 1930 | Carga | & 2-8-2 Articulada 2-8-2 Sobrecalentado | 57160 |
| 123 | " " " | 1930 | " | & 2-8-2 2-8-2 " | 57160 |
| 124 | " " " | 1930 | " | & 2-8-2 2-8-2 " | 57160 |
| 125 | " " " | 1933 | " | & 2-8-2 2-8-2 " | 57160 |

### *0-6-0T d/w ?, cyls. ?, built by Yorkshire Engine in 1949*

Ordered by ? So far this loco has not been found in the YECo list.

**35**[3] w/n ?

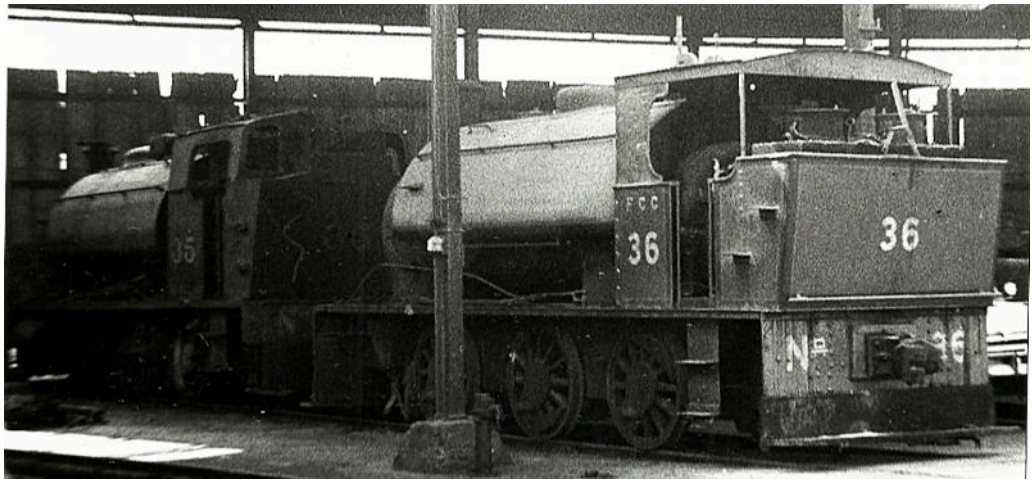



### *0-6-0T d/w 45"?, cyls. 16x22"?, built by Hunslet in 1950*

Ordered by Peruvian Corporation.

**40**[2] w/n 3690? Renumbered **36**[2]. However, listed as no. **40** in *World of South American Steam* in 1974.


No. **36** ex no. **40**, seen at Guadalupe in 1976. Photo by C. P. Ludena found on the internet.

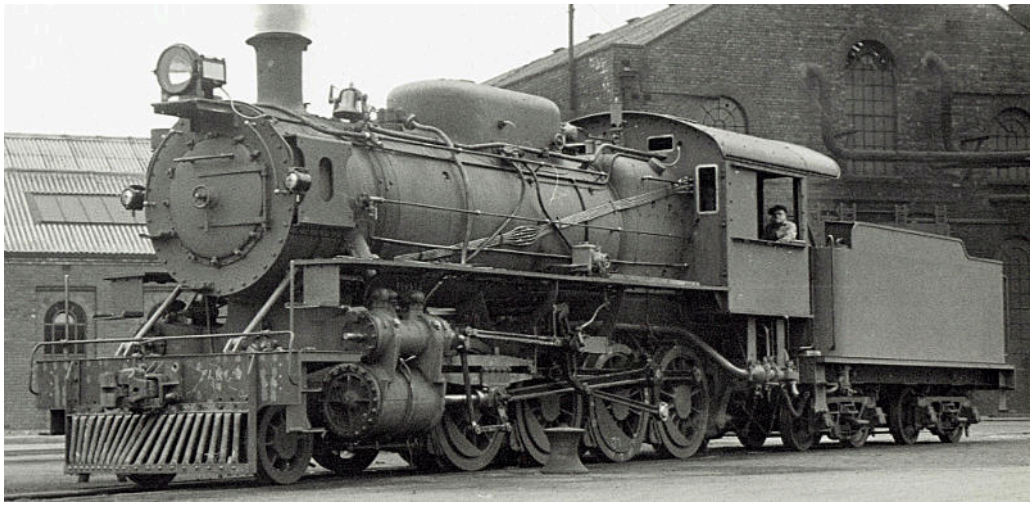



FCC shunters **35** and **36** on shed at Lima in 1975. Photo by H. Komtheuer.

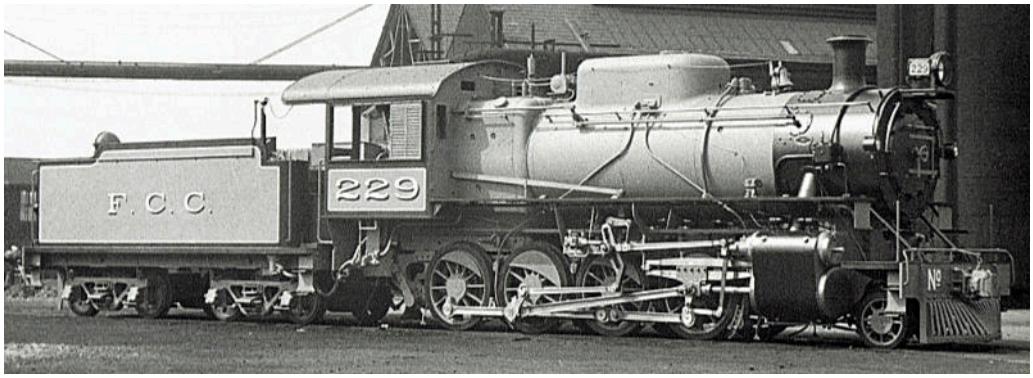
### *2-8-0 d/w 52", cyls. 20x28", built by Beyer Peacock in 1950 and 1953*

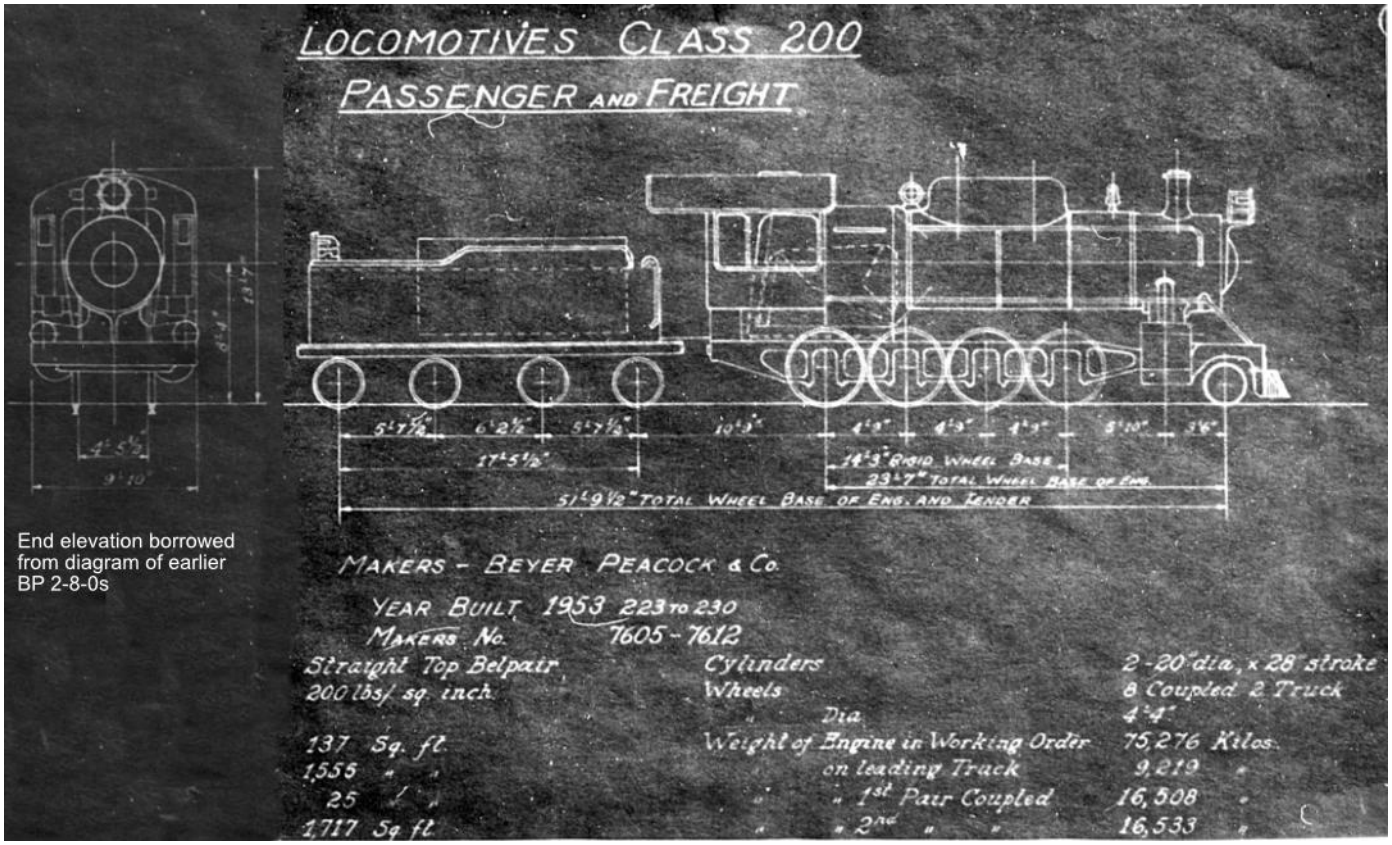
Ordered by ?

| | | |
|---|---|---|
| **215** | w/n 7314 | |
| **216** | w/n 7315 | |
| **217** | w/n 7316 | |
| **218** | w/n 7317 | |
| **219** | w/n 7318 | |
| **220** | w/n 7319 | |
| **221** | w/n 7320 | Withdrawn 1950. |
| **222** | w/n 7321 | |
| **223** | w/n 7605 | |
| **224** | w/n 7606 | |
| **225** | w/n 7607 | |
| **226** | w/n 7608 | |
| **227** | w/n 7609 | |
| **228** | w/n 7610 | |
| **229** | w/n 7611 | |



A newly-completed Andes at Gorton before dispatch, and still requiring its air pump and cylinder lagging to be added.




An FCC diagram for the later pattern Andes class locos, by courtesy of Garth Samuel and Richard Pelham.

## 1951 reports, making recommendations about the Garratts

It is clear that there was debate about the future of the Garratts, which were not well-suited to the *FC Central*, for a variety of reasons not all of which were to do with the locos themselves. A 1951 report on this topic is reproduced in full as an appendix to this list. Other loco-related comments from this group of Peruvian Corporation reports included the following:

3. Locomotive Dept. (a) The Mountain Section is operated almost entirely with the 200-class locomotives (and the two 100-class for the passenger trains) and these do a magnificent job. We undoubtedly have got a first class locomotive and the only minor items needing improvement are pony truck springs, cylinder bolts and lubrication of the main piston rod glands. I will try to discuss these details with Messrs. Beyer Peacock & Co. These locomotives are in good shape and are well maintained, and it is amazing how well they stand up to the hammering they get. (Please see my special report on trial of a 200-class locomotive on the Southern). The drivers as a whole are excellent.

(b) It is evident that water softening on the Central has paid a most handsome dividend and the conditions of the boilers are now excellent.

(f) I was disappointed to find that the two American "Austerity" engines were out of service as I had had good service from these engines during the war and they should be quite suitable for the Callao-Chosica run. The trouble however seems to be that the fireboxes do not stand up to oil firing and continually break their stays. I suggest consideration be given to fitting flexible stays in the breaking zones.

5. Some notes re 200 Class Locomotives.

(a) There is something not quite right with the springing of the pony trucks as I have seen new coil springs and new plate springs from U.K. which have broken in service. Engine No.200 was sometime ago fitted with an American pony truck with helical springs only and plain bearings and has been most satisfactory. I have the drawings of this and will discuss it with Messrs. Beyer Peacock. Also the original type of cam action centering as supplied with the very first batch of these engines is too stiff and causes

3.

derailment in yards. These should all be gradually changed to the latest type of swing link extension.

(b) The main piston rod gland requires forced lubrication. At present it tends to get dry and for the rods to run hot.

(c) Cylinder bolts tend to get loose and seem to be insufficient in number (or size?) to take the continued strain of full power operation up the mountain.

(d) There have been some unexplained failures of the roller bearings on the pony truck axle which have come in for repairs with races badly scored.

(e) I believe an automatic drifting valve (like the Stones originally fitted to the Southern Railway loco) would help with cylinder lubrication on the long down grades.

## Engines added to the fleet from Callao port

Of the locomotives listed below as belonging to Callao port, those numbered **2** up to **14** certainly survived long

enough for their ownership to be handed on to the *Agencia Portuario de Callao* in the 1950s. Nos. **11-14**, ie the ex-Frederick Snare Corp. VIW 0-6-0STs and the 1896 Baldwin, then were handed over to the *FCC* at some later point, retaining their running numbers as previously. Whether any of the Thomas Green engines were transferred seems doubtful.

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These three carriage-side badges of the FC Central are from example transfers in the collection of Gerald Hartley. At present I have no idea of the time periods during which each one was used.

## 13.2.5 *La Agencia Portuario de Callao*

***Región de Lima***

**18??-1969**

### Background

Standard gauge. Work began on the new port of Callao in 1865, for the government of Peru. Contractors included Templeman, Bergman & Co. and Thomas Brassey & Co. at various stages. Contracts to operate the port generally went to French companies, such as *Dreyfus Freres et Cie*., who were later succeeded by the *Societe General de Paris*. Much later the American company the Frederick Snare Corporation undertook further expansion works in the late 1920s.

The port was notable for being a major operator of locos built by Thomas Green & Son of Leeds.

By the 1950s the port operator was known as the *Agencia Portuario de Callao*, but in 1969 all Peruvian ports were nationalised as the *Empresa Nacional de Puertos* or *ENaPu*.

### *0-4-0ST d/w 30", cyls. 6x12", built by Manning Wardle in 1865 and 1871*

First ordered by Peruvian government for Callao harbour, second via *Dreyfus Freres et Cie* for Callao harbour. MW class B locos.

| | | |
|---|---|---|
| **'HERMANA'** | w/n 114 | |
| **'CHUCUITO'** | w/n 349 | With very large tank, canopy, steam pump and different buffer beams with low level side buffers. |

### *0-4-0ST d/w 33", cyls. 9x14", built by Manning Wardle in 1871*

Ordered by Thomas Brassey & Co. for Callao harbour. MW class E loco.

| | |
|---|---|
| **'BRASSEY'** | w/n 348 |

### *0-6-0ST d/w 37½", cyls. 12x17", built by Manning Wardle in 1872*

Ordered by Thomas Brassey & Co. for Callao harbour. MW class K loco.

| | |
|---|---|
| **?** | w/n 393 |

### *0-6-0ST d/w 36", cyls. 13x18", built by Manning Wardle in 1872*

Ordered by Thomas Brassey & Co. for Callao harbour. MW class M loco.

| | |
|---|---|
| **?** | w/n 402 |

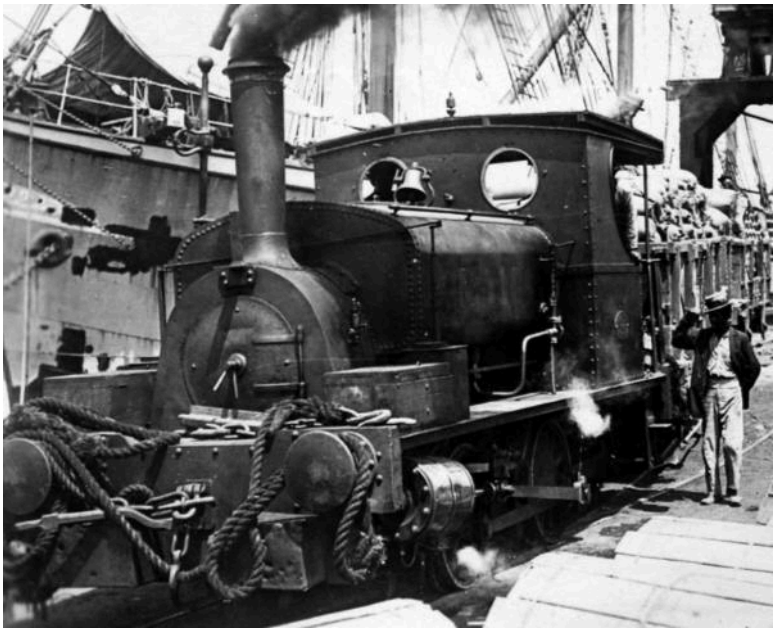
### *0-4-0ST d/w and cyls. see below, built by Thomas Green in various years*

Ordered as below. The dates of building and the running numbers do not match up, so maybe the numbers were allocated later, though Copeland implies not for those ordered via the *Societe General de Paris*.

| | | | | | |
|---|---|---|---|---|---|
| **1** | w/n 192? | d/w ? | cyls. ? | built in 1892? | Ordered via *Soc. Gen. de Paris* for Callao harbour board. |
| **2** | w/n 300 | d/w ? | cyls. 10x18" | built in 1902 | Ordered for Lima Rly. |
| **3** | w/n 483 | d/w ? | cyls. 12x18" | built in 1908 | Ordered via *Soc. Gen. de Paris* for Callao harbour board. |
| **4** | w/n ? | d/w ? | cyls. ? | built in ? | Ordered via *Soc. Gen. de Paris* for Callao harbour board. |
| **5** | w/n 277 | d/w ? | cyls. 10x18" | built in 1901 | Ordered for Lima & Callao Rly as no. **27**, though RW states that it had been Lima railway no. 7. |
| **6** | w/n 625 | d/w ? | cyls. 10x18" | built in 1921 | Ordered via *Soc. Gen. de Paris* for Callao harbour board. |
| **7** | w/n ? | d/w ? | cyls. ? | built in ? | Ordered via *Soc. Gen. de Paris* for Callao harbour board. |
| **8** | w/n 439 | d/w ? | cyls. 12x18" | built in 1906 | Ordered via *Soc. Gen. de Paris* for Callao harbour board. |
| **9** | w/n 365 | d/w ? | cyls. 12x18" | built in 1904 | Ordered via *Soc. Gen. de Paris* for Callao harbour board. |
| **10** | w/n 358 | d/w ? | cyls. 12x18" | built in 1903 | Ordered via *Soc. Gen. de Paris* for Callao harbour board. |

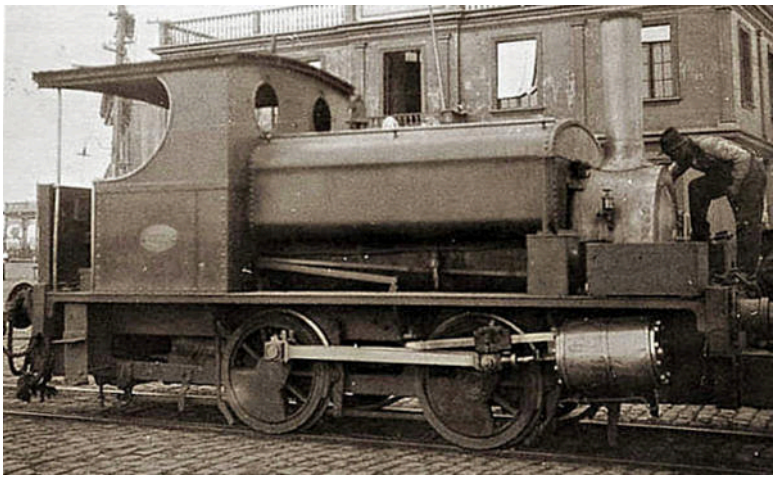
Plinthed at the *Terminal Maritimo del Callao*.

Thomas Green nos. 192, 228, and 482, were also ordered via the *Soc. Gen. de Paris* probably for Peru, and possibly 625. Nos. 223 and 224 were also ordered for the Lima Railways Co.

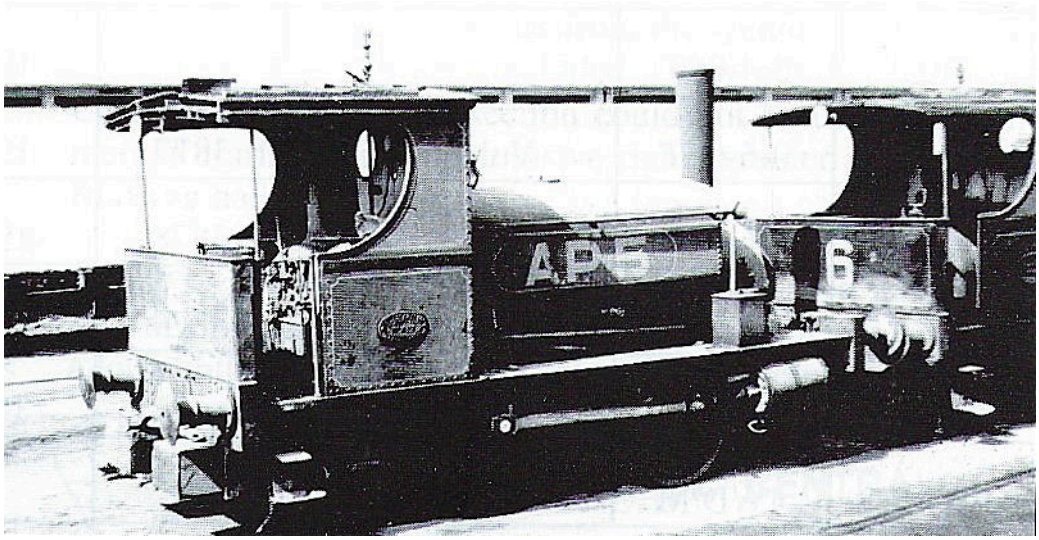


An unidentified Thomas Green 0-4-0ST on a wharf alongside a steamer.

Two 0-4-0STs at the entrance to Callao port. The nearer one has a saddle tank commencing behind the chimney, and the cab spectacle plate does not extend to the sides of the cab.



A Thomas Green 0-4-0ST at Callao in 1927. Found on the Flickr pages of Carlos Andrés Gamero Esparza.

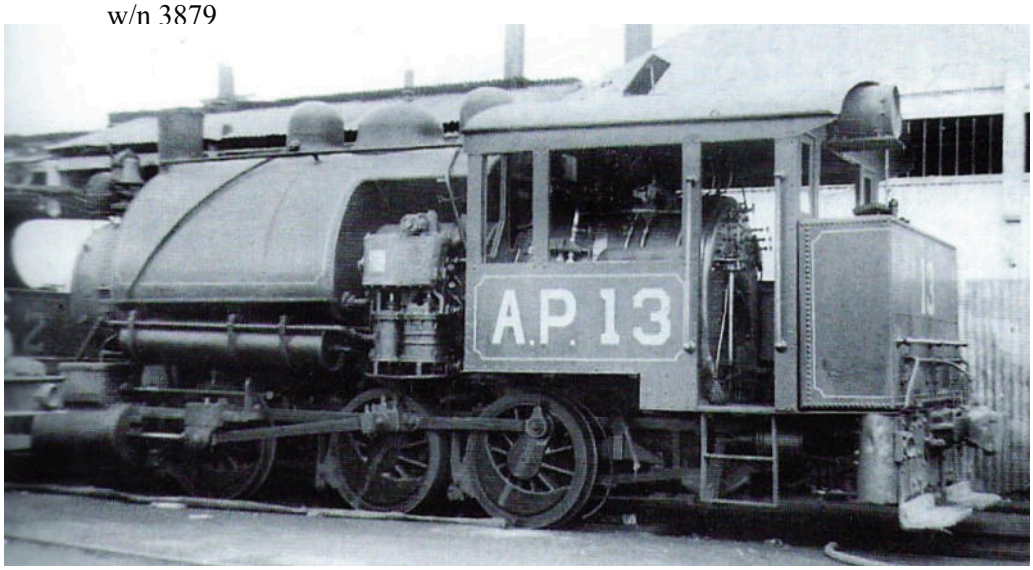



Port of Callao nos. **5** (ex-Lima Railway no. **7**) and **6** in 1958. Photo by Bob Whetham.

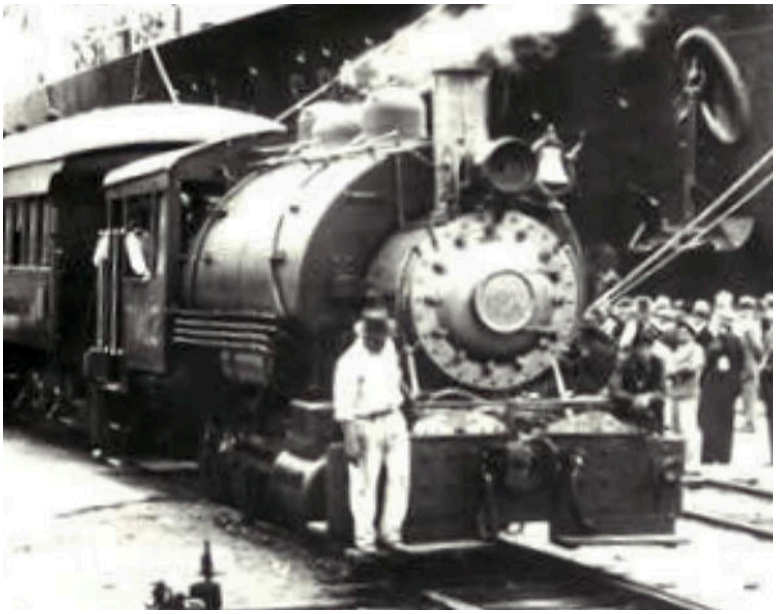
### *0-6-0ST d/w 42", cyls. 15x24", built by VIW in 1928*

Ordered by Frederick Snare Corporation as nos. **1-3**, for port works. Then to harbour board as nos. **11-13**. Later to *FC Central* with same numbers?

| | |
|---|---|
| **11** | w/n 3877 |
| **12** | w/n 3878 |
| **13** | w/n 3879 |



VIW no. **13**, ex-Frederick Snare Corporation. Photo by the late Bob Whetham.



One of the three big VIW 0-6-0STs that came from the Frederick Snare Corporation.

### *0-6-0ST d/w ?, cyls. ?, built by Baldwin in 1896*

Ordered by ?

**14** w/n ?

## Additional notes

It is not known if early locomotives carried numbers, if T. Green locomotives received names or when Numbers were assigned to the T. Green locomotives. Records are unclear. Locomotives had their numbers preceeded by the letters "A.P." in later years.

Nos. **AP-1**, **AP-4** and **AP-7** are believed to have been sent to the ports at either Ilo or Pisco. Three T. Green locomotives built for the *Soc. General de Paris* remain unidentified, and might be these engines:

**?** 0-4-0ST cyls. 10x18" T. Green 192 built 1896
**?** 0-4-0ST cyls. 10x18" T. Green 228 built 1897
**?** 0-4-0ST cyls. 10x18" T. Green 482 built 1908

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## 13.2.6 *El FC Lima Pisco y Ayacucho*

### Background

I don't believe that any of this proposal was ever built. See source [11, 1886 p207]:

"1. *Nueve locomotoras de primera clase de Krupp, en Essen,. Prusia, de preferencia, con tender y segun los Ultimos adelantos, capaces de arrastrar de subida cien toneladas de peso bruto, no comprendiendo en ello el tender a razon de trece kilometros por hors, sobre gradientes de cuatro por ciento, combinadas en curvas de trescientos cincuenta y dos pies de radio. Debiendo ser dichas locomotoras garantizadas.*

*2." Dos locomotoras tender, para el servicio de las estaciones de Lima y Pisco.* "

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# 13.3 High in the Andes

## 13.3.1 The Cerro de Pasco Railway & Mining Co.

***Regiónes de Junín y Pasco***

**1899-1974**

## Later nationalised as *Centromin*


### Background

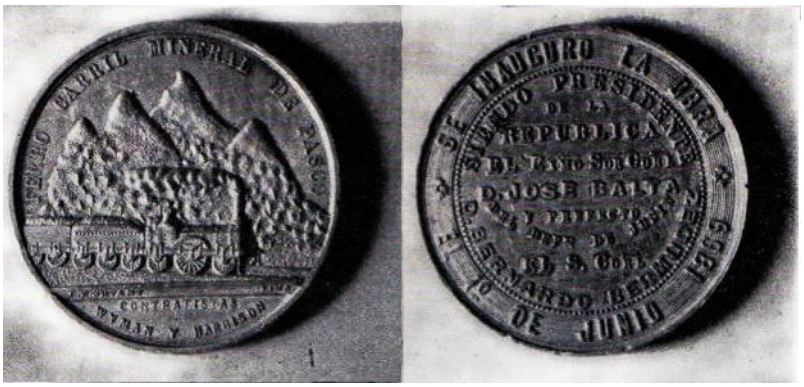
Standard gauge, but earlier using 3' 6" gauge, for which see the Peruvian narrow gauge file section 14.1.8.

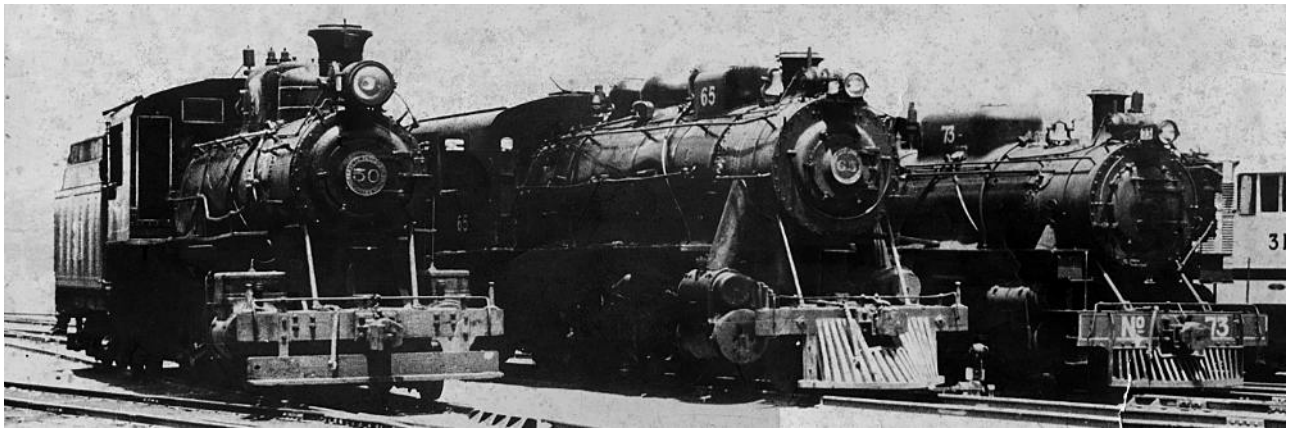
Meiggs proposed in 1877 to extend the Lima Oroya railway northward to Cerro de Pasco. However, he died that very year and little was done.

After the *FCC* reached La Oroya in 1903 a new concession was awarded which eventually ended up in the hands of the Cerro de Pasco Railway & Mining Co. 132 km. from La Oroya to Cerro de Pasco opened in 1904, and 42 km. more along a branch to Goyllarisquisga in 1907. There were later branches to Quishuarcancha and Malpaso, as well as isolated sections from *FCC* lines to access CdP mining locations. One of these was at Morococha. The CdP built a duplicate route to enable the ore to reach the smelter at La Oroya without going through the Galera tunnel. This was sold eventually to the *FCC* but is now abandoned. The other was south of La Oroya and ran fifty miles or so from Pachacayo to Chaucha. Closure occurred in 2000 and the line has now been lifted.

The CdP was a very American operation, though its last new steam locomotives were Andes' class 2-8-0s from Beyer Peacock purchased in the 1950s when steam engines were no longer being built in the USA. The first diesels arrived in 1964.

In 1974 The Cerro de Pasco Co. was nationalized, and named *Centromina*. The railway is currently operated by *Ferrocarril Central Andino*.



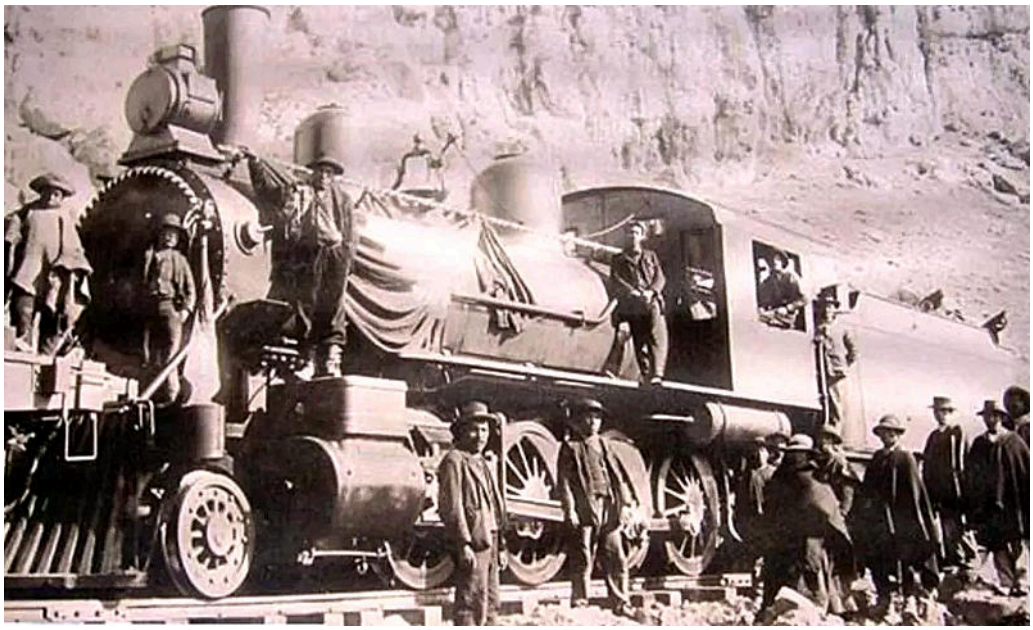


Cerro de Pasco Railway locomotives **50, 65** and **73** lined up. The first was an ALCO Rhode Island 2-6-0, the second an ALCo 2-8-0, and the third a Beyer Peacock Andes type 2-8-0. The diesel on the right dates this image to the mid 1960s or slightly later. Photo from Garth Samuel's collection by courtesy of Richard Pelham.

### *2-8-0 d/w 52", 20x24", built by ALCo Rhode Island in 1903*

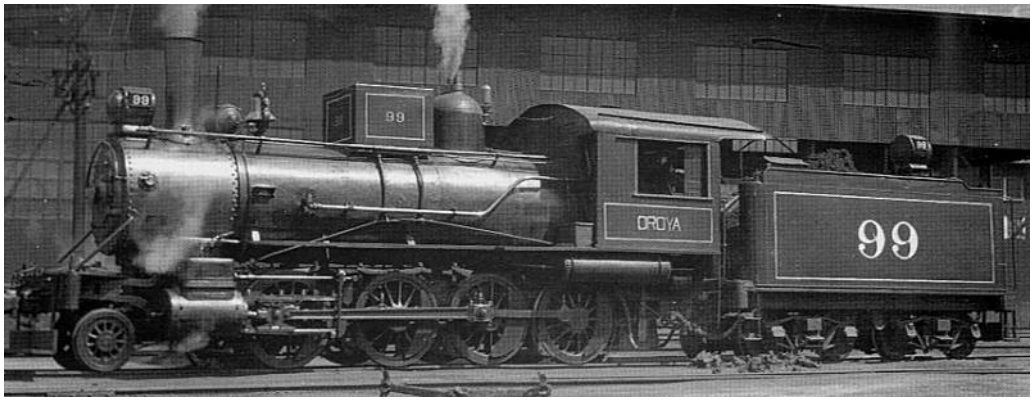
Ordered by Cerro de Pasco via J. B. Haggin.

| | | |
|---|---|---|
| **1**[1] later **100** | w/n 27625 | Renumbered **8**[2] by 1908. In service 1925. |
| **2**[1] later **101** | w/n 27626 | Renumbered **9** by 1908. In service 1925. |

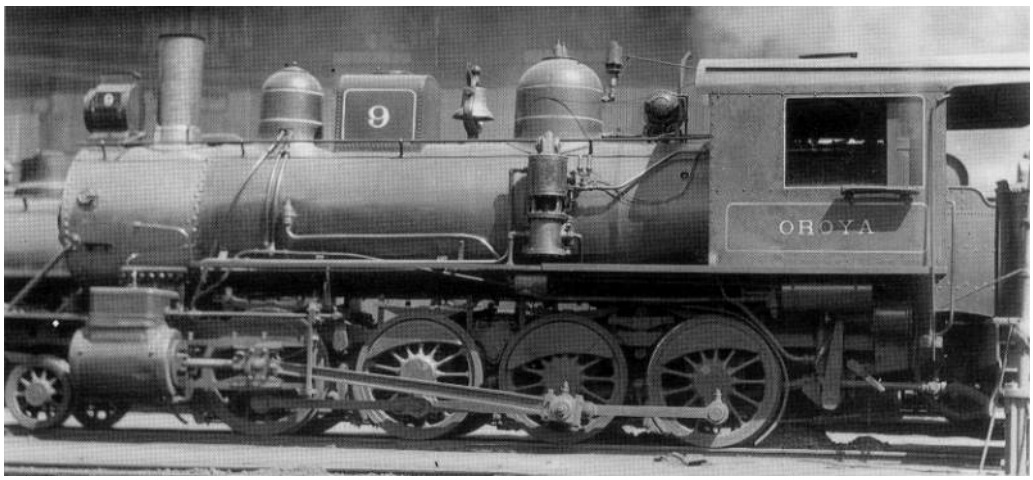


This would appear to be one of the *FCCdP*'s Rhode Island consolidations in original or at least early condition. Note the kerosene headlamp, the

wooden pilot and the distinctive pony truck wheels.




A Brian Fawcett photo of the Cerro de Pasco Railway's no. **99**. It very much looks as though it was one of the Rhode Island -built 2-8-0s, but I am not clear how the number **99** fitted into that order.

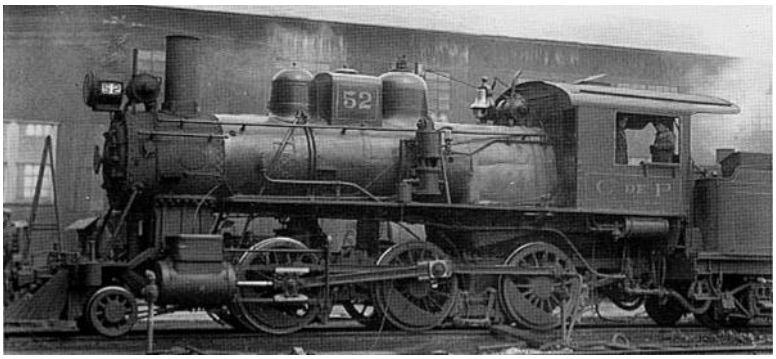



A Brian Fawcett photo of the Cerro de Pasco Railway's no. **9**.

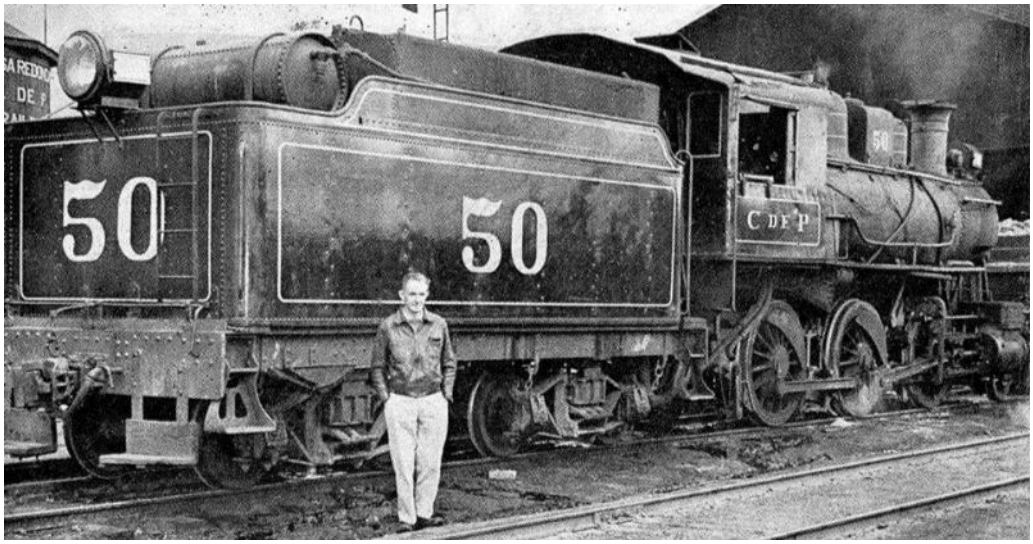
### *2-6-0 d/w 57", cyls. 19x26", built by ALCo Rhode Island in 1903*

Ordered via J. B. Haggin for Cerro de Pasco. Source [2] gives the cylinder dimensions in 1925 as 16½x28".

| | | |
|---|---|---|
| **3**[1] later **50** | w/n 28308 | In service 1925. |
| **4**[1] later **51** | w/n 28309 | In service 1925. |
| **5**[1] later **52** | w/n 28310 | In service 1925. |
| **6**[1] later **53** | w/n 28311 | In service 1925. |




A Brian Fawcett photo of the Cerro de Pasco Railway's no. 52.





## The fleet in 1908

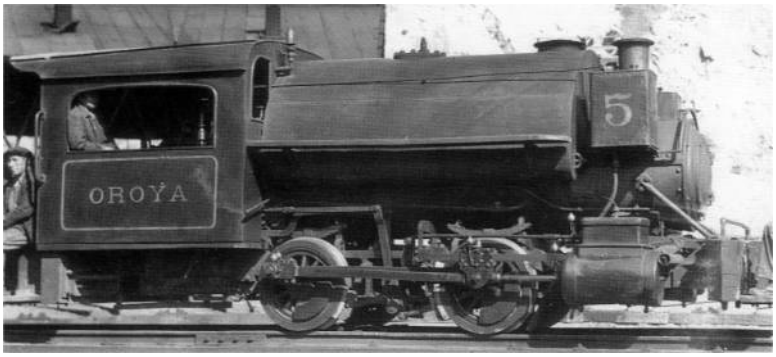
Solely the above six engines were listed by Costa y Laurent in 1908, which suggests that some of those listed below as built in 1906, say, may have been in mines service rather than in the mainline fleet.

### *0-4-0ST d/w ?, cyls. 10x12", built by Davenport in 1904, 1905 and 1906*

Ordered by Cerro de Pasco Mining Co. Some of these were low profile mines type locos for working under loading docks and the like. These were not listed in the fleet in 1925, so may not have been regarded as part of the mainline fleet, being rather industrial plant maintained by a particular mine or processing facility.

| | | |
|---|---|---|
| **20**[1] | w/n 315 | |
| **21** | w/n 316 | |
| **22** | w/n 317 | |
| **23** | w/n 342 | Built in 1905. |
| **24**[1] | w/n 514 | Built in 1906. OoS Oroya 1965 [5]. |
| **25**[1] | w/n 515 | Built in 1906. |


A poor photo but showing a low profile no. **25** as later fitted with sandboxes either side of the smokebox. Photo from Garth Samuel's collection by courtesy of Richard Pelham. NB Confirmation is needed that this was one of the earlier Davenports rather than one from the 1938 batch listed below.



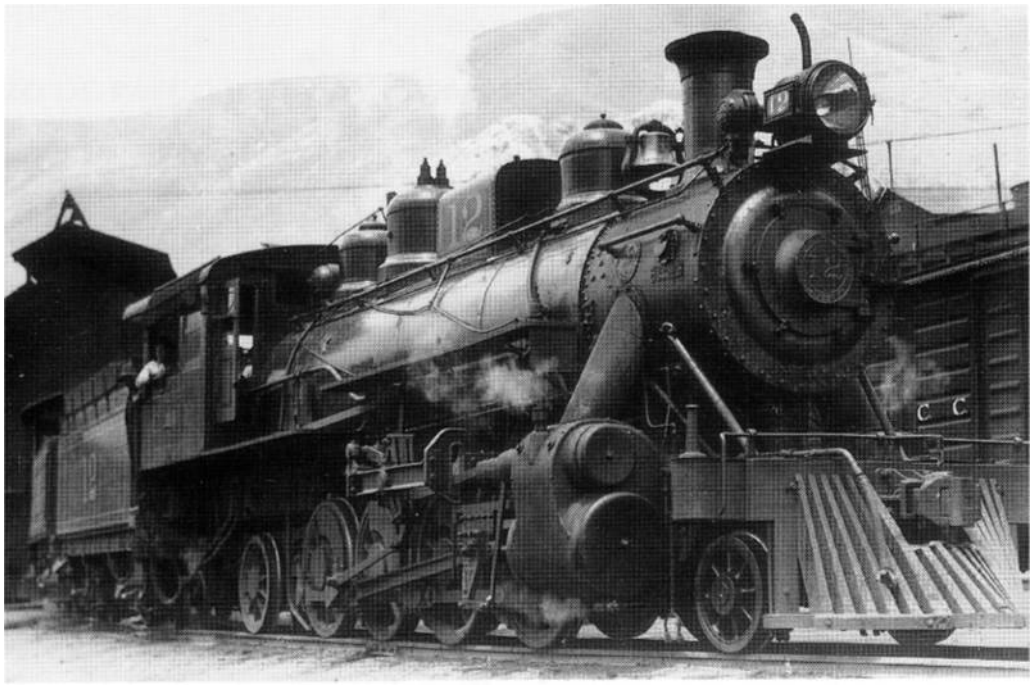

A Brian Fawcett photo of the Cerro de Pasco Railway's no. **5**. This would appear to be similar to locos 20-25 listed here, but how it fitted into the number series is a mystery at present.

### *2-8-2 d/w 52", cyls. 20x26", built by Baldwin in 1907*

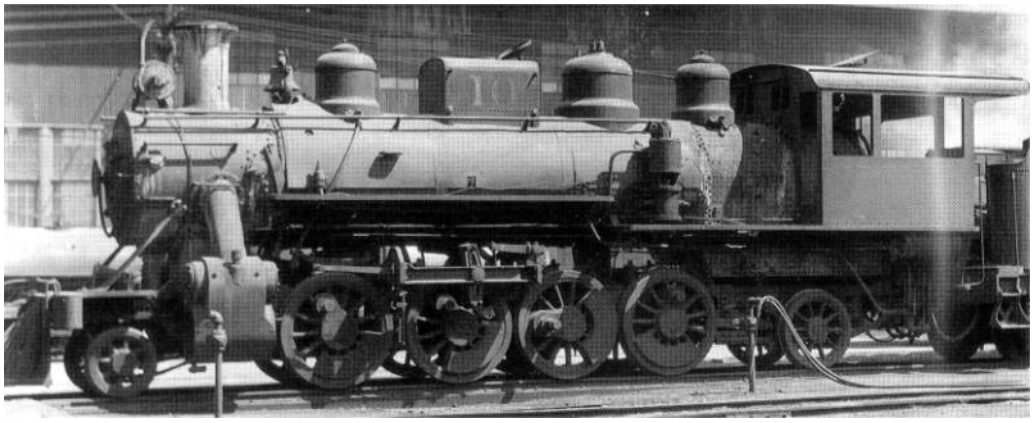
Ordered by Cerro de Pasco. BLW class 12-34¼E nos. 1-2 and 5-6. Spec. is in vol. 30 p185. Fawcett said that these were good engines.

| | | |
|---|---|---|
| **10** | w/n 30078 | In service 1925. New boiler 1928 [5]. |
| **11** | w/n 30125 | In service 1925. New boiler 1935 [5]. |
| **12** | w/n 32270 | In service 1925. New boiler 1928 [5]. |
| **14** | w/n 32271 | In service 1925. New boiler 1928 [5]. |


This image is from Baldwin negative 02311 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania. Note that this engine carries slide valves, unlike all the later photos of these machines which show piston valves.



A Brian Fawcett photo of the Cerro de Pasco Railway's no. **12**.
Note that this loco and the one below now have piston valve cylinders.

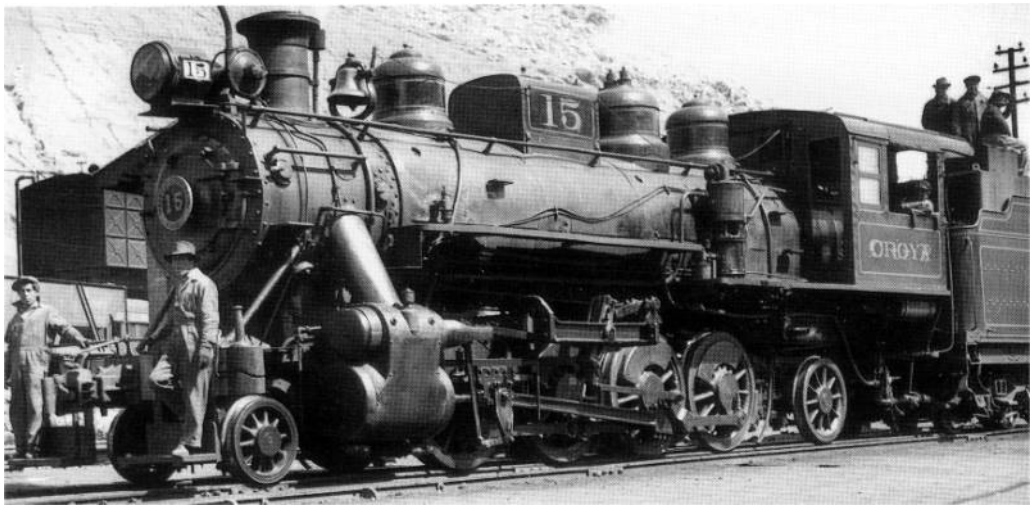


No. 10 with rods off, for overhaul or after withdrawal.

### *2-8-2 d/w ?, cyls. ?, built by ? in ?*

Ordered by ? Looks similar to Baldwin mikados **10-12** and **14**, but no additional loco has been found in Baldwin lists. This may be a renumbering of one of the others.

**15** w/n ? Not listed in 1925 in [2]. OoS Oroya 1965 [5].



A Brian Fawcett photo of the Cerro de Pasco Railway's no. **15**.


### *4-6-0 d/w 58", cyls. 19x26", built by ALCo in 1907*

Ordered by *FC Central* as their no. **54** (or maybe **51**?), later sold to *FC Cerro de Pasco*, and was there when Fawcett was in Oroya.

**20**[2] w/n 41513 In service 1925.

### *2-6-0 d/w 52", cyls. 18x24", built by Baldwin in 1907*

Ordered by Cerro de Pasco. BLW class 08-30D no. 640. Spec. is in vol. 30 p184. Mark on tank 'F. C. CERRO DE PASCO'. Cylinder dimensions given in 1925 in [2] as 16x24".

**40**[1] w/n 30129 Later became *FC Central* no. **47**[2]. Not listed in 1925 in [2] so may have left the *CdP* fleet by then.

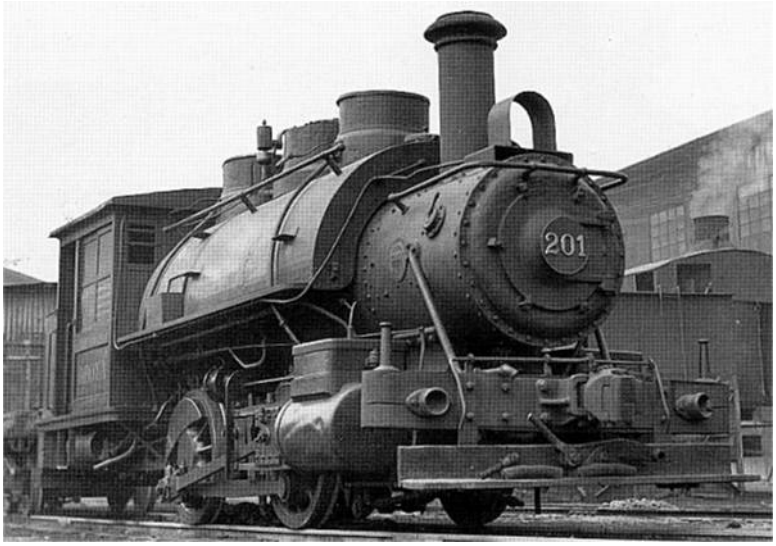

This image is from Baldwin negative 02309 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.

### *0-4-0ST d/w 48", cyls. 16x24", built by Baldwin in 1908*

Ordered by Cerro de Pasco. BLW class 04-26C nos. 122-123. Spec. is in vol. 31 p195.Mark on tank 'F. C. CERRO DE PASCO'.

**200** w/n 32720 In service 1925.

**201** w/n 32721 In service 1925.



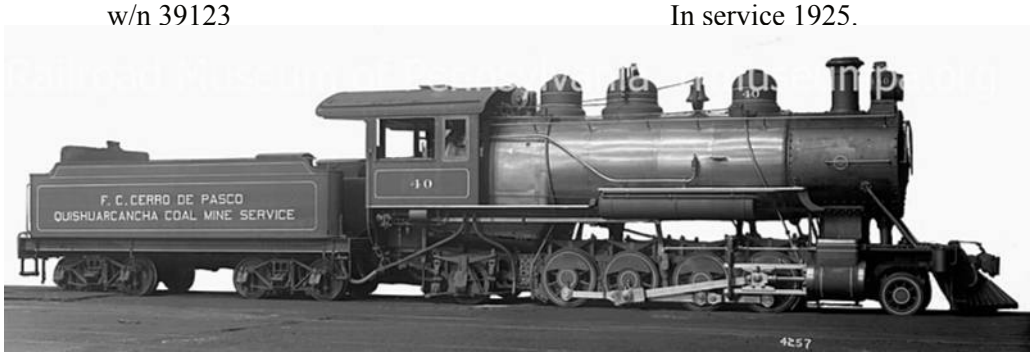

A Brian Fawcett photo of the Cerro de Pasco Railway's no. **201**.

### *2-8-2 d/w 42", cyls. 21x22", built by Baldwin in 1913*

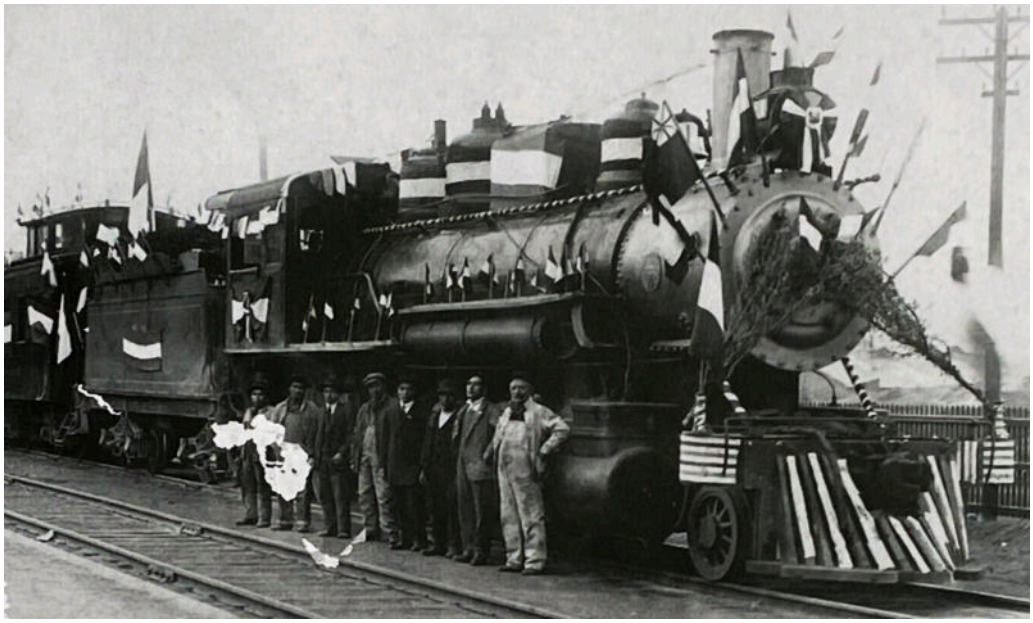
Ordered by Cerro de Pasco. As many parts as practicable to be interchangeable with locos nos. **10-14**. BLW class 12-34¼E nos. 21-22. Spec. is in vol. 44 p217. Mark on tank 'F. C. CERRO DE PASCO QUISHUARCANCHA COAL MINE SERVICE'. Brian Fawcett said these were less successful, and very slippery, thus leading to them being relegated to yard service.

**40**[2] w/n 39122 In service 1925.

**41** w/n 39123 In service 1925.

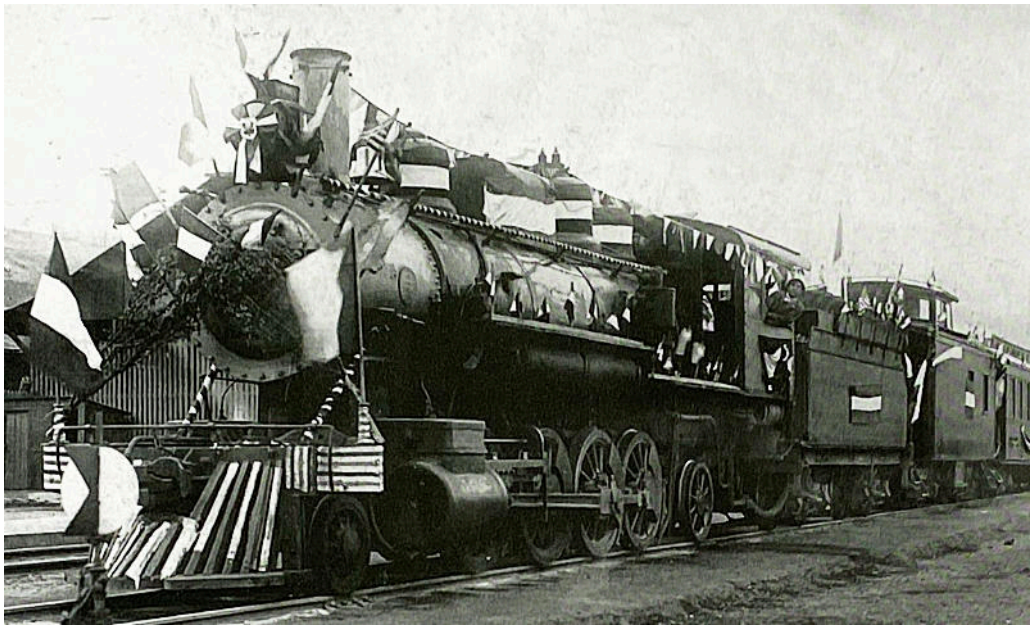



This image is from Baldwin negative 04257-1 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.

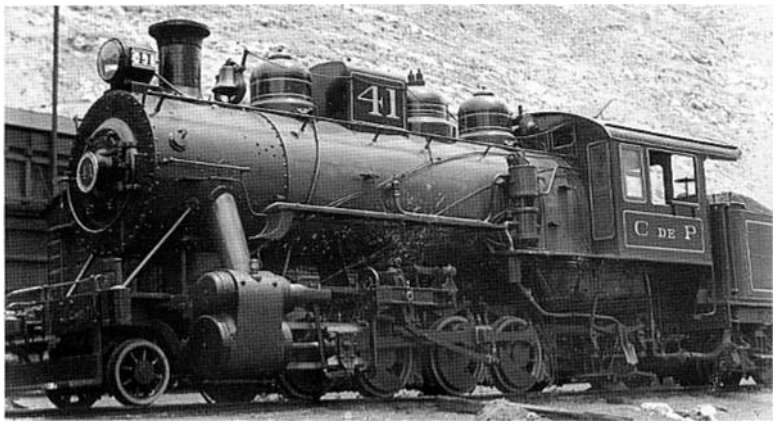


This loco, seen decorated for the opening of the FCC line to the

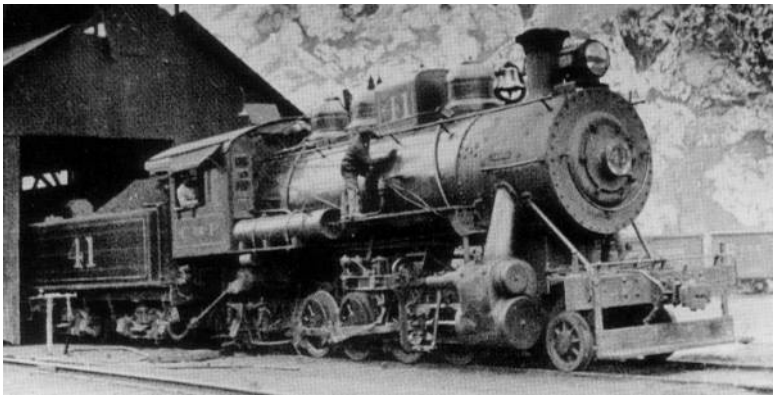
La Oroya smelter, would seem to be CdeP no. **40**, albeit with a few modifications when compared to the previous pic, eg. a change to a stove-pipe stack, and the addition of the railway's usual rectangular sandbox.



No. **40** from the other side, on the same occasion.




A Brian Fawcett photo of the Cerro de Pasco Railway's no. **41**. Note that no. **41** seems to have borne piston valve cylinders from new, rarther than the slide valves seen in the previous images. It also has an outside frame trailing truck.



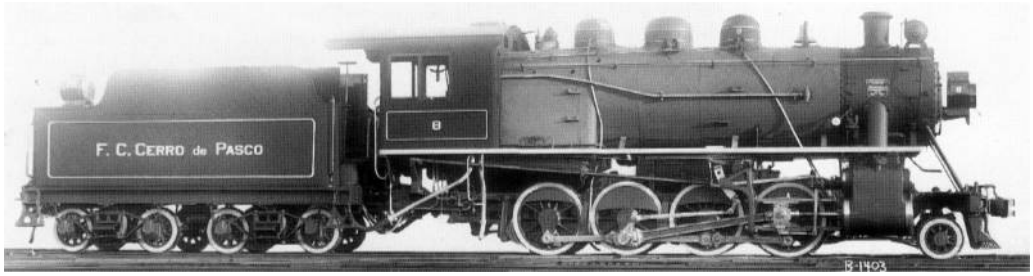

Another Brian Fawcett photo of the Cerro de Pasco Railway's no. **41**.


This photo from Garth Samuel's collection by courtesy of Richard Pelham, shows no. **40** much later in its life, on the Oroya scrap line. The usual big rectangular CdeP sandbox has been added, but the air reservoir beneath the running board has disappeared. The original slide valve chest has been replaced by piston valves and outside steam pipes, possibly using brand new cylinders rather than a 'bolt-on' valve chest though that is not certain.

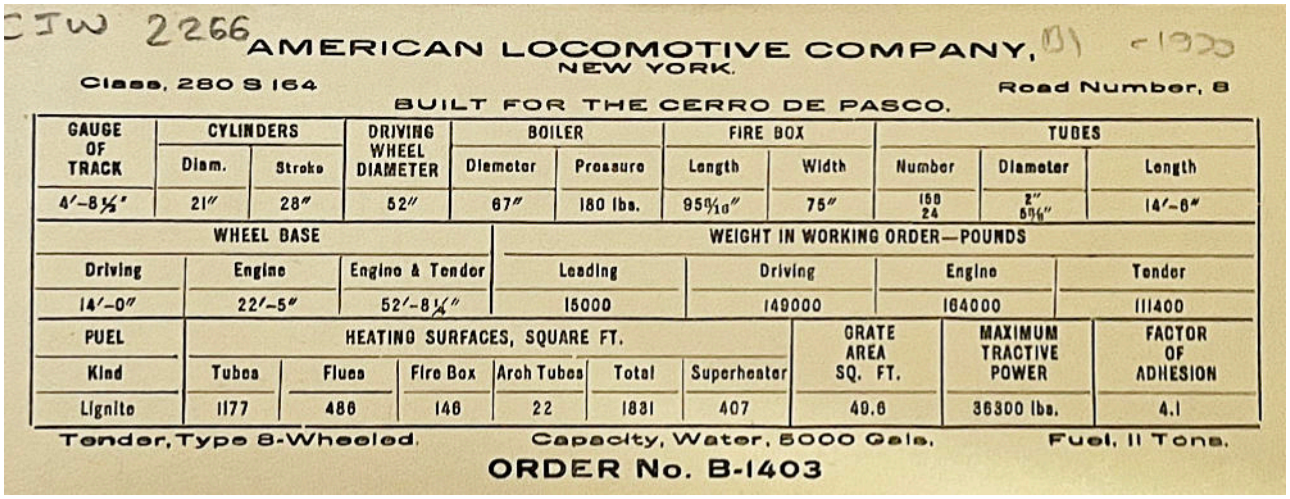
### *2-8-0 d/w 52", cyls. 21x28", built by ALCo in 1916, 1919, 1925 and 1930*

Ordered by ? First six were coal-fired, last two oil-fired and with Worthington feedwater heaters [Brian Fawcett].

| | | |
|---|---|---|
| **5**[3] later **65** | w/n 58742 | Built 1919. Strangely not listed in fleet in 1925. |
| **6**[2] later **66** | w/n 58743 | Built 1919. Strangely not listed in fleet in 1925. |
| **7** later **67** | w/n 56185 | Built 1916. Strangely not listed in fleet in 1925. |
| **8**[1] later **68** | w/n 56186 | Built 1916. Strangely not listed in fleet in 1925. |
| **3**[2] later **63** | w/n 66576 | Built 1925. |
| **4**[2] later **64** | w/n 66577 | Built 1925. Brian Fawcett says built 1927, as a hand-fired coal burner. |
| **1**[2] later **61** | w/n 68286 | Built 1930. |
| **2**[2] later **62** | w/n 68287 | Built 1930. |




An image of no. **8** as found in an ALCo catalog.



CJW 2266 AMERICAN LOCOMOTIVE COMPANY, NEW YORK. 01 -1920

Class, 280 S 164 — Road Number, 8

BUILT FOR THE CERRO DE PASCO.

| GAUGE OF TRACK | CYLINDERS | | DRIVING WHEEL DIAMETER | BOILER | | FIRE BOX | | TUBES | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Diam. | Stroke | | Diameter | Pressure | Length | Width | Number | Diameter | Length |
| 4'-8½" | 21" | 28" | 52" | 67" | 180 lbs. | 95 9/16" | 75" | 158<br>24 | 2"<br>5 5/16" | 14'-6" |

| WHEEL BASE | | | WEIGHT IN WORKING ORDER—POUNDS | | | |
|---|---|---|---|---|---|---|
| Driving | Engine | Engine & Tender | Leading | Driving | Engine | Tender |
| 14'-0" | 22'-5" | 52'-8¼" | 15000 | 149000 | 164000 | 111400 |

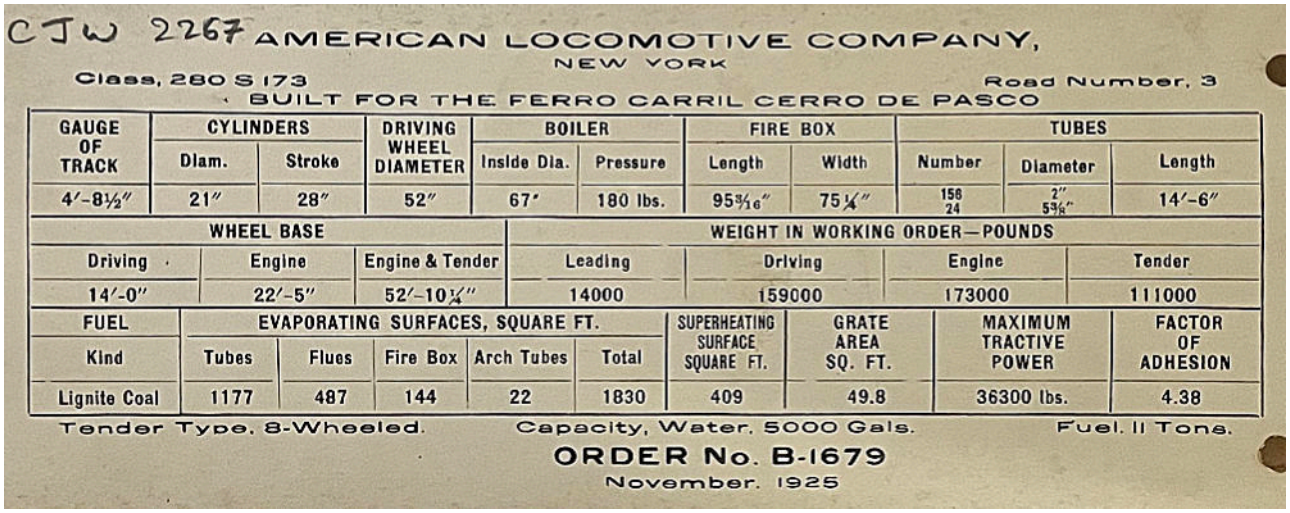
| FUEL | HEATING SURFACES, SQUARE FT. | | | | | | GRATE AREA SQ. FT. | MAXIMUM TRACTIVE POWER | FACTOR OF ADHESION |
|---|---|---|---|---|---|---|---|---|---|
| Kind | Tubes | Flues | Fire Box | Arch Tubes | Total | Superheater | | | |
| Lignite | 1177 | 486 | 146 | 22 | 1831 | 407 | 49.6 | 36300 lbs. | 4.1 |

Tender, Type 8-Wheeled. Capacity, Water, 5000 Gals. Fuel, 11 Tons.

ORDER No. B-1403

FCCdP no. **8**[2] ALCo publicity card details.


An ALCo builder's photo of no. **3** , as found by
Brian Fawcett. Note the smaller tender lettering,
though may merely have been the ALCo paint shop's whim.



CJW 2267 AMERICAN LOCOMOTIVE COMPANY,
NEW YORK

Class, 280 S 173 — Road Number, 3

BUILT FOR THE FERRO CARRIL CERRO DE PASCO

| GAUGE OF TRACK | CYLINDERS | | DRIVING WHEEL DIAMETER | BOILER | | FIRE BOX | | TUBES | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Diam. | Stroke | | Inside Dia. | Pressure | Length | Width | Number | Diameter | Length |
| 4′-8½″ | 21″ | 28″ | 52″ | 67″ | 180 lbs. | 95 3/16″ | 75¼″ | 156<br>24 | 2″<br>5⅜″ | 14′-6″ |

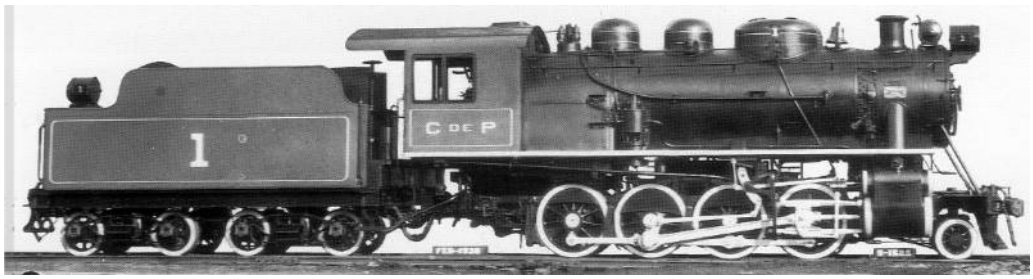
| WHEEL BASE | | | WEIGHT IN WORKING ORDER—POUNDS | | | |
|---|---|---|---|---|---|---|
| Driving | Engine | Engine & Tender | Leading | Driving | Engine | Tender |
| 14′-0″ | 22′-5″ | 52′-10¼″ | 14000 | 159000 | 173000 | 111000 |

| FUEL | EVAPORATING SURFACES, SQUARE FT. | | | | | SUPERHEATING SURFACE SQUARE FT. | GRATE AREA SQ. FT. | MAXIMUM TRACTIVE POWER | FACTOR OF ADHESION |
|---|---|---|---|---|---|---|---|---|---|
| Kind | Tubes | Flues | Fire Box | Arch Tubes | Total | | | | |
| Lignite Coal | 1177 | 487 | 144 | 22 | 1830 | 409 | 49.8 | 36300 lbs. | 4.38 |

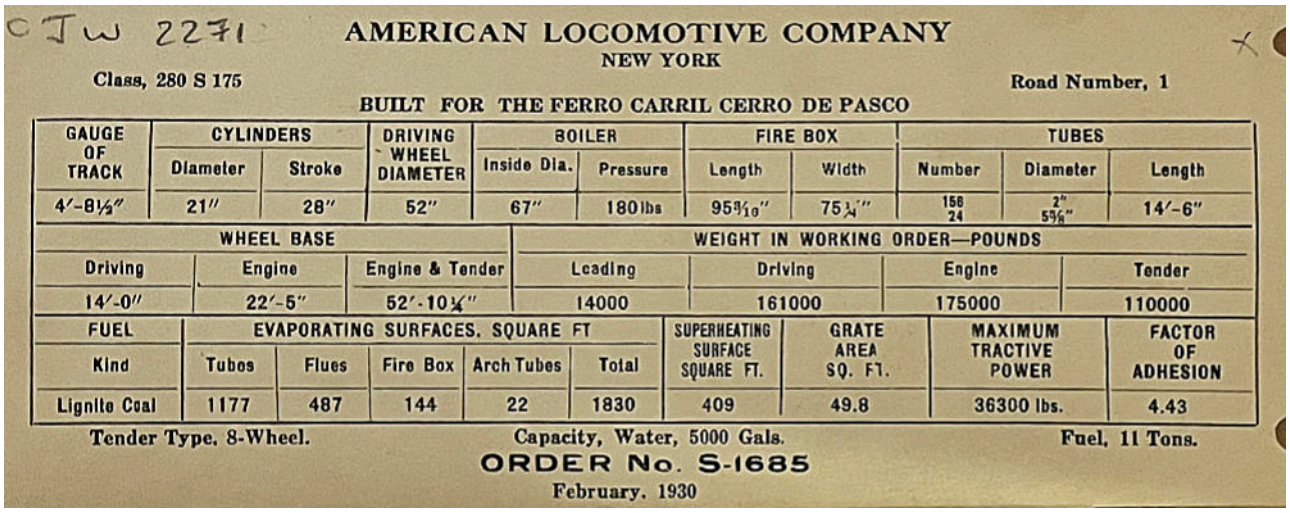
Tender Type, 8-Wheeled. Capacity, Water, 5000 Gals. Fuel, 11 Tons.

ORDER No. B-1679
November, 1925

FCCdP no. **3**[2] ALCo publicity card details.




An ALCo builder's photo of no. **1** , as found by Brian Fawcett.
By now a larger front sand-dome had been specified.



CJW 2271 AMERICAN LOCOMOTIVE COMPANY
NEW YORK

Class, 280 S 175 — Road Number, 1

BUILT FOR THE FERRO CARRIL CERRO DE PASCO

| GAUGE OF TRACK | CYLINDERS | | DRIVING WHEEL DIAMETER | BOILER | | FIRE BOX | | TUBES | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Diameter | Stroke | | Inside Dia. | Pressure | Length | Width | Number | Diameter | Length |
| 4′-8½″ | 21″ | 28″ | 52″ | 67″ | 180 lbs | 95 9/10″ | 75¼″ | 156<br>24 | 2″<br>5⅜″ | 14′-6″ |

| WHEEL BASE | | | WEIGHT IN WORKING ORDER—POUNDS | | | |
|---|---|---|---|---|---|---|
| Driving | Engine | Engine & Tender | Leading | Driving | Engine | Tender |
| 14′-0″ | 22′-5″ | 52′-10¼″ | 14000 | 161000 | 175000 | 110000 |

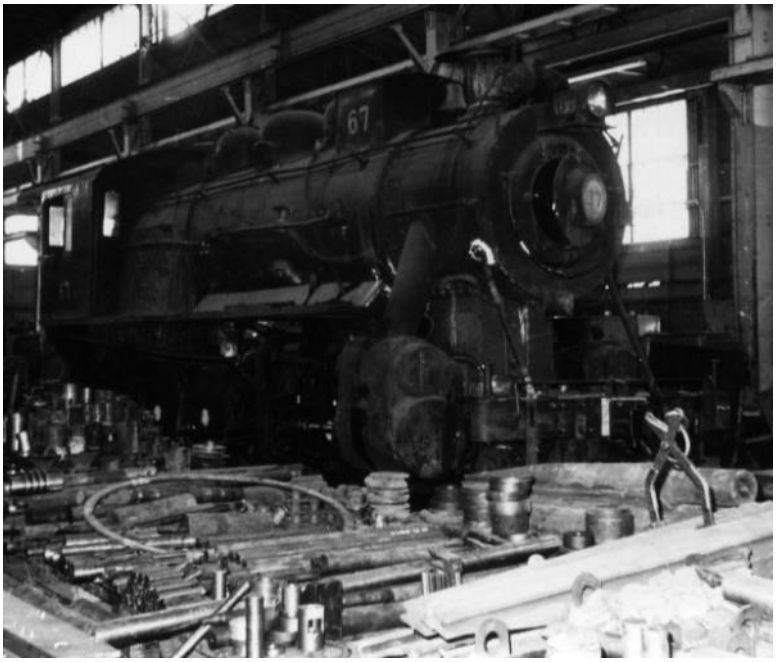
| FUEL | EVAPORATING SURFACES, SQUARE FT | | | | | SUPERHEATING SURFACE SQUARE FT. | GRATE AREA SQ. FT. | MAXIMUM TRACTIVE POWER | FACTOR OF ADHESION |
|---|---|---|---|---|---|---|---|---|---|
| Kind | Tubes | Flues | Fire Box | Arch Tubes | Total | | | | |
| Lignite Coal | 1177 | 487 | 144 | 22 | 1830 | 409 | 49.8 | 36300 lbs. | 4.43 |

Tender Type, 8-Wheel. Capacity, Water, 5000 Gals. Fuel, 11 Tons.

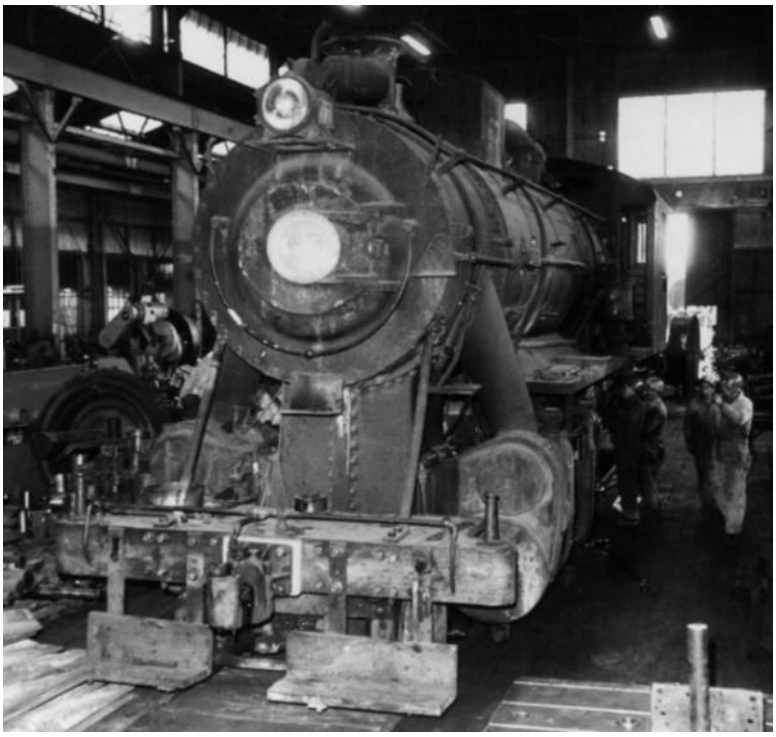
ORDER No. S-1685
February, 1930

FCCdP no **1** ALCo card publicity details.


A *CdeP* Railway official photo from the collection of Garth Samuel by courtesy of Richard Pelham.



*CdeP* Railway official photos of no. **67** in the shops at La Oroya, from the collection of Garth Samuel by courtesy of Richard Pelham.



***2-8-0 d/w ?, cyls. ?, built by Baldwin in ?***

Ordered by ? Not found in Baldwin lists as ordered for Cerro de Pasco, but might have come from *FC Central*? Though there are no Baldwin 2-8-0s in the *FCC* list!

**102** w/n ? In service 1926 [5].

### *0-4-0ST d/w ?, cyls. 11x16", built by Davenport in 1938*

Ordered by ? 2174-5 in 1930,

**24**[3] w/n ?

**25**[2] w/n ?

**26** w/n ?

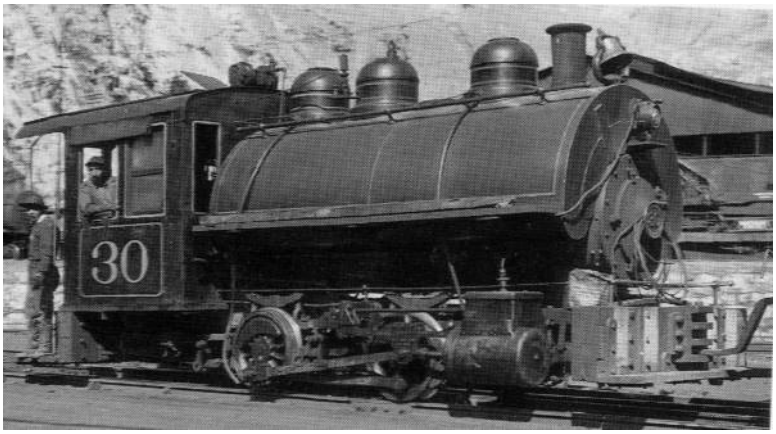
**27** w/n ?

**28** w/n ?

**29** w/n ?

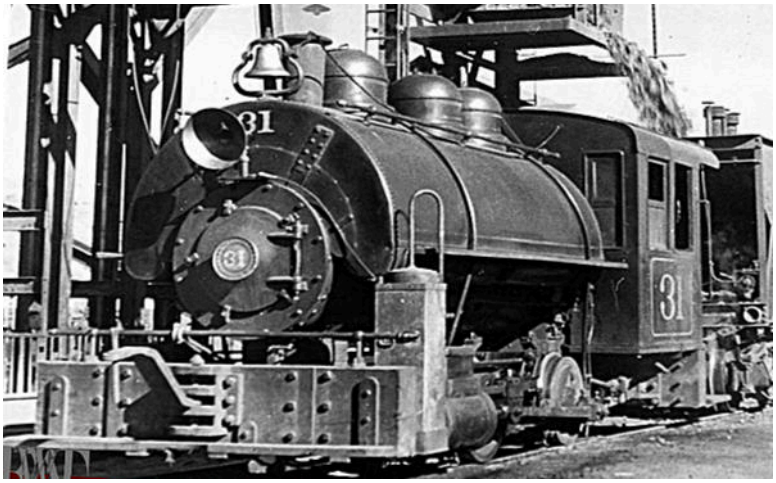
**30** w/n ? Working at Oroya 1965 [5].

**31** w/n ?

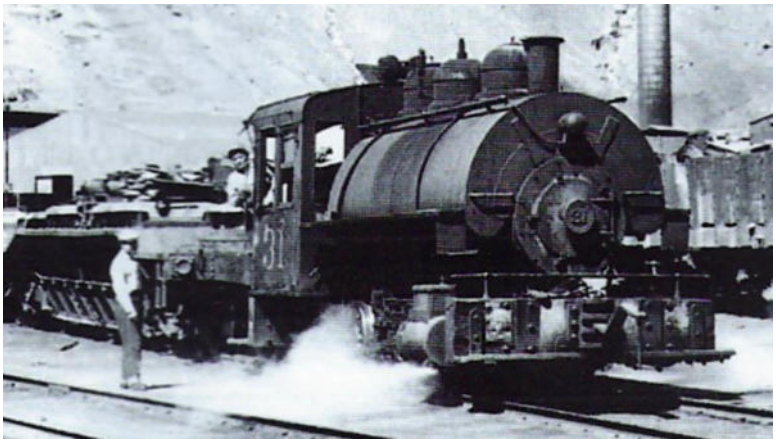



A Brian Fawcett photo of the Cerro de Pasco Railway's no. **30**.

No. **30**. Note the full length saddle tank, which contrasts with the shorter tank on the later VIW-built 0-4-0STs.




No. **31**.




Another image of no. **31** shunting at La Oroya. This is by the late Bob Whetham and comes from vol. 2 of his book [5].

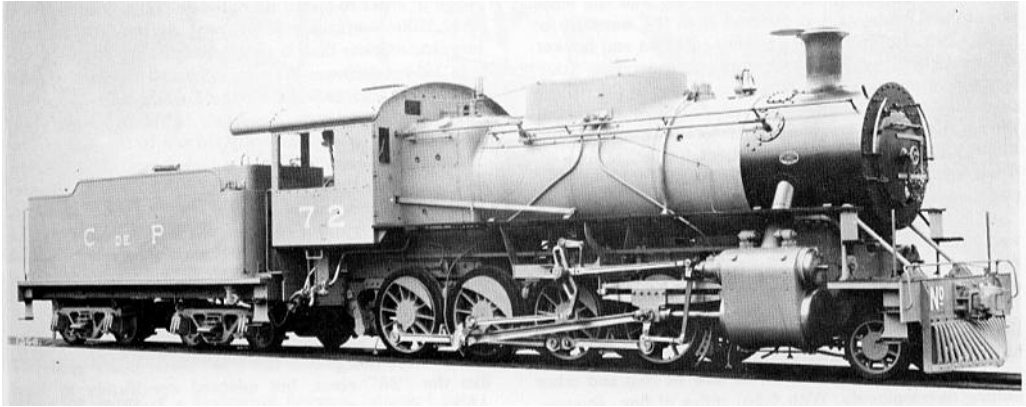
This photo, taken at Oroya in 1926, shows a very small saddle tank loco. As yet it has not beeen identified.

### *2-8-0 d/w ?, cyls. ?, built by Beyer Peacock in 1951 and 1957*

Ordered by ?

| | | |
|---|---|---|
| **71** | w/n 7620 | Source [8] says on loan to *FC Central* in 1972. |
| **72** | w/n 7621 | |
| **73** | w/n 7682 | |

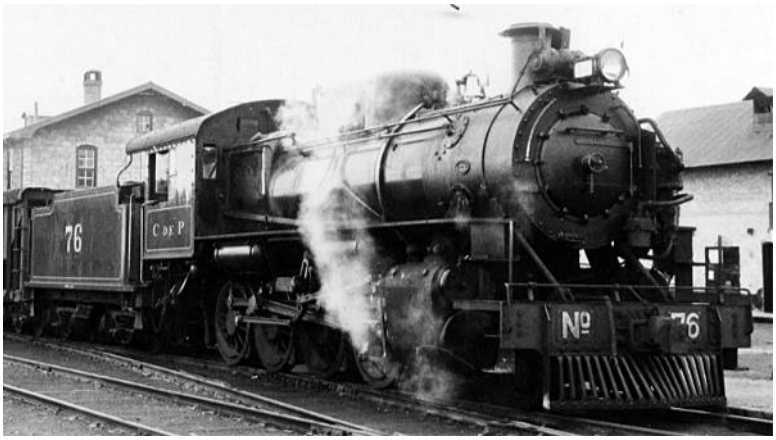
| | | |
|---|---|---|
| **74** | w/n 7683 | |
| **75** | w/n 7684 | |
| **76** | w/n 7777 | Source [8] says on loan to *FC Central* in 1972. |
| **77** | w/n 7778 | Source [8] says on loan to *FC Central* in 1972. |
| **78** | w/n 7779 | Preserved at La Oroya. |

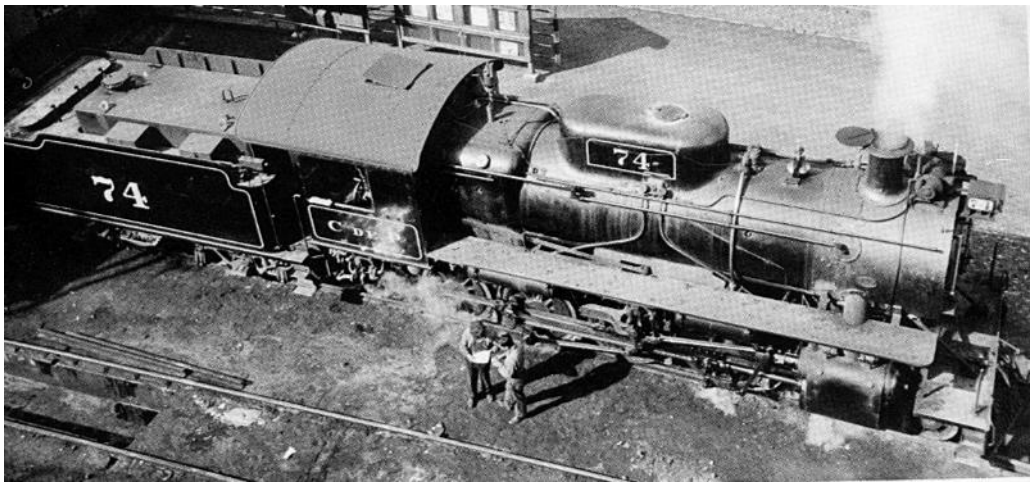



A Beyer Peacock builder's photo of no. **72**.


No. **77** in service, as seen in a photo from Garth Samuel's collection by courtesy of Richard Pelham.


A pair of photos from Garth Samuel's collection showing BP 2-8-0 no. **76** in two different paint schemes. The first has a C *de P* roundel on the tender and the loco running number on the cabside, whilst the second has the running number on the tender and the letters 'C *de P*' on the cab side sheet. The second photo was dated December 1961.




Cerro de Pasco Railway Andes class 2-8-0 no. **74** seen from above on shed at Oroya. Photo by Brian Fawcett.

### *0-4-0ST d/w 44", cyls. 16x20", built by Vulcan Iron Works in 1953*

Ordered by ?

| | | |
|---|---|---|
| **210** | w/n 4734 | |
| **211 'OROYA'** | w/n 4735 | A whole lot of photos show the word 'OROYA' on loco cabsides, so this may have been more of an allocation location than an individual name. |


This image is from VIW negative 00534 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.


This image is from VIW negative 00537 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.


A *CdeP* shed scene, probably at La Oroya, in the late 1950s or early '60s. The loco at bottom right, and probably that in front of it too, is a 60 class ALCo 2-8-0. Top right is Baldwin 0-4-0ST no. **200**. The photo is from Garth Samuel's collection, by courtesy of Richard Pelham.

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# 13.3.2 *El FC Tambo del Sol á Pucallpa*

***Región de Pasco***

**1950s but never completed or opened**

## Background

36.6 km. See the Peruvian narrow gauge steam locomotives file for details of the earlier 1920s scheme from Tambo del Sol toward Pachitea. One source states that 80 km of track was laid before the project was abandoned, but it is not clear which of the two schemes got further.

Certainly there is a 1000m. tunnel at Tauli, now used by road transport to access the district of Huachón. One of the portals apparently bears the date 1952.

In 2025 the *Huachón Huancabamba comité* page on Facebook published the following relevant information (following on from paragraphs about the earlier scheme which are reproduced in sub-section 14.3.10 of the Peruvian narrow gauges file.).

"*En los años 50 durante el Gobierno del General Manuel A. Odría se retomó nuevamente este ambicioso Proyecto determinándose dos sectores: Tramo Huachón –Oxapampa y tramo Puerto Inca – Pucallpa. Se realizaron todos los reconocimientos del caso, con la ayuda del Estudio "Económico, Financiero, Ingeniería, Construcción a cargo de Morrison –Knudsen Company INC. New York. Se efectuaron las Poligonales Taquimétricas y algunos Trazos. Por falta de financiamiento, nuevamente se llegó a levantar el tramo de trocha angosta de Tambo el Sol a Huachón por una plataforma de vía normal, que hoy sirve como carretera.*

*La Junta Militar encabezada por el General Manuel A. Odría dio el D.L. Nº 11043, considerando que es de primordial importancia la prosperidad de la Nación y que la zona de Selva, tiene excepcional potencial para el país, por las riquezas que encierran: madera, petróleo, productos agrícolas, industria ganadera, minerales, etc. Y que es de vital importancia unir la capital del Perú con la amazonia, a fin de incrementar la explotación de los recursos naturales y para atraer la corriente de inmigración de colonos nacionales y extranjeros es prioritaria la culminación de la construcción del ferrocarril Tambo de Sol – Pucallpa en el Ucayali, convocando para esta grandiosa obra a los capitales nacionales y extranjeros con el objeto de financiarla y ejecutarla en el plazo de cinco años (publicado por el Comercio del 08-09-49).*

*En su mensaje al Congreso Nacional el 28-07-55, el General Odría manifestó que hasta la fecha se habían invertido 87 millones de soles en estudios aerofotográficos y obras como construcción de 49 Kms. de explanaciones, enrielado de 12 Kms., adquisición de líneas con todos sus accesorios para 38 Kms y un túnel de 980 m.*

*Este proyecto es tan antiguo como importante, sin embargo se han perdido más de 80 años, cuando era posible financiar una gran parte de su construcción, con los recursos maderables y los asentamientos rurales a emplazarse a lo largo de su recorrido.*"

It has been suggested that *FC Ilo á Moquegua* Baldwin 2-4-0 no. **3 'PACOCHA'** spent some time here in the 1950s before moving on to the *FC Tacna á Arica*, where it remains to this day.

### *2-4-0 d/w 44", cyls. 13x20", built by Baldwin in 1909*

Ordered by Ilo Moquegua. BLW class 06-20C no. 7. Spec. is in vol. 32 p250. Fuel: soft coal. Stack: straight. MCB auto-coupler.

**3 'PACOCHA'** w/n 32845 Later went to *FC Tacna Arica* as their no. **1**[2].

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# 13.4 The Southern network

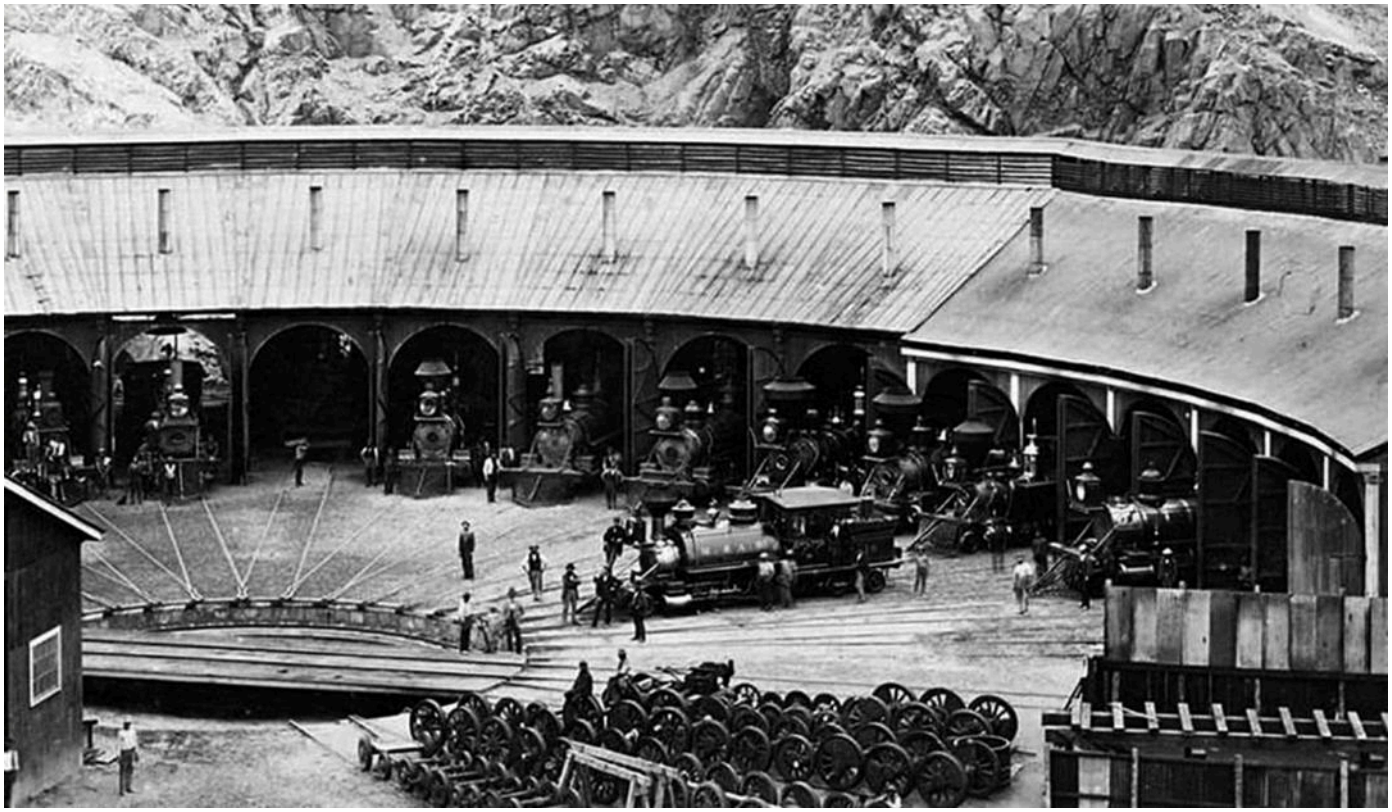
## 13.4.1 *El FC Mejía á Arequipá*

***Región de Arequipá***

**1868-1872**


### Background

Standard gauge. Linked Arequipá to the coast at Mollendo, despite an understanding that extending further north to Islay would have improved access to the sea. Mollendo equates to no more than a typical Cornish or Hebridean fishing port, with solely a narrow inlet where lighters could be loaded before being towed out to ships in the open roadstead, but Islay later became the terminus, on a sheltered north-facing shore facilitating the building of a pier so that ships could lie alongside.



An early view of the *FCMyA*'s Mollendo roundhouse, found on the *Mollendo Antiguo* page on Facebook. The image is from the collection of Adrián Murriel. Close examination reveals that six out of the ten locos display spark-arresting stacks of one kind or another, and that the second loco from the right had side tanks and was probably no. **21** or **22**. The engine out in front was a 2-4-4ST,

possibly no. **18**, but the builder has not yet been identified. At a guess the photo dates from no earlier than 1871, after the arrival of engines **19-22**, but not much later than that though clearly the roundhouse had been extended since it was first built.

### *4-6-0 d/w 49", cyls. 18x24", built by Rogers in 1868*

Rogers order no. 624. Ordered by *FC Mejía y Arequipa*. A general report about the state of the railway construction, dated 7th March 1870 [11, 1874A p100] contained extensive detail: "*De las diez que debe entregar el empresario segue contrata, siete estan armadas y en uso, y las tres restantes lo reran luego que se desembarquen sus piezas de la fragata "Orient." Las locomotoras son de gran poder. En la prueba que so hizo, con la denominada* ***El Conquistador,*** *se obtuvo un resultado muy favorable. Enganchados a la locomotora cinco carros con diez toneladas de rieles cada uno, hallabase el convoy, en estado de sufrir la prueba que la Comision deseaba ver realizada observando la subida del convoy por las mayores gradientes; mas tuvo quo acceder a los deseos del representante de la Empresa, consintiendo en que se agregase a ese peso el do doce toneladas, representado por un coche de segunda clase con los pasajeros que en el iban. Hizose pues la prueba con sesenta y dos toneladas de peso, sin contar con el de la locomotora y de los cinco carros, en vez de hacerla con cincuenta, que para este caso requiere la contrata, y al llegar al principio de un fuerte ascenso, cuyas gradientes son las maximas y sus curvas del menor numero de grados admisible; como que en las primeras, ya en curvas, ya en rectal, se alcanza al tres y cuatro por ciento (3 y 4 por 100), y en las segundas, a radios poco mayores que trescientos cincuenta y dos pies, limite de lo que so tolera; se tomo nota de la hora y desde ese momento se procedió a la prueba, quedando al fin convencida la Comision de que era extraordinaria la potencia de esa maquina al presenciar que en diez y nueve minutos, venció cinco millas y un quinto en aquella pendiente: de lo que se deduce, bajo el calculo de una proportion, que en vez de arrastrar la locomotora el peso neto de cincuenta toneladas de subida a razon de diez millas por hora, es capaz de conducir por la misma pendiente sesenta y dos toneladas, a razon de diez y seis millas y dos quintos do milla por hora.*" Ro.gers spec. sheet details provided to P. C. Dewhurst by ALCo (in1920s?) say d/w were 48".

| | | |
|---|---|---|
| **1 'El CONQUISTADOR'** | w/n (1547) | Later became *FCMyA/FCAyP* no. **1**, and then *FCS* no. **1**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Con seis ruedas acopladas y truque de cuatro ruedas adelante o sea tipo Ten wheeler. Cilindro de 18" de diametro y 26" de carrera. Ruedas motrices de 48" de diametro. En servicio de carga en la Division de Mollendo. Reconstruida totalmente con caldera nueva y puesta al servicio en Setiembre de 1893. Ha recorrido desde entonces 124,580 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1893, in '*carga*' service, weight of engine 38 tonnes and of tender 24 tonnes, pressure 160psi, condition at the time '*bueno*'. |
| **2 'El INCA'** | w/n (1560) | Later became *FCMyA/FCAyP* no. **2**, and then *FCS* no. **2**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Maquina tipo Ten wheeler cilindro de 18" X 26". Motrices de 48". En servicio de carga en la División Mollendo. Reconstruida con caldero nuevo y puesta al servicio en Abril de 1895. Ha recorrido 78,148 kilometros.*<br>1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1904, in '*carga*' service, weight of engine 47 tonnes and of tender 16 tonnes, pressure 180psi, condition at the time '*bueno*'. |
| **3 'HIJO del SOL'** | w/n (1561) | Later became *FCMyA/FCAyP* no. **3**, and then *FCS* no. **3**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler Cilindros de 18" X 26". Motrices de 48". En servicio de carga en la Division Mollendo. Reconstruida con caldero nuevo y servicio desde Agosto de 1892. Ha recorrido 157,420 kilómetros.* |

1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1892, in '*carga*' service, weight of engine 38 tonnes and of tender 24 tonnes, pressure 160psi, condition at the time '*bueno*'.

### *2-6-0 d/w 49", cyls. 18x24", built by Rogers in 1868*

Ordered by *FC Mejía y Arequipa* but diverted to *FC Arica a Tacna* to replace locos destroyed by *maremoto* in 1868.

( w/n (1569) )

( w/n (1570) )

Rogers order no. 628. Although it has been surmised that these engines did eventually arrive here after their work at Arica, there is no evidence to support this, unless they became the mysterious nos. **11** and **12**. Alternatively they may well have moved on to the Iquique and Pisagua railways which were perpetually short of motive power. See the Chilean intermediate gauge railways list in this series for more on this topic.

### *2-6-0 originally? later 4-6-0 d/w 49", cyls. 18x24", built by Baldwin in 1868*

Ordered by Arequipa & Mejia Railroad. BLW class (10-)30D no. 1. Spec. is in vol. 4 p 215. Brass name letters only sent out when no. **9** was completed, ditto the sandboxes.

**4 'La ESTRELLA'** w/n 1793 Later became *FCMyA/FCAyP* no. **4**, and then *FCS* no. **4**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler. Cilindros de 18" X26" Motrices de 48". En servicio de carga en la División Mollendo. Reconstruida con caldero nuevo y convertida del tipo Mogul. En servicio desde Setiembre de 1892. Ha recorrido 125588 kilómetros.*
1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1892, in '*carga*' service, weight of engine 36 tonnes and of tender 24 tonnes, pressure 160psi, condition at the time '*bueno*'.

### *2-6-0 d/w 49", cyls. 18x24", built by Rogers in 1869*

Ordered by ? [11, 1874A p100] says seven locos had been erected and were in use, the remaining three were still to be unloaded from the ship *Orient*.

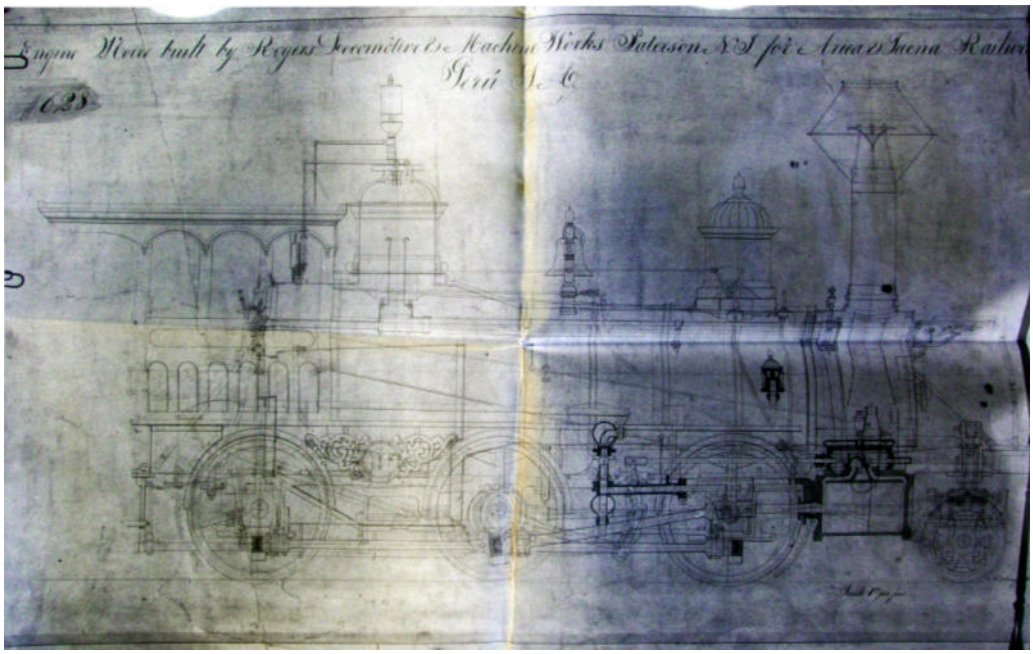
**5 'AREQUIPÁ'** w/n (1591) Later became *FCMyA/FCAyP* no. **5**, and then *FCS* no. **9**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 18"x26". Motrices de 48" En servicio de carga en la Division Puno. Reconstruida con caja de fuego nueva y en servicio desde Setiembre de 1890. Ha recorrido 145050 kilometros. Se esta construyendo un caldero nuevo para esta locomotora.*
1908 report by Costa y Laurent [1] re *FCS* no. **9** says: 2-6-0 built Rogers 1871, in '*carga*' service, weight of engine 35 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'.

**6 'MEJÍA'** w/n (1592) Later became *FCMyA/FCAyP* no. **6**, and then *FCS* no. **6**.
The 1898 Anales report [11, 1898 p270-4] says: *Maquina de 6 ruedas acopladas y truque de 2 ruedas ó sea tipo Mogul. Cilindros de 18"x26". Motrices de 48". Reconstruida con caja de fuego nueva y puesta al servicio en Mayo de 1892. Ha recorrido 131999 kilometros. A consecuencia de un descuido del maquinista que permitió bajar el nivel del agua en la caldera y que sin duda al apercibirse de esto, trató de restablecerlo, se produjo una ampoya en el cielo de la caja de fuego, con rajaduras, escapandose el vapor y quemando al maquinista y fogonero. Este accidente tuvo lugar en*

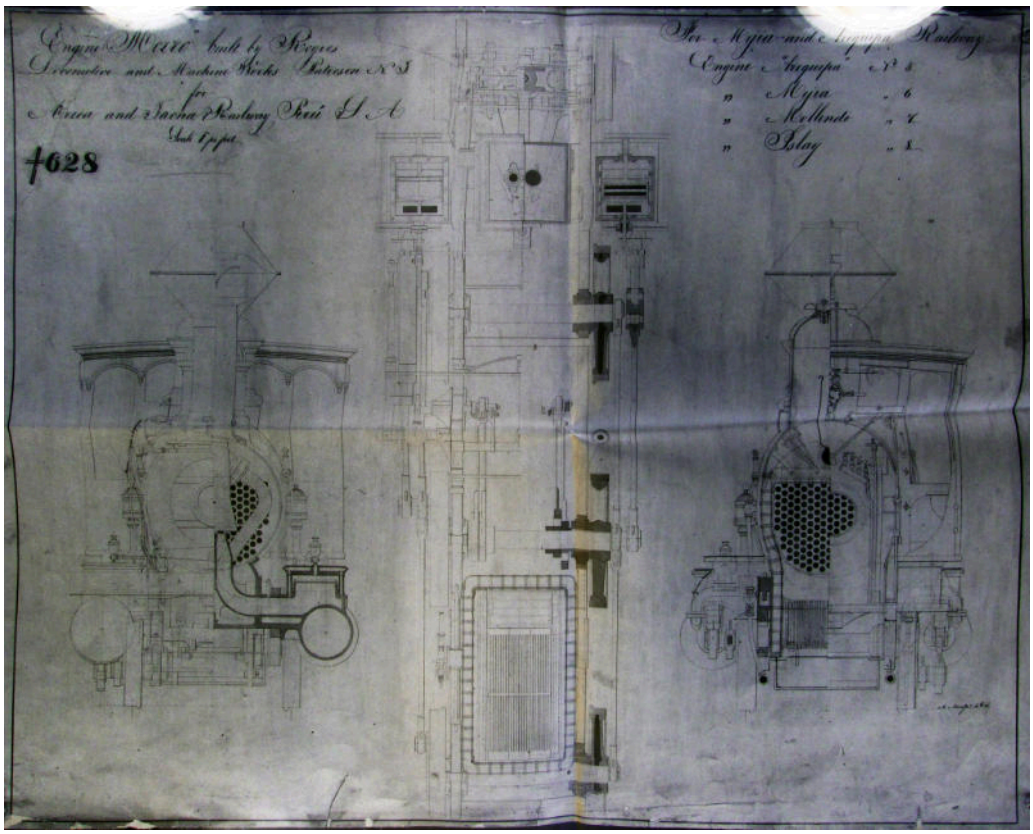
*Diciembre del año anterior, arrastrando la maquina un convoy de pasajeros de Arequipa a Yura, produciendo la consiguiente alarma. Esta maquina debe repararse.*
1908 report by Costa y Laurent [1] says: 2-6-0 built Arequipá 1900, in '*carga*' service, weight of engine 49 tonnes and of tender 16 tonnes, pressure 180psi, condition at the time '*bueno*'.

**7 'MOLLENDO'** w/n (1597) Later became *FCMyA/FCAyP* no. **7**, and then *FCS* no. **7**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 18"x24". Motrices de 48" Reconstruida con caja de fuego nueva y en servicio desde Setiembre de 1890. Ha recorrido 152735 kilometros. Está actualmente reparandose y se esta construyendo un caldero nuevo para reemplazar el actual.*
1908 report by Costa y Laurent [1] says: 2-6-0 built Arequipá 1903, in '*carga*' service, weight of engine 47 tonnes and of tender 16 tonnes, pressure 180psi, condition at the time '*bueno*'.

**8 'ISLAY'** w/n (1598) Later became *FCMyA/FCAyP* no. **8**, and then *FCS* no. **8**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindro de 18"x26" Motris de 48". En servicio de carga en la Division Puno. Reconstruida con caja de fuego nueva y en servicio desde Abril de 1892. Ha recorrido 125432 kilómetros.*
1908 report by Costa y Laurent [1] says: 2-6-0 built Arequipá 1904, in '*carga*' service, weight of engine 49 tonnes and of tender 16 tonnes, pressure 180psi, condition at the time '*bueno*'.

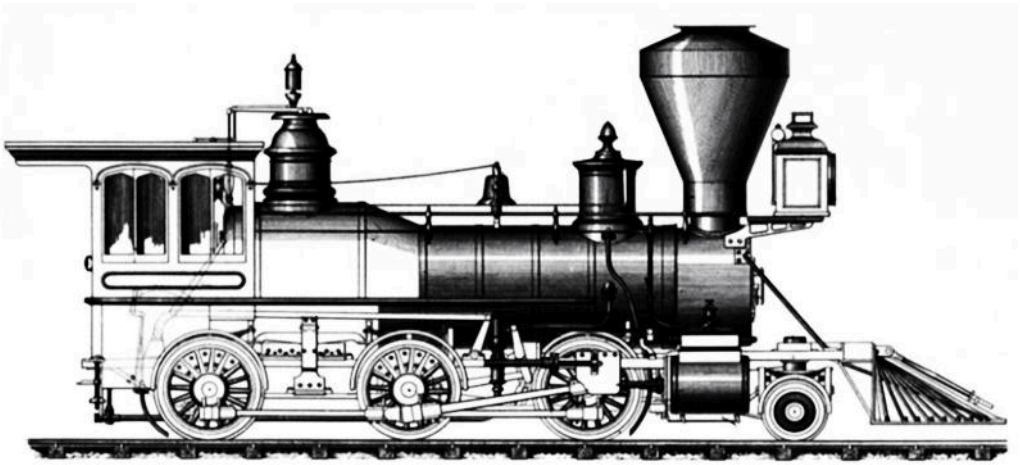


These Rogers drawings from the P. C. Dewhurst archive at the National Railway Museum in York, England, are in the form of blueprints, which have been tonally-inverted here for marginally-improved clarity. This pair were drawn for *FCAT* loco **'MORRO'** but as the lower drawing clearly shows were also applicable to this batch.




## A long-standing puzzle

The following side elevation engraving, copied from Weissenborn's 1871 work [26], supposedly shows Danforth Cooke locos built in that year for the *FC Mexía y Arequipá*. Leaving aside the minor detail that they were for the *FC Arequipá y Puno* rather than the *FCMyA*, they don't match those engines either in basic dimensions or in styling, and nor do they match any other Danforths of that era! Weissenborn gives the driving wheels as 42" and cylinders as 18x20", dimensions which do not correspond to any engines in Connelly's Cooke list (though there are a number of orders with no dimensions given).



This sketch side elevation, from the Facebook page of the group *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos*, supposedly shows one of the *FCMyA*'s first locos. The lack of a compensating beam ahead of the smokebox suggests that it is supposed to represent a Rogers engine rather than a Danforth. However, the cabside and the front buffer beam braces ending high on the smokebox differ from the Rogers moguls delivered to the *FCMyA* and shown in the drawings above.

### *4-6-0 d/w 49", cyls. 18x24", built by Baldwin in 1869*

Ordered by *FC Mejía y Arequipa*. BLW class (10-)30D no. 5. Spec. is in vol. 4 p 215.

| | | |
|---|---|---|
| **9 'TAMBO'** | w/n 1857 | Later became *FCMyA/FCAyP* no. **9**, and then *FC del Sur* no. **5**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler. Cilindro 18" x 26". Motrices de 48". En servicio de carga en la Division Mollendo. Reconstruida con caldero nuevo y convertida del tipo Mogul. En servicio desde Marzo de 1893. Ha recorrido 135925 kilometros.*<br>1908 report by Costa y Laurent [1] says of loco no. **5**: 4-6-0 built Arequipá 1893, in '*carga*' service, weight of engine 36 tonnes and of tender 24 tonnes, pressure 160psi, condition at the time '*bueno*'. |

### *2-6-0 d/w 56", cyls. 18x24", built by Rogers in 1869*

Ordered by *FC Mejía y Arequipa*. First one built for this line but sent to *FC Lima y Oroya* instead. Second one built for that railway as no. **2**[1] **'LIMA'** but diverted here to fill the gap. See note below re names, under heading The 'blessing of the locomotives'.

| | | |
|---|---|---|
| (**10**[1] **'VITOR' 'OROYA'**) | w/n (1639) | This was a 4-6-0. Became *LyO ? CLyO / FC Central* no. **1**[2] |
| **10**[2] **'VITOR'** | w/n (1813) | Later became *FCMyA/FCAyP* no. **10**, and then *FCS* no. **10**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindro 18"x26". Motrice de 48". En servicio de carga en la Division Puno. Reconstruida con caldero nuevo en Enero de 1897. Ha recorrido 19872 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 2-6-0 built Arequipá 1897, in '*carga*' service, weight of engine 35 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'. |

## The 'blessing of the locomotives'

On the 28th December 1870, as part of the ceremonies accompanying the opening of the railway, the Bishop of Arequipá blessed several of the new locos at Arequipá. These reportedly included **'El CONQUISTADOR'** (no. **1**), **'MOLLENDO'** (no. **7**), **'El INCA'** (no. **2**), **'TAMBO'** (no. **9**), **'MEJÍA'** (no. **6**), and **'AREQUIPÁ'** (no. **5**). Note that the report, which was in source [15] page 183-4, did not give the loco numbers, which may not have been allocated at that stage, but these have been added here for ease of identification. It was noted that locos **'HIJA del SOL'** (*sic*) (no. **3**), **'ESTRELLA'** (no. **4**), and **'ISLAY'** (no. **8**) were not presented, perhaps because they were under repair or otherwise unavailable for steaming, and that engines **'LIMA'** (no. **10**[2], later renamed **'VITOR'**) and **'La JOYA'** (no. **30**) were also in Arequipá at the time. This emphasises that no. **10**[2] must still have been named **'LIMA'** when it arrived there.

### *2-6-0 d/w 48", cyls. 17x26", built by ? in ?*

Ordered by ? These could well have been 2-6-0 d/w 48", cyls. 17"x22", built by Rogers in 1866 for the *FC de Copiapó* as their nos. **19** and **20**, Rogers numbers (1393) and (1396). These were sold to Arequipá in October 1871 [63]. Note that whilst the cylinder dimensions given here may not have been those applicable when the locos were built, if they had been then this rules out Rogers as the builder, for that company constructed no engines with 26" cylinder stroke until 1887. In the case of Baldwin 1881 saw the first 26" cylinders.

| | | |
|---|---|---|
| **11 'TINGO'** | w/n ? | Later became *FCMyA/FCAyP* no. **11**, and then *FCS* no. **11**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindro de 17"x26". Motrices de 48" Reconstruida con caldero nuevo y en servicio desde Enero de 1891. Ha recorrido 93512* |

*kilómetros. Esti actualmente en reparation.*
1908 report by Costa y Laurent [1] says: 2-6-0 built Arequipá 1901, in '*carga*' service, weight of engine 36 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'.

**12 'ENSENADA'** w/n ? Later became *FCMyA/FCAyP* no. **12**, and then *FCS* no. **12**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindro de 17"x26". Motrices de 48". En servicio de carga en la Division Puno. Reconstruida con caldero nuevo y en servicio desde Setiembre de 1891. Ha recorrido 42050 kilometros.*
1908 report by Costa y Laurent [1] says: 2-6-0 built Arequipá 1902, in '*carga*' service, weight of engine 36 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'.

### *4-6-0 d/w 48"?, cyls. 18x24"?, built by ? in ?*

Ordered by ? Driving wheel diameter and cylinder dimension suggest possibly by Baldwin.

**13 'TREVITHICK'** w/n ? Later became *FCMyA/FCAyP* no. **13**, and then *FCS* no. **13**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler. Cilindro de 18"x24". Motrices de 48". En servicio de carga en Division Mollendo. Construida en Arequipa y en servicio desde Octubre de 1895. Ha recorrido 60042 kilómetros.*
1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1895, in '*carga*' service, weight of engine 38 tonnes and of tender 24 tonnes, pressure 180psi, condition at the time '*bueno*'.

### *2-6-0 d/w 42", cyls. 18x20", built by ? in ?*

Ordered by ?

**14 'STEPHENSON'** w/n ? Later became *FCMyA/FCAyP* no. **14**, and then *FCS* no. **14**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindro de 18"x20". Motrices de 42". Necesita caldero nuevo y reparación general.*
1908 report by Costa y Laurent [1] says: 2-6-0 built Arequipá 1905, in '*carga*' service, weight of engine 35 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'.

### *0-6-0 d/w 42", cyls. 18x20", built by Baldwin in 1871*

Ordered by *FC Mejía y Arequipa*. BLW class 06-30D nos. 8 and 9. Spec. is in vol. 5 p250. Smoke stack not to exceed 15 ft. from rail. Seemingly both later rebuilt with front pony truck or bogie, see notes for each engine. The name has sometimes been quoted as 'AMAZONA' (and that is how it was written in the BLW register book) but Amazonas is the name of a Peruvian *departamento* and it seems likely that this was the engine's name.

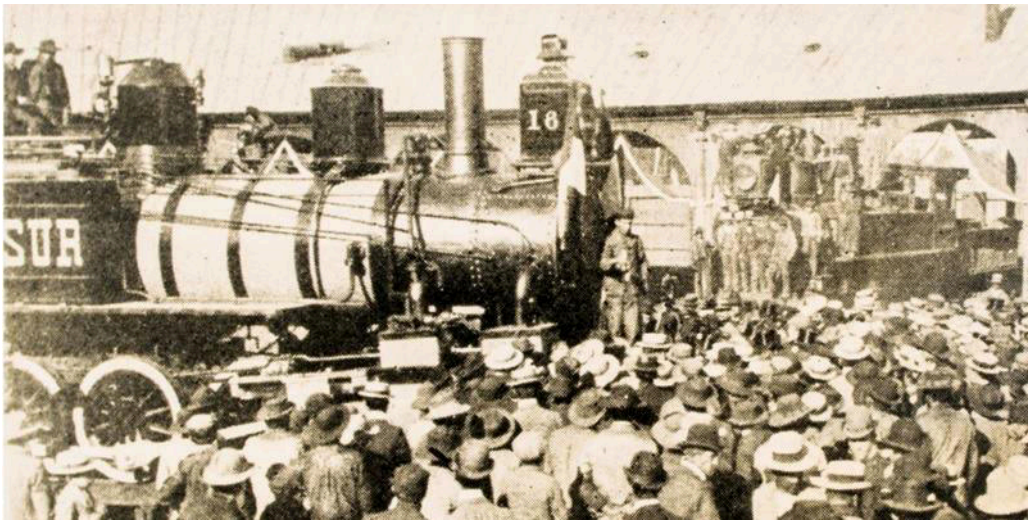
**15 'AMAZONAS'** w/n 2528 Later became *FCMyA/FCAyP* no. **15**, and then *FCS* no. **15**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler. Cilindro de 18"x24". Motrices de 48". En construccion. El caldero nuevo esta listo.*
1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1899, in '*carga*' service, weight of engine 47 tonnes and of tender 16 tonnes, pressure 180psi, condition at the time '*bueno*'.

**16 'TIERRA CALIENTE'** w/n 2533 Later became *FCMyA/FCAyP* no. **16**, and then *FCS* no. **16**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul.*

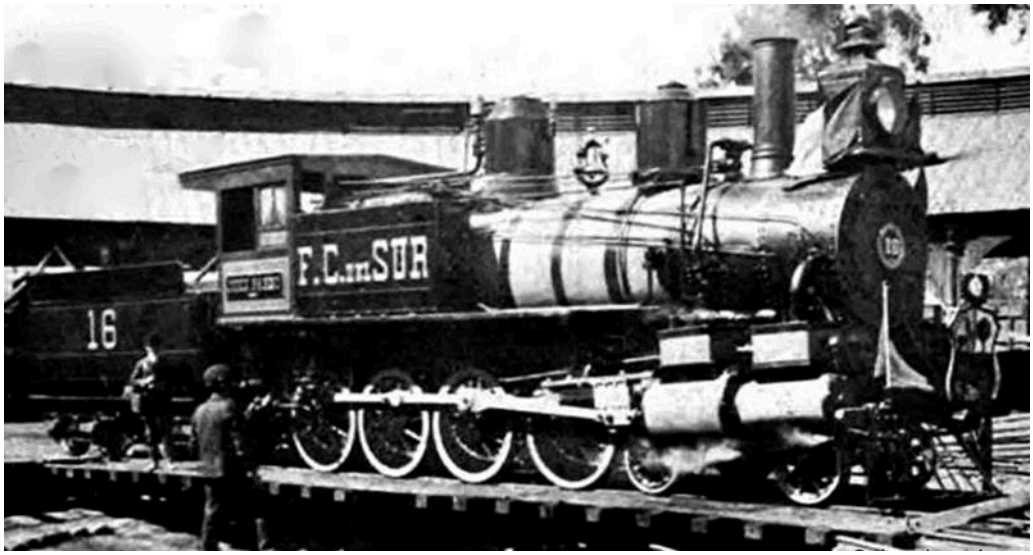
*Cilindro de 18"x24". Motrices de 42". Necesita caldero nuevo y reparacion general.*

1905 rebuilt as a tandem compound 4-8-0, and seemingly renamed for a while as **'JOSÉ PARDO'**. See photos below. The design would appear to owe much to that of Atchison, Topeka and Santa Fé Railway no. 999, a 2-8-0 designed by John Player that was outshopped in 1898. The wide distancing of the high and low pressure valve chests and the greatly-extended smokebox are particularly reminiscent of that design. Sr. José Pardo was a Peruvian politician who served the country's president from 1904-1908 and 1915-1919.

1908 report by Costa y Laurent [1] says: 4-8-0 built Arequipá 1905, in '*carga*' service, weight of engine 78 tonnes and of tender 30 tonnes, pressure 180psi, condition at the time '*bueno*'.




This image was found captioned as *"Bendición de la Locomotora "José Pardo"*, 1906 Lima", but that location is unlikely. The word 'SUR' on the loco to the left, and the improvised-looking domes, suggest that this might be the unveiling of a newly-rebuilt engine at the Arequipá shops of the *FC del Sur*. *FCS* no. **16 'TIERRA CALIENTE'** had been a Baldwin 0-6-0 but was reconstructed as a 4-8-0 there in 1905. Points of interest, apart from the domes, include the apparent side tanks, what appear to be tandem compound valve chests, and a rivetted smokebox extension. Additionally, do not miss what appears to be a substantial tank-tender loco in the right background. NB don José Pardo first became President of Peru in 1904. If this engine was indeed (re-)named for him, then 1905-6 would have been a very likely date for that honour. However, source [1] in 1908 has engine no. **16** retaining its **'TIERRA CALIENTE'** name. Pardo left office in September 1908 and it is possible that the engine reverted to its original name at that point, though there are clues that the 1906 photo was actually created a year or two earlier than that in which case the puzzle is at present inexplicable..




This second photo of the rebuilt no. **16** confirms most of the suppositions in the caption above, but also proves that the name was indeed **'JOSÉ PARDO'**. The tanks were presumably for oil fuel, as they would have been too small to be much use if filled with water. From Sr. Abrill Talevera's *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos* page on Facebook.

### *2-4-4RT d/w 30", cyls. 11½x18", built by Baldwin in 1871*

Ordered by *FC Mejía y Arequipa*. BLW class 13½C nos. 1 and 2. Spec. is in vol. 5 p283. Diamond stack, not over 15' from rail. Names on raised white metal letters on cab sides. Russia iron jacket.

**17 'OCCIDENTAL'** w/n 2557 Later became *FCMyA/FCAyP* no. **17**, and then *FCS* no. **17**.
The 1898 Anales report [11, 1898 p270-4] says: *Locomotora con estanques y sin tender con 6 ruedas acopladas, un tanque de dos ruedas adelante y otro atras. Cilindros de 15 1/4"x20". Motrices de 42". En servicio en la estación de Arequipa. Construida en Arequipa y en servicio desde Julio de 1892. Ha recorrido 126120 kilómetros.*
1908 report by Costa y Laurent [1] says: 2-6-2 built Arequipá 1892, in '*cambios*' service, weight of engine 27 tonnes with no tender, pressure 180psi, condition at the time '*bueno*'.

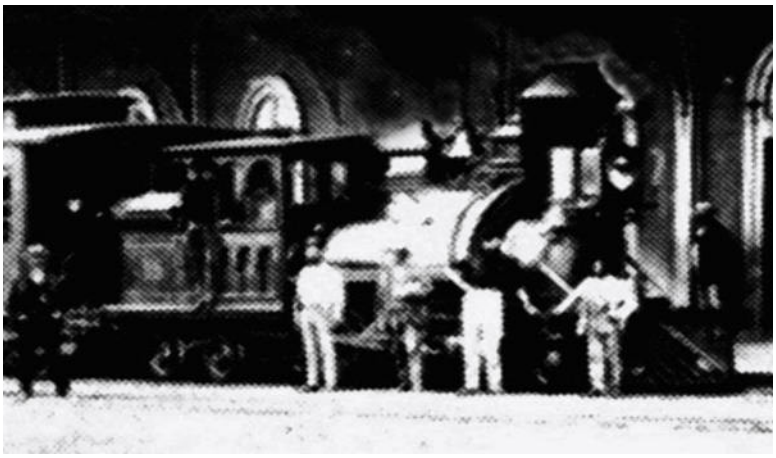
**18 'BUENA VISTA'** w/n 2553 Later became *FCMyA/FCAyP* no. **18**, and then *FCS* no. **18**.
The 1898 Anales report [11, 1898 p270-4] says: *Locomotora sin tender para pasajeros, con 4 ruedas acopladar, un tanque de 4 ruedas adelante y uno de dos ruedas atras. Cilindro de 15"x24". Motrices de 48", Construida en Arequipa, puesta al servico en Noviembre de 1893. Ha recorrido 125055 kilómetros y esta actualmente en reparacion.*
1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1904, in '*carga*' service, weight of engine 46 tonnes and of tender 30 tonnes, pressure 180psi, condition at the time '*bueno*'.

### *2-4-4T d/w 48"?, cyls. 18x24"?, built by ? in ?*

Ordered by ?

**19 'SAN LORENZO'** w/n ? Later became *FCMyA/FCAyP* no. **19**, and then *FCS* no. **19**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler. Cilindro de 18"x24". Motrices de 48". En construcción.*
1908 report by Costa y Laurent [1] says: 2-4-4 built Arequipá 1903,

in '*cambios*' service, weight of engine 37 tonnes with no tender, pressure 180psi, condition at the time '*bueno*'.



It is by no means certain that this 2-4-4ST on a train in Mollendo station was no. **19**. However, the number on the bunker side certainly begins with a 1, and there is no evidence that nos. **17** and **18** had saddle tanks.

### *4-6-0 d/w 48"?, cyls. 18x24"?, built by ? in ?*

Ordered by ?

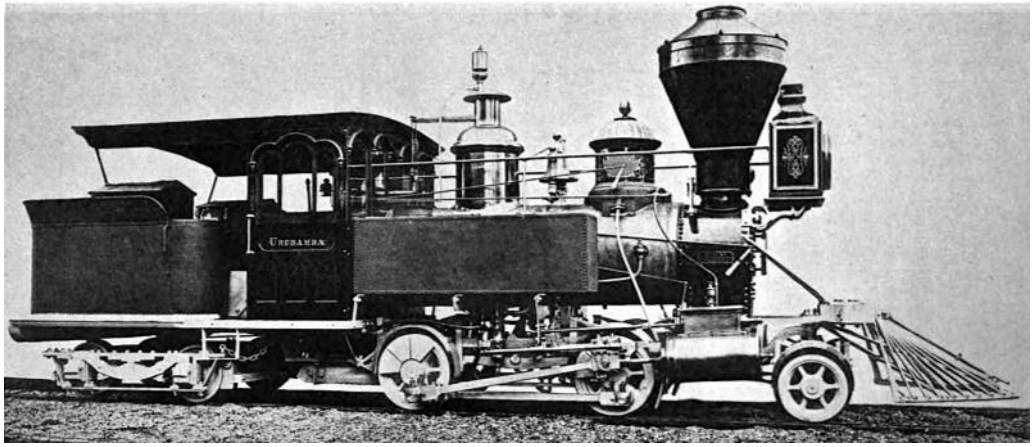
**20 'MARAÑON'** w/n ? Later became *FCMyA/FCAyP* no. **20**, and then *FCS* no. **20**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler. Cilindro de 18"x24". Motrices de 48". En servicio de carga en la Division Mollendo. Construida en Arequipa y puesta al servicio en Agosto de 1894. Ha recorrido 88,856 kilómetros.*
1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1894, in '*carga*' service, weight of engine 38 tonnes and of tender 24 tonnes, pressure 180psi, condition at the time '*bueno*'.

### *2-4-4T d/w 30¼", cyls. 11x18", built by Rogers in 1871*

Ordered by ?

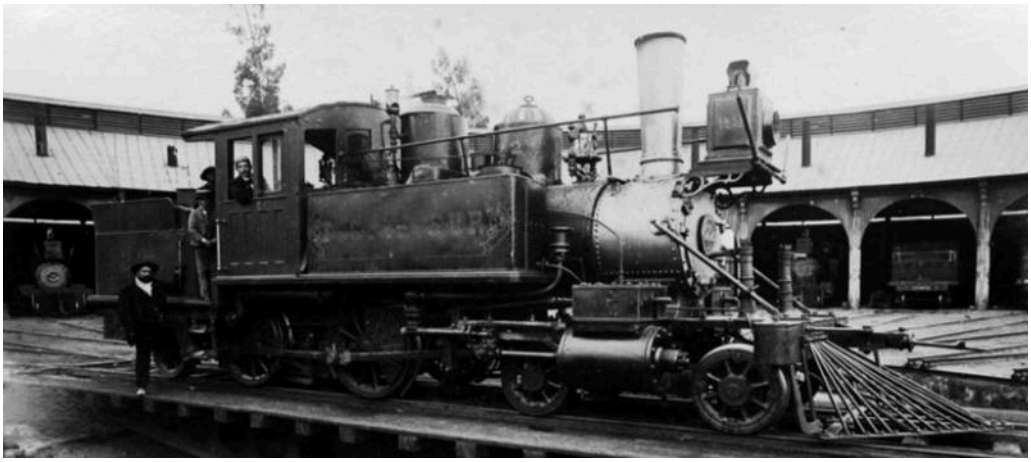
**21 'URUBAMBA'** w/n (1978) Later became *FCMyA/FCAyP* no. **21**, and then *FCS* no. **21**.
The 1898 Anales report [11, 1898 p270-4] says: *Locomotora sin tender para pasajeros con 4 ruedas acopladas, un tanque de 2 ruedas adelante y otro de 4 ruedas atras. Cilindros de 11½x20". Motrices de 36". Necesita caldero nuevo y reparación general.*
1908 report by Costa y Laurent [1] says: 2-6-0 built Arequipá 1897, in '*carga*' service, weight of engine 33 tonnes and of tender 24 tonnes, pressure 180psi, condition at the time '*bueno*'.

**22 'CARABAYA'** w/n (1979) Later became *FCMyA/FCAyP* no. **22**, and then *FCS* no. **22**.
The 1898 Anales report [11, 1898 p270-4] says: *Igual a la anterior. En servicio de pasajeros en la Division Mollendo. Construida en Arequipa y puesta al servicio en Diciembre de 1895. Ha recorrido 63,240 kilometros.*
1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1903, in '*carga*' service, weight of engine 35 tonnes and of tender 24 tonnes, pressure 180psi, condition at the time '*bueno*'.




*FCMyA* Rogers 2-4-4T no. **21 'URUBAMBA'**.

This photo, from Costa y Laurent's 1908 paper, supposedly shows one of the *FCMyA* Rogers 2-4-4Ts. However, it looks very different to the previous image in several respects: the rear end is rather shorter; the steam dome is different; and there would seem to be a pipe along the outside of the tank.



A seemingly much rebuilt no. **22**, now a 4-4-2T, seen here on the turntable of the Arequipá roundhouse. Photo from Sr. Abrill Talevera's *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos* page on Facebook.

### *0-4-0 d/w 30", cyls. 12x18", built by Baldwin in 1871*

Ordered by *FC Mejía y Arequipa*. BLW class 13-00C nos. 1 and 2. Spec. is in vol. 5 p262. Names to be on sides of cab on painted white metal letters. Cab to be in walnut varnished and polished. Smoke stack not to exceed 15 ft. from

rail.

| | | |
|---|---|---|
| **23 'MARIPOSA'** | w/n 2526 | Later became *FCMyA/FCAyP* no. **23**, and then *FCS* no. **23**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Con 4 ruedas acopladas para hacer cambios en las estaciones. Cilindros de 1 12¼"x20". Motrices de 42". Reconstruida con caja de fuego nueva y puesta al servicio en Noviembre de 1891. Ha recorrido 37,728 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 0-4-0 built Baldwin 1871, in '*cambios*' service, weight of engine 20 tonnes with no tender, pressure 125psi, condition at the time '*bueno*'. |
| **24 'TIGRECITO'** | w/n 2529 | Later became *FCMyA/FCAyP* no. **24**, and then *FCS* no. **24**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Locomotora igual a la anterior. En servicio en la estación de Mollendo. Reconstruida con caja de fuego nueva y puesta en servicio en Junio de 1890. Ha recorrido 56,218 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 0-4-0 built Baldwin 1871, in '*cambios*' service, weight of engine 20 tonnes with no tender, pressure 125psi, condition at the time '*bueno*'.<br>It begins to look as though this engine gained its later name of **'La MOLLENDINA'** during its working life rather than merely once it had been withdrawn and plinthed on display. |

### *2-6-0 d/w 42"?, cyls. 18x20"?, built by Danforth in 1871*

Ordered by ?

| | | |
|---|---|---|
| **25 'DON QUIJOTE'** | w/n ? | Later became *FCMyA/FCAyP* no. **25**, and then *FCS* no. **25**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 18"x20". Motrices de 42". Necesita caldero nuevo y reparación general.*<br>1908 report by Costa y Laurent [1] says: 2-6-0 built Danforth 1871, in '*carga*' service, weight of engine 32 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'. |
| **26 'SANCHO PANZA'** | w/n ? | Later became *FCMyA/FCAyP* no. **26**, and then *FCS* no. **26**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 18"x20" Motrices de 42". Necesita caldero nuevo y reparación general.*<br>1908 report by Costa y Laurent [1] says: 2-6-0 built Danforth 1871, in '*carga*' service, weight of engine 32 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'. |

### *0-4-4T d/w 36"?, cyls. 7¾x14"?, built by Rogers in 1871*

Ordered by *FC Arequipa y Puno* as their no. **9**.

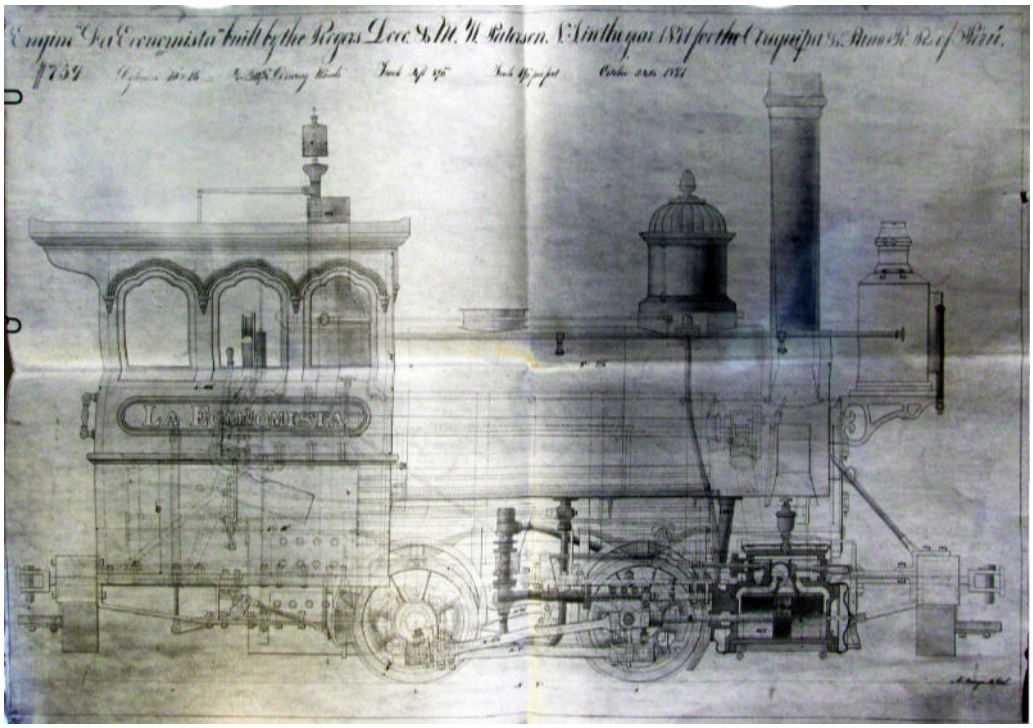
| | | |
|---|---|---|
| **27 'AREQUIPEÑA'** | w/n ? | Later became *FCMyA/FCAyP* no. **27**, rebuilt as a 4-2-4T, and then *FCS* no. **27**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Locomotora con cochesito con solo un par de ruedas motrices y dos truques de 4 ruedas. Cilindros 7¾"xI4". Motrices de 36". En servicio. Totalmente reconstruida y puesta en servicio en Noviembre de 1890. Ha recorrido 96,626 kilómetros.* |

1908 report by Costa y Laurent [1] says: 4-2-4 built Arequipá 1890, in '*especiales*' service, weight of engine 21 tonnes with no tender, pressure 140psi, condition at the time '*bueno*'.

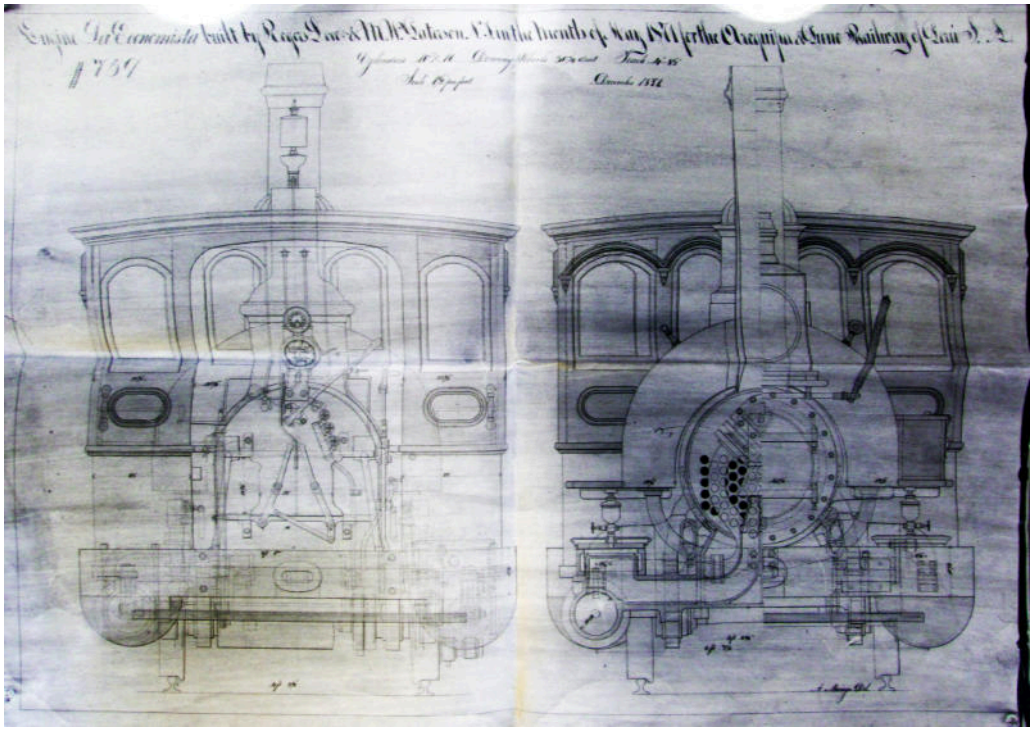
### *0-4-0T d/w 30", cyls. 10x16", built by Rogers in 1871*

Rogers order no. 759. Ordered by *FC Arequipa y Puno*, as a 'track-laying pony', but may have been delivered direct to the *FCMyA*.

**28 'ECONOMISTA'** w/n (1894) Later became *FCMyA/FCAyP* no. **28**, and then *FCS* no. **28**.
The 1898 Anales report [11, 1898 p270-4] says: *Maquina para cambios con 4 ruedas acopladas. Cilindro de 10"x16". Motrices de 30". En buen estado pero no en servicio.*
1908 report by Costa y Laurent [1] says: 0-4-0 built Rogers 1871, in '*cambios*' service, weight of engine 15 tonnes with no tender, pressure 140psi, condition at the time '*bueno*'.




These Rogers drawings from the P. C. Dewhurst archive at the National Railway Museum in York, England, are in the form of blueprints, which have been tonally-inverted here for clarity.



### *0-4-0T d/w 42"?, cyls. 10x16"?, built by Rogers? in 1871*

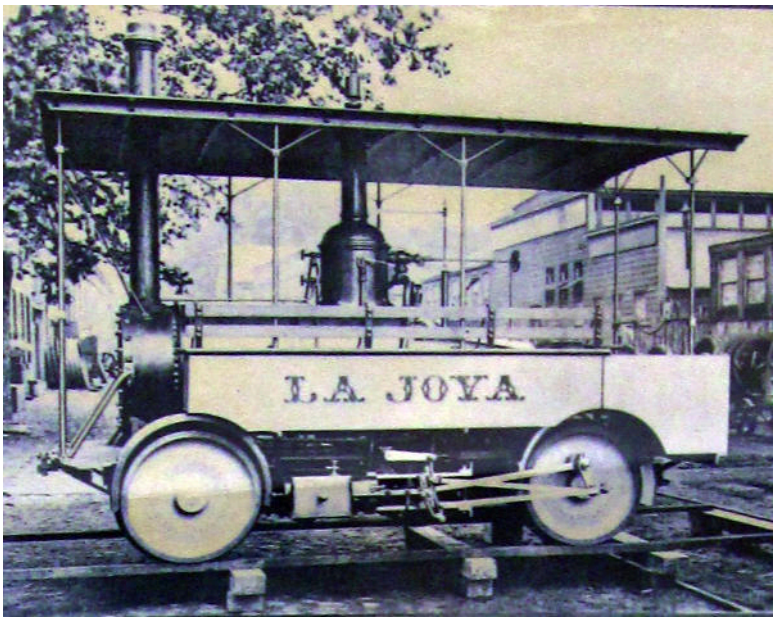
Ordered for ?

| | | |
|---|---|---|
| **29 'VINCOCAYA'** | w/n ? | Later became *FCMyA/FCAyP* no. **29**, and then *FCS* no. **29**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Maquina pequeña para pasajeros, con 4 ruedas acopladas. Cilindros de 10"x16" Motrices de 42". En mal estado.*<br>1908 report by Costa y Laurent [1] says: 4-4-0 built Arequipá 1876, in *especiales* service, weight of engine 17 tonnes and of tender 24 tonnes, pressure 125psi, condition at the time '*malo*'. |

### *2-2-0T d/w 30", cyls. 5x12", built by Rogers in 1869*

Rogers order no. 641 along with similar **'CABALLITO'** for the *FC Lima y Huacho*. Ordered by ?

| | | |
|---|---|---|
| **30 'La JOYA'** | w/n (1629) | Later became *FCMyA/FCAyP* no. **30**, and then *FCS* no. **30**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Maquina con cochesito con solo 1 par de ruedas motrices. Cilindros de 7¾"x14". Motrices de 36". Construida en Arequipa, puesta at servicio en Febrero de 1892. Ha recorrido 24,621 kilometros. Actualmente esta fuera de servicio por tener la caja de fuego en mal estado.*<br>1908 report by Costa y Laurent [1] says: 2-2-0 built Arequipá 1892, in 'especiales' service, weight of engine 14 tonnes with no tender, pressure 140psi, condition at the time '*bueno*'. |




**'La JOYA'** prior to its departure from the Rogers works.

Probably the same machine, now with a revised cab,
a bigger boiler, and apparently with slightly longer tanks.

## Railway and locomotives later absorbed into the FC del Sur

The locos listed above passed to the *FCS* in 18??, retaining their original numbers.

It needs to be noted that many of these early locomotives were rebuilt at Arequipá works during the 1890s, often with major changes to wheel arrangement, driving wheel diameter and cylinder sizes. Thus the dimensions mentioned in italics from the *anales* reports of that period tend not to be a good guide to an engine's original appearance. In fact some of the changes were so radical, eg. from 0-6-0 to 4-8-0 or from 2-4-4RT to 4-6-0, that it seems likely that only the number and name were transferred to the new engine. Nevertheless, the identities will be regarded as continuing until any different information has been confirmed.

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## 13.4.2 *El FC Arequipá y Puno*

***Regiónes de Arequipá y Puno***

**1869-1872**

### Background

Standard gauge.

### The original proposed locomotives

Source [20] from 1870 states that the following were to be ordered:
*Diez y seis locomotoras americanas de primera clase para carbon bituminoso (Bisles Safety Truck) y con los últimos adelantos, y capaces de arrastrar de subida cincuenta toneladas netas de carga, es decir fuera del peso propio, y el de los carros y á razon de [16 k.] diez y seis kilómetros por hora, sobro gradientes de 4 % combinadas con curvas de [300 m.) trescientos metros de radio.* [Page 45-6, digital page 394]. This does indeed match almost perfectly those locos listed below, though no. **9** of the sixteen engines ordered was an 0-4-4T 'passenger pony' rather than a mogul like all the others.

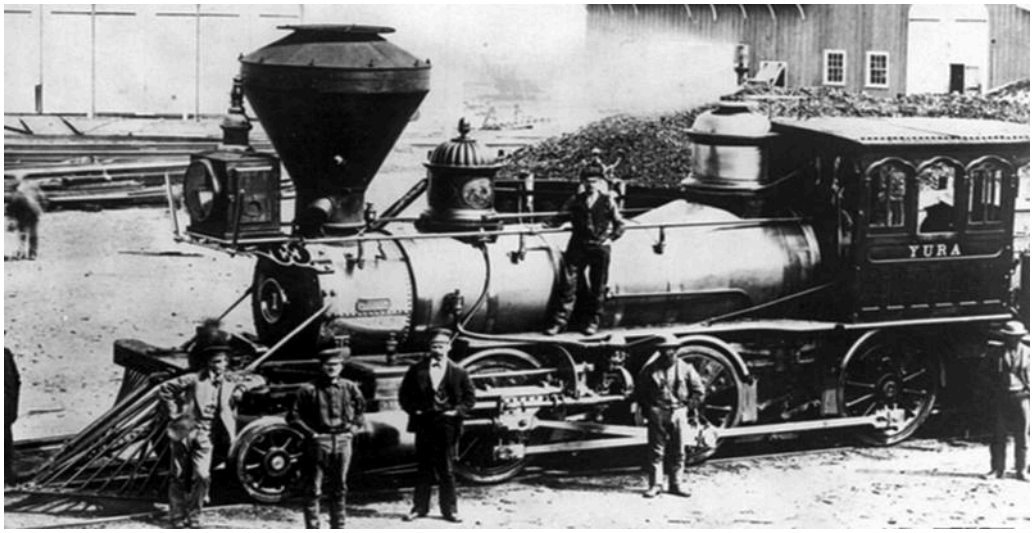
### *2-6-0 d/w 48"?, cyls. 18x24", built by Danforth? in 1871*

Rogers order no. 738. Ordered by *FC Mejía y Arequipa*? according to Connelly and others, but nos. **3** and **4** had probably been built for the *FC Lima y Oroya*. [5] says first two ordered via Henry Meiggs. The usual lists conflict over these engines. The Danforth Cooke unattributed lists have nos. 750-755 as *FCAyP* **1-4** and **7-8** though neither Rumary nor Connolly confirm this in their Cooke lists. However, the Rogers lists of Lehmuth and Connolly show nos. **1** and **2** as being by that builder (their nos. (1863) and (1867)).

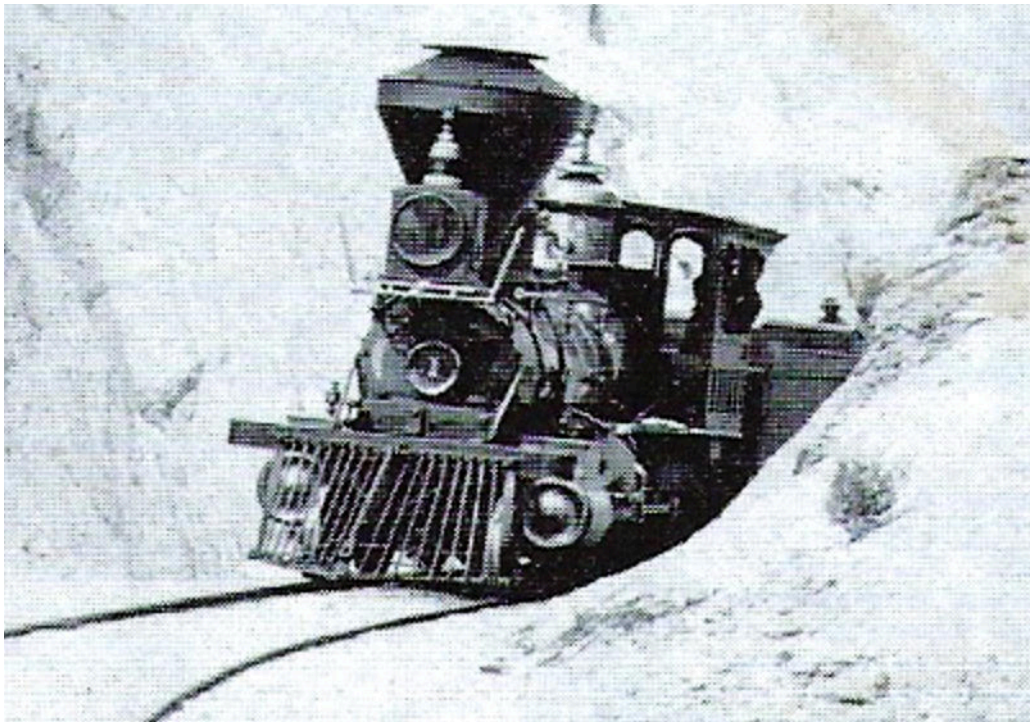
| | | |
|---|---|---|
| **1 'YURA'**<br>Later **31**. | w/n 750 | Later became *FCMyA/FCAyP* no. **31**, and then *FCS* no. **31**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler. Cilindros de 18"x26". Motrices de 48". En reconstruccion con caldero nuevo. Esta máquina ha sido del tipo Mogul.*<br>1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1898, in '*carga*' service, weight of engine 47 tonnes and of tender 16 tonnes, pressure 180psi, condition at the time '*bueno*'. |
| **2 'UYUPAMPA'**<br>Later **32**. | w/n 751 | Later became *FCMyA/FCAyP* no. **32**, and then *FCS* no. **32**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler. Cilindros de 18"x26" Motrices de 48". En servicio de carga en la Division Mollendo. Reconstruida con caldero nuevo y convertida del tipo «Mogul». Fue puesta al servicio en Mayo de 1897 y ha recorrido 14638 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1897, in '*carga*' service, weight of engine 47 tonnes and of tender 16 tonnes, pressure 180psi, condition at the time '*bueno*'. |
| **3 'CAÑAGUAS'**<br>Later **33**. | w/n 752 | Later became *FCMyA/FCAyP* no. **33**, and then *FCS* no. **33**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Locomotora tipo American. Con 4 ruedas acopladas y tanque delantero de 4 ruedas. Cilindros de 17"x24". Motrices de 48". En servicio de pasajeros en la Division Puno. Reconstruida con caja de fuego nueva en Noviembre de 1891. Ha recorrido 172,190 kilometros. Se esta construyendo un caldero nuevo para esta locomotora.*<br>1908 report by Costa y Laurent [1] says: 4-4-0 built Arequipá 1898, in '*pasajeros*' service, weight of engine 35 tonnes and of tender 24 tonnes, pressure 180psi, condition at the time '*bueno*'. |

| | | |
|---|---|---|
| **4 'COLCA'**<br>Later **34**. | w/n 753 | Later became *FCMyA/FCAyP* no. **34**, and then *FCS* no. **34**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo American. Cilindros de 18"x24". Motrices de 48". En servicio de pasajeros en la Division Puno. Reconstruida con caja de fuego nueva y puesta al servicio en Setiembre de 1892. Ha recorrido 138,654 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 4-4-0 built Arequipá 1871, in '*pasajeros*' service, weight of engine 35 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'. |

*FCAyP* Danforth Cooke mogul no. **1 'YURA'** in a photo by Herr Alphons Stúbel. Distinguishing features of these Danforth engines, when compared to the Rogers 1872 moguls, are the smokebox number-plates, the bolted-on multi-part wheel balance weights, the suspension cross-compensating beam in front of the smokebox, and the larger diameter of the steam dome. Source [14].




This photo found by Elard Wilfredo Abrill Talavera of Arequipá, also shows no. **1 'YURA'** and from the other side.



No. **1** at Mundo Nuevo.

A final image of no. **1 'YURA'**, taken by Alphons Stübel at Vincocaya station. The suspension cross-compensating beam characteristic of these Danforth engines (though not of most others as far as can be seen from an internet search) can clearly be seen below the smokebox number-plate. The smokebox door must have been of small diameter if on opening it were not to foul the compensating beam and its centre pivot; however, none of these photos shows the door clearly.

### *2-6-0 d/w 49", cyls. 17x22", built by Baldwin in 1871*

Ordered by *FC Arequipa y Puno*. BLW class (2-)? 25½D nos. 4 and 5. Spec. is in vol. 5 p234. Diamond stack not to higher than 14½ft. from rail. Identities **3 'CANAGUAS'** and **4 'COLCA'** had been crossed out on the spec. sheet and replaced with details as below.

**5 'MARAVILLAS'** w/n 2525 Later became *FCMyA/FCAyP* no. **35**, and then *FCS* no. **35**.

Later **35**. The 1898 Anales report [11, 1898 p270-4] says: *Tipo Ten wheeler. Cilindros*

*de 19"x26" Motrices de 48". Construida en Arequipa, ha sido recien puesta al servicio de carga en la Division Mollendo.*
1908 report by Costa y Laurent [1] says: 4-8-0 built Arequipá 1904, in '*carga*' service, weight of engine 64 tonnes and of tender 24 tonnes, pressure 180psi, condition at the time '*bueno*'.

**6 'SUMBAY'** w/n 2527 Later became *FCMyA/FCAyP* no. **36**, and then *FCS* no. **36**.
Later **36**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo American. Cilindros de 17"x24". Motrices de 48". Reconstruida con caldero nuevo y convertida del tipo Mogul». Acaba de terminarse y esta destinada al servicio de pasajeros en la Division Puno.*
1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1897, in '*pasajeros*' service, weight of engine 35 tonnes and of tender 24 tonnes, pressure 180psi, condition at the time '*bueno*'.

### *2-6-0 d/w ?, cyls. 18x24", built by Danforth in 1871*

Ordered by *FC Mejía y Arequipa*? according to Connolly and others, but no. **7** had possibly been built for the *FC Lima y Oroya*. Note that the 1908 report [1] gives these two as built by Rogers rather than Danforth.

**7 'TAYATAYA'** w/n 754 Later became *FCMyA/FCAyP* no. **37**, and then *FCS* no. **37**.
Later **37**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 18"x26". Motrices de 44". Reconstruida con caja de fuego nueva y puesta en servicio en Julio de 1891. Ha recorrido 152,807 kilómetros. Esta actualmente en reparacion y se esta construyendo un caldero nuevo para esta maquina.*
1908 report by Costa y Laurent [1] says: 4-6-0 built Rogers 1871, in '*carga*' service, weight of engine 35 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'.

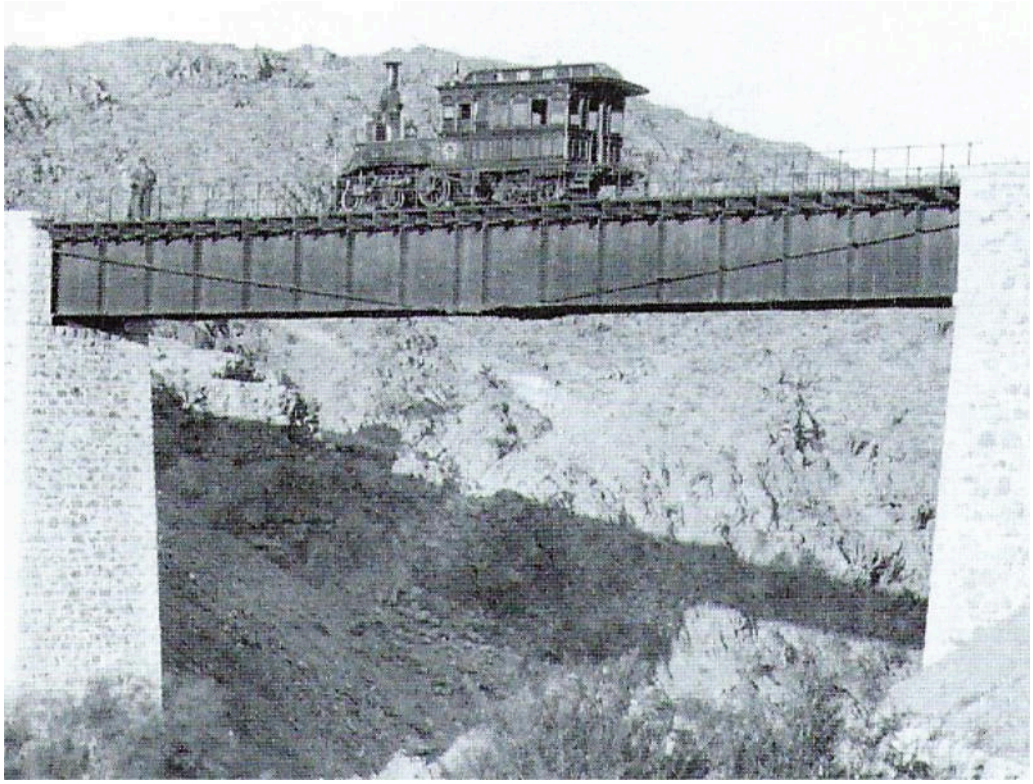
**8 'TITICACA'** w/n 755 Later became *FCMyA/FCAyP* no. **38**, and then *FCS* no. **38**.
Later **38**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 18"x26". Motrices de 48". En servicio de carga en la Division Puno. Reconstruida con caja de fuego nueva. Se terminó en Enero de 1891. Ha recorrido 176,839 kilometros.*
1908 report by Costa y Laurent [1] says: 4-6-0 built Rogers 1871, in '*carga*' service, weight of engine 35 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'.

### *0-4-4T d/w 36", cyls. 7x14", built by Rogers in 1871*

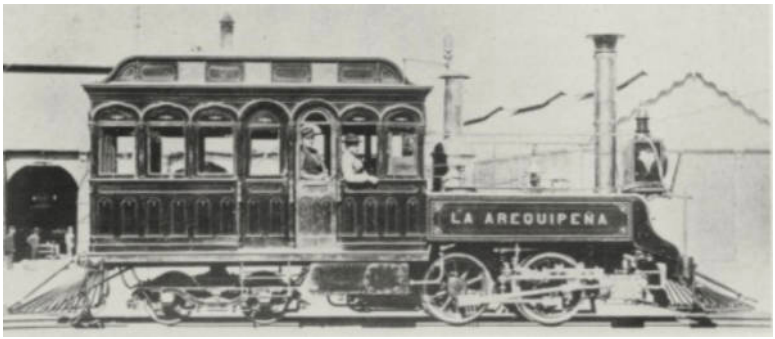
Ordered by *FC Arequipa y Puno*. 'Passenger pony'.

**9[1] 'EXPLORADOR'** w/n (1899) Ordered initially as **'HATANCOLLA'** but delivered as **'EXPLORADOR'**, according to Bob Lehrmuth's Rogers list, then became *FCMyA/FCAyP* no. **27 'La AREQUIPEÑA'** (certainly before 1887 when this loco was mentioned as having run an express round trip from Arequipá to Puno on government business [10 p215]. Later rebuilt as 4-2-4T? Then became *FCS* no. **27**.
See under no. **27** for later history.


A Rogers builders pic of **'EXPLORADOR'** before delivery.



**'La AREQUIPEÑA'** ex **'EXPLORADOR'** during its period as a 4-2-4T.




The same machine after it had been re-bodied, now named **'La AREQUIPEÑA'**. Whilst the bodywork looks similar to that in the photo above, the open rear platform has disappeared.

### *2-6-0 d/w 45", cyls. 17x22", built by Rogers in 1872*

Ordered by *FC Arequipa y Puno*.

**9**[2] **'HATANCOLLA'** w/n (2044?) Later **39**?

Later became *FCMyA/FCAyP* no. **39**, and probably then *FCS* no **39**.
Does not appear in the 1898 Anales report [11, 1898 p270-4].
By 1908 was named **'SANTO DOMINGO'**.

| | | |
|---|---|---|
| | | 1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1899, in '*carga*' service, weight of engine 47 tonnes and of tender 16 tonnes, pressure 180psi, condition at the time '*bueno*'. |
| **10 'PUNO'**<br>Later **40**. | w/n (2047) | Later became *FCMyA/FCAyP* no. **40**, and then *FCS* no. **40**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 17"x24". Motrices de 44". En servicio de carga y pasajeros en la Division Cuzco. Reconstruida con caja de fuego nueva. Se terminó en Setiembre de 1893. Ha recorrido 73,148 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 2-6-0 built Rogers 1872, in '*carga*' service, weight of engine 33 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'. |
| **11 'HUALLATA'**<br>Later **41**. | w/n (2048) | Later became *FCMyA/FCAyP* no. **41**, and then *FCS* no. **41**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 18"x24". Motrices de 48". En servicio de carga en la División Puno. Reconstruida con caja de fuego nueva. Se terminó en Diciembre de 1893. Ha recorrido 84,518 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 2-6-0 built Rogers 1872, in '*carga*' service, weight of engine 33 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'. |
| **12 'JLPA'**<br>Later **42**. | w/n (2049) | Later became *FCMyA/FCAyP* no. **42**, and then *FCS* no. **42**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 17"x24". Motrices de 44". En servicio de carga en la Division Puno. Reconstruida con caja de fuego nueva. se terminó en Febrero de 1891. Ha recorrido 58,758 kilómetros.* The name is often written as **'ILPA'** or **'JALPA'** but high resolution photos by Alphons Stübel show clearly that it was indeed spelt **'JLPA'**. There is a Cerro Ilpa roughly half-way between Lima and Huancavelica, and an estación Ilpa just north of Puno. The latter is the more likely inspiration for the name of an *FCAyP* loco, but it is not known if the original spelling of the locality was Jlpa.<br>1908 report by Costa y Laurent [1] says: 4-6-0 built Arequipá 1901, in '*carga*' service, weight of engine 54 tonnes and of tender 24 tonnes, pressure 180psi, condition at the time '*bueno*'. Name at that time spelt **'ILPA'**. |
| **13 'MISTI'**<br>Later **43**. | w/n (2051) | Later became *FCMyA/FCAyP* no. **43**, and then *FCS* no. **43**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 17"x24". Motrices de 44". En servicio de pasajeros y carga en la Division Cuzco. Reconstruida con caja de fuego nueva. Se terminó en Setiembre de 1893. Ha recorrido 55,143 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 2-6-0 built Rogers 1872, in '*carga*' service, weight of engine 33 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'. |
| **14 'JULIACA'**<br>Later **44**. | w/n (2073) | Later became *FCMyA/FCAyP* no. **44**, and then *FCS* no. **44**.<br>The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 17"x24". Motrices de 44". En servicio de pasajeros y carga en la Division Cuzco. Reconstruida con caja de fuego nueva. Se termino en Octubre de 1893. Ha recorrido 53,546 kilómetros.*<br>1908 report by Costa y Laurent [1] says: 2-6-0 built Rogers 1872, in '*carga*' service, weight of engine 33 tonnes and of tender 24 |

tonnes, pressure 140psi, condition at the time '*bueno*'.

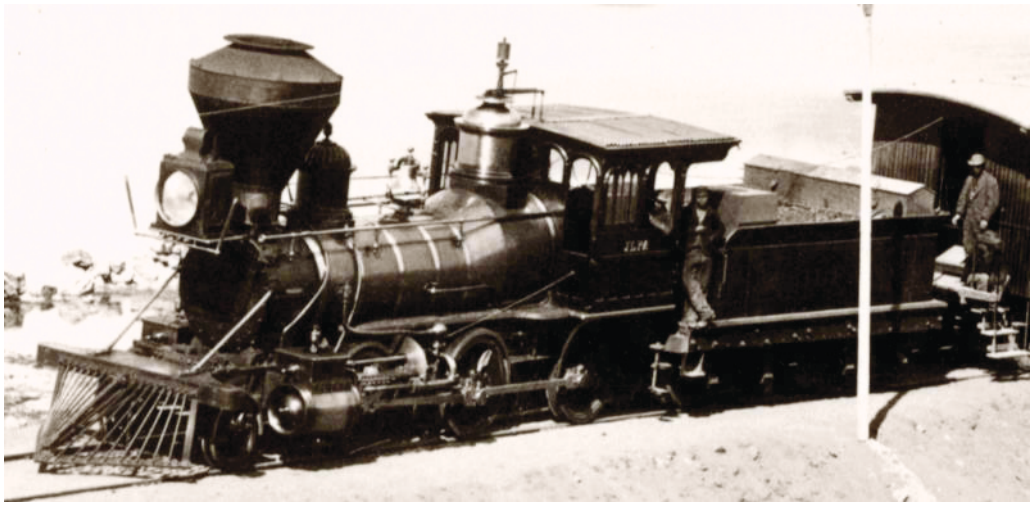
**15 'CABANILLAS'** w/n (2075)
Later **45**.

Later became *FCMyA/FCAyP* no. **45**, and then *FCS* no. **45**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindros de 17"x24". Motrices de 44". En servicio de lastre en la Division Puno. Reconstruida con caja de fuego nueva. Se terminó en Setiembre de 1892. Ha recorrido 73,139 kilómetros.*
1908 report by Costa y Laurent [1] says: 2-6-0 built Rogers 1872, in '*carga*' service, weight of engine 33 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'.

**16 'CHARCHANI'** w/n (2076)
Later **46**.

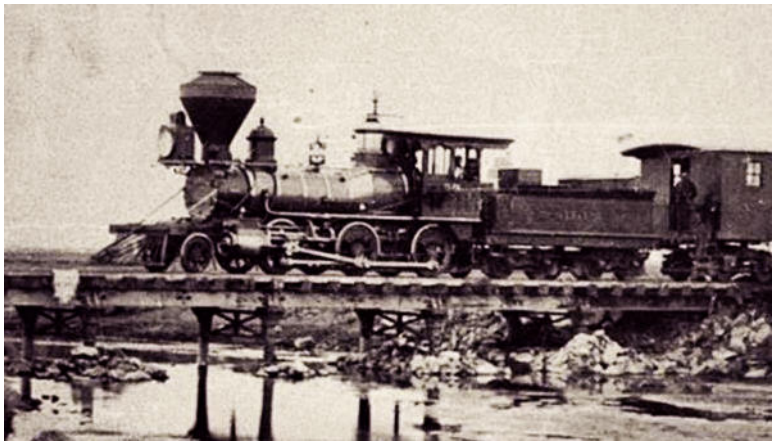
Later became *FCMyA/FCAyP* no. **46**, and then *FCS* no. **46**.
The 1898 Anales report [11, 1898 p270-4] says: *Tipo Mogul. Cilindro de 17"x24". Motrices de 44". En servicio en la Division Cuzco. Reconstruida con caja de fuego nueva. Se terminó en Agosto de 1892 y ha recorrido 90,249 kilómetros.*
1908 report by Costa y Laurent [1] says: 2-6-0 built Rogers 1872, in '*carga*' service, weight of engine 33 tonnes and of tender 24 tonnes, pressure 140psi, condition at the time '*bueno*'.

Another of the photos by Alphons Stübel, this time showing *FCAyP* Rogers mogul no. **11 'HUALLATA'**. Source [14].

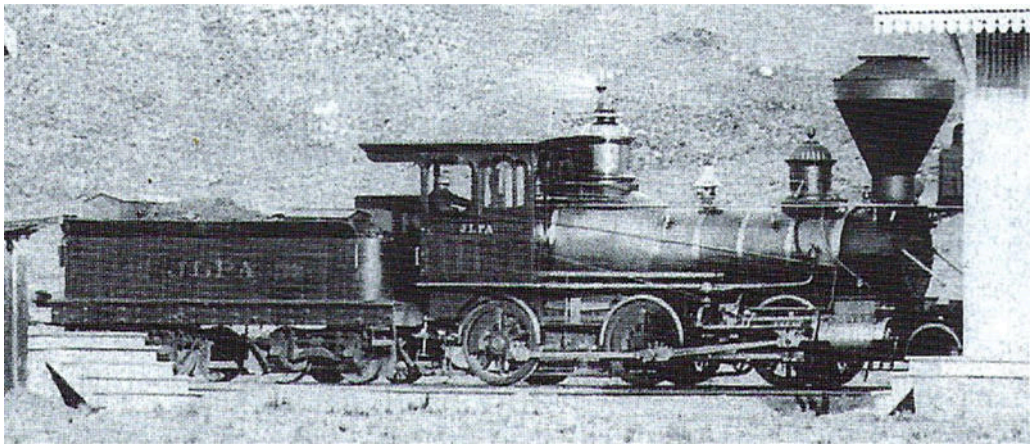


The image above shows Rogers mogul no. **12 'JLPA'**. This name has often been mis-spelt, but the two enlargements below show clearly that it was correct. Source [14].





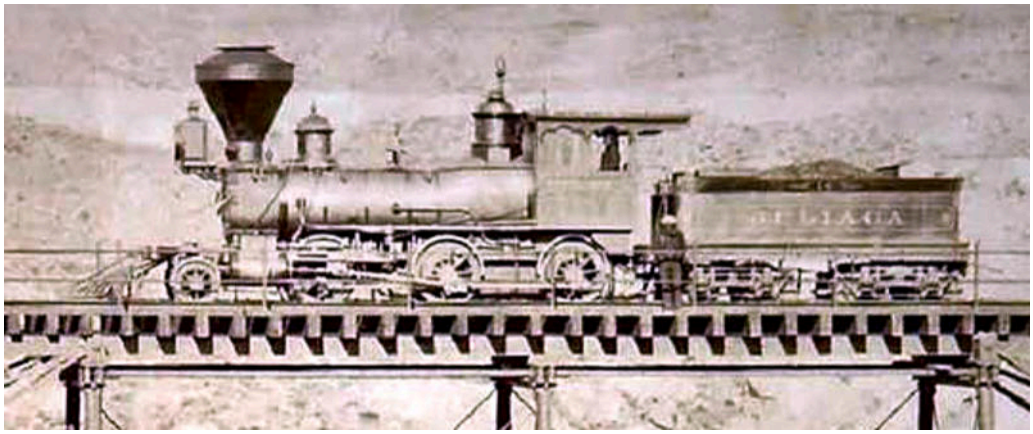
An unidentified Rogers 2-6-0 on the Río Illpa bridge between Juliaca and Puno. The engine might be no. **12 'JLPA'** as 'L' appears to be the second of four or five forming the name on the tender side. That would be very appropriate, as **'JLPA'** would seem to be an alternative spelling of Illpa.




Rogers 2-6-0 no. **14 'JLPA'**, this time from the right hand side.

It is quite likely that this photo and the one below show no. **11 'HUALLATA'**, as both images were taken by Herr Alphons Stübel out along the line. Herr Stübel clearly had permission to pose trains for his pictures, sometimes in spectacular locations. Two separate consists can be identified in his images, a van and a coach hauled by no. **12 'JLPA'**, and two bogie flats, a van and a coach pulled by no. **11 'HUALLATA'**. These two pictures show the second of those two trains.

Another Rogers mogul on the *FCAyP*, this one numbered **14 'JULIACA'**, and found by Sr. Abrill Talavera. Unusually for a Rogers on this railway it carries a smokebox number-plate.



No. **14 'JULIACA'** stands on the Sumbay viaduct.

## Railway and locomotives later absorbed into the *FC del Sur*

The locos listed above passed to the *FCS* in 18??, each with their original number increased by thirty.

It needs to be noted that many of these early locomotives were rebuilt at Arequipá works during the 1890s, often with major changes to wheel arrangement, driving wheel diameter and cylinder sizes. Thus the dimensions mentioned in italics from the *anales* reports of that period tend not to be a good guide to an engine's original appearance. In fact some of the changes were so radical, eg. from 0-6-0 to 4-8-0 or from 2-4-4RT to 4-6-0, that it seems likely that only the number and name were transferred to the new engine. Nevertheless, the identities will be regarded as continuing until any different information has been confirmed.

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# 13.4.3 *El FC del Sur*
# The Southern Railway

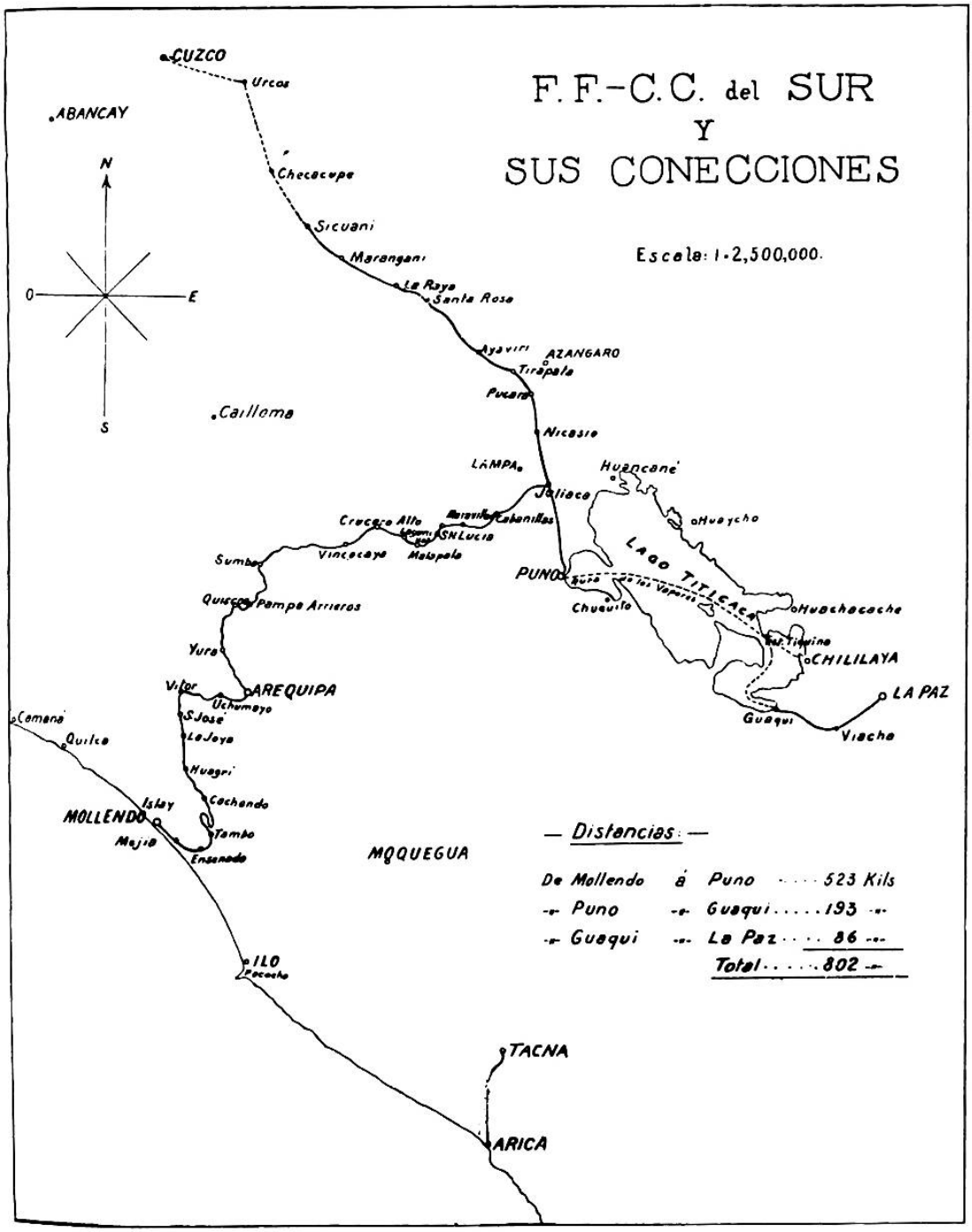
***Regiónes de Arequipá, Puno y Cusco***

**Government run 1890-1928**

**Peruvian Corporation operated 1928-1972**

## Background

Standard gauge. 940 km in length, the longest of all Peruvian railways. The section between Mollendo and Arequipá opened in 1871, followed by the route from Arequipá up to Puno in 1874. Henry Meiggs was the builder. The northern arm from Juliaca to Cuzco was begun in 1872 but subject to long delays. It was only completed in 1908 after the Peruvian Corporation had restarted the work in 1890. The corporation took over the operation of the whole railway in 1928.

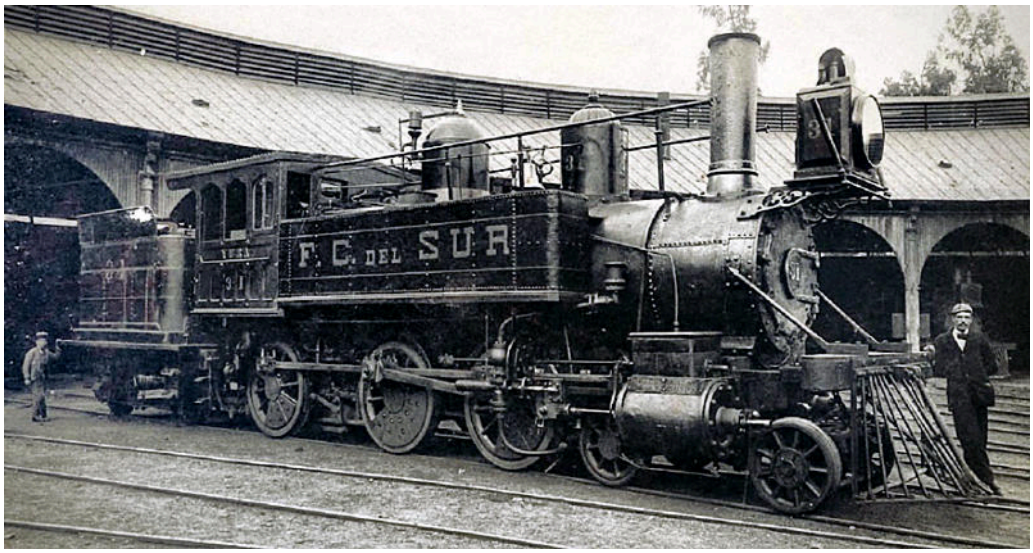


## 1 Pre-existing locomotives of the *FC Mejía y Arequipá* and *FC Arequipá y Puno*

The *FCMyA* engines, listed in section 13.4.1 above, came into the new combined fleet largely with their original numbers intact, whilst the *FCAyP* locos (section 13.4.2) were renumbered above them in the new combined list. To save space, rather than giving the full details of these early engines again, they are summarised in the table below. For full details, please see preceding sections on *FCMyA* and *FCAyP*. Much of this information came from Costa y Laurent in 1908, so details such as wheel arrangements might be different from the originals.

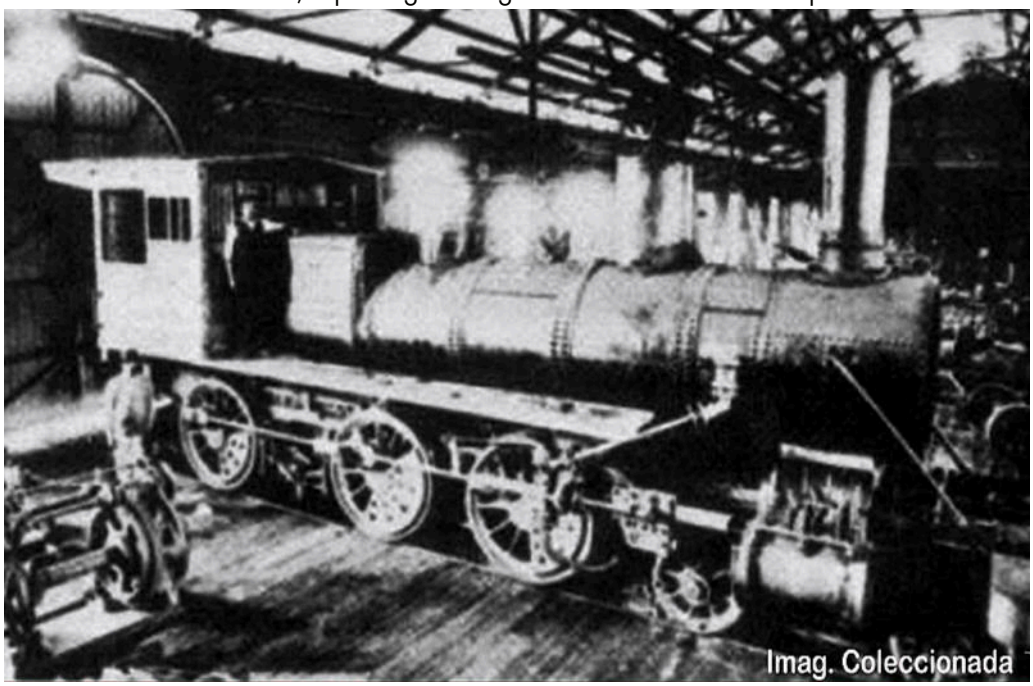
| **Original rly. & no.** | ***FCS* no. & name** | **Wheels** | **Builder** | **Works no.** | **Year built** | **Later history** |
|---|---|---|---|---|---|---|
| *FCMyA* **1** | **1 'El CONQUISTADOR'** | 4-6-0 | Rogers | (1547) | 1868 | 1893 rebuilt Arequipa. In use 1908. In service 1923 burning coal. |
| *FCMyA* **2** | **2 'El INCA'** | 4-6-0 | Rogers | (1560) | 1868 | 1904 rebuilt Arequipa. In use 1908. |
| *FCMyA* **3** | **3 'HIJO del SOL'** | 4-6-0 | Rogers | (1561) | 1868 | 1892 rebuilt Arequipa. In use 1908. In service 1923 burning coal. |
| *FCMyA* **4** | **4 'La ESTRELLA'** | 4-6-0 | Baldwin | 1794 | 1868 | 1892 rebuilt Arequipa. In use 1908. |
| *FCMyA* **5** | **5 'AREQUIPA'** later **9** | 2-6-0 | Rogers | (1591) | 1869 | In use 1908. |
| Possibly nos. **5** and **9** had merely swopped names. | | | | | | |
| *FCMyA* **6** | **6 'MEJIA'** | 2-6-0 | Rogers | (1592) | 1869 | 1900 rebuilt Arequipa. In use 1908. In service 1923 burning coal. |
| *FCMyA* **7** | **7 'MOLLENDO '** | 2-6-0 | Rogers | (1597) | 1869 | 1903 rebuilt Arequipa. In use 1908. |
| *FCMyA* **8** | **8 'ISLAY'** | 2-6-0 | Rogers | (1598) | 1869 | 1904 rebuilt Arequipa. In use 1908. |
| *FCMyA* **9** | **9** then **5 'TAMBO'** | 4-6-0 | Baldwin | 1857 | 1869 | 1893 rebuilt Arequipa. In use 1908. |
| *FCMyA* **10**[2] | **10 'VITOR'** | 2-6-0 | Rogers | (1813) | 1870 | 1897 rebuilt Arequipa. In use 1908. |
| *FCMyA* **11** | **11 'TINGO'** | 2-6-0 | ? | ? | ? | 1902 rebuilt Arequipa. In use 1908. |
| *FCMyA* **12** | **12 'ENSENADA'** | 2-6-0 | ? | ? | ? | 1902 rebuilt Arequipa. In use 1908. |
| *FCMyA* **13** | **13 'TREVITHICK'** | 4-6-0 | ? | ? | ? | 1895 rebuilt Arequipa. In use 1908. |
| *FCMyA* **14** | **14 'STEPHENSON'** | 2-6-0 | ? | ? | ? | 1895 rebuilt Arequipa. In use 1908. |
| *FCMyA* **15** | **15 'AMAZONAS'** | 0-6-0 | Baldwin | 2528 | 1871 | 1899 rebuilt Arequipa as 4-6-0. In use 1908. |
| *FCMyA* **16** | **16 'TIERRA CALIENTE'** | 0-6-0 | Baldwin | 2533 | 1871 | 1905 rebuilt Arequipa as a tandem compound 4-8-0. |
| *FCMyA* **17** | **17 'OCCIDENTAL'** | 2-4-4T | Baldwin | 2557 | 1871 | 1902 rebuilt Arequipa as 2-6-0. In use 1908. |
| *FCMyA* **18** | **18 'BUENA VISTA'** | 2-4-4T | Baldwin | 2553 | 1871 | 1904 rebuilt Arequipa as 4-6-0 In use 1908. |
| *FCMyA* **19** | **19 'SAN LORENZO'** | 2-4-4T | ? | ? | ? | 1903 rebuilt Arequipa. In use 1908. |
| *FCMyA* **20** | **20 'MARAÑÓN'** | 4-6-0 | ? | ? | ? | 1894 rebuilt Arequipa. In use 1908. |
| *FCMyA* **21** | **21 'URUBAMBA'** | 2-4-4T | Rogers | 1931 | 1871 | 1897 rebuilt Arequipa as 2-6-0. In use 1908. |
| *FCMyA* **22** | **22 'CARABAYA'** | 2-4-4T | Rogers | 1933 | 1871 | 1903 rebuilt Arequipa as 4-6-0. In use 1908. |
| *FCMyA* **23** | **23 'MARIPOSA'** | 0-4-0 | Baldwin | 2526 | 1871 | In use 1908. In service 1923 burning coal. |
| *FCMyA* **24** | **24 'TIGRECITO'** | 0-4-0 | Baldwin | 2529 | 1871 | In use 1908. In service 1923 burning coal. |
| *FCMyA* **25** | **25 'DON QUIJOTE'** | 2-6-0 | Danforth | ? | 1871 | In use 1908. |
| *FCMyA* **26** | **26 'SANCHO PANZA'** | 2-6-0 | Danforth | ? | 1871 | In use 1908. . |
| *FCAyP* **9** *FCMyA* **27** | **27 'AREQUIPEÑA'** | 0-4-4T | Rogers | ? | 1871 | 1890 rebuilt Arequipa as 4-2-4T. In |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | use 1908. |
| *FCMyA* – | **28 'ECONOMISTA'** | 0-4-0T | Rogers | (1894) | 1871 | In use 1908. |
| *FCMyA* **29** | **29 'VINCOCAYA'** | 4-4-0 | ? | ? | ? | 1876? rebuilt Arequipa. In use 1908 but in poor condition. |
| *FCMyA* **30** | **30 'La JOYA'** | 2-2-0T | Rogers | 1621 | 1869 | 1892 rebuilt Arequipa. In use 1908. |
| *FCAyP* **1** | **31 'YURA'** | 2-6-0 | Danforth | 750 | 1871 | 1898 rebuilt Arequipa as 4-6-0TT. In use 1908. |
| *FCAyP* **2** | **32 'UYUPAMPA'** | 2-6-0 | Danforth | 751 | 1871 | 1897 rebuilt Arequipa as 4-6-0. In use 1908. |
| *FCAyP* **3** | **33 'CAÑAGUAS'** | 2-6-0 | Danforth | 752 | 1871 | 1898 rebuilt Arequipa as 4-4-0. In use 1908. |
| *FCAyP* **4** | **34 'COLCA'** | 2-6-0 | Danforth | 753 | 1871 | ? rebuilt Arequipa as 4-4-0. In use 1908. In service 1923 burning coal. |
| *FCAyP* **5** | **35 'MARAVILLAS'** | 2-6-0 | Baldwin | 2525 | 1871 | 1904 rebuilt Arequipa as 4-8-0 . In use 1908. |
| *FCAyP* **6** | **36 'SUMBAY'** | 2-6-0 | Baldwin | 2527 | 1871 | 1897 rebuilt Arequipa as 4-6-0. In use 1908. |
| *FCAyP* **7** | **37 'TAYATAYA'** | 2-6-0 | Danforth | 754 | 1871 | In use 1908. In service 1923 burning coal. |
| *FCAyP* **8** | **38 'TITICACA'** | 2-6-0 | Danforth | 755 | 1871 | In use 1908. |
| *FCAyP* **9** | **39 'SANTO DOMINGO'** | 2-6-0 | Rogers | 1998 | 1872 | 1899 rebuilt Arequipa as 4-6-0. In use 1908. |
| *FCAyP* **10** | **40 'PUNO'** | 2-6-0 | Rogers | 2000 | 1872 | In use 1908. |
| *FCAyP* **11** | **41 'HUALLATA'** | 2-6-0 | Rogers | 2001 | 1872 | In use 1908. |
| *FCAyP* **12** | **42 'JLPA'** | 2-6-0 | Rogers | 2002 | 1872 | 1901 rebuilt Arequipa as 4-6-0. In use 1908. |
| *FCAyP* **13** | **43 'MISTI'** | 2-6-0 | Rogers | 2006 | 1872 | In use 1908. |
| *FCAyP* **14** | **44 'JULIACA'** | 2-6-0 | Rogers | 2026 | 1872 | In use 1908. |
| *FCAyP* **15** | **45 'CABANILLAS'** | 2-6-0 | Rogers | 2025 | 1872 | In use 1908. |
| *FCAyP* **16** | **46 'CHARCHANI'** | 2-6-0 | Rogers | 2029 | 1872 | In use 1908. In service 1923 burning coal. Strangely the 1923 list shows this engine as by Black Hawthorn. |



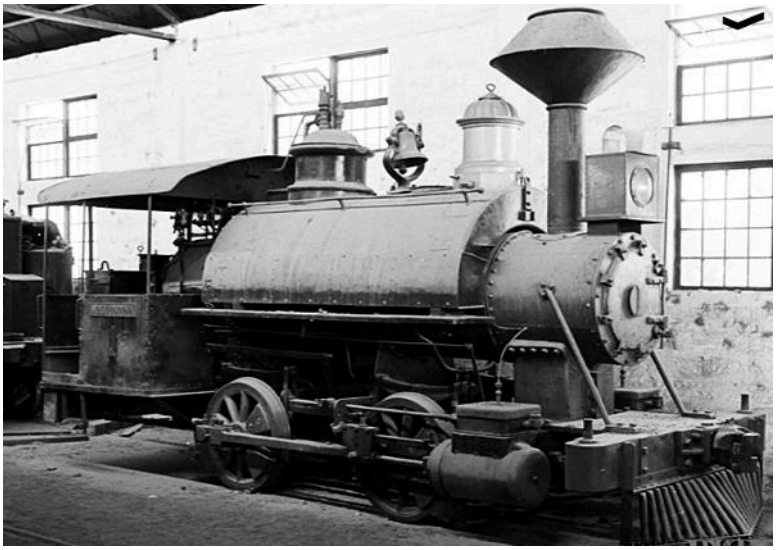

*FC del Sur* no. **31 'YURA'** as rebuilt to a 4-6-0TT configuration. The short four-wheeled tender suggests that there was a particular need to keep the

overall length to a minimum. Photo from the Fernando Garreaud collection. The steam chest appears to bear the legend 'MAESTRANZA AREQUIPA', replacing the original Danforth Cooke inscription.




An unidentified 4-6-0 in the Arequipá workshops. Note the prominent belpaire firebox, the bolt-on balance weights on the driving wheels, and the apparent cross-head driven pump feeding straight to the clack. From Sr. Abrill Talevera's *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos* page on Facebook.


No. **24** after a 1922 rebuild at Arequipá shops.



A photo taken by Harold Navé in Arequipá works and found on the Facebook page of *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos*. Note that the engine already appears to be carrying the **'La MOLLENDINA'** plates that it bears in preservation. By now it has a replacement and rather shallower saddle tank.

The *FC Mejía y Arequipá* Baldwin 0-4-0ST originally named **24 'TIGRECITO'**, as now displayed under the name **'La MOLLENDINA'**.

This 2-6-0 is supposed to be FCS no. **44 'JULIACA'**, but presumably much later than the pictures displayed on earlier pages. Certainly the domes have been relocated, presumably after a re-boilering, but also the cab differs in that the sides extend downwards much further rather than ending at the running board.

## A summary report on the locomotives of the new *FC del Sur*

*DEPARTAMENTO DE LOCOMOTORAS.*

*Según los contratos de construcción para las tres lineas que componen estos ferrocarriles, su equipo de Locomotoras debe componerse de 46 Locomotoras de 1a clase, capaces de arrastrar de subida 50 "toneladas de carga sobre gradiente de 4 por ciento en curvas de 107 m. (=352 pies ingleses) radio (Vease Ferrocarril del Peru Tomo "1.° pagina 554)"*

*La Administration Fiscal, nombrada por Decreto de Mayo 1 1888, recibio en efecto 46 maquinas de las cuales 14 son del tipo de 18" x 24" y 48" diametro de las ruedas motrices, y las demas de inferior poder.*

*El estado en que se recibieron, y todos sus pormenores, constan detalladamente en el cuadro quo remiti a Ud. junto con mi informe de fecha Junio 4 del corriente, del cual me es honroso acompañarle un resumen, al que se le ha agregado el importe de las composturas hechas en el mes de Mayo del corriente.*

*El importe de todas las composturas hasta, Junio 1. 1889 asciende a S. 42,75733 por cuya suma se han hecho composturas grandes y serias en 16 locomotoras. Como tales se han considerado aquellas cuyo importe en termino medio es de S. 1,000 a S. 3,000.*

*Ademas se han hecho composturas menores, en 25 locomotoras, en su mayor parte tales como ocurren en maquinas que estan, en trafico.*

*Los pesos anotados en las columnas correspondientes del cuadro N.° 1, son tanto para las maquinas y tenders vacios, como en columna separada, para cuando estan llenas, o sea para las maquinas listas como para salir al servicio.*

*Segun esos datos, quo casi todos son datos practicos, por haberse pesado las maquinas vacios y equipadas resulta:*

*Promedio de una maquina y su tender vacios 34,426 kilos*

*Id. id. id. cargados .... 49,235 ,,*

*Del cuadro N.° 2 se ve que las 27 Locomotoras que han estado en servicio desde que se tomo el Ferrocarril por el Fisco han recorrido un total de 413,657 kilometros siendo de notarse que numero de kilometros recorridos ha ido aumentando gradualmente y viene a ser en Mayo de 1889, casi el doble que en Mayo de 1888.*

*Debo llamar la atencion de Ud. sobre el hecho de aparecer en algunos casos las dimensiones de los cilindros de las maquinas en realidad distintas a las que se consignan en el resumen adjunto. Esto se explica porque en muchas maquinas se han alterado las dimensiones de los cilindros durante la Administration anterior; a fin de darle mas poder a las Locomotoras; pero como su verdadero valor de fabrica, se rije por las dimensiones y su poder originales, se han tornado estos factores como punto de partida, tanto mas porque, todas las dimensiones y proporciones de una maquina, se rijen por la que originalmente se les da a los cilindros.*

*Finalmente debo llamar la atencion de Ud. save la conveniencia de ir reponiendo poco a poco las Locomotoras destruidas que se encontraron en Mayo de 1,888 y algunas, que por malas o antieconomicas, habian sido aun antes puestas fuera de servicio, con otras mas adecuadas para el servicio de estas lineas, que corresponda a los adelantos de la epoca, maquinas como las del Mogul type de Baldwin ó Rodgers, pero haciendolas del sistema compound serían muy adecuadas, tanto por su mayor poder como por la gran economía de combustible que representa el sistema indicado, ya sea según Webb ó según Borries y Wordsdell. El aumento de trafico que ya se nota en un año de la Administracion Fiscal y que tiene que ser mayor cada año, requiere tambien mayores exigencias en el servicio, las que se podran llenar ampliamente con la introduction de unas 6 ú 8 Locomotoras nuevas, que se podrían adquirir con las mismas utilidades que rinden estas lineas.*

*Llamo muy especialmente la atencion sobre este punto, porque dada la edad y el fuerte servicio que tienen las maquinas, muchas de ellas estan tan estropeadas que debian prestar servicio de 3er orden, si no se condenaban ó se hacen en otras reparations muy serias. Pero hay que tener presente que por bien que se hagan estas reparaciones nunca prestan la garantia y seguridad para un buen servicio, como una Locomotora, nueva de buena construction.*

*Así pues tomando el valor de tres composturas serias se puede casi adquirir con el una maquina nueva que prestaría mejores servicios que tres compuestas.*

## Liveseys' report in 1889

The English language reports produced by Livesey & Co. in 1889 include the statement that this railway possessed at that time forty-six locos of which only twelve were in use.

Rolling stock. The following is a list and brief description of the extensive rolling stock common to the three above-mentioned divisions :—

46 Locomotives,
56 Passenger Cars,
295 Freight Cars.

Locomotives. Of the forty-six locomotives only twelve are at present in use, the remainder being either under repair or stored under cover at Arequipa and various points on the line.

The cost of putting into thorough repair twenty-one of the passenger and freight engines and three yard engines, which would suffice for double the present traffic, is estimated at £7,500.

## Transfer of a loco from the *FC del Sur* to the *FC Paita á Piura* in 1894?

The following paragraph appeared in the 1894 *Anales* [11, 1894 p176]. No further details are yet known.
*Traslación de una máquina al ferrocarril de Paita a Piura.*
*Lima, Abril 9 de 1894. Visto el anterior recurso del representante de la Peruvian Corporation Limited, por el cual pide autorizacion para trasladar de Mollendo a Paita una de las varias máquinas que existen sin aplicacion en Ia Empresa de los ferrocarriles del Sur, y la cual se necesita para Ia reparación de Ia linea ferrea de Paita a Piura. Concedese la autorización solicitada y pasese at Ministerio de Hacienda, para que por la Aduana de Mollendo se permita el embarque de Ia máquina y útiles respectivos con destino a Paita.*
An 1896 reference in the *Anales* suggests that an engine did indeed make this move, but was then found to be rather heavy for the track at Paita.

## An 1898 inventory

The 1898 Anales volume contains a full list of FCS locos, with brief details of each [11, 1898 p270-273]. Those notes have been reproduced for each engine a few pages earlier, under the *FC Mejía y Arequipá* and *FC Arequipá y Puno* headings. The report begins: *MATERIAL RODANTE*
*De la inspección practicada y de los datos tomados del Registro del servicio de locomotoras, resulta la siguiente relation.*
Then comes the list of locos with their respective details, from 1 to 46 but missing no. 39 and including the unknown no. 21b mentioned immediately below. This section of the text then concludes: *De la anterior relacion resulta que hay 32 máquinas en servicio, 4 en reparación, 3 en construcción y 7 que necesitan repararse.*
*De las 32 en servicio; 8 son nuevas; a 11 se les ha cambiado caldero y a 13 cajas de fuego.*
*Aunque no se puede declarar que es perfecto el estado general de las locomotoras, las que en su mayor parte son las primeras que se utilizaron en los ferrocarriles del Sur, las reparaciones que en ellas se efectuan y el esmero que se tiene en su conservación, hacen que presten buenos servicios sin temor a accidentes extraordinarios. Indudablemente que de un modo paulatino se llegara a la sustitución por nuevas locomotoras que con tanta inteligencia se construyen en la maestranza de Arequipa.*
*Coches y Carros*
*Cuenta la Empresa con el siguiente material: Entre coches de it clase, clase, mixtos y particulares y equipaje: 55. De esos, hay 41 en servicio, 5 en reparación y 9 en mal estado. Entre Bodegas, jaulas, Carboneros y pianos: 288. De estos, 283 en servicio, 4 en reparacion y 1 en construccion. Se ha hecho un pedido de quinientas ruedas para cambiar*

*aquellas que estan ya gastadas. En la estación de Arequipa hay un taller especial para atender a la pintura y aseo de los coches y carros. Tambien se va a reparar el techo de ellos para impedir pase el agua en epoca de lluvias.*

## An unidentified loco on the *FC del Sur* in 1898

The inventory of locomotives on the *FC del Sur* in the 1898 Anales [11, 1898 p272] includes the following unknown un-named engine:

### *4-4-2T d/w 48", cyls. 17x24", built by Arequipá in 1897?*

| | | |
|---|---|---|
| Ordered for ? | | The 1898 Anales report [11, 1898 p270-4] says: *Locomotora sin tender para pasajeros, con 4 ruedas acopladas, truque de 4 ruedas adelante y de 2 atras. Cilindros de 17"x24". Motrices de 48". En servicio de pasajeros en la Division Mollendo. Construida en Arequipa y puesta al servicio en Agosto de 1897. Ha recorrido 12,424 kilometros.* |
| **21b** | w/n | |

## The fleet in 1908

The list displayed in Costa y Laurent's report in 1908 [1], lists engines up to no. **46**, but none of the later machines supposedly built in 1906 and 1907. This suggests that the data in the list was actually collected a year or two earlier.

# FERROCARRILES DEL SUR

## LOCOMOTORAS

| No. | NOMBRE | Fabricante | Tipo | Fecha en la que entró al servicio por la vez. | Servicio que hace | PESOS Equipada para el servicio Toneladas de 1000 kilos | | Pares de ruedas acupladas | Presión normal de la caldera | Estado de conservación. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | de la locomotora | del tender | | | |
| 1 | Conquistador. | Maestr^a Areq^a | 4-6-0 | 1893 | Carga | 38 | 24 | 3 | 160 | Bueno |
| 2 | Inca ..... | ,, | 4-6-0 | 1904 | ,, | 47 | 16 | 3 | 180 | ,, |
| 3 | Hijo del Sol.. | ,, | 4-6-0 | 1892 | ,, | 38 | 24 | 3 | 160 | ,, |
| 4 | Estrella. | ,, | 4-6-0 | 1892 | ,, | 36 | 24 | 3 | 160 | ,, |
| 5 | Tambo.. | ,, | 4-6-0 | 1893 | ,, | 36 | 24 | 3 | 160 | ,, |
| 6 | Mejia..... | ,, | 2-6-0 | 1900 | ,, | 49 | 16 | 3 | 180 | ,, |
| 7 | Mollendo. | ,, | 2-6-0 | 1903 | ,, | 47 | 16 | 3 | 180 | ,, |
| 8 | Islay ..... | ,, | 2-6-0 | 1904 | ,, | 49 | 16 | 3 | 180 | ,, |
| 9 | Arequipa. | Rogers | 2-6-0 | 1871 | ,, | 35 | 24 | 3 | 140 | ,, |
| 10 | Vitor..... | Maestr^a Areq^a | 2-6-0 | 1897 | ,, | 35 | 24 | 3 | 140 | ,, |
| 11 | Tingo.... | ,, | 2-6-0 | 1901 | ,, | 36 | 24 | 3 | 140 | ,, |
| 12 | Ensenada | ,, | 2-6-0 | 1902 | ,, | 36 | 24 | 3 | 140 | ,, |
| 13 | Trevithick | ,, | 4-6-0 | 1895 | ,, | 38 | 24 | 3 | 180 | ,, |
| 14 | Stephenson ... | ,, | 2-6-0 | 1905 | ,, | 35 | 24 | 3 | 140 | ,, |
| 15 | Amazona. | ,, | 4-6-0 | 1899 | ,, | 47 | 16 | 3 | 180 | ,, |
| 16 | Tierra Caliente | ,, | 4-8-0 | 1905 | ,, | 78 | 30 | 4 | 180 | ,, |
| 17 | Occidental.... | ,, | 2-6-2 | 1892 | Cambios | 37 | — | 3 | 180 | ,, |
| 18 | Buena Vista.. | ,, | 4-6-0 | 1904 | Carga | 46 | 30 | 3 | 180 | ,, |
| 19 | S. Lorenzo | ,, | 2-4-4 | 1903 | Cambios | 37 | — | 2 | 180 | ,, |
| 20 | Marañón . | ,, | 4-6-0 | 1894 | Carga | 38 | 24 | 3 | 180 | ,, |
| 21 | Urubamb. | ,, | 2-6-0 | 1897 | ,, | 33 | 24 | 3 | 180 | ,, |
| 22 | Carabaya. | ,, | 4-6-0 | 1903 | ,, | 35 | 24 | 3 | 180 | ,, |
| 23 | Mariposa. | Baldwin | 0-4-0 | 1871 | Cambios | 20 | — | 2 | 125 | ,, |
| 24 | Tigrecito. | ,, | 0-4-0 | 1871 | ,, | 20 | — | 2 | 125 | ,, |
| 25 | D. Quijote | Danforth | 2-6-0 | 1871 | Carga | 32 | 24 | 3 | 140 | ,, |
| 26 | Sancho Panza. | ,, | 2-6-0 | 1871 | ,, | 32 | 24 | 3 | 140 | ,, |
| 27 | Arequipeña ... | Maestr^a Areq^a | 4-2-4 | 1890 | Especiales | 21 | — | 1 | 140 | ,, |
| 28 | Economista... | Rogers | 0-4-0 | 1871 | Cambios | 15 | — | 2 | 140 | ,, |
| 29 | Vincocaya | Maestr^a Areq^a | 4-4-0 | 1876 | Especiales | 17 | 24 | 2 | 125 | Malo |
| 30 | La Joya... | ,, | 2-2-0 | 1842 | ,, | 14 | — | 1 | 140 | Bueno |
| 31 | Yura ..... | ,, | 4-6-0 | 1898 | Carga | 47 | 16 | 3 | 180 | ,, |
| 32 | Urupampa .... | ,, | 4-6-0 | 1897 | ,, | 47 | 16 | 3 | 180 | ,, |
| 33 | Cañaguas. | ,, | 4-4-0 | 1898 | Pasajeros | 35 | 24 | 3 | 180 | ,, |
| 34 | Colca ..... | ,, | 4-4-0 | 1871 | ,, | 35 | 24 | 3 | 140 | ,, |
| 35 | Maravillas | ,, | 4-8-0 | 1904 | Carga | 64 | 24 | 4 | 180 | ,, |
| 36 | Sumbay. | ,, | 4-6-0 | 1897 | Pasajeros | 35 | 24 | 3 | 180 | ,, |
| 37 | Tayataya. | Rogers | 2-6-0 | 1871 | Carga | 35 | 24 | 3 | 140 | ,, |
| 38 | Titicaca.. | ,, | 2-6-0 | 1871 | ,, | 35 | 24 | 3 | 140 | ,, |
| 39 | St Domingo. | Maestr^a Areq^a | 4-6-0 | 1899 | ,, | 47 | 16 | 3 | 180 | ,, |
| 40 | Puno..... | Rogers | 2-6-0 | 1872 | ,, | 33 | 24 | 3 | 140 | ,, |
| 41 | Huallata.. | ,, | 2-6-0 | 1872 | ,, | 33 | 24 | 3 | 140 | ,, |
| 42 | Ilpa ..... | Maestr^a Areq^a | 4-6-0 | 1901 | ,, | 54 | 24 | 3 | 180 | ,, |
| 43 | Misti ..... | Rogers | 2-6-0 | 1872 | ,, | 33 | 24 | 3 | 140 | ,, |
| 44 | Juliaca .. | ,, | 2-6-0 | 1872 | ,, | 33 | 24 | 3 | 140 | ,, |
| 45 | Cabanillas | ,, | 2-6-0 | 1872 | ,, | 33 | 24 | 3 | 140 | ,, |
| 46 | Charchani | ,, | 2-6-0 | 1872 | ,, | 33 | 24 | 3 | 140 | ,, |

The list from Costa y Laurent's 1908 report.

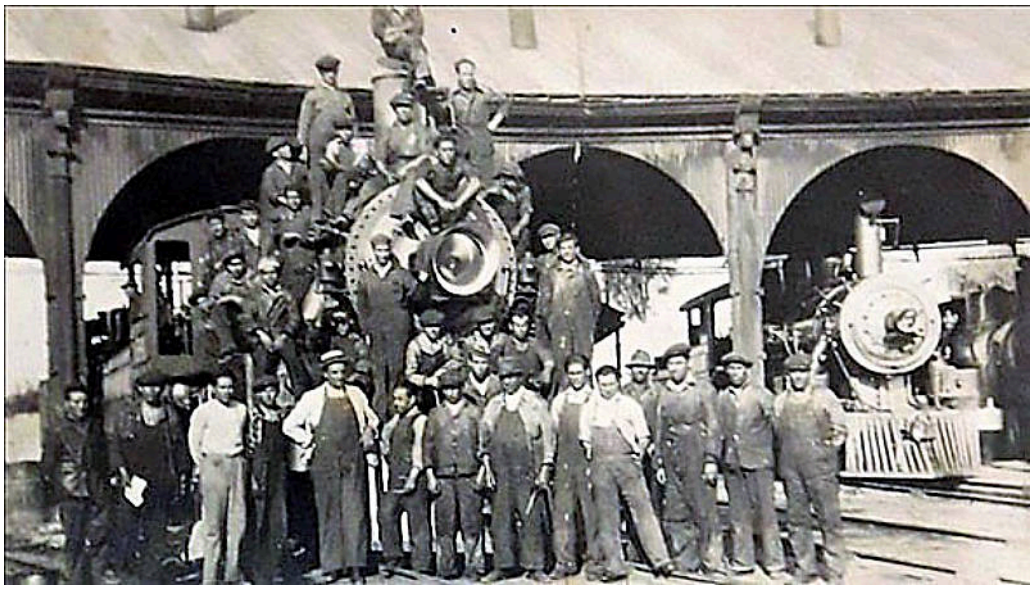
## Brian Fawcett's comments

Whilst Brian Fawcett worked for the *FC Central* between 1923 and 1947, his book [16] covered a number of Andean railways and as the *FC del Sur* was, like the *Central*, operated by the Peruvian Corporation, there may have been close links between the respective staffs. His thoughts on the *FC del Sur*'s early loco fleet are as follows: "When I say that

the Southern was more self-sufficient than the Central, I'm thinking of the remarkably ambitious output of the Locomotive Department's shops in Arequipa, where not only did they build freight and passenger cars —sleepers, chair cars, day coaches and baggage cars — but for many years locomotives as well. Out of a total of 46 engines in a roster of 1908, no less than 32 were Arequipa-built, ranging from a 4-8-0 to a 2-2-0. Incidentally, every engine on this roster was named as well as numbered – *'Stephenson', 'Trevithick', 'Don Quijote', 'Sancho Panza', 'Conquistador', 'Economista'*, to mention a few. The original Arequipa line was powered with Moguls, some by Danforth & Cooke but most by Rogers, similar to those that worked the early Oroya line, and equipped with the huge balloon stacks associated with wood burning. Actually, they burned coal, imported from South Wales at enormous cost. Southern locomotive practice departed from the Central's in several ways, but both systems belonging to the Peruvian Corporation Ltd. of London (now of Toronto), the Southern, greater in mileage but smaller in revenue, from time to time received Central reach-me-downs. Easier grades and faster running brought the 4-6-0 into a prominence in Arequipa that it never knew on the up-and-down Central. There were also the Rogers 4-8-0 compounds of the 50 class, carrying 185 pounds boiler pressure, with cylinders 20 and 31 inches by 28-in. stroke, driving 52-inch wheels. Until comparatively recently the imported engines were all of somewhat ancient vintage, rebuilt with modern fittings such as superheaters and feed-water heaters. The Arequipa-built engines were strictly speaking assembled from imported parts. For instance, Arequipa shops did not cast driving wheel centres and bar frames, forge main and side rods, or roll boiler plate. They were not tooled for it; and the term 'Arequipa built', in the case of locomotives, must be accepted with reservations." [16, 1st edition 1963 p157; 2nd edition 1997 p105] Fawcett also suggests that most of the parts imported for Arequipá-rebuilt engines came from Rogers. Certainly there are no signs of any in the Baldwin XO books.

## 2 New locomotives purchased for the *FC del Sud* after the merger

In the 1923 list, all locos numbered **50** and above were fitted with air brakes. On the other hand, of those numbered below **50**, only **1, 3** and **6** had air brakes, the remainder having solely steam brakes presumably working on the loco alone.

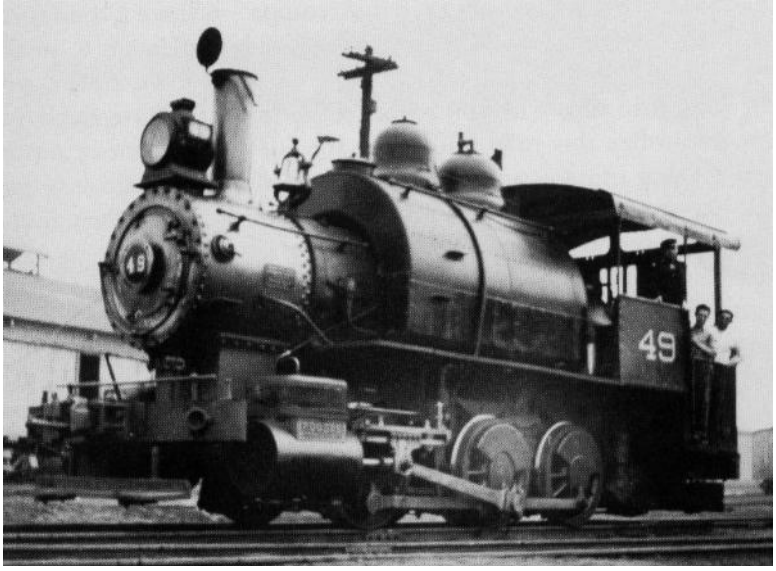


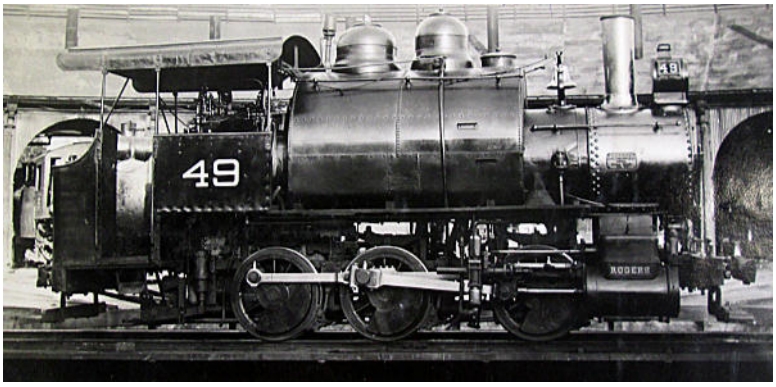
This view taken at an *FCS* roundhouse, possibly at Arequipá, shows two locos with smokebox-door-mounted headlights. The classes and identities are as yet unknown, but they appear to have taller chimneys than those seen in other photos in this section.

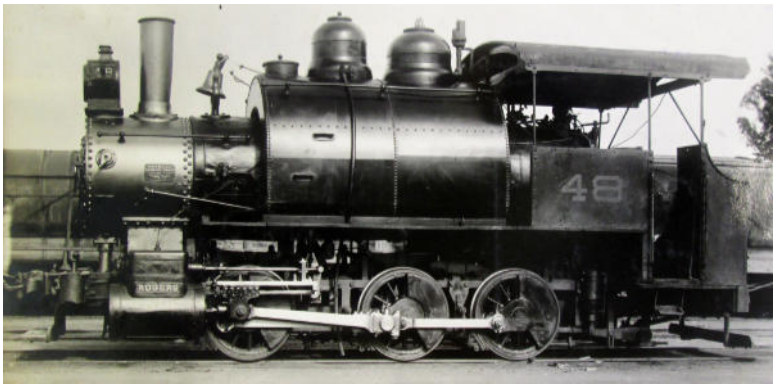
### *0-6-0ST d/w 44", cyls. 16x24", built by ALCo Rogers in 1906*

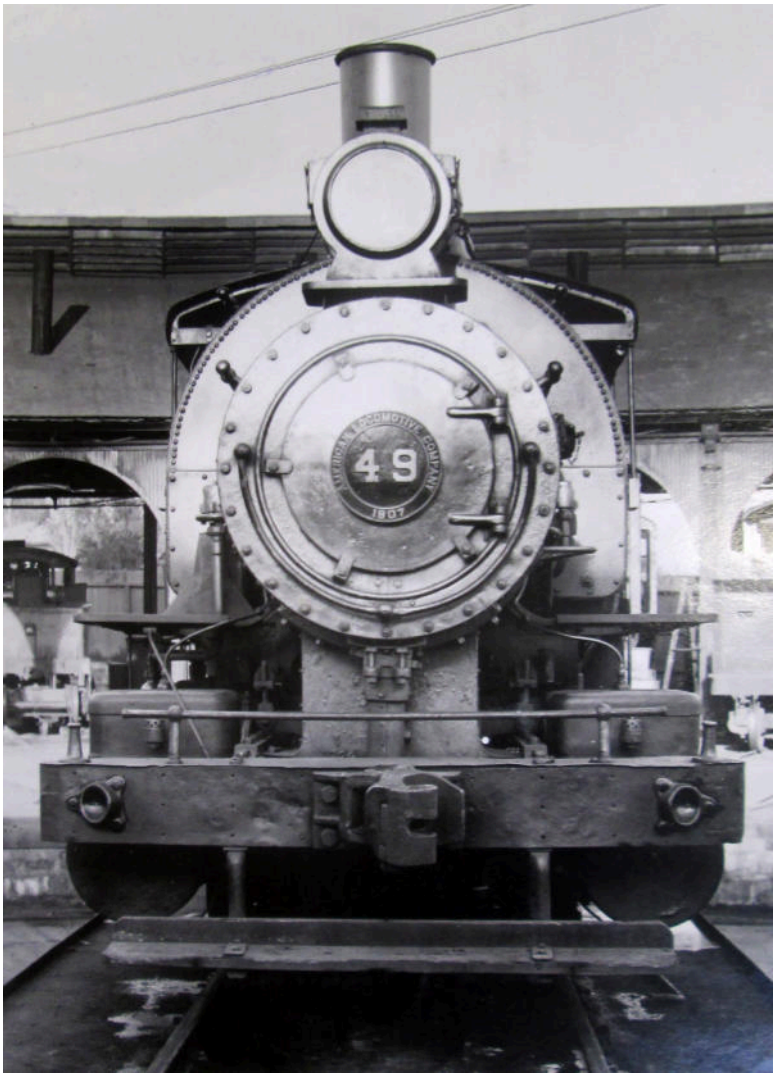
Ordered by Southern of Peru. Class 40s (?)

| | | |
|---|---|---|
| **47** | w/n 39909 | In service 1923 burning coal. |
| **48** | w/n 39910 | In service 1923 burning coal. |
| **49** | w/n 39911 | In service 1923 burning coal. |


49


49


48




.

### *4-8-0 d/w 52", cyls. 20/31x28", built by ALCo Rogers in 1906*

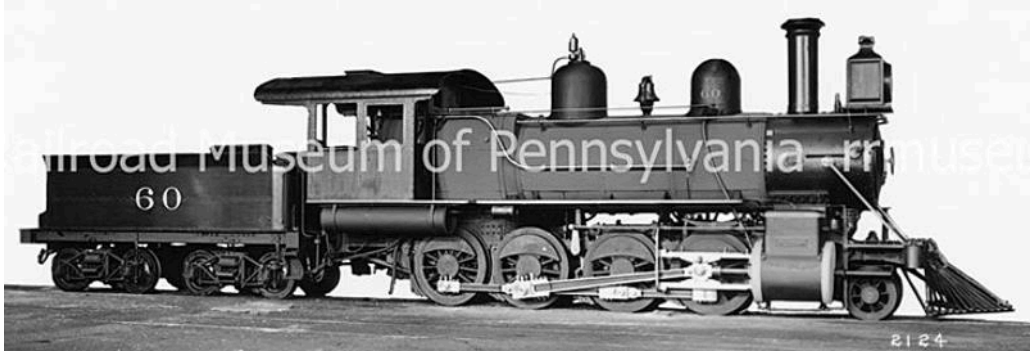
Ordered by Southern of Peru. Two cylinder compounds. Class 50s.

| | | |
|---|---|---|
| **50** | w/n 39912 | In service 1923 burning oil. |
| **51** | w/n 39913 | In service 1923 burning coal. |
| **52** | w/n 39914 | In service 1923 burning coal. |
| **53** | w/n 39915 | In service 1923 burning oil. |
| **54** | w/n 39916 | In service 1923 burning oil. |
| **55** | w/n 39917 | In service 1923 burning oil. |
| **56** | w/n 39918 | In service 1923 burning oil. |
| **57** | w/n 39919 | In service 1923 burning oil. |
| **58** | w/n 39920 | In service 1923 burning oil. |
| **59** | w/n 39921 | In service 1923 burning coal. |

### *2-8-0 d/w 52", cyls. 21/31x26", built by Baldwin in 1906*

Ordered by ? Vauclain cross compound. BLW class 10-36/56E nos.1 and 2. Spec. is in vol. 28 p263.

| | | |
|---|---|---|
| **60**[1] | w/n 27606 | In service 1923 burning oil. |
| **61**[1] | w/n 27607 | In service 1923 burning coal. |




This image is from Baldwin negative 02124 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.


No. **60** seen rather later in its life, after a re-boilering it would appear.

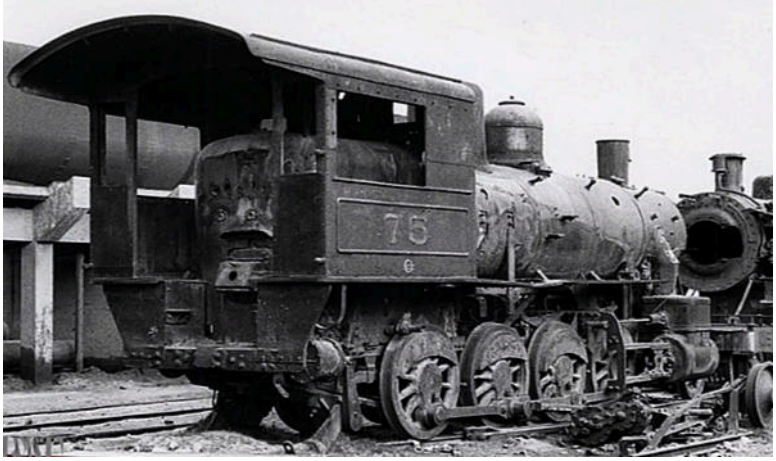
### *2-8-0 d/w 52", cyls. 20x28", built by ALCo Rogers in 1907*

Ordered via W. R. Grace & Co. for *FC del Sur*. Class 70. Ten of these engines were shipped new to the *FC Central* in exchange for 4-6-0s nos. **80-87**. Copeland suggests those sent to the *Central* might have been nos. **75-84**.

| | | |
|---|---|---|
| **60** | w/n 41185 | |
| **61** | w/n 41186 | |
| **62** | w/n 41187 | |
| **63** | w/n 41188 | |
| **64** | w/n 41189 | |
| **65** | w/n 41190 | In service 1923 burning oil. |
| **66** | w/n 41191 | In service 1923 burning oil. |
| **67** | w/n 41192 | |
| **68** | w/n 41193 | In service 1923 burning oil. |
| **69** | w/n 41194 | In service 1923 burning oil. |
| **70** | w/n 41195 | Connelly's ALCo list says used on *FC Central*. |
| **71** | w/n 41196 | In service 1923 burning coal. Connelly's ALCo list says used on *FC Central*. |
| **72** | w/n 41197 | In service 1923 burning oil. Head-on collision with no. **74** at Km. 130.751 on Mollendo line, 16th Nov. 1948. |
| **73** | w/n 41198 | Connelly's ALCo list says used on *FC Central*. |
| **74** | w/n 41199 | Head-on collision with no. **72** at Km. 130.751 on Mollendo line, 16th Nov. 1948. Connelly's ALCo list says used on *FC Central*. |
| **75** | w/n 41200 | |
| **76** | w/n 41201 | In service 1923 burning coal. |
| **77** | w/n 41202 | In service 1923 burning oil. |

| | | |
|---|---|---|
| **78** | w/n 41203 | In service 1923 burning oil. |
| **79** | w/n 41204 | In service 1923 burning coal. |
| **80** | w/n 41205 | |
| **81** | w/n 41206 | |
| **82** | w/n 41207 | |
| **83** | w/n 41208 | |
| **84** | w/n 41209 | |

Fifteen of these engines were not listed in 1923, **60-64, 67, 70, 73-75**, and **80-84**. Presumably they may have been those transferred to the *FC Central* either from new or later on.




No. **75** derelict at Juliaca at the end of its life.

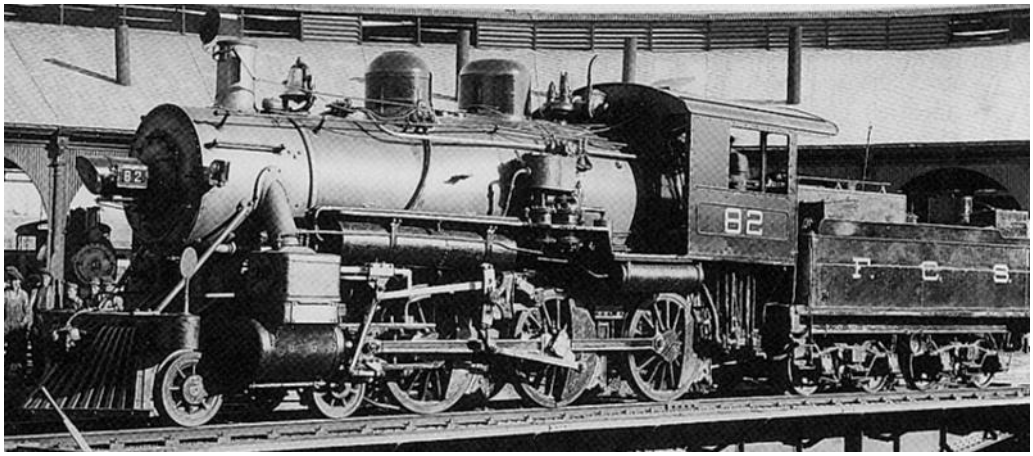
### *4-6-0 d/w 58", cyls. 19x26", built by ALCo in ?*

Ordered by ? Eight of the ten were shipped south from the *FC Central* in 1914 in exchange for ten of the above batch of 2-8-0s. These engines had been from *FC Central* nos. **47-56**, ALCo nos. 41509-41518.

| | | |
|---|---|---|
| **80** | w/n ? | A photo taken on 6th January 1951 shows this loco hauling an inaugural passenger train on the new La Joya to Matarani link, whilst still fitted with bolt-on piston valve chests. |
| **81** | w/n ? | |
| **82** | w/n ? | |
| **83** | w/n ? | In service 1923 burning oil. |
| **84** | w/n ? | In service 1923 burning coal. |
| **85** | w/n ? | In service 1923 burning oil. |
| **86** | w/n ? | In service 1923 burning oil. |
| **87** | w/n ? | In service 1923 burning oil. |

The 1923 list includes a loco no. **88** with the same dimensions as those above. This might be a mistake, or possibly the eight locos were numbered **81-88** rather than **80-87**.

| | | |
|---|---|---|
| **88** | w/n | In service 1923 burning oil. |




No. **82** as later fitted with 'bolt-on' piston valve chests and thus outside steam-pipes. A copy of this photo in the Peruvian Corporation archive makes clear that this was taken after a new 200psi superheated boiler had been dropped onto frame and wheels brought over from the *FCC*. The replacement steam chests and valves had all been made in Arequipá. Photo taken in January 1940.


No. **82** again, this time at Ayaviri, and with an additional mysterious device between sand dome and steam dome. It cannot be the turbo-generator, for the exhaust pipe from that is still visible just ahead of the cab, as it was in the previous photo.

No. **91** at Wanchaq station in Cuzco in 1941. The loco still has its original link-and-pin coupler socket, and and ALCo style tender, but has been fitted with new piston valve cylinders and is missing the forward-mounted air reservoir seen in other photos.


No. **87**.


No. **85** even later in its career when rebuilt with new piston valve cylinders.

On 24th April 1946 there was a collision near Juliaca, seemingly between two passenger trains though this has not been confirmed. At least one of the two locomotives was an ALCo 4-6-0, and that is shown above and below lying on its side. The other engine in the picture above is also a 4-6-0 but it is not known if that had been involved in the collision or was a rescue loco.

### *2-8-0 d/w 45", cyls. 16x22", built by ALCo Schenectady in 1914*

Ordered by Southern Railway of Peru. Class 90s. NB In 1923 [] these were listed with d/w 52" and cyls. 16½x26", and were shown as having the numbers **91** to **94** rather than **90** to **93**.

| | | |
|---|---|---|
| **90** | w/n 54533 | |
| **91** | w/n 54534 | In service 1923 burning coal. |
| **92** | w/n 54535 | In service 1923 burning oil. Holzinger says became *FCTA* no. **93**. |
| **93** | w/n 54536 | In service 1923 burning oil, plus **94** burning oil. |

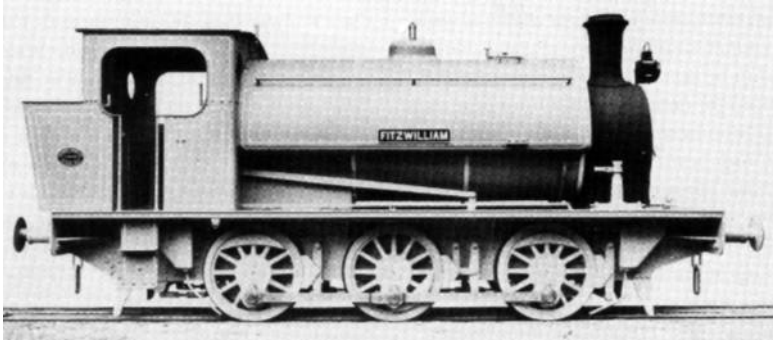

This photo showing 2-8-0 no. **91** supposedly at Sicuani was taken by Robert H. Platt in 1930, and is from the AGSL photo archive at the University of Wisconsin Milwaukee.

### *0-6-0ST d/w 45", cyls. 16x22" IC, built by Hunslet in 1927, 1930, 1938, 1948 and 1950*

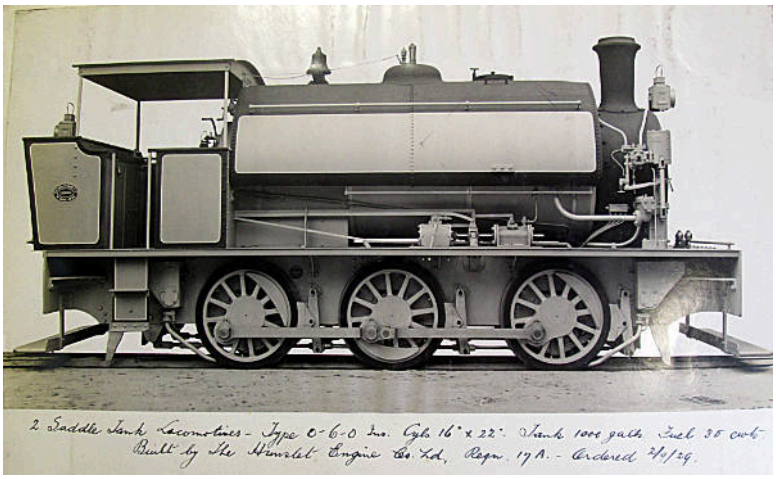
Ordered for Peruvian Corporation.

| | | | | |
|---|---|---|---|---|
| **46** | w/n 1495 | built 1927 | ) Two out of these | No. **44** fell off the quay at |
| **44** | w/n 1651 | built 1930 | ) three later became *FCC* | Puno in Jan. 1939 and was |
| **45** | w/n 1652 | built 1930 | ) nos. **35** and **36** | only recovered in March. |
| **43** | w/n 1876 | built 1938 | This engine does not appear in the list of 16x22" inside cylinder locos on page 102 of [13], but Andrew Smith states that according to the Hunslet drawing list this engine was built to the same drawings as nos. 1651-2. | |
| **42** | w/n 3507 | built 1948 | | |
| **40**[2] | w/n 3690 | built 1950 | Don Townsley's Hunslet history [13] says this loco had a cab roof on four pillars, a Weir feedwater heater, and a Westinghouse pump. | |

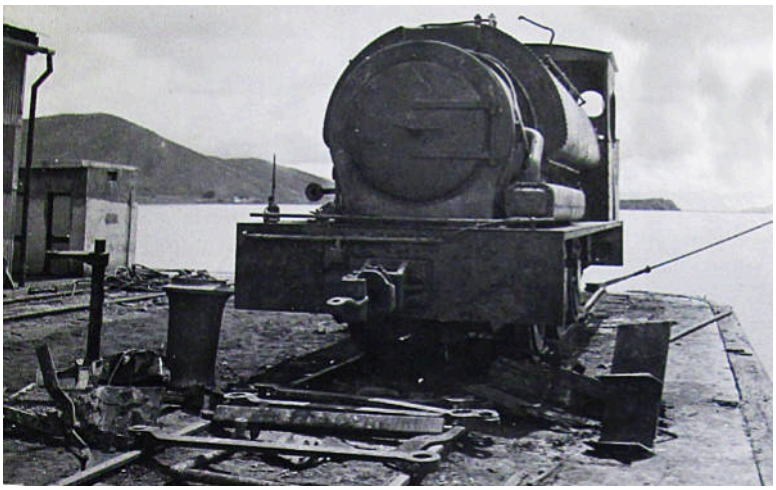
One of these engines apparently survives plinthed in a park in Arequipá.




A typical Hunslet 16" 0-6-0ST.




One of those delivered to the *FCS*. Differences would seem to include the pump alongside the smokebox, the Hendrie or possibly Hadfield-type steam-operated reverser on the running plate, the bell on the tank, the open cab, the shunters' platforms at either end, the deeper buffer-beams, and of course the lack of side buffers.



No. **44** at Puno in March 1939, immediately after being recovered from the lake bottom.

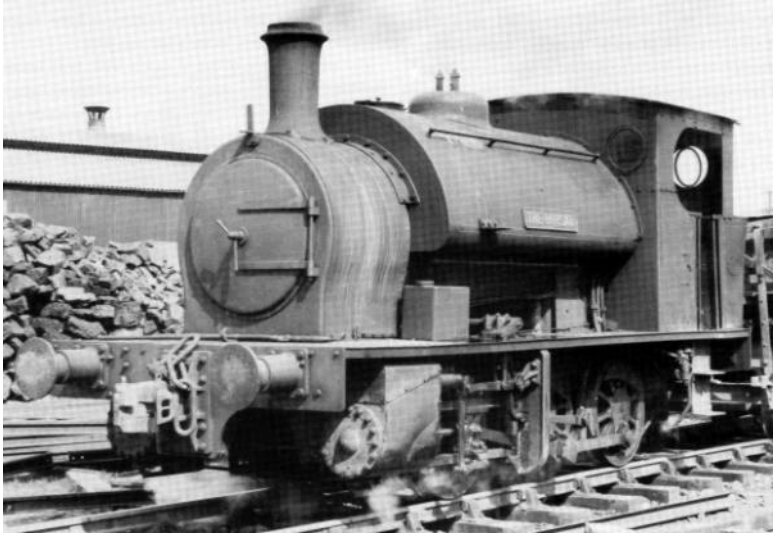
This photo from Sr. Abrill Talavera of Arequipá would seem to show one of the standard 16" Hunslets in recent years.

Two tank engines shunting at Mollendo port. That on the right is Hunslet 0-6-0ST no. **43**, whilst that in the left background was probably one of the earlier ALCo Rogers trio. From Sr. Abrill Talevera's *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos* page on Facebook.

### *0-6-0ST d/w 40", cyls. 14x20"IC, built by Hunslet in 1929*

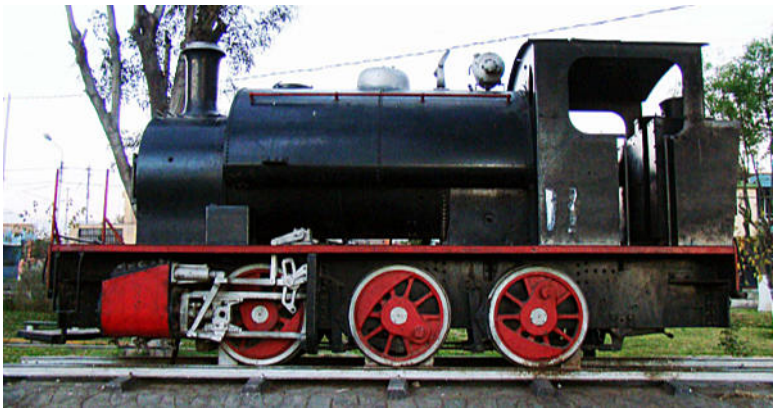
Ordered by the Crown Agents for harbour works at Haifa in Palestine in 1929 as part of a batch of twelve locos (HHWD no. **3**?). Returned to Hunslet with others in 1938, and then worked for British Army at Bramley in Hampshire (No. **71659)**, then as a Hunslet hire loco, and finally to the Peruvian Corporation in 1953 [13].

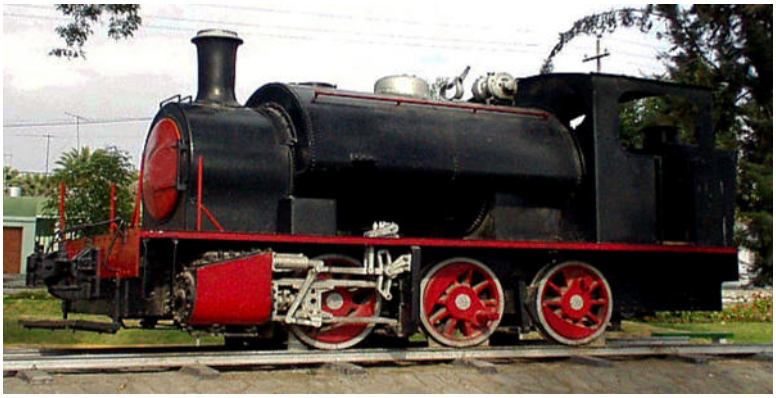
**22** w/n 1643



Another of the ex-Haifa harbour Hunslet 14" locos, as working in Oxfordshire in the 1950s. The knuckle coupler and the cab back-sheet were later additions but the double roof to the cab was original.


No. **22** seen here, would appear to be this locomotive, though working here as a stationary boiler. This image from the *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos* group on Facebook has enabled me to identify the running number of this engine for the first time.



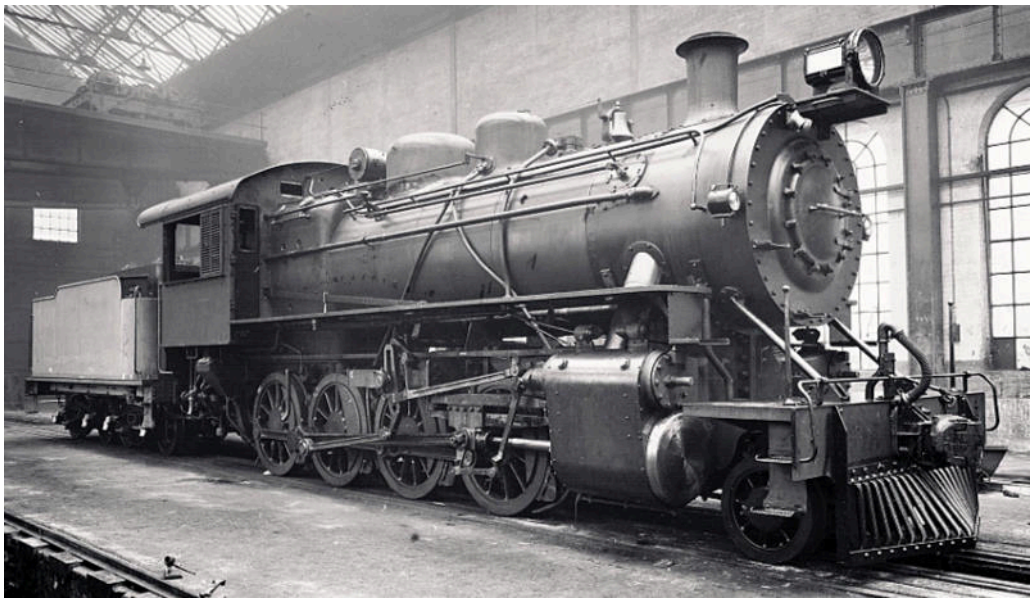


Further images from a Facebook post by Sr. Abrill Talavera of Arequipá. These show the Hunslet 0-6-0ST plinthed in a local park. It is probably the 14" ex-Haifa loco mentioned above.

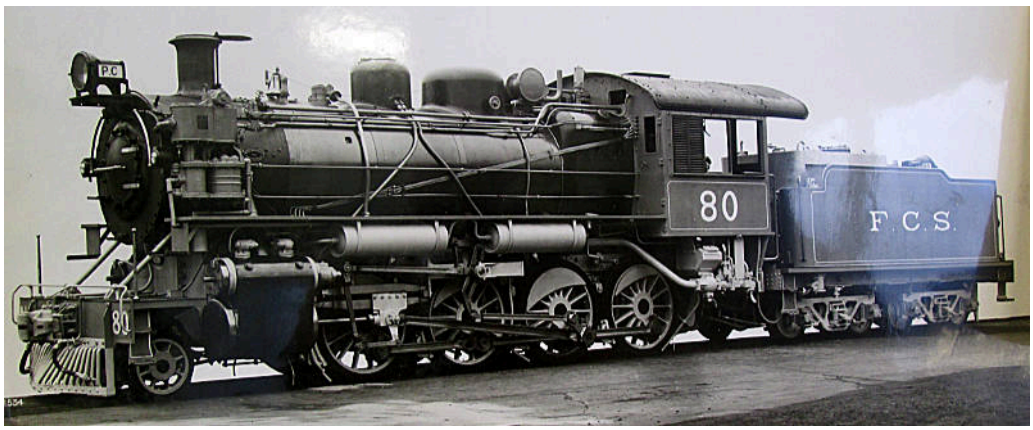
### *2-8-0 d/w 56", cyls. 20½x28", built by Beyer Peacock in 1937, 1939, 1940, 1946, 1950 and 1952*

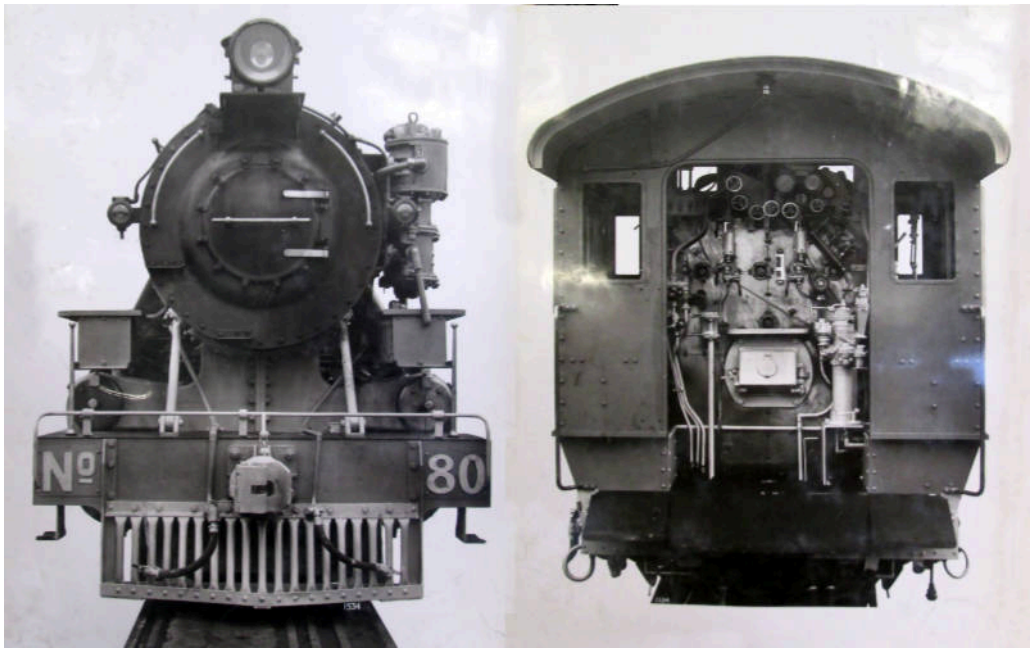
Ordered by ?

| | | | |
|---|---|---|---|
| **110** | w/n 6833 | built 1937 | Renumbered **80**[2] and later moved to *FCC* as no. **100**? Given that photos apparently taken by BP after construction show this loco as *FCS* no. **80**, the idea of it having been renumbered from **110** seems a little difficult to believe. |
| **111** | w/n 6876 | built 1937 | Renumbered **81**[2] and later moved to *FCC* as no. **101**? |
| **112** | w/n 6918 | built 1939 | |
| **113** | w/n ? | built 1940 | |
| **114** | w/n ? | built 1940 | |
| **106** | w/n 7218 | built 1946 | |
| **107** | w/n 7219 | built 1946 | |
| **108** | w/n 7220 | built 1946 | |
| **109** | w/n 7221 | built 1946 | |
| **200** | w/n 7322 | built 1950 | Renumbered **250** |
| **201** | w/n 7323 | built 1950 | Renumbered **251** |
| **202** | w/n 7324 | built 1950 | Renumbered **252** |
| **203** | w/n 7325 | built 1950 | Renumbered **253** |
| **204** | w/n 7613 | built 1952 | Renumbered **254** |
| **205** | w/n 7614 | built 1952 | Renumbered **255** |
| **206** | w/n 7615 | built 1952 | Renumbered **256** |
| **207** | w/n 7616 | built 1952 | Renumbered **257** |
| **208** | w/n 7617 | built 1952 | Renumbered **258** |
| **209** | w/n 7618 | built 1952 | Renumbered **259** |
| **210** | w/n 7619 | built 1952 | Renumbered **260** |
| | | | |
| **103**? | w/n ? | built ? | A photo on the Facebook page of the *Amigos a los que gusta Ferrocarriles y Tranvias Peruanos* group appears to show an earlier type Andes engine bearing this number. |
| **211**? | w/n ? | built ? | A photo on the Facebook page of the *Amigos a los que gusta Ferrocarriles y Tranvias Peruanos* group appears to show a later type Andes engine bearing this number. |



An early Andes class engine before its departure from Beyer Peacock's Gorton works. NB The precise machine is unidentified, so it might have been destined for either the *FC del Sud* or the *FC Central*.



Beyer Peacock 'Andes' class 2-8-0 no. **252**, as surviving at Juliaca.

## A 1951 report

A 1951 Peruvian Corporation report survives in the PC archive cared for by University College, London, but actually housed at the National Archives in Kew. A couple of paragraphs are particularly relevant and are reproduced below.

(ii) Apart from the 5-100 class and the 4-200 class all the locomotive stocks on the Southern Railway are old American locomotives of which many are 45 years old. By superhuman efforts the Mechanical Department have kept the motion and boilers of these old locomotives in good running order but their old bar frames are getting as brittle as glass and are having to be continually welded up - one engine recently came in with 3 cracks in its frame after one trip which is an even dangerous state of affairs.

I believe 2 sets of new frames have been asked for from U.K. to rebuild the best of the bunch.

It is definitely urgent that the four rebuilt Garratts and the 7 new 200 class from U.K. should be supplied to the Southern Railway as soon as possible.

4) Garratt Locomotives

The only fear in the past of Southern Railway regarding these has been the possibility of being saddled with locomotives in such a poor condition as to cause us permanent concern. Given engines in good condition we can use them to great advantage with improved volume of service and saving of personnel.

---

Signed C.V. Sampson

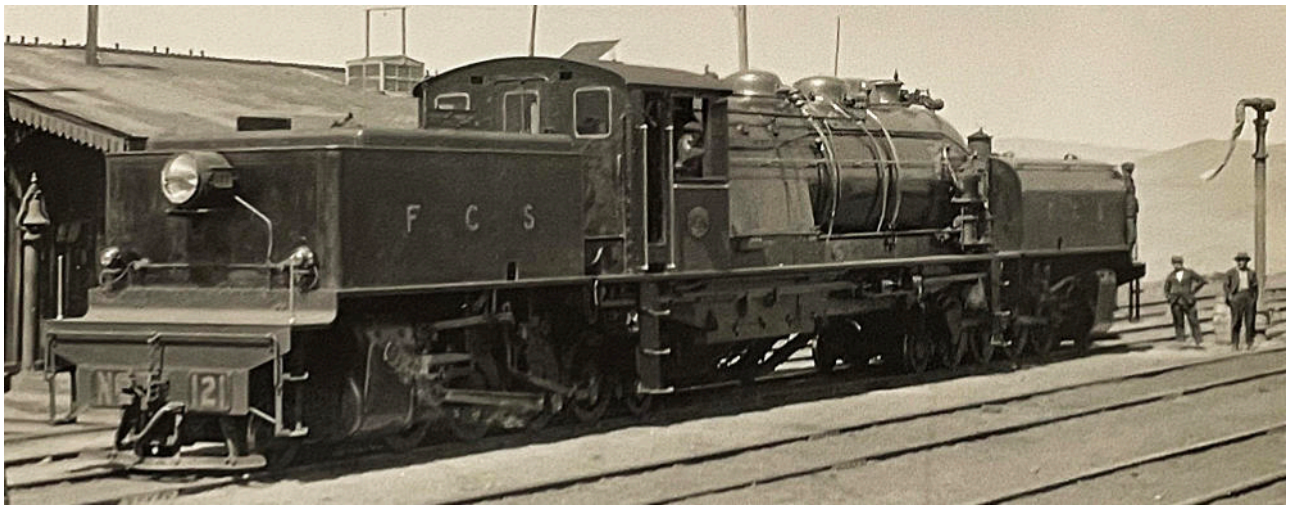
7/3/51.

### *2-8-2+2-8-2 Garratt d/w 45", cyls. 19½x24", built by Beyer Peacock in 1929 and 1931*

Ordered by Peruvian Corporation for the *FC Central*. Originally *FCC* nos. **123** and **125 'COCHRANE'**, later **401** and **403**.

| | |
|---|---|
| **401** | w/n 6627 |
| **403** | w/n 6730 |


These two photos clearly show Garratt no. **121** bearing *FCS* lettering on both tanks. This conflicts with the notes above which suggest that the two machines transferred from the *FC Central* were nos. **123** and **125**.

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# 13.4.4 *El FC Vítor y Sotillo*

***Región de Arequipá***

**1899-1930?**

## Background

Standard gauge. Built 1899? by the government, and stretching 12 km. as a branch off the *FC del Sur*. Originally intended to extend to Majes, a total of 110 km. Vitor and Sotillo lie on an irrigated valley floor about 10 km. west of La Joya on the *FC del Sur* route up from the coast to Arequipá.

A few years later an 'auto-ferrocarril' was proposed to extend along the same route about 140 km. WNW beneath the Andean escarpment to the Camana valley, and with another 150 km line back down to Camaná town via the coast. The intention was that this system should be operated by 'auto-carriles' or motor cars, possibly by the Ziegler Gas Car & Locomotive Co. of NY, or by Fairbanks Morse of Chicago. However, at that time, in the early 1920s, road transport was developing very rapidly, and it seems probable that the whole project was overtaken by technological developments.

The short section previously built was operated by the Peruvian Corporation until 1923 and then taken over by the government. In 1925 the motive power was recorded as solely three rail motor cars.

There are articles on the proposed Auto-carril network in *Informaciones y memorias de la Sociedad de Ingenieros ... v.20 1918*, pp204-216, 274-284, and 321-336, https://babel.hathitrust.org/cgi/pt?id=uc1.b2870097&view=1up&seq=396&skin=2021 A quick glance showed up only one steam reference, to Bell locomotives, on page 330. However, there is a mention that "*Tanto, para la construcción como para ia explotacion del auto-carril, es indispensable adquirir el ferrocarril de Belaúnde, de "El Ramal á Sotillo", que tiene 14 k. 218 y cuya línea está bien conservada.*" (p333).

### *Two truck Shay d/w 22", cyls. (2) 6x10", built by Lima in 1912*

Ordered by ? Class A13-2. Empty weight 23,725 lbs. Coal fired.

**1**? w/n 2628


A class A two-cylinder Shay. However, these locos varied greatly so do not take this image as necessarily being an accurate representation of the Vitor á Sotillo machine.

---

# 13.5 Isolated southern lines

## 13.5.1 *El FC Pisco á Ica*

***Región de Ica***

**1867-1956**


### Background

Standard gauge. 73 km long. Authorised 1861, begun in 1867 and completed in 1871. The principal purpose was to aid the shipment of agricultural produce from the Ica valley. Chilean incursions during the War of the Pacific destroyed the railway, though not to the same extent as at Ilo further south.

The mainline ran from Pisco across the desert to Guadalupe and into the Ica valley. There were two branches, to a mill within Pisco, and to the Hacienda Macacona.

Purchased by government in 1871, but leased to Sr. Modesto Basadre. In poor condition 1879. Handed over to Peruvian Corporation in 1928 with the other government railways, but later rented to Sr. Alvarez Calderon. Returned to Peruvian Corp. in 1940. Closed 1956 and rails removed several years later.

### A mystery loco

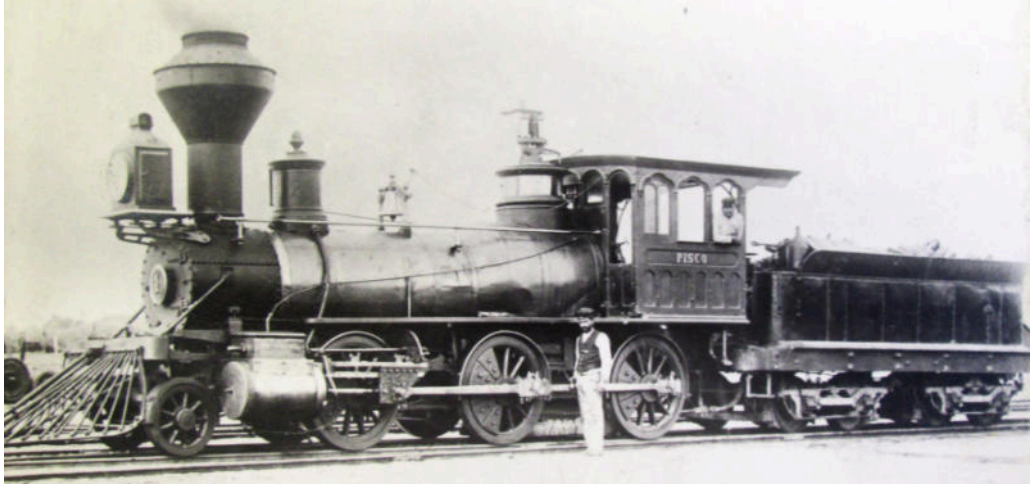
An 1869 *FC Lima a Ancon y Chancay* ledger in the Archivo Nacional in Lima (File H-4 2124) has several references

to a locomotive **'PERUANA'** being shipped either to or from Pisco and Ancon. Its identity is currently unknown, but it is definitely not the **'PERUANA'** of the *FC Pacasmayo, Guadalupe y Chilete* which was only built in 1872 and possibly not delivered to Peru until rather later.

### *2-6-0 d/w 48¾", cyls. 17x24", built by Rogers in 1870*

Ordered for *FC Pisco a Ica*.

**1¹ 'PISCO'** w/n (1715) Not listed in mileage tables in 1886, 1888, 1889, 1891, 1892 or 1893. In service and in good condition in 1908 but said to have four pairs of coupled wheels. This may be a different and later engine.




This is the mogul no. **1 'PISCO'**.


Whilst the date of this derailment is unknown, the proportions of the domes and other features suggest that the loco is number **1**, a guess which the smokebox number plate does nothing to dispel.


Whilst this second photo of the derailment adds little to our knowledge

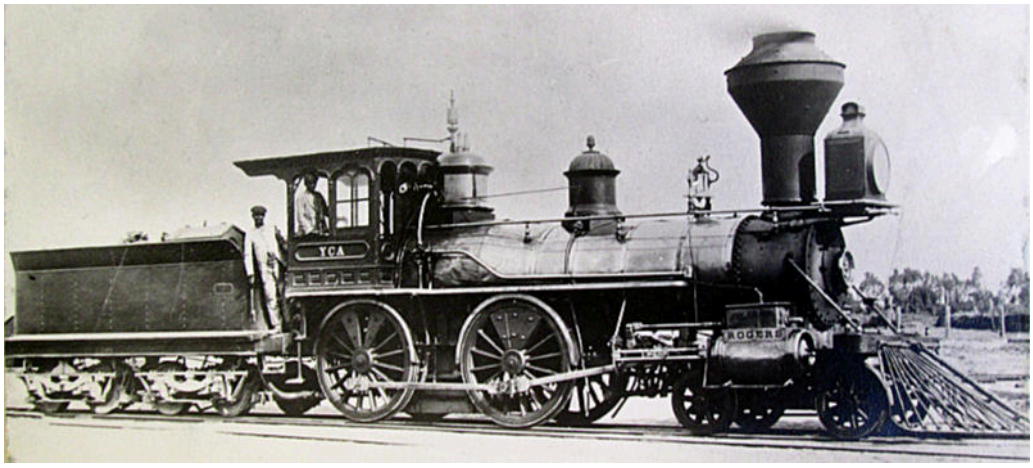
of the locomotive, it does make very clear how wooden-bodied coaches could peel open in an accident.

### *4-4-0 d/w 56", cyls. 16x24", built by Rogers in 1870*

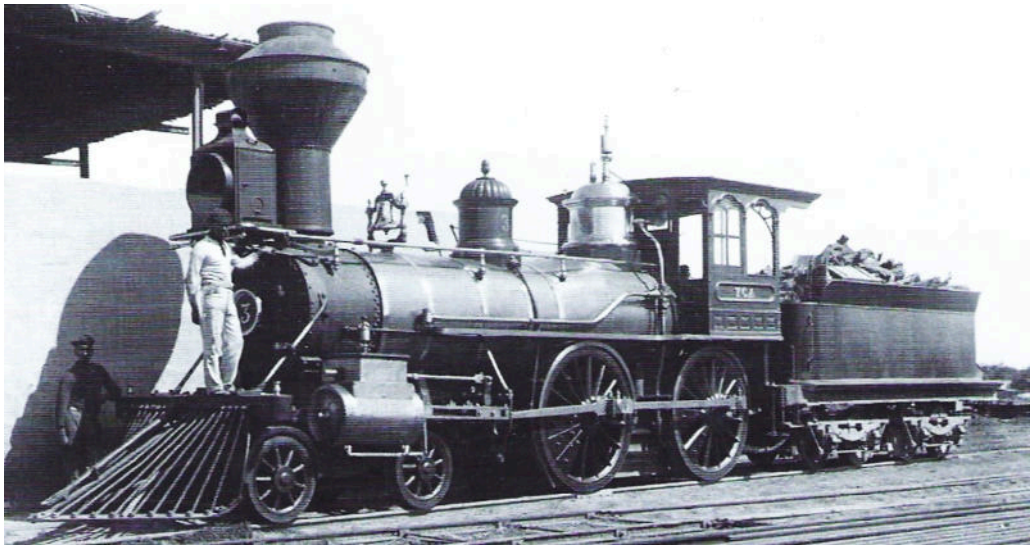
Ordered for *FC Pisco a Ica*.

**2**[1] **'YCA'** w/n (1758) Later renumbered **3** before 1886 and spelling eventually changed to **'ICA'**.
Ran 1372 km in 1886 [11, 1886 p580].
Ran 9028 km in 1888 [11, 1888 p506].
Ran 9028 km in 1889 [11, 1889 p528]. Kms. definitely equal to 1888, checked.
Ran 7335 km. in 1891 [11, 1891 p450].
Ran 6764 km. in 1892 [11, 1892 p468].
Ran 6512 km. in 1893 [11, 1893 p652].
Ran 444 km. in 1894 [11, 1894 p440].
Ran 3922 km. in 1895 [11, 1895 p262].
Ran 4884 km. in 1896 [11, 1896 p708].
Ran 5032 km. in 1897 [11, 1897 p598].

In service in 1908 but boiler said to be old.




No. **2 'YCA'**, above, and the same engine below after renumbering as **3**.




### *? d/w ?, cyls. ?, built by ? in ?*

Ordered by ? See paragraph below at no. **8** for speculation about the origin of this engine. It might have been Rogers () of 187?, ex no. **18** of the FC de Copiapó, but Allen Copeland alternatively speculates that it might have been 4-4-0TT Rogers (2441) of 1876, ex no. **17 'MANCO CAPAC'** later **'GUADALUPE'** of the *FC Lima y Oroya*.

**3 'La FAVORITA'** w/n ?

### *2-6-0 d/w ?, cyls. ?, built by Rogers in 1870*

Ordered by ?

**4[1] 'EMPRESA'**w/n ? Ran 11692 km in 1886 [11, 1886 p580].
Ran 7696 km in 1888 [11, 1888 p506].
Ran 5994 km in 1889 [11, 1889 p528].
Ran 6595 km. in 1891 [11, 1891 p450].
Ran 7034 km. in 1892 [11, 1892 p468].
Ran 3330 km. in 1893 [11, 1893 p652].
Ran 6882 km. in 1894 [11, 1894 p440].
Ran 1258 km. in 1895 [11, 1895 p262].
Ran 2220 km. in 1896 [11, 1896 p708].
Ran 4588 km. in 1897 [11, 1897 p590].
Not in service in 1908.

### *0-4-0 d/w ?, cyls. ?, built by ? in ?*

Ordered by ? The book *Ferrocarril de Pisco*, by ???, suggests that this small loco or inspection car was built by the railway itself, in 1897. However, this needs confirmation as not everything in that volume is correct.

**4[2] 'CALGUITO'** w/n ? Not listed in 1886, 1888, 1889, 1891, 1892, 1893 or 1894 mileage tables.
Rebuilt 1897 and renumbered **1[2]**.
Required a new boiler in 1909 [5].
1908 report says entered service most recently in 1904, and in good condition at time of report. Identity was given than as **1 'GALGUITO'** and as having entered serice at Pisco in October 1897.

### *? d/w ?, cyls. ?, built by ? in ?*

Ordered for ? This might have been 4-4-0 d/w 60", cyls. 13"x20", built by Rogers in 1866, Rogers (1261) which had been *FC de Copiapó* no. **18**, reported sold to *FC Pisco á Ica* in October 1870 [63] as wheels had been too large for use at Copiapó.

**5[1] 'VILLACURI'** w/n ? Ran 1406 km in 1886 [11, 1886 p580].
Ran 746 km in 1888 [11, 1888 p506].
Ran 296 km in 1889 [11, 1889 p528].
Not listed in 1891 mileage table.
Ran 6960 km. in 1892 [11, 1892 p468].
Ran 7252 km. in 1893 [11, 1893 p652].
Ran 6660 km. in 1894 [11, 1894 p440].
Ran 5994 km. in 1895 [11, 1895 p262].
Inspected 1896 and permitted to continue with a BP of 120psi. See report below. [11, 1896 p104].
Ran 7622 km. in 1896 [11, 1896 p708].
Ran 7104 km. in 1897 [11, 1897 p590].
Not in service 1908.

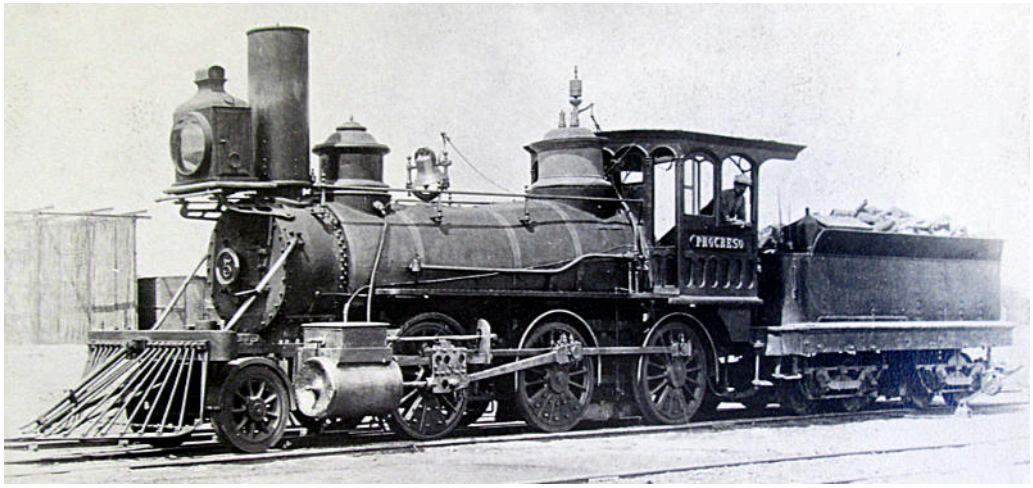
### *2-6-0 d/w ?, cyls. ?, built by Danforth in ?*

Ordered by ?

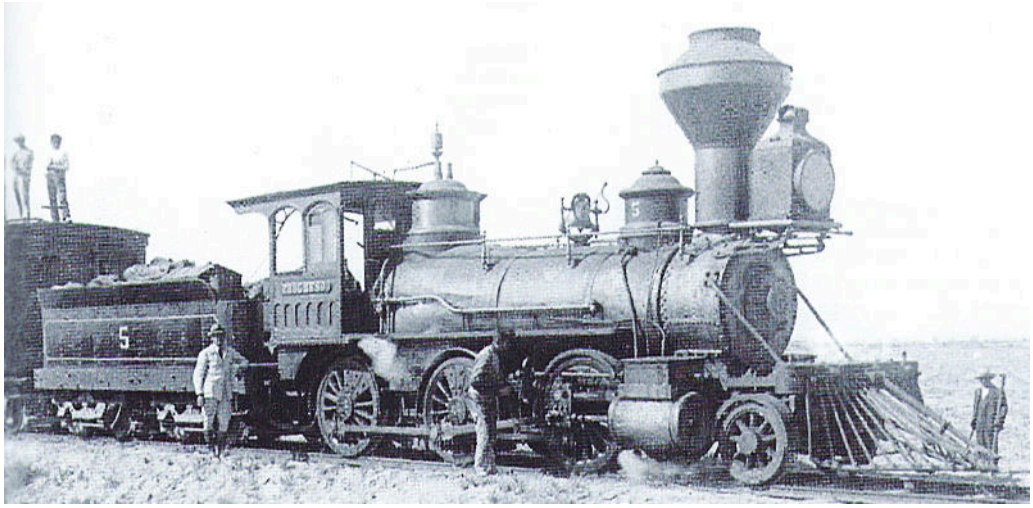
**5[2] 'PROGRESO'** w/n ? Not listed in mileage tables 1886-1895. Costa y Laurent has Julio 1904 as date of entry into service, which might mean that it arrived here then.

In service 1904 [5] and in 1908.

**6[1] 'FAVORITA'** w/n ? Ran 1036 km in 1886 [11, 1886 p580].
Not listed in 1888 mileage table.
Ran 2442 km. in 1891 [11, 1891 p450].
Ran 1332 km. in 1892 [11, 1892 p468].
Ran 888 km. in 1893 [11, 1893 p652].
Ran 2812 km. in 1894 [11, 1894 p440].
Ran 740 km. in 1895 [11, 1895 p262].
Inspected 1896 and permitted to continue with a BP of 80psi. See report below. [11, 1896 p104].
Ran 3256 km. in 1896 [11, 1896 p700].
Not listed on mileage table in 1897 [11, 1897 p590].
Not in service 1908.



Note the rather odd chimney on no. **5**, almost like a diamond stack but with the upper part missing.



The same engine but with a more conventional diamond stack.

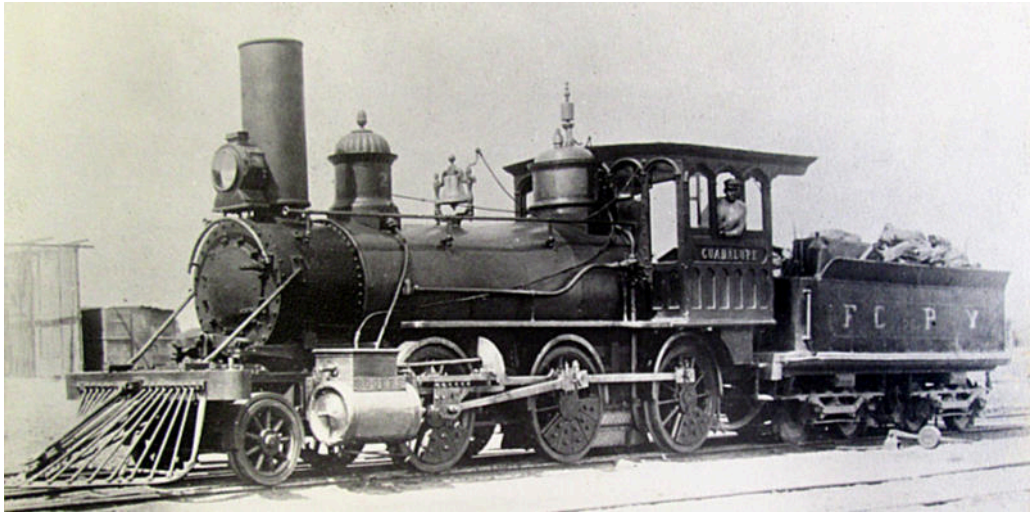
## Another Danforth mogul?

The following photo shows a Danforth 2-6-0 named **'GUADALUPE'** on the *FCPY* in the early days. The number on the sand-dome would appear to be **2**, but the loco of that name is referred to in the 1884 reports below as no. **4** or no. **5**.

### *2-6-0 d/w ?, cyls. ?, built by Danforth in ?*

Ordered by ?

**2 'GUADALUPE'** w/n ?




Another engine with a similar strange stack. The cross-compensating beam common to these Danforth engines is clearly visible in front of the smokebox.

## The fleet in 1884

"*Las locomotoras no tienen, como no han tenido nunca, un local apropiado para ser depositadas cuando no estan en servicio. La factoria no tiene ni tornos para ruedas; estas ultimas han Ilegado a un estado de deformacion increible y presentan un peligro constante pa-ra la seguridad del trafico. Si la inspeccion quisiera proceder con todo rigor, deberia no mas sino por el estado de las ruedas, separar del servicio casi la totalidad del material rodante, paralizando el trafico hasta su renovacion.*

*He aqui el estado actual de las locomotoras:*

***1.° La "Balta"*** *vino va usada; se encuentra fuera del servicio y sin posibilidad de ser refaccionada.*

***2.° El "Caballito,"*** *maquinita pequeña que ha servido para el ferrocarril urbano, se encuentra en el mismo estado que la anterior.*

***3.° El "Pisco"*** *tiene su caldera muy gastada, asi como su fogon; cambiando ademas sus ruedas pudiera quizas servir para un servicio auxiliar de carga.*

***4.° La "Ica"*** *ha salido el año pasado de una renovacion completa de chimenea, fogon y tubas; es quiza la mejor como su estado para el servicio.*

***5.° La "Guadalupe"*** *vino de Ilo en 1874, ha servido con mas frecuencia desde este tiempo, necesita de una renovacion de fogon, de tubas, de ruedas y ejes; se halla mientras tanto descompuesta en la factoria.*

***6.° La "Dos de Mayo"*** *que vino de Ilo, en el mismo tiempo, sirve actualmente para el trafico por no haber otra que la reemplace; tiene su fogon gastado y sus ruedas deterioradas; ha recibido solo tubas nuevos el año pasado.*

***7.° La "Favorita."*** *maquina pequeña, se encuentra descompuesta en la factoria, necesita renovar sus tubas, su fogon, parte de su caldera y sus ruedas."* [11, 1884 p454-5].

It is very possible that the numbers listed above before each loco name were merely added for the purposes of the list and had no actual significance on the railway.

## A highly critical report

"*Inform del Ingeniero de Estado D. L. Folklerski, sobre el ferrocarril de Pisco a Ica.*

*Ica, Dicicmbre 4 de 1883. Señor Prefecto del Departamento de Ica..*

*S. P.*

*Comisionado por orden Suprema para inspeccionar el ferrocarril de Pisco a Ica, he encontrado desde luego el material de este ferrocarril en tan mal estado, que para aplicar con todo vigor las disposiciones del Reglamento, hubiera debido en virtud del articulo 78, separar del servicio todas las locomotoras; pues no he encontrado ni una que pueda ofrecer garantias suficientes para la seguridad y Ia regularidad del trafico. Los coches y carros no se encuentran mejor; la deformacion de las ruedas gastadas sobre manera, compromete la estabilidad de los vehiculos y*

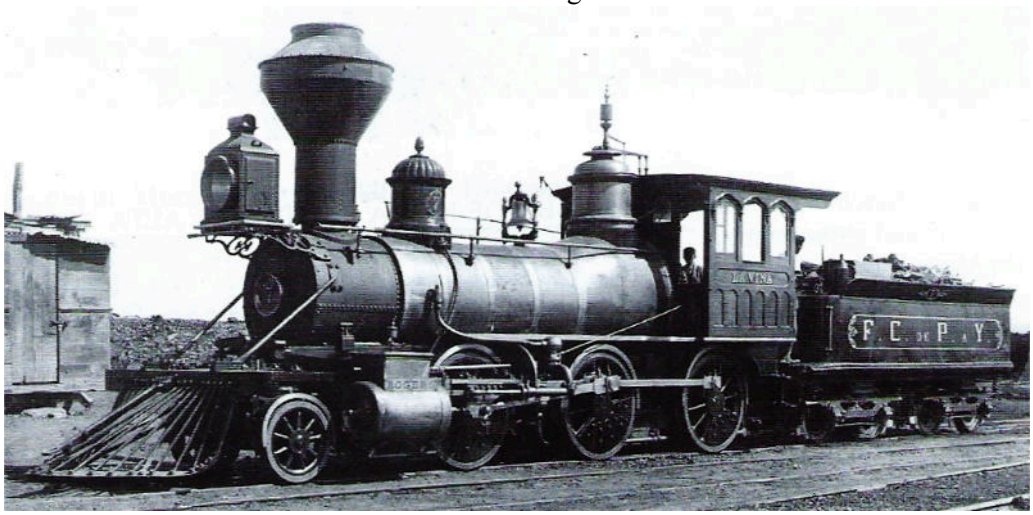
*ocasiona deterioros en la via. Las chimeneas carecen por completo de aparatos protectores contra la salida de chispas; siendo la leña el combustible ordinario, los incendios deben ocurrir con frecuencia. Sin embargo, como la aplicacion estricta de las prescripciones reglamentarias ocasionaria una suspension del trafico durante algunos meses; como de otro lado, la conformacion particular de la via en terreno llano y arenoso sin cortes ni terraplenes ni obras de arte de ninguna clase, hace poco probables, desgracias mayores en cuanto a la vida de los pasajeros, con tal que se tomen las debidas precauciones, puede ser que US. sea de opinion de tolerar por algunas semanas mas, este estado de cosas que a mi me parece intolerable bajo el punto de vista profesional; en este caso me permitire someter a la aprobacion de US. las medidas siguientes que, en use de las atribuciones especificadas en el articulo 5.° y otros del Reglamento, creo de mas urgencia para la seguridad del trafico, sin perjuicio de las medidas mas radicales, que podra tomar el Gobierno en vista de mi informe:*
*1. Notifiquese a Ia Empresa, que en aplicacion del articulo 15 y demas del Reglamento General de Ferrocarriles, en vista del mal estado de su material rodante, queda especialmente responsable por todo accidente o perjuicio de cualquiera naturaleza, que pueda sobre venir de aqui en adelante.*
*2°. En el termino perentorio de 30 dias, la Empresa debe tener lista para el trafico una locomo(to)ra nueva refaccionada por completo (por ejemplo concluir las refacciones completas de la **"2 de Mayo"** actualmente en el taller); en un otro termino de 50 dias, poner una segunda locomotora en las mismas condiciones [por ejemplo **"La Favorita"** tambien en el curso de refaccion en la factoria] y al fin en el tercer termino de 30 dias, tener una tercera locomotora en perfecto estado para el trafico (por ejemplo la **"Ica"** en servicio actual pero con fogon y tubos completamente gastados): bajo pena de multa proporcionada por cada dia de atrazo sobre el termino perentorio fijado. El Ingeniero que suscribe se ha impuesto por un examen detenido de la posibilidad de cumplir con las mencionadas exigencias, aun con cierta latitud para la Empresa. Tres locomotoras en perfecto estado es el minimun que se puede exigir para el trafico de este ferrocarril.*
*3°. La Empresa debe proporcionar a su factoria cuanto antes treinta pares de ruedas nuevas para coches y carros, por lo memos. Estas ruedas pueden conseguirse en el acto en cualquiera de las factorias del Callao. La renovacion de dichas ruedas es de todo indispensable para la seguridad del trafico y la preservacion del resto del material.*
*4. Las chimeneas de las locomotoras deben ser inmediatamente provistas de los aparatos protectores contra la salida de las chispas. El Ingeniero que suscribe cree de su deber someter a la decision de US. las medidas mencionadas, cuya oportunidad sin duda le ha sido ya patente desde antes.*
*Senor Prefecto,*
*Folkierski.*" [11, 1884 p461-2.]
This was followed up by a rather more critical review of each engine than that displayed above:
"*Las locomotoras se encuentran actualmente en el estado siguiente:*
***1.° La "Ica"** tiene su fogon (fire box) completamente gastado y sus tubos que no pueden servir mas; renovando ademas algunos accesorios, esta maquina, la mejor de todas, puede aun prestar servicio por algun tiempo.*
***2.° La "Dos de Mayo"** necesita de una refaccion completa: de un nuevo fogon y tubos etc., se encuentra desmontada en la factoria y no se repara por falta materiales.*
***3.° La "Favorita"** desmontada en la factoria; se trata de rehacerla por completo, renovando su caldera y cilindros, y de aumentar su poder para hacerla servible para el trafico de pasajeros.*
***4.° La "Guadalupe"** completamente gastada: es dudoso si vale la pena de refaccionarla para un servicio auxiliar de estaciones o carga.*
***5.° La "Pisco"** en el mismo estado que la anterior; inservible.*
***6.° La "Balta"** condenada por completo hace años; se encuentra en piezas inutilizables.*
***7.° El "Caballito"** maquinita chica que servia para el muelle y tranvia; hace años ya que esta inutilizada en piezas.*"
[11, 1884 p465].

## *2-6-0 d/w ?, cyls. ?, "built by Rogers in 1885" or possibly in 1871*

Ordered for ?  Bob Whetham [5] repeats Allen Copeland's supposition that this was from 1885, and even captions a photo of the engine as "a fairly typical Rogers 2-6-0 constructed new for the railway in 1885".  However, I would like

to suggest that this engine was Rogers (1892), no. **3 'La VIÑA'** of the *FC Pacasmayo Guadalupe y Chilete*, which disappeared from that line between 1884 and 1887. Thus the supposed build date of 1885 may actually have been its arrival date at Pisco.

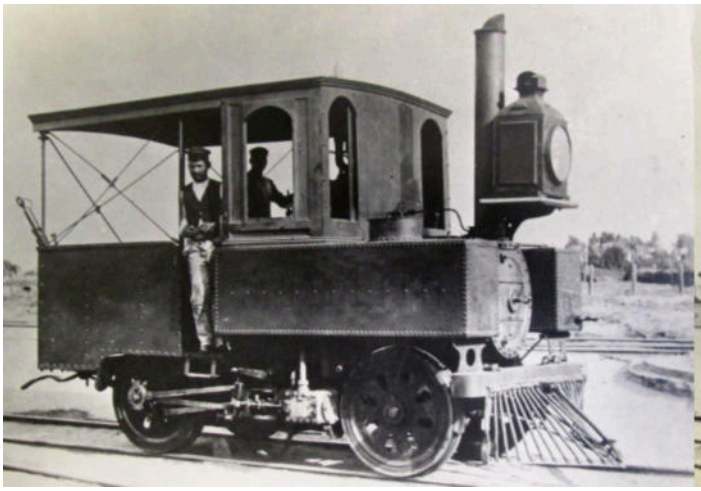
**7 'La VIÑA'** w/n (1892)? Ran 14046 km in 1886 [11, 1886 p580].
Ran 7944 km in 1888 [11, 1888 p506].
Ran 11544 km in 1889 [11, 1889 p528].
Ran 6669 km. in 1891 [11, 1891 p450], but name given as **'NIÑA'**.
Listed in 1892 and 1893 mileage tables but distances not given [11, 1892 p468] and [11, 1893 p652]. Name had returned to **'VIÑA'**.
Ran 7622 km. in 1894 [11, 1894 p440].
Ran 9916 km. in 1895 [11, 1895 p262].
Inspected 1896 and permitted to continue with a BP of 120psi. See report below. [11, 1896 p104].
Ran 7104 km. in 1896 [11, 1896 p700].
Ran 5328 km. in 1897 [11, 1897 p590].
In service 1908 and in good condition.

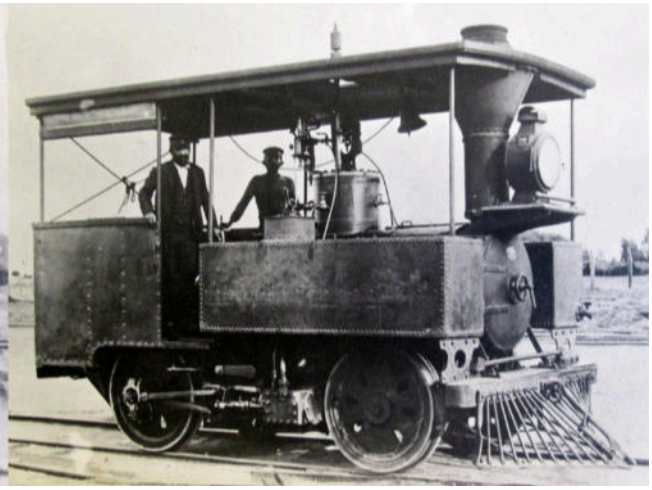



### *2-2-0T d/w 30", cyls. 5x12", built by Rogers in 1869*

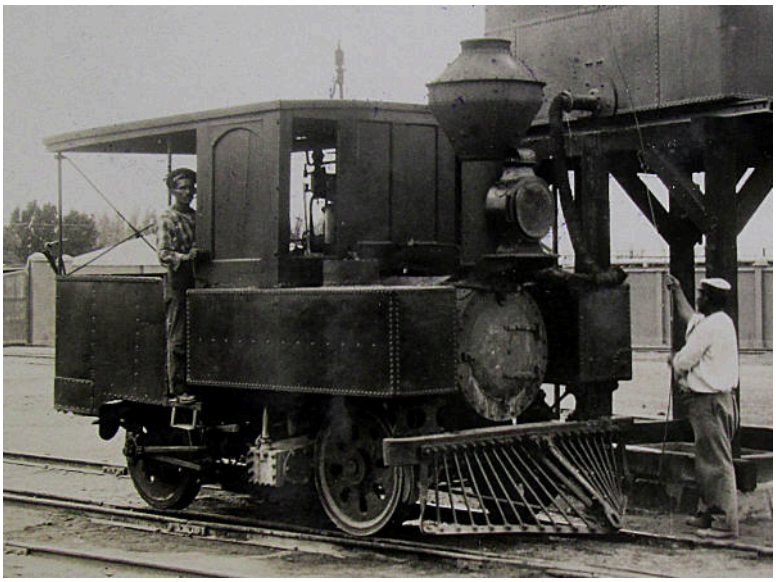
Ordered by *FC Lima y Huacho*. Originally *FC Lima Ancon Chancay* no. **4**, then *FC Callao Lima y Oroya/FC Central* no. **31**. Presumably arrived here 1885 or later, ie. after no. **7**.

**8 'CABALLITO'** w/n (1649) Not listed in 1886 mileage table.
Under overhaul in 1889 [11, 1889 p528].
Ran 3404 km. in 1891 [11, 1891 p450].
Ran 6768 km. in 1892 [11, 1892 p468].
Ran 7696 km. in 1893 [11, 1893 p652].
Ran 6364 km. in 1894 [11, 1894 p440].
Ran 7770 km. in 1895 [11, 1895 p262].
Ran 5698 km. in 1896 [11, 1896 p700].
Ran 9102 km. in 1897 [11, 1897 p590].
Renumbered **2**[2] before 1909 [5].
Not in service in 1908 under either number.





Whilst these two images show similar Rogers 2-2-0Ts supposedly on the *FCPI*, there are too many differences for them to be the same machine. Even if one had been rebuilt at some point, parts such as the tank front support brackets, the eccentrics and the smokebox door would not all have been changed. These images were all found in an *FCPI* collection within the Peruvian Corporation archive held by University College, London, at TNA, Kew.



A third picture of a Rogers 2-2-0T. This one may not have been taken on the *FCPI* though there are definite similarities to the machine in the first of the photos above.

## A second Rogers 2-2-0T?

The photos above suggest that the *FCPaI* possessed two of these small Rogers inspection locos. Whilst only one of them has been identified as ordered for Peru, the other might very well have been the *FC de Copiapó*'s no. **21**, Rogers (1475) of 1867. That machine had been sold on from Copiapó in 1871, supposedly to the *FC Lima y Huacho*, but might well have come on here with its Rogers sister engine, 4-4-0 no. **18** of the *FC de Copiapó*. It might very well have become no. **3 'La FAVORITA'**.

## Liveseys' report in 1889

The English language reports produced by Livesey & Co. in 1889 include the statement that this railway possessed at that time five locomotives of which only two were in service.

The rolling stock consists of five locomotives, five passenger cars, and ten goods wagons. The whole of this stock is in a wretched condition, and only two locomotives are available for service. Considerable additions to this rolling stock must be made, therefore, to enable the line to work the requirements of the traffic.

## A summary published in 1895

A report on the railway dated October 1894 has the following to say about the engines:
Material rodante y mueble.—*El material rodante se encuentra en been estado de conservation, y se atiende constantemente a sus reparations, como he tenido ocasian de verlo con las maquinas* ***Ica*** *y* ***Caballito*** *que estan actualmente en obra. La* ***Ica****, cuya reparación no bajara de seis mil soles, estara expedita en un mes mas, y el Caballito quedara listo en una quincena.* [11, 1895 p146].

## An 1896 inspection report

*F. C. DE PISCO A ICA*
*Inspección de la linea,*
*Lima, Setiembre 12 de 1896. Apareciendo de Ia inspection practicada, en el ferrocarril de Pisco a Ica, por el ingeniero del Estado don Manuel A. Villas;*
*1o. Que apesar de que la via ferrea se encuentra en buen estado, hay necesidad de cambiar algunos rieles y durmientes;*
*2o. Que, el edificio de Ia factoria necesita repararlo convenientemente. notandose, a la vez, deficiencia en Ia instalacion de la bomba hidraulica;*
*3o. Que las locomotoras números* ***5****,* ***7*** *y* ***6*** *pueden funcionar respectivamente, con una presion de 120 libras las dos primeras y 8o libras la última, hallandose en reparation la denominada* ***Caballito*** *y Ia número* ***4****;*
*4o Que la otra locomotora número* ***3****, no pudo ser probada por estar en servicio activo,*
*5o. Que según el contrato de 17 de Setiembre de 1884, no puede exiairse al arrendatario del ferrocarril que haga variaciones en Ia linea ó en las estaciones, dentro de plazo determinado; y estando a lo informado por el referido ingeniero y a las observaciones hechas por el arrendatario ante-dicho;*
*Se resuelve:*
*1o. Autorizase la entrega al tráfico público de las locomotoras números* ***5****,* ***7*** *y* ***6****, pudiendo funcionar las dos primeras con una presion de 120 libras y con 8o libras la última.*

*Inspeccion del ferrocarril de Pisco a Ica.*
*Lima, Julio 16 de 1896.*
*Senor Director de Obras Pablicas:*
*He inspeccionado el ferrocarril de Pisco a Ica, y tengo el honor de informar a US. lo siguiente:*
*…*
*Factoria.—El edificio necesita algunas reparaciones, pues las planchas de calamina de las paredes y techos estan ya bien deterioradas.*
*Me he ocupado principalmente en la factoria de ver el estado de las maquinas, y en consecuencia, he pedido al contratista que sometieramos estas maquinas a una presion hidraulica para conocer su estado.*
*Como la instalacion de la bomba hidraulica que existia era algo defi-ciente, no se ha podido hacer esta operation tal como lo deseaba y era necesario; sin embargo he aqui el resultado obtenido con tres maquinas probadas.*
*La núm.* ***5 Villacuri*** *fue probada con solo 175 libras por no haber podido seguir funcionando la bomba hidraulica. Esta presion podia autorizar una presión de marcha de 100 libras; pero estoy seguro pueden it hasta 120 libras con toda seguridad.*
*La núm.* ***7*** *fue probada a 200 libras; asi es que Ia presion que se puede autorizar en marcha es la de 120 libras; esta*

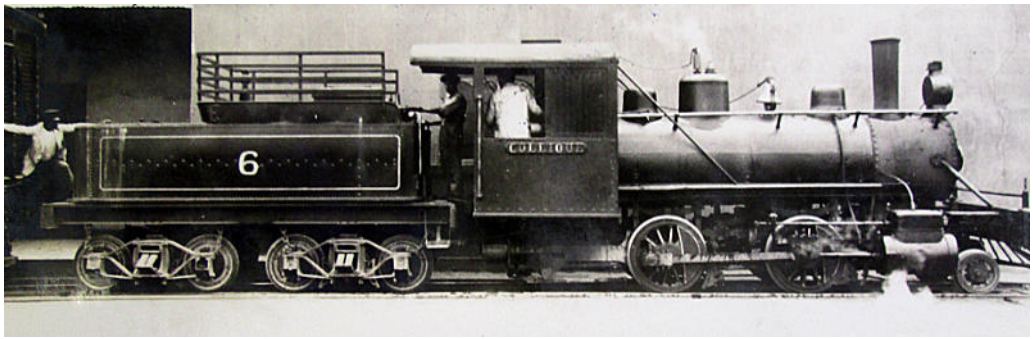
*es suficiente en el servicio de esta linea.*
*La núm.* ***4*** *esta en reparation completa.*
*La num.* ***6*** *que solo sirve para lastre y que no esta en muy buen estado fue probada a 160 libras, por lo que puede autorizarse el servicio con 80 libras de presión.*
*La num.* ***3 (Ica)*** *no pudo ser probada por estar en servicio activo en esos dias; la prueba debe hacerse en una nueva inspección.*
*El* ***Caballito****, estaba en pequeña reparación.*
*He prevenido al senor contratista, que en general toda maquina debe ser probada al salir de una reparacion, y la prueba debe hacerse con el forro descubierto de la caldera, para poder notar todas las imperfecciones.*
*Asi mismo, en una nueva inspección y prueba de caldera debera tenerse una buena instalacion de bomba hidraulica.*
*Es todo lo que tengo que informar.*
*Dios guarde a US.*
*M. A. VIÑAS*
*Ingeniero del Estado.*

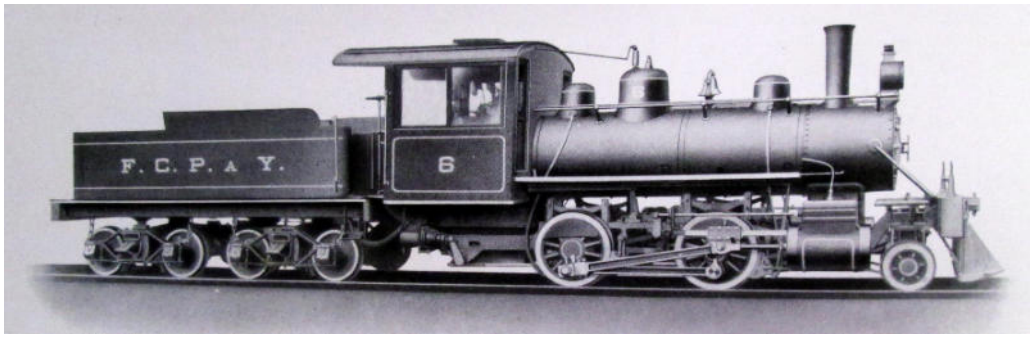
## Boiler tests in March 1897

*Señor Director de Obras Públicas.*
*He inspeccionado nuevamente la linea férrea de Pisco á lca, y del resultado de mi inspección, tengo que informar á US. lo siguiente:*
*1o. La línea se conserva siempre en buen estado, atendiéndose á su limpieza, cambio de rieles y durmientes á medida que es necesario, existiendo en reserva rieles nuevos para cuando se ofrezca; pero siempre hay algunos rieles, cerca de la playa de Pisco, que deben ser cambiados por no estar en perfecto estado;*
*2o. Ningún cambio se ha hecho en las estaciones por las razones que ya he expuesto en otros informes; sin embargo, en la Factoría de Pisco se han hecho pequeñas refecciones en las paredes de zinc y techos;*
*3o. Las máquinas han sido refeccionadas, y las he probado con presión hidráulica, obteniendo los siguientes resultados:*
*Máquinas {No.* ***3*** *probada á 200 libras* ***'Ica'***
*No.* ***4*** *id. 200 id.* ***'Empresa'***
***Caballito*** *id. 220 id.*
*así es que cualquiera de estas máquinas puede prestar sus servicios perfectamente, no pasando la presión de 120 libras en el tráfico.*
*La bomba hidráulica que ha servido para las pruebas, ha sido refeccio nada muy bien y ha funcionado satisfactoriamente.*
*Lima, Marzo 31 de 1897.*
*M. A. Viñas,*
*Ingeniero del Estado.*

## *2-4-0 d/w 34", cyls. 12x18", built by ALCo Cooke in 1914*

Ordered via W. R. Grace & Co. for *FC Pisco Sur* (?). Most, though not all, ALCo lists show this as an 0-4-2T.
**6² 'COLLIQUE'** w/n 54786




No. **6** as illustrated in an ALCo sales corporation catalog.

No. **6** arrives in Ica.

## The fleet in 1918

The 1918 edition of the *Anales*, p392, says:

*Locomotoras*

*Pisco N.* 1.—Acaba de salir de la factoría y encuéntrase en buenas condiciones para el servicio. Lleva tres pares acoplados y se le ha provisto de zapatas al par central. Tiene establecido también el breque a vapor.

*Guadalupe N. 2.*—En idénticas condiciones a la anterior, habiéndosele dotado de breques a vapor.

*Ica N. 3.*—Solo consta de dos pares acoplados- Está totalmente desarmada, en revisión general, para reparar su caldero.

*Progreso N. 5.*—Esta consta de tres pares, pero al central aún no se le han colocado zapatas, He notificado a la empresa para que proceda a efectuar ese trabajo; pudiendo, mientras sale la "Ica" de la factoría, hacer el servicio de patio, pero no de trenes a ésta. He advertido que debe colocársele también freno a vapor.

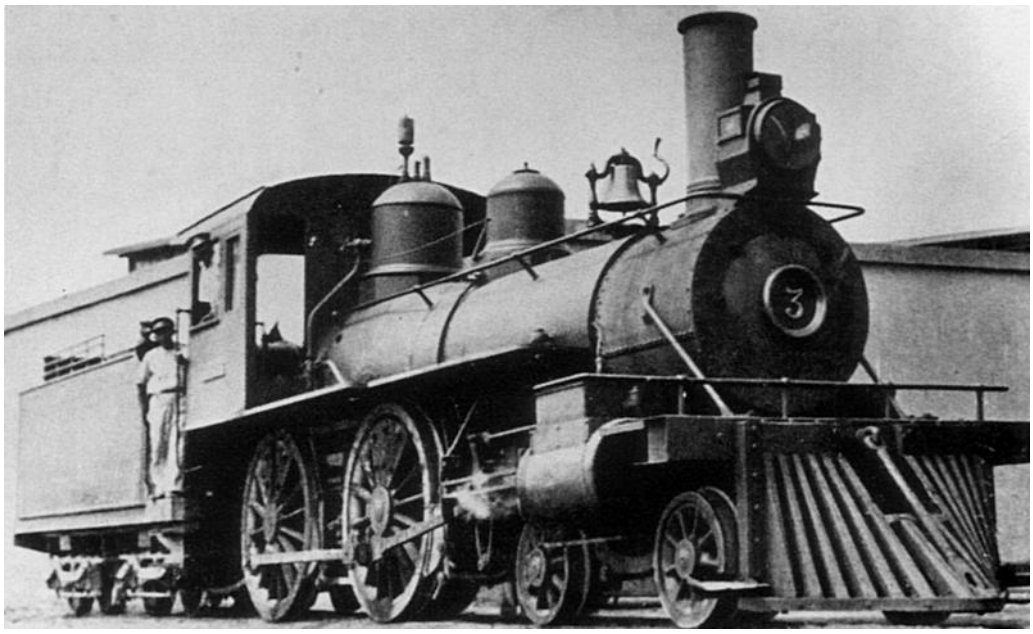
*N. 6.*—Sólo consta de dos pares acoplados, es la más nueva de las locomotoras de la casa "American Locomotive Company", solo tiene cuatro años de uso.

*Caballito N. 1 y Galguito N. 2.*—Son máquinas de patio para el servicio del muelle; se encuentran en bastante buenas condiciones.

***4-4-0TT d/w 60", cyls. 18½x22", built by Rogers in 1876***

Rogers order no. 950. Ordered by *FC Callao Lima y Oroya,* as their **17 'MANCO CAPAC'**, one of five similar machines. Shipped Oct. & Nov. 1876. Tank on engine 400 gall. Boiler diameter at front 50". Wheelbase 8'6" driving and 22' 1" total. Most Rogers lists show these as tender engines. However, the typed spec. sheet provided by ALCo to P. C. Dewhurst clearly states that they originally had a small 400 gallon water tank/s on each engine.

**3[2] 'ICA'** w/n 2441 Not listed in 1890-97 *FCC* mileage tables, and definitely OoS by 1891. [5] says that one of these locos was transferred to the *FC Pisco á Ica*, becoming their no. **3 'ICA'**. It may well have been this engine. The 1918 table immediately above is the first documentary evidence of a no. **3 'ICA'** being a 4-coupled machine, but it may have arrived much earlier and possibly by 1891.




One of the ex-*FCC* Rogers 4-4-0s seen as *FCPI* no. **3**. Note that the original small water tanks have gone along with other changes no doubt including reboilerings. Source [23].

## The fleet in 1925

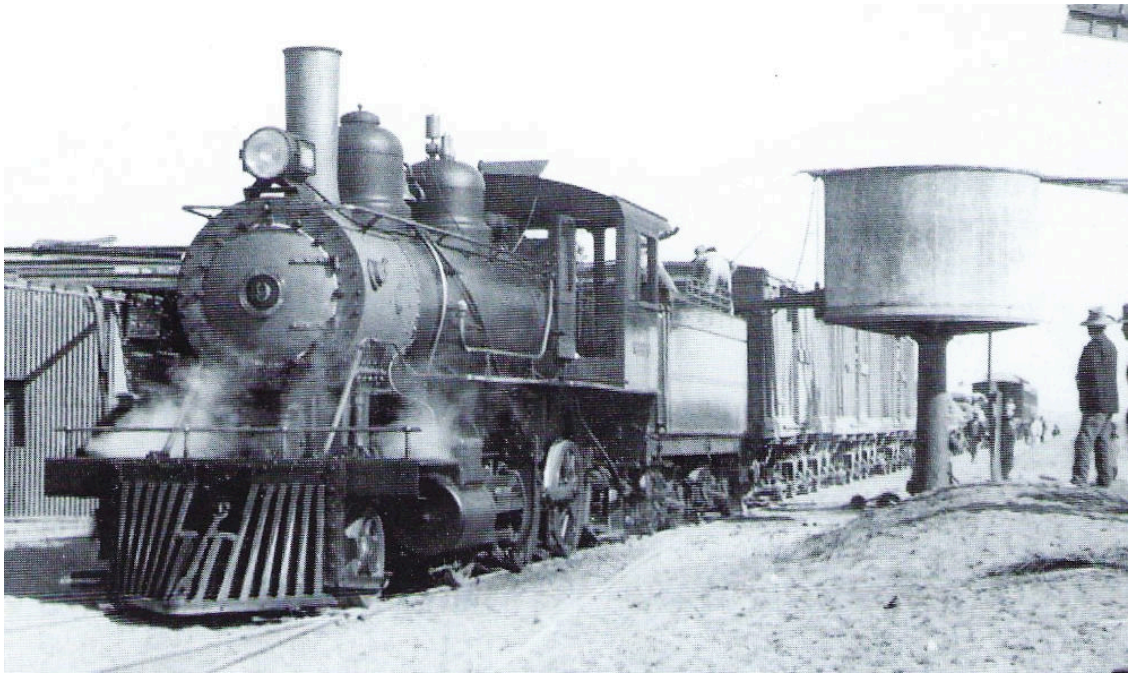
The 1920s US report states that there were five 4-coupled engines, and two with only two driving wheels. That makes a total of seven out of the ten locos listed above, but it is difficult to correlate the types of engine with those listed, particularly as only one single-driver machine is shown as having arrived here.

### *2-6-0 d/w 44", cyls. 17x24", built by Baldwin in 1925*

Ordered for *Empresa del FC de Pisco a Ica*. BLW class 08-28D no. 335. Spec. is in vol. 78 p210. Mark on tank sides: 'F. C. PISCO Á ICA'. Sunbeam turbo-generator. No copper top on chimney. Fuel rack on tender.

**9 'MIGUEL CABALLERO'** w/n 58311

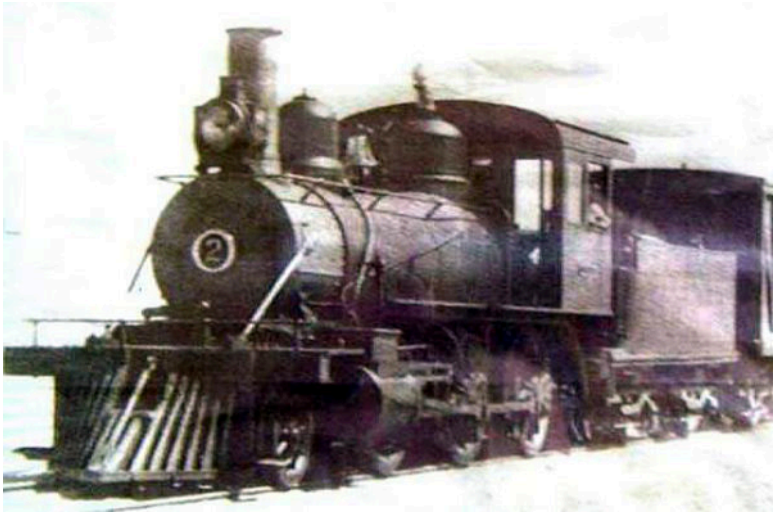

This image is from Baldwin negative 09456 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.



No. **9 'MIGUEL CABALLERO'** seen at Milla 18..

## An unidentified later 2-6-0

This mogul numbered **2** is carrying relatively-modern boiler mountings, though the dome is over the firebox. It also has four bar slidebars rather than the alligator type seen in the image above. It might, of course, be a re-boilering of one of the earlier locos. It does have many similarities with the Rogers 4-4-0 no. **3 'ICA'** which had arrived from the *FCC*, though with differently-spaced boiler mountings. However, the engine in the photo below does appear to be a 2-6-0 rather than a 4-4-0.



## The fleet in 1932

In 1932, the railway had nine locomotives (6 for road service and 3 for switching), as well as 13 passenger cars and 43 freight cars.

## A 1950s report

2. Locomotives.

In spite of all that I had heard the locomotive situation was about the best part of this neglected railway - Ashton has done good work in selecting 4 similar engines which take stand tyres etc. out of the old "junk" at Pisco. He has two of these in service, Nos.9 and 6 and two more Nos.2 and 5 are under repairs. The shops at Pisco are good and coupled with Guadalupe for special heavy work can compete with requirements except, and there is one very big but and that is boiler work. The reason for this is that the water for boiler use is awful and such that even with the maximum care in washing out etc. a new firebox is ruined in about 18 months work. I saw one such boiler under repair in Guadalupe and when I looked at the firebox roof it was all bulged and I thought it had been run short of water but Ashton said "no only 18 months ordinary use". I therefore consider that the very first economy we should take on the Pisco-Ica line is to instal water softening. As a rough estimate it should repay its capital cost in 2 to 3 years. We just cannot afford to go on running boilers on this water. A base exchange water softening system can be installed by Messrs. Chambers from Chile and I recommend that detailed estimates be prepared and submitted for approval as soon as possible.

In connection with the scheme consideration should be given to using more of the Ica water (which is a bit better) and running it by tank car to Pisco as I think there is normally spare capacity on the daily freight train. This might save in the cost of the treatment plants required.

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# 13.5.2 *El FC Ilo á Moquegua*

***Región de Moquegua***

**1870-1880**

## later rebuilt and re-opened

**1909-1964**


An invoice frtom the first generation *FCIM*, as found on Sr. Elio Galessio's blog at https://trenesdelperu.blogspot.com/

### Background

Standard gauge. Completed in 1873 but destroyed by the Chilean army in 1880 during the War of the Pacific. Attempts to rebuild it failed, and it was not until early in the new century that the government ambarked on the reconstruction.

There were thus two completely separate generations of locomotives. There have been persistent stories about first generation locos being taken to Chile by the invaders, and this topic forms an appendix in the file on Chilean intermediate gauge locos. However, a portion of an 1896 inventory displayed below suggests that the remains of eight identifiable locos survived at Ilo station in that year.

The second phase of operations ran from 1909 to 1964, when some locos and stock were moved to the *FC Tacna Arica* not far to the south. A stretch of the route near the coast is still in use as part of the Southern Peru Copper Company's railway.

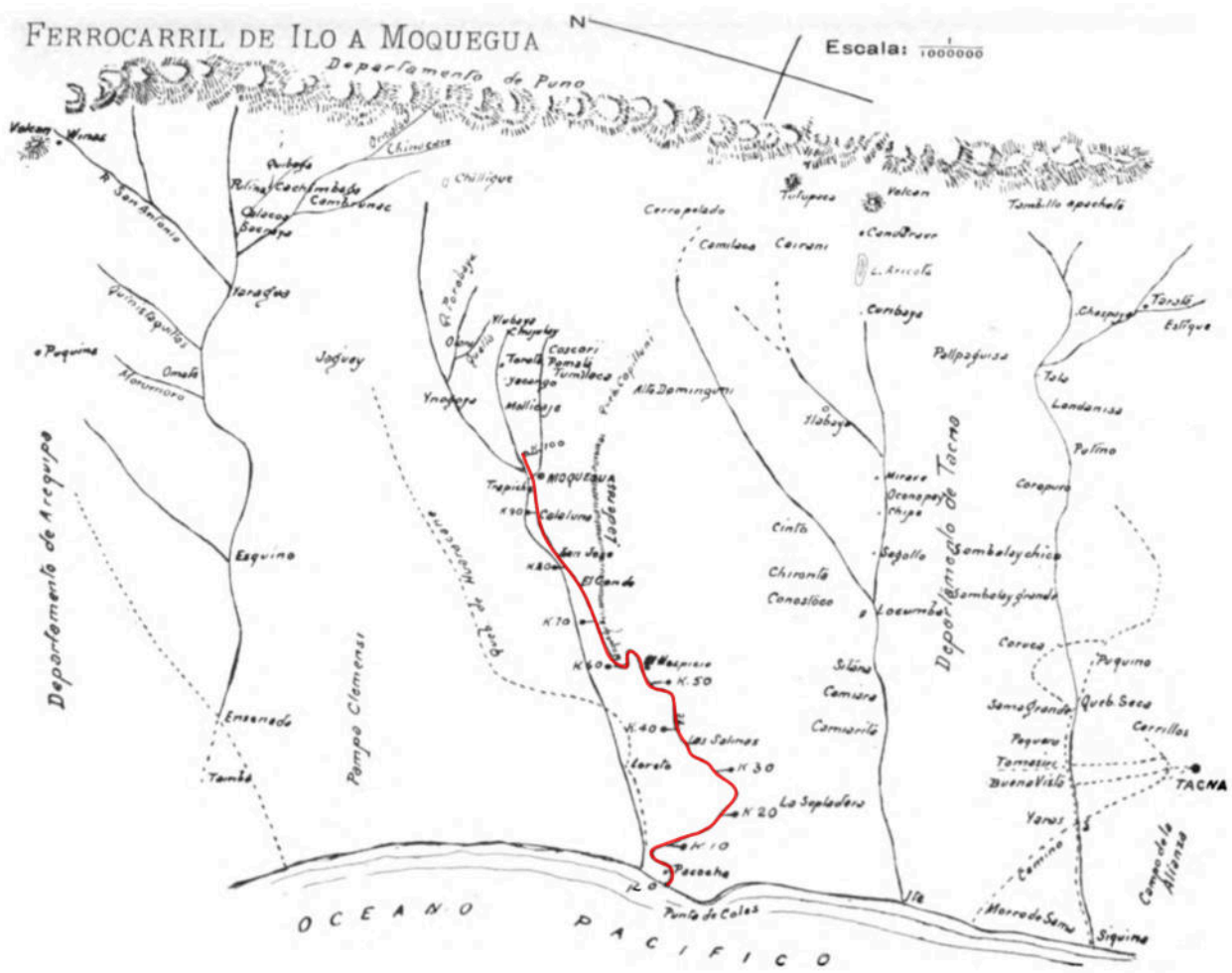
### The anticipated fleet

The bases of contract from June 1870 reproduced in source [24], list the following motive power as needed for the new railway:

"*Equipo del camino o material rodante. Ocho locomotoras de peso de 30 toneladas, con 3 pares de ruedas motrices 4' 6" de diámetro, cilindros de 16 pulgadas de diámetro y 24 pulgadas de manga, capaces de arrastrar trenes de 50 toneladas de peso neto en subida, por gradientes de 3 % y curvas de 120 metros de radio mínimo con la velocidad de 15 millas por hora. ...*

*Dos idem á vapor (steamcars ) capaces de arrastrar 4 toneladas de peso neto por gradieutes de 3 % y curvas de 130 metros de radio mínimum.*"

Note that whilst the road loco driving wheel diameter is given here as 4' 6", a page or two earlier in the same document the locos for the Tacna to frontera de Bolivia railway were to have had wheels of 46". It is likely that one or other figure was a type-setting mistake.




## The first generation fleet

That the fleet was made up of "*locomotoras en número de 10, 8 grandes y 2 pequeñas*" is confirmed by source [11. 1874B p66].

### *2-6-0 d/w 48", cyls.18x24", built by Rogers in 1871*

Ordered by Ilo & Moquegua.

**? 'ILO'** w/n (1870)

**? 'MOQUEGUA'** w/n (1875)

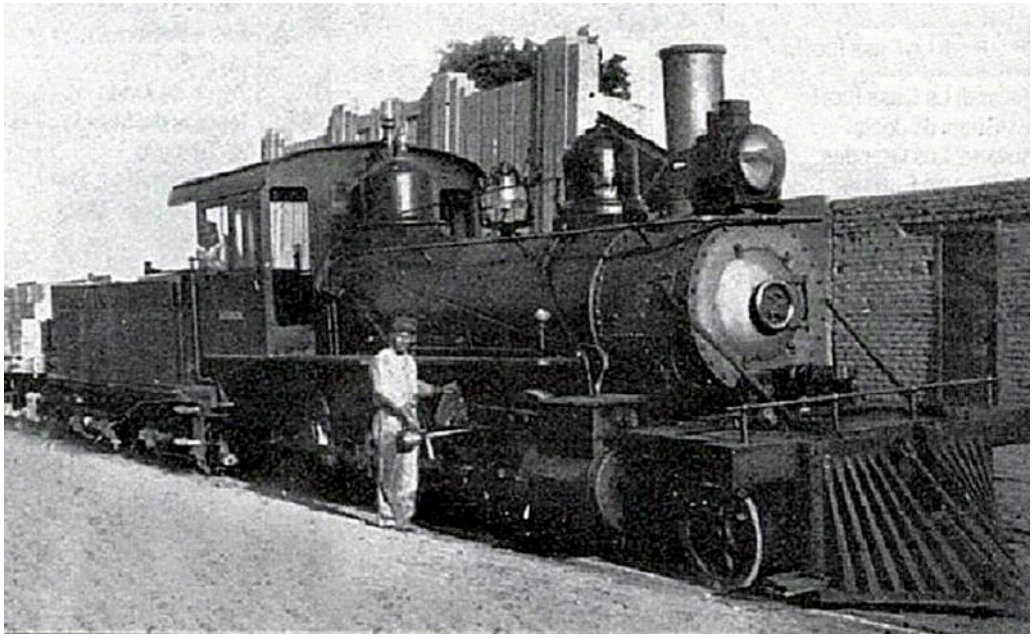
### *2-6-0 d/w ?, cyls. 17x22", built by Danforth in 1871*

Ordered by Ilo & Moquegua. Whilst we have little firm evidence about any names for these locos, in August 1874 the new Nitrate Railways company in Tarapacá was debating whether to purchase two locos named **'ILO'** and **'PACOCHA'** from the *FC Ilo a Moquegua*. It seems likely that the second of these was one of these Danforths. One of the loco names listed but not identified in the 1896 inventory listed below was **'TACNA'**, and this may also have been one of the Danforths. The name 'PACOCHA' is that of the cove to which the port of Ilo was relocated after the 1868 tsunami.

**?** w/n 772

**?** w/n 773

**?** w/n 774



This undated image, from the *Ilo – fotos de recuerdo antiguas* page on Facebook, might be from either of the railway's two eras. However, this mogul numbered **2** has a firebox-mounted dome and a Danforth-style cross-compensating beam in front of the smokebox, suggesting that it might be from the earlier era.

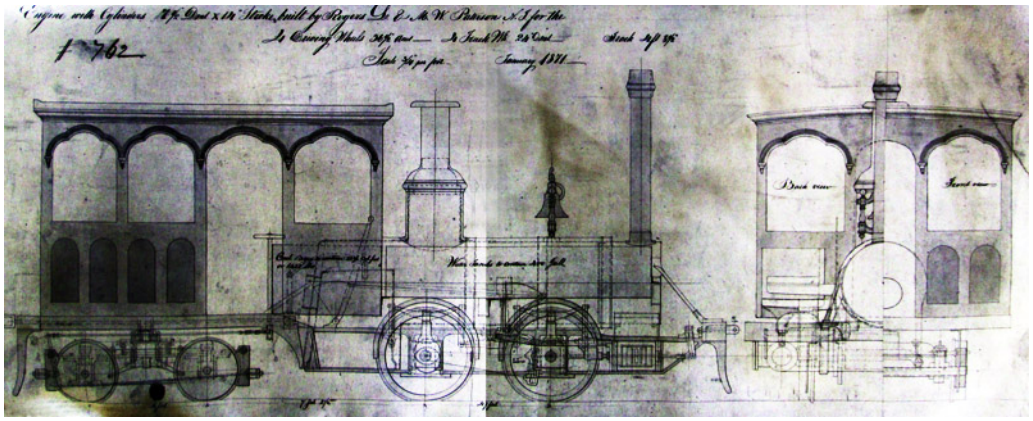
## Two locos sold and the remainder eventually numbered?

There is no proof that the sale of two locos to the Nitrate Railways actually went through. However, not only would such a sale solve a problem in the NRC list, but it would also very neatly leave just three 2-6-0s to take the numbers **1** to **3** in the *FC Ilo á Moquegua*'s eventual fleet numbering system. The only problem is that both of the two engines supposedly on offer in 1874, **'ILO'** and **'PACOCHA'**, were still at Ilo in 1896, but two others, the Baldwin mogul **'OTORA'** and the third Danforth, were missing.

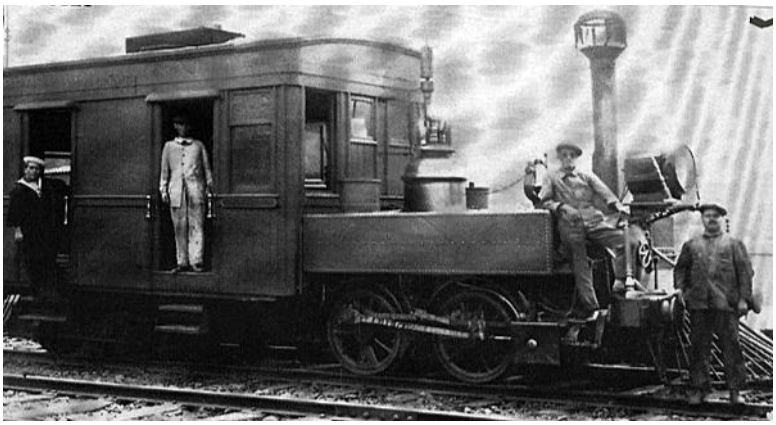
## *0-4-4T d/w 36½", cyls. 7½x14", built by Rogers in 1872*

Ordered by *Ilo y Moquegua*. 'Passenger pony'.

**4**? **'El HUANUCO'** w/n (2032)



The sketch above is from a Rogers blueprint, showing a standard gauge inspection saloon, of which at least three were built for Peru. The drawing is dated January 1871, so this was probably the first of the three known examples, though most photos show it with a clerestory roof possibly a later modification. Interestingly the end elevations are labelled 'Front view' meaning the saloon end, and 'Back view' meaning the chimney end – very logical for an inspection saloon.



It is still unclear whether the Chilean *EFE*'s inspection car no. **60 'PLACILLA'** originated on the *FCIM* or on another Peruvian railway. The similar cars belonging to the *FC Central* and the *FC del Sur* both had long service lives in Peru, but the *FCIM*'s **'El HUANUCO'** was suspected to have been commandeered by the Chilean forces during the War of the Pacific. However, the reports below list both boiler and coach frame as surviving at Ilo in 1896, so the puzzle as yet remains unsolved. The photo above shows **'PLACILLA'** as regauged and rebodied in Chile, hence the side-buffers as used there.

### *0-4-0T d/w 34", cyls. 10x18", built by Rogers in 1871*

Ordered by ?

**5**? **'ALERTA'** w/n (1893)

### *2-6-0 d/w 49", cyls. 17x22", built by Baldwin in 1871-2*

Ordered by Ilo Moquegua (though the vol. 5 p319 spec. sheet has Arequipa & Puno crossed out and Ilo Moquegua inserted. Also a comment "These engines are duplicates of class 25½D nos. 4 and 5" (which were nos. **5** and **6** on the *FCAyP*. BLW class 25½D nos. 13-15. Spec. is in vol. 5 p319 and vol. 6 p14. Not clear why two separate spec. pages. Earlier one says Yankee stack, whilst later one says diamond stack.

| | | |
|---|---|---|
| **6 'LOCUMBA'** | w/n 2683 | |
| **7 'HUARACANI'** | w/n 2686 | The name 'Huaracane' is that of a tributary of the Moquegua river. |
| **8 'OTORA'** | w/n 2691 | The name 'Otora' is that of a tributary of the Moquegua river. The relevant BLW register book has this name and number crossed out and **4 'EMPRESA'** pencilled in. |

## The fleet in 1886

Source [11], the *Anales de las Obras Públicas del Perú* for 1886, p237:

"*Que destruido el Ferrocarril de Ilo Moquegua por el ejercito chileno, ha desaparecido todo su material rodante, quedando solo una pequeña parte del material fijo, que puede servir de base para reconstruir esa linea ferrea.*"

p392: The *inventario de las existencias en la estacion 'Alto de la Villa'* included '*un ténder de la máquina **Tacna***' in poor condition.

p396: Items abandoned at Ilo station: "*6 restos de maquinas consistentes en calderas oxidadas, puestas sobre seis ruedas. 2 maquinas pequeñas **"Alerta"** é **"Ilo"** destrozadas por completo. 1 tender destrozado por completo.*"

p402 there was an assumption that a rebuilding of the railway would require the purchase of three large locos at S15,000 each, and two small at S10,000 each. P405 on the other hand suggests:

"*Clausula 3.*— El equipo del camino ó material rodante, será por lo menos el siguiente: A — Cuatro locomotoras de treinta toneladas de peso con tres pares de ruedas motrices capaces de arrastrar trenes de cincuenta toneladas de peso new con gradientes de cuatro por ciento de subida y en curvas de ciento veinte metros de radio minimum con la velocidad de veinticinco kilómetros por hora. Dos locomotoras pequeñas, capaces de arrastrar cuatro toneladas de*

*peso neto con gradientes de cuatro por ciento y curves de ciento veinte metros de radio minimum.*"
p410-411: "*La cláusula relativa al equipo, debe ser modificada, expresando que el poder de las locomotoras, sea el de arrastrar ochenta toneladas neto en la gradiente, radios y con la vclocidad que se expresa.*
*La razon está, primero, en que una locomotora que en su extreno tiene la potencia de arrastrar solo cincuenta toneladas, va perdiendo con los años de use su potencia de un modo gradual; de donde resultaría que, si se pusiera máquinas de solo la potencia de cincuenta toneladas, á los cinco años no podrian arrastrar mas de treinta, y serian máquinas anti-económicas, hasta el extremo de llegar á ser inútiles antes de ocho años; y segundo en que una locomotora de treinta tonelada de peso tiene el poder de arrastrar un peso neto tres y cuatro veces mayor.*
*Las locomotoras que puso D. Enrique Meiggs, tuvieron el poder de arrastrar ochenta toneladas netas, y á los cuatro años no podían con cuarenta, por el pésimo material empleado en su construccion.*
*Las dos máquinas pequeñas, deben tambien tener el poder de arrastrar veinte toneladas mínimun, quc son las mas usuales para el tráfico de pequeñas distancias y a proposito para el del muelle y del Valle. Una locomotora del poder de arrastrar solo cuatro toneladas, no sería capaz de conducir una bodega ó un carro llenos ó cargados de mercaderia de peso, del muelle de Ilo á la estacion, y sería nada mas que un objeto de lujo, útil solo para expresos conduciendo un cochecillo con quince ó veinte personas.* "

## Proposals for the reconstruction of the railway in 1887

"*El equipo del camino ó material rodante sera por lo menos el siguiente:*
*A.—Cuatro locomotoras de la mejor clase, de treinta toneladas de peso minimun, con tres pares de ruedas motrices, capaces aquellas de arrastrar trenes de ochenta toneladas de peso neto, en gradientes de 4% de subida y en curva de 120 metros de radio minimum, con la velocidad de 15 kliometros por ahora.*
*B.—Seis coches para pasajeros: dos de primera clase, dos de segunda y dos mixtos.*
*C.—Doce carros para carga. seis cerrados y seis de plataforma.*
*D.—Cuatro carro cerrados para equipajes.*
*E.—Dos carros de jaula, para animales.*
*F. —Dos locomotoras pequeñas del poder de arrastrar veinte toneladas de peso neto en gradientes de 4 por ciento y curvas de 120 metros de radio mínimun.*"

## An inventory of surviving items at Ilo station in 1896

*Existencias EN LA ESTACIÓN DE ILO.*
*...*
*13o. Un caldero de la maquina **Huaracane** faltandole tubos d= 1m14*
*l=5m75*
*14o. id id **Ilo** sobre 2 truk de carros sin tubos.*
*15o. id id **Pacocha** sobre 1 truk.*
*16o. id id **Huánuco** sin tubos ni ruedas.*
*17o. id id **Moquegua** sobre 1 truks y un par de ruedas*
*de0m45 d= 1m23*
*l =5m92*
*18o. id id **Locumba** sin ruedas y con tender.*
*19o. Un caldero de la máquina **Tacna** sobre un truk, sin tubos.*
*20o. Id id **Alerta**, con tanque y carbonera, sobre dos pares de ruedas, sin tubos, y con sus dos cajas de distribucion sueltas.*
*21o. Cinco armazones de plataforma con sus truks y montage*
*22o. Una bodega completa en regular estado con montage*
*23o. Id. sin montage Via ancha*
*24o. Un carro de equipaje en piezas (desarmado)*
*25o. Dos coches de 2' id. ( id. )*

*26o. Seis plataformas para carros de via angosta, hechos con material anti-guo y tablero de pino oregOn nuevo, sin ruedas ni ejes.*
*27o. Dos carros de plataforma con sus respectivas ruedas etc. (nuevas)*
*28o. Un carro de plataforma, casi terminado.*
*29o. Cuarenta y tres marcos para truks.*
*30o. Un cuadro para el coche del **Huanuco**.*
*31o. Ciento catorce pares de ruedas con sus ejes (diametro o" 82)*
*32o. Diez id. id. id. (diametro on L45)*
*33o. Noventa y cuatro ruedas sueltas de om•82.*
*34o. Dos truks sueltos, 26 piezas centrales de madera para truks y 14 topes para carros.*
...

## The narrow gauge interlude

An *FC del Sur* letter from Mollendo in 1906 reporting on this railway says:
"In 1880 it was partly destroyed by the Chilians and has not been in use since, although some ten years ago a man named Valez relaid a portion of it to a 2' 6" gauge, but the engine purchased to work it would not climb the grades, and it was abandoned."
and later:
"The first sixteen miles of the road has been altered from a 4' 8½" gauge to a 2' 6" gauge by moving one rail."
If any further information is found it will be placed in section 14.5.8 of the Peruvian narrow gauge locos file.

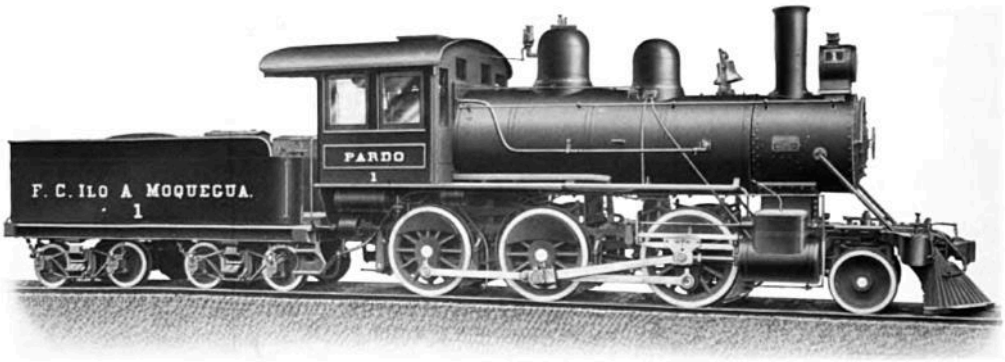
## The second generation fleet

Costa y Laurent in 1908 [1] writes (p207) that there were "*2 locomotoras tipo 'Ajuinaker' de gran poder, de la Locomotive Co. de New York, una locomotora pequeña, tipo 'Mangoneara' de la Baldwin Locomotive Co. de Philadelphia,...*" The strange names might well have been the manufacturers' telegraphic codes for those particular types.

### *2-6-0 d/w 54", cyls. 16x24", built by ALCo in 1908*

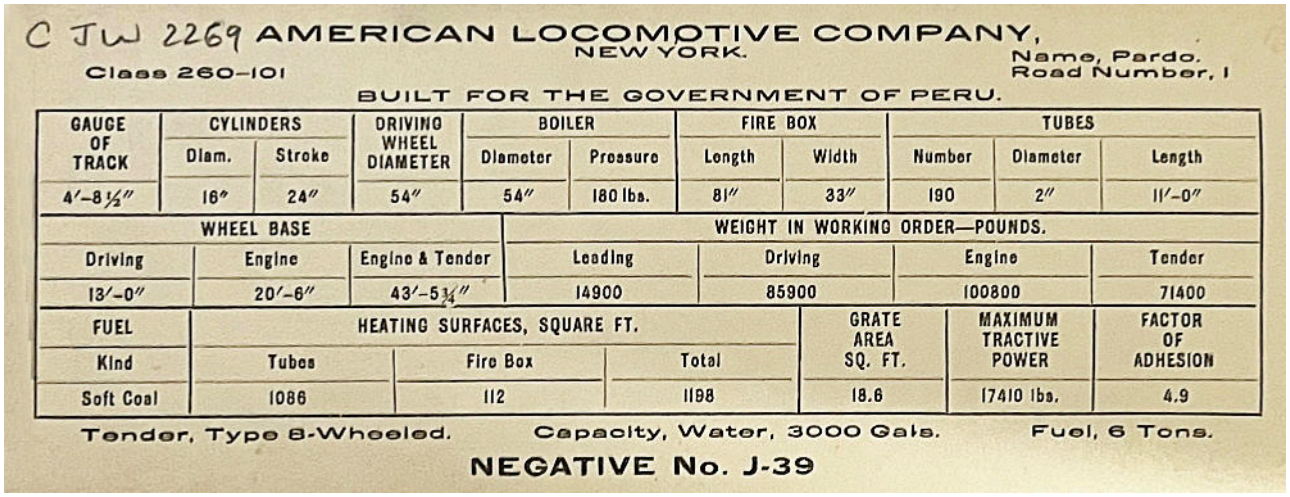
Ordered by Govt. of Peru.

| | | |
|---|---|---|
| **1 'PARDO'** | w/n 44954 | Copeland suggests named **'ILO'**, but an ALCo photo in [5] shows the loco named **'PARDO'**. Later it went to *FC Tacna Arica* as their no. **9**. |




*FCIM* no. **1 'PARDO'** as illustrated in an ALCo catalog.


*FCIM* no **1** ALCo publicity card photo.



C JW 2269 AMERICAN LOCOMOTIVE COMPANY, NEW YORK.

Class 260-101

Name, Pardo. Road Number, 1

BUILT FOR THE GOVERNMENT OF PERU.

| GAUGE OF TRACK | CYLINDERS | | DRIVING WHEEL DIAMETER | BOILER | | FIRE BOX | | TUBES | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Diam. | Stroke | | Diameter | Pressure | Length | Width | Number | Diameter | Length |
| 4′-8½″ | 16″ | 24″ | 54″ | 54″ | 180 lbs. | 81″ | 33″ | 190 | 2″ | 11′-0″ |

| WHEEL BASE | | | WEIGHT IN WORKING ORDER—POUNDS. | | | |
|---|---|---|---|---|---|---|
| Driving | Engine | Engine & Tender | Leading | Driving | Engine | Tender |
| 13′-0″ | 20′-6″ | 43′-5¾″ | 14900 | 85900 | 100800 | 71400 |

| FUEL | HEATING SURFACES, SQUARE FT. | | | GRATE AREA SQ. FT. | MAXIMUM TRACTIVE POWER | FACTOR OF ADHESION |
|---|---|---|---|---|---|---|
| Kind | Tubes | Fire Box | Total | | | |
| Soft Coal | 1086 | 112 | 1198 | 18.6 | 17410 lbs. | 4.9 |

Tender, Type 8-Wheeled. Capacity, Water, 3000 Gals. Fuel, 6 Tons.

NEGATIVE No. J-39

*FCIM* no **1** ALCo publicity card details.

### *2-6-0 d/w 46", cyls. 16x24", built by Baldwin in 1908*

Ordered by Ilo Moquegua. BLW class 08-26D no. 185. Spec. is in vol. 32 p303. Mark on tank 'F. C. ILO Á MOQUEGUA'.

**2 'MOQUEGUA'** w/n 32983 Later went to *FC Tacna Arica* as their no. **2**[2].


This image is from Baldwin negative 02746 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.

### *2-4-0 d/w 44", cyls. 13x20", built by Baldwin in 1909*

Ordered by Ilo Moquegua. BLW class 06-20C no. 7. Spec. is in vol. 32 p250. Mark on tank 'F. C. ILO Á MOQUEGUA'. Fuel: soft coal. Stack: straight. MCB auto-coupler.

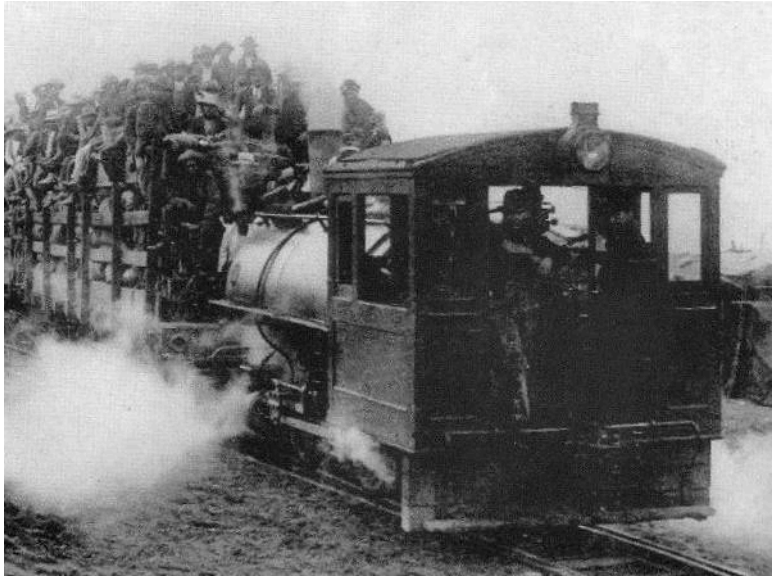
**3 'PACOCHA'** w/n 32845 Later went to *FC Tacna Arica* as their no. **1**[2].

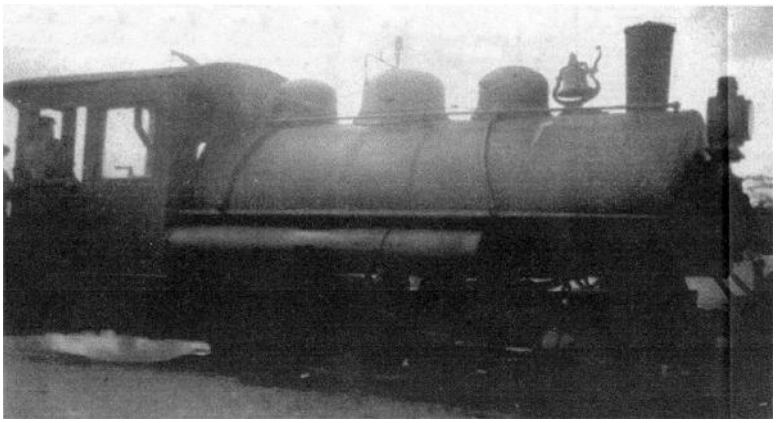

This image is from Baldwin negative 02700-1 and hi-res copies can be purchased from the Railroad Museum of Pennsylvania.

### *0-4-0ST d/w 30½", cyls. 10x16", built by VIW in 1919*

Ordered via Vulcan Steel Products for *FC Huancayo á Ayacucho* when that was to be standard gauge and then transferred to *FCIM* according to [11, 1919 p523].

**4** w/n 2930





### *4-6-0 d/w ?, cyls. 18x26"?, built by ? in ?*

Ordered for ? This was probably one of Arequipá Works' creations, and very likely one of *FCS* locos **1, 2, 3, 4, 5** (ex-**9**), **13, 20, 31, 32, 36, 39** or **42**, each of which ended up as a 4-6-0. Cyl. dimensions inferred from 1925 reference below.

**?** w/n ?

This derailed engine, supposedly on the *FCIM*, has not yet been identified. However, it would appear to be a 4-6-0 or 2-6-0, and the home-made dome cover suggests an Arequipá works product. There is also a pronounced belpaire firebox. From Sr. Abrill Talevera's Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos page on Facebook.

## The fleet in 1925

The US report [2] lists the following locos on this line at that time:

| | |
|---|---|
| One 4-6-0 of 64 tons with cyls. of 18x26". | Presumably the mystery loco ex *FCS* that is speculated about above. |
| Two 2-6-0s of 60 tons with cyls. of 16x24". | Presumably nos. **1** and **2**. |
| One 2-4-0 of 44 tons with cyls. of 13x20". | Certainly no. **3**. |
| One 0-4-0 of 20 tons with cyls. of 10x16". | Presumably no. **4**. |

## *2-8-2 d/w 44", cyls. 18x24", built by Baldwin in 1927*

Ordered by *FC Ilo Moquegua*. BLW class 12-30¼E no. 107. Spec. is in vol. 79 p191.

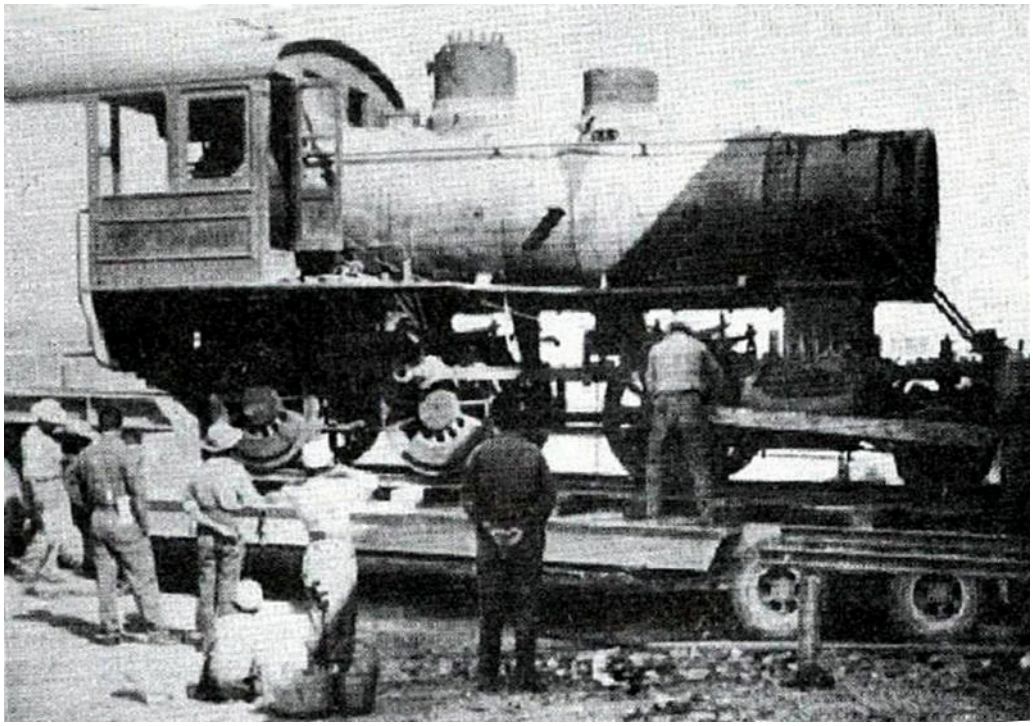
**5 'PRESIDENTE LEGUIA'** w/n 59809

This appears to be the Baldwin 2-8-2 no. **5 'PRESIDENTE LEGUIA'**. It has slide valves, an inside bearing trailing truck, and a Worthington feedwater heater on the left side. The lettering on the tender says 'F. C. ??? Á ????????'. The words are not clear enough to read with any certainty though the first one is certainly short enough to be 'ILO'. From Sr. Abrill Talevera's *Amigos a los que les gusta Ferrocarriles y Tranvias Peruanos* page on Facebook.

An Ilo history page at http://eadriazola.blogspot.com/2008/05/el-ferrocarril-ilo-moquegua.html lists the loco names of this second iteration of the railway as **'PARDO', 'LEGUIA', 'LEONOR'** and **'PACOCHA'**. Whilst three out of the four are listed above, there has been no mention of a **'LEONOR'**. This might, however, have been the name given to either the small VIW 0-4-0T or to the 4-6-0 seemingly received from the *FC del Sur*. However, source [25] states that the later road locomotives were **'PARDO', 'MOQUEGUA'** and **'LEGUIA'**.

## Dispersal of assets

The image below, from the *Ilo – fotos de recuerdo antiguas* page on Facebook, was captioned as showing part of the dispersal of railway assets from Ilo in 1965, when anything useful went to Tacna and the remainder was sold for scrap. It looks as though this 2-6-0 might have been regarded as worth saving, despite its woebegone condition, but its identity is more of a puzzle.



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## 13.5.3 The Southern Peru Copper Co. railway

***Región de Moquegua***

**1959-date**

### Background

Standard gauge. This modern line utilises several miles of the erstwhile *FC Ilo a Moquegua* close to the coast, but as far as is known its tracks have never seen a steam locomotive since they were only brought into use in 1959.

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# 13.5.4 *El FC de Arica á Tacna* – The Arica & Tacna Railway Co. Often known nowadays as the *FC Tacna á Arica*.

***Región de Tacna***

**1855 to date**

NB This is a duplicate of section 2.1.3 in the Chilean intermediate gauges file in this series.

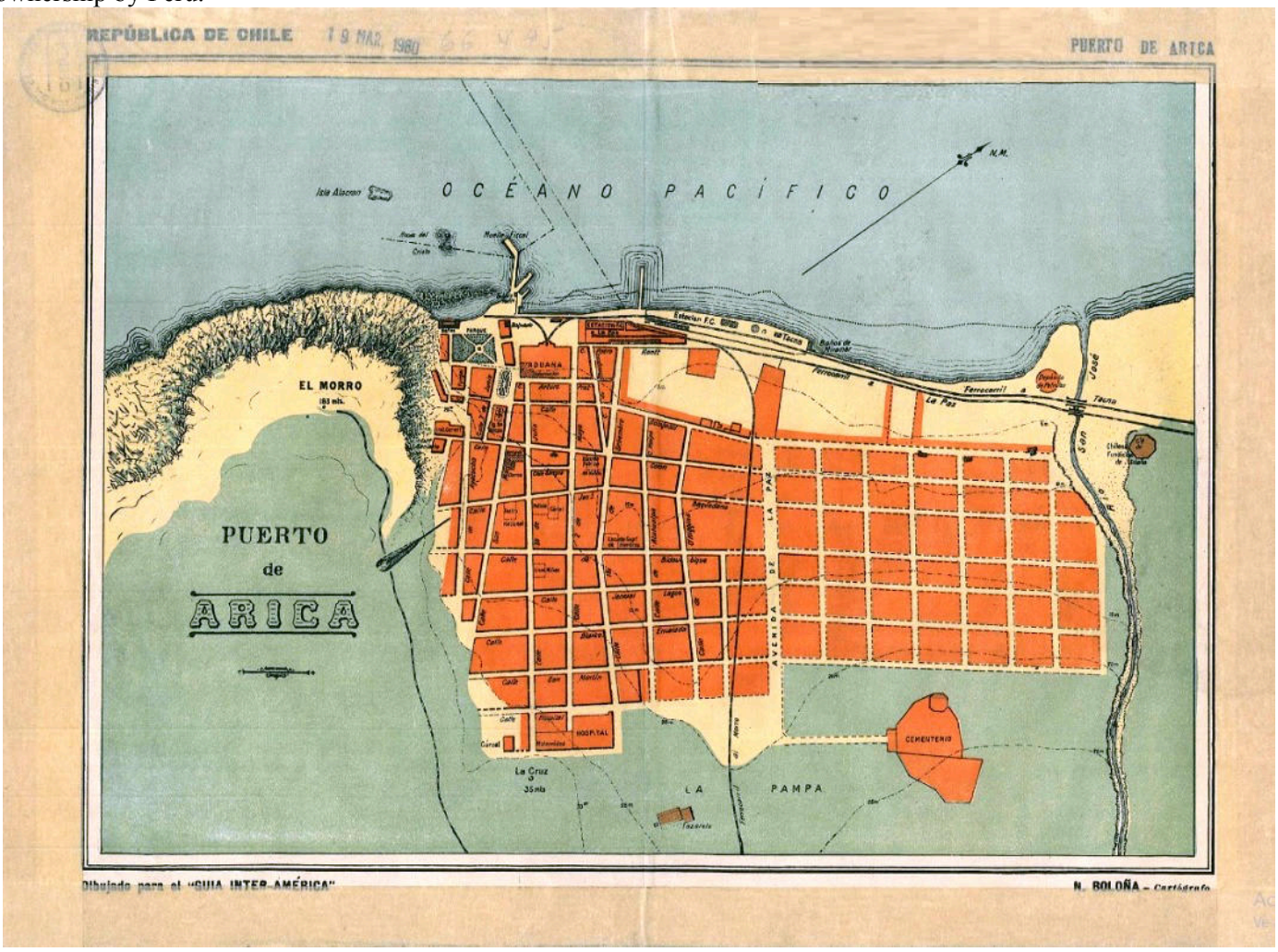
## Background

Standard gauge. Built 1855 by Joseph Hegan. 62 km. long. [30] quoting Hawthorn order books at the NRM states that the 1869 and 1870 locos were ordered via John Hegan & Co. of Liverpool. Hegan seems to have been the Peruvian government's principal contractor for the line. Ownership was then transferred in 1856 to the London-based Arica & Tacna Railway Company, with Hegan remaining a director of that company until his death in 1876. Almost the entire sequence of Directors' reports to Shareholders from 1857 to 1939 have been scoured for references to the locomotives, as have the subsequent newspaper reports of each AGM. The relevant paragraphs are set out in Appendix 4 at the tail end of this file.

Whilst the railway purchased in 1911 two Kerr Stuart tank locos for passenger railmotor use, thereafter they began to use petrol railcars converted from road vehicles. By the late 1920s the management clearly would like to have got rid of steam altogether, but there was no money available and from then on the financial situation only went from bad to worse.

The railway was taken over by the Peruvian government in 1942, and is now administered by the Tacna provincial government.

The original workshops were at Arica and almost on the beach, with devastating consequences during the 1868 tsunami, but were removed to Tacna for safety after the 1877 tsunami and remain there today, reflecting the railway's ownership by Peru.

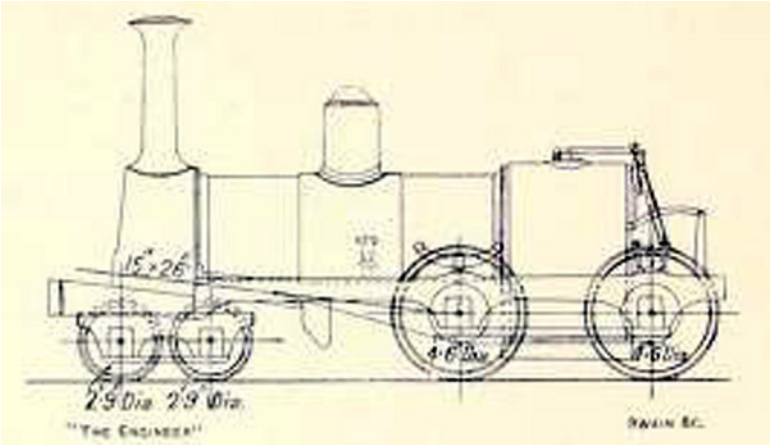


This map of Arica from the 1920s shows the Arica & Tacna Railway running along the seashore and with a turning triangle where the current Plaza Vicuña McKenna stands. Parallel to the Tacna railway but a few yards further inland is the metre gauge *FCALP*, with its branch to the top of the Morro diverging eastward just a few metres north of the station and then reappearing high on the hillside as it climbs west to the summit.

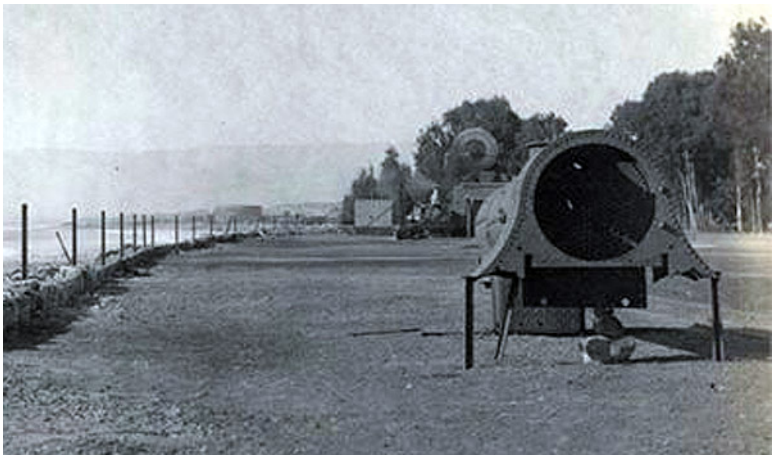
### *4-4-0 d/w 54", cyls. 15"x26", built by R. & W. Hawthorn in 1853-4?*

Inside cylinders. Very short bogie wheelbase (3' 0") a long way ahead of the coupled wheels. Ordered September 1853 [30] by 'Hegan Esq.'. There may only have been four of these, but other sources suggest that there were five. However, R&WH order book 2 in the NRM in York lists only four, ordered by Hegan for 'general traffic' and delivered on various dates from March 10th to May 29th. The following two engines, no. 873 and 874, are shown as having been ordered by a Mr. J? Burge for a Swedish railway. The contracted dates had been between February 15th to August 1st, so whilst the first two locos were a couple of weeks late the remainder were two to three months early. The tenders were to hold 2600 gallons of water and 2 tons of coke and were numbered 498-501.

| | | |
|---|---|---|
| **1 '?'** | w/n 869 | Probably destroyed by the tsunami of 13th August 1868. |
| **2 '?'** | w/n 870 | Probably destroyed by the tsunami of 13th August 1868. |
| **3 '?'** | w/n 871 | Probably destroyed by the tsunami of 13th August 1868. |
| **4 '?'** | w/n 872 | Possibly the only one of the batch to survive past 1868. |




A sketch of one of the original Hawthorn 4-4-0s for the FCAT. Note the very short bogie wheelbase. This sketch was published in E. L. Ahrons' *The British Steam Railway Locomotive from1825 to 1925*, but seems to have come originally from an article in *The Engineer* which has not yet been found.



This boiler and smokebox preserved on the seafront at Arica in the 1930s may well have been the sole surviving remnant of one of the original *FCAT* 4-4-0s which had been destroyed in 1868. It is difficult to think of any reason why a later boiler should

have been preserved in this way. However, the shape of the smokebox implies that these engines had outside cylinders much like the later ones and not inside cylinders as had previously been surmised.

## The earthquake and tsunami of 13th August 1868

This caused devastation in Peru and Chile, and indeed was felt all around the Pacific. The question of the destruction of early locos in the tsunami of 13th August 1868 is covered in some detail in [30]. ITN points out that when the tsunami struck, (at about 5.15pm local time), the majority of the locos would have been in the *maestranza* in Arica rather than safe in Tacna away from the ocean. Arica was more or less flattened by the disaster.

1 "*La noticia se esparció por todo Tacna, atribulando a tantos que tenían parientes en Arica. Ambas ciudades siempre estuvieron entrelazadas.*

*Una tribulación diversa sienten los señores tacneños propietarios de negocios en el puerto, la mayoría extranjeros. Antes de que rompiera el nuevo día ya habían organizado un viaje especial del ferrocarril para saber que suerte habían corrido sus mercancías. El tren que salió en la madrugada no logró pasar el Alto Hospicio: Las líneas estaban destruidas…*

*Lo que había sido la ciudad no era entonces más que un cúmulo grisáceo de ruinas, restos de mercaderías, una gran cantidad de peces muertos, las columnas y gruesos trozos de muros de la aduana, una locomotora y coches retorcidos del ferrocarril a Tacna, los postes telegráficos destrozados, jabas y cajas de licores y cerveza, todo junto a cuerpos macabramente desfigurados por el roce con la arena provocado por el violento vaivén de las olas.*"[11]

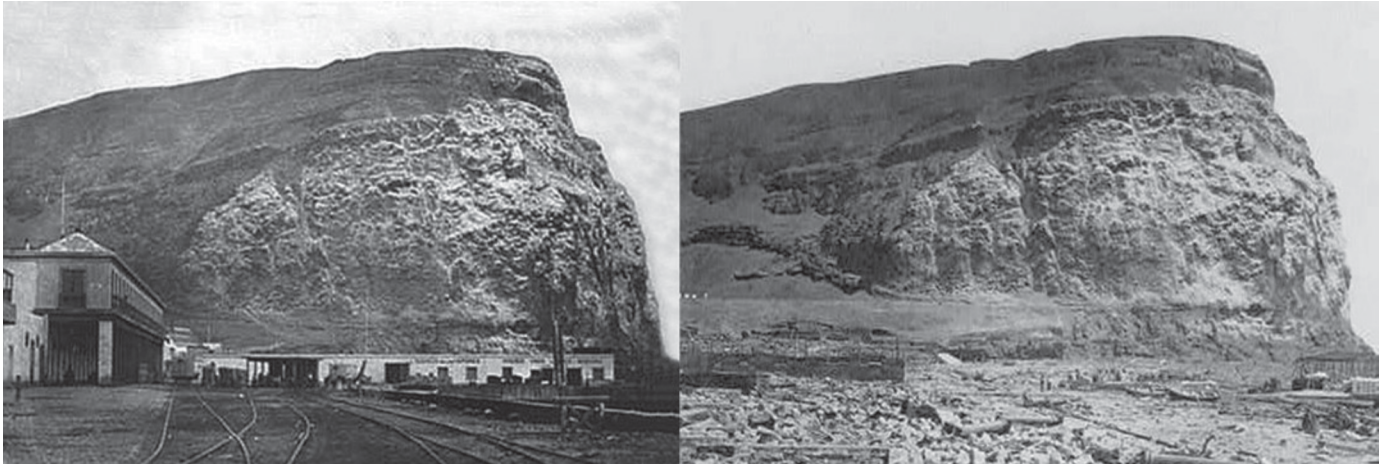
"*La gran ola de las seis y cuarto de la tarde, con mayor fuerza y altura que las anteriores, terminó de diseminar barcos, coches y locomotoras del ferrocarril;*"[11]

2 "*Antes del terremoto, Arica poseía una de las mejores y más modernas maestranzas entre Callao y Valparaíso. Muchas de las máquinas eran pesadas y apropiadamente fijas a fundamentos de cemento. Había también varias locomotoras, coches y muchas piezas fundidas de gran peso. Todo eso desapareció sin dejar vestigio alguno. Es imposible que puedan haber sido barridos hacia el mar, pero, con seguridad, tampoco fueron encontrados en tierra.*" Before the earthquake, Arica had one of the best and most modern workshops between Callao and Valparaíso. Many of the machines were heavy and properly attached to concrete foundations. There were also several locomotives, cars, and many heavy castings. All that disappeared without leaving any trace. It is impossible that they could have been swept out to sea, but certainly they were not found ashore either. [Luther Guiteau Billings of the US Navy (later Rear Admiral Billings), whose account of the disaster has been disputed but at least gives a flavour of the events. NB The quotes are from a Spanish translation of the original English]

3 "There is not a vestige left of the railway works. The three locomotives are in the sea and destroyed ; they were washed some 500 yards from the station. The cars &c., were seen by the crew of a vessel many leagues out at sea." [Reported in *Cheltenham Examiner* and other UK papers, 21st October 1868].

4 "*Al punto de alcanzar la playa encontré un cúmulo de escombros de tres a cinco metros de altura, compuesto primordialmente de fragmentos de naves naufragadas, trozos de casas de madera, puertas, marcos de ventanas, muebles aplastados -entre los que distinguí una cuna y, cerca de ella, una locomotora estropeada y los restos retorcidos de un coche de carga y otros de pasajeros-, también un cañón de 68 libras (probablemente del Fredonia, buque-almacén naufragado de Estados Unidos) y muchas columnas de hierro pertenecientes al gran edificio de la Aduana.*" At the point of reaching the beach I found a pile of rubble three to five meters high, composed primarily of fragments of shipwrecked ships, pieces of wooden houses, doors, window frames, crushed furniture - among which I distinguished a crib and, nearby, a broken locomotive and the gnarled remains of a freight car and other passenger cars - also a 68-pound cannon (probably from the wrecked, shipwrecked warehouse ship of the United States) and many iron columns belonging to the large building of Customs. [*Arica 1868 – un tsunami y un terremoto*, Manuel Fernandez Canque. DIBAM, Santiago 2007].

"The water raised to the same height as before, and in rushing back it brought not only the debris of a ruined city with it, but even a locomotive and tender and a train of four cars were seen carried away by the fearful force of the waves." [*San Francisco Chronicle* 31 October 1868 p1].



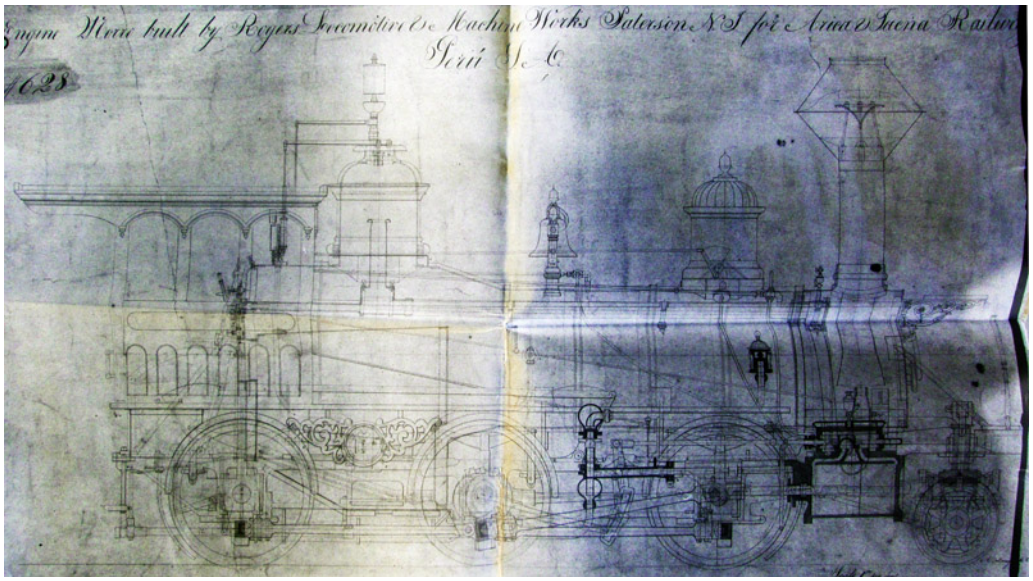
1 Arica *FCAT* station with the aduana building to the left, and 2 the same scene after the tsunami of 1868.

### *2-6-0 d/w 49", cyls. 18"x24", built by Rogers in 1868*

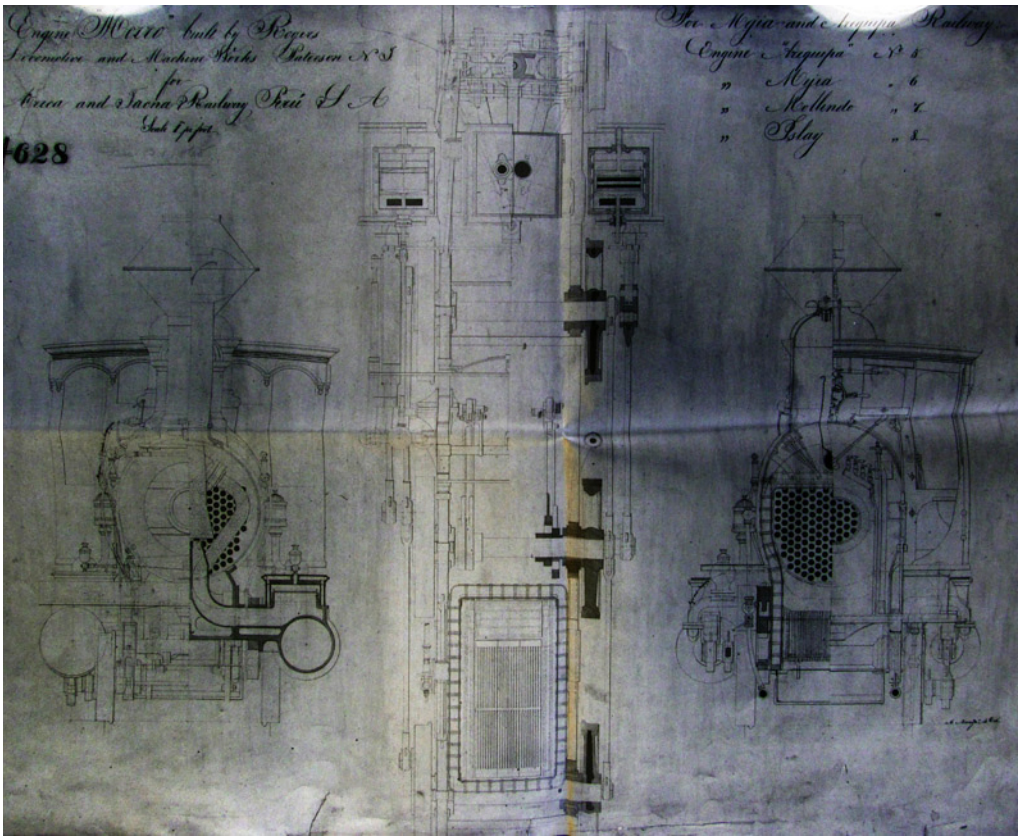
These were ordered initially for the *FC Mejia y Arequipa* in Peru but were diverted to the *FCAT* according to Connelly's Rogers list. Rogers' order no. 628. Possibly this was a loan following the 1868 tsunami, or perhaps a rush order to fill a desperate shortage of motive power. The Rogers summary sheets provided by ALCo to P. C. Dewhurst in the 1920s suggest that just one loco, **'MORRO'**, came to the *FCAT* and that four more (actually Rogers nos. 1591-2 and 1597-8) remained on the *FCMA* as their nos. **5-8**, but Connelly's Rogers list clearly shows a total of six engines with the first two of them being completed for the *FCAT*. The company's 1869 report to shareholders stated that these engines only arrived in Arica in June 1869, "after an unusually long voyage".

| | | |
|---|---|---|
| **? 'MORRO'** (names may have been | w/n (1569 in CF list) | Name certainly is appropriate for the *FCAT* rather than for *FCMA*. |
| **? 'TACORA'** other way round) | w/n (1570 in CF list) | Name certainly is appropriate for the *FCAT* rather than for *FCMA*. |

ITN [30] suggests that these locos moved on to the *FC Mejia y Arequipa* (later the *FC del Sur* of Peru) once the *FCAT* had obtained replacements for the locos destroyed in 1868. However, this has not yet been confirmed in the *FCMA / FC del Sur* lists. Alternatively they may have moved on to Iquique where the nascent nitrate railways were experiencing a severe loco shortage. See the next section for the evidence supporting this surmise.



It is clear from these tonally-inverted blueprint photostats from the P. C. Dewhurst collection at the NRM that Rogers saw this loco as being built specifically for the *FCAT* rather than as the short-term loan of a new engine from the *FCMA*. The sheet below showing end elevations and a plan also lists the four *FCMA* loco names at top right.



### *4-4-0 d/w 54", cyls. 16"x24", built by R. & W. Hawthorn in 1869? (1-2), and 1871-2 (4-5).*

First two ordered 4th May 1869 [30] by John Hegan. Tenders numbered 787 and 788 and to hold 2500 gallons. Last two ordered 20th January 1871 by John Hegan Co. for Arica & Tacna Rly., ex works on 9th December 1872 [30]. Tenders were numbered 815 and 816.

| | | |
|---|---|---|
| **1 '?'** | w/n 1465 | Spare boiler ordered for this loco from HL in December 1923. Scrapped by 1968 [18]. |
| **2 '?'** | w/n 1466 | Scrapped by 1968 [18]. |
| **4 '?'** | w/n 1545 | Spare boilers for no. 4 ordered from HL in 1905 and 1911 but could presumably have used used for any of these engines. Scrapped by 1968 [18]? [16] says this is the loco now numbered **3** and plinthed in the main square in Tacna. |
| **5 '?'** | w/n 1546 | Scrapped by 1968 [18]. |

Whilst this numbering fits with original loco no. **3** having been the sole survivor of the 1868 *maremoto*, the last two may have been renumbered **3** and **4** at some point, see [30] for more discussion on this topic. A letter from Hawthorn Leslie to P. C. Dewhurst in June 1929 certainly states that these engines were numbered **3** and **4** by the railway. However, the photo immediately below certainly shows the number **5** on the front buffer-beam.

The directors' report in June 1874 (see Appendix 4) refers to three new locomotives by then being in service. Whist the two engines built in 1872 might well have been reported as new, the reference to **three** is a little puzzling.

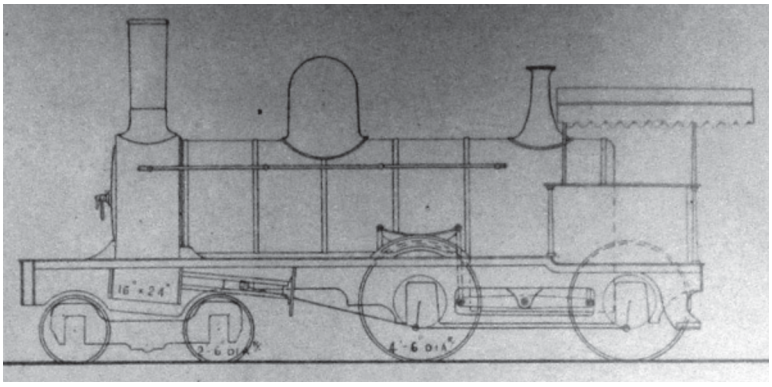
## Distinguishing between these Hawthorn 4-4-0s

The original 1853 batch may well have had inside cylinders, though that needs confirmation, and certainly had very short-wheelbase bogies. However, no photos of these engines have been seen.

Photos of the later locos show individuals bearing numbers **3, 4** and **5**, but there are differences between the various surviving images. Some of these may reflect minor swoppings of parts, but others suggest that there were differences between the two batches as built.

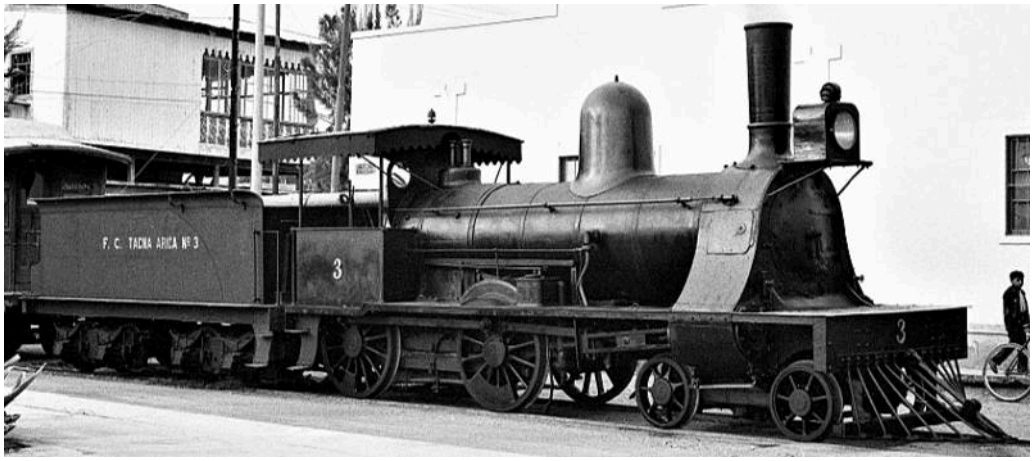
1 Most images show cow-catchers/pilots with vertical bars, whereas that seen on no. **5** is of the Argentine style with horizontal bars.

2 The early picture of loco no. **3** has a tall safety valve bonnet and a one piece chimney without a ring at the top of the base, it also has no short smokebox-side handrail.
3 The photo of no. **5** has the cab spectacle plate further forward, at the front edge of the roof rather than set back inside.
4 All of the above differences are minor, and could have changed from year to year. More significant is that most photos show four bar crosshead guides whilst no. **5** in the final photo is fitted with single bar guides.
5 No. **5** also has a slightly different design of running board edge angle, with a smooth curve behind the front buffer beam rather than a sharp right angle.

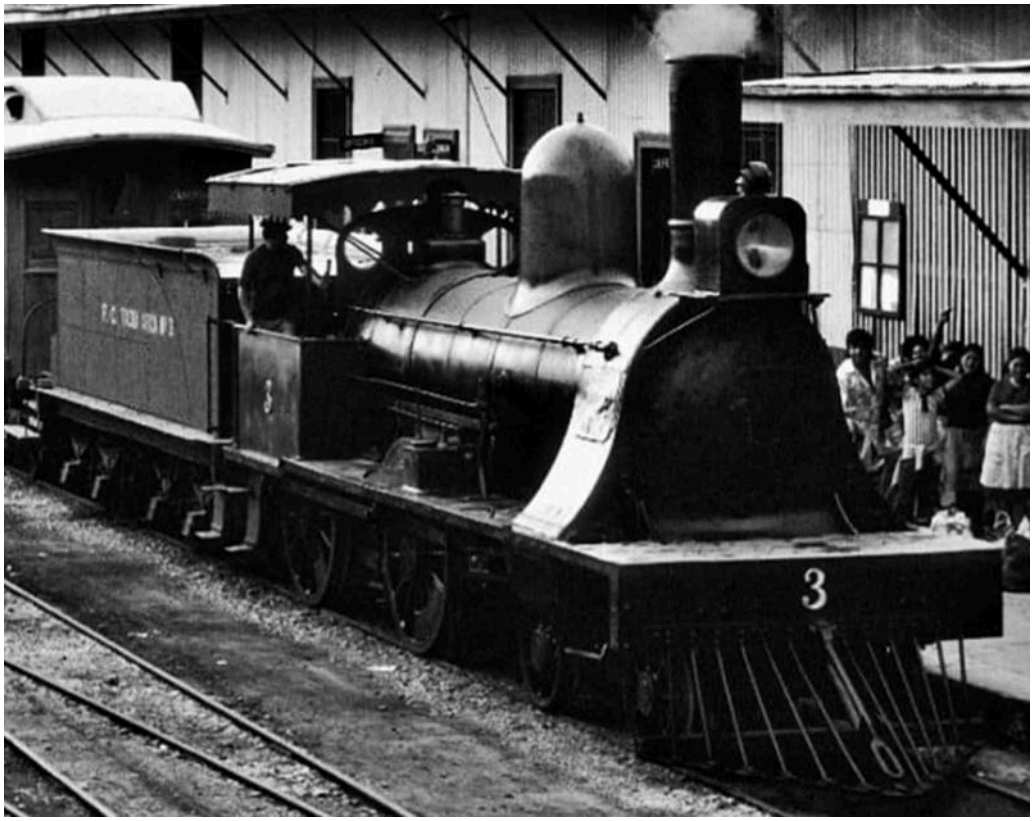



A sketch as found in the P. C. Dewhurst archive at the NRM in York.

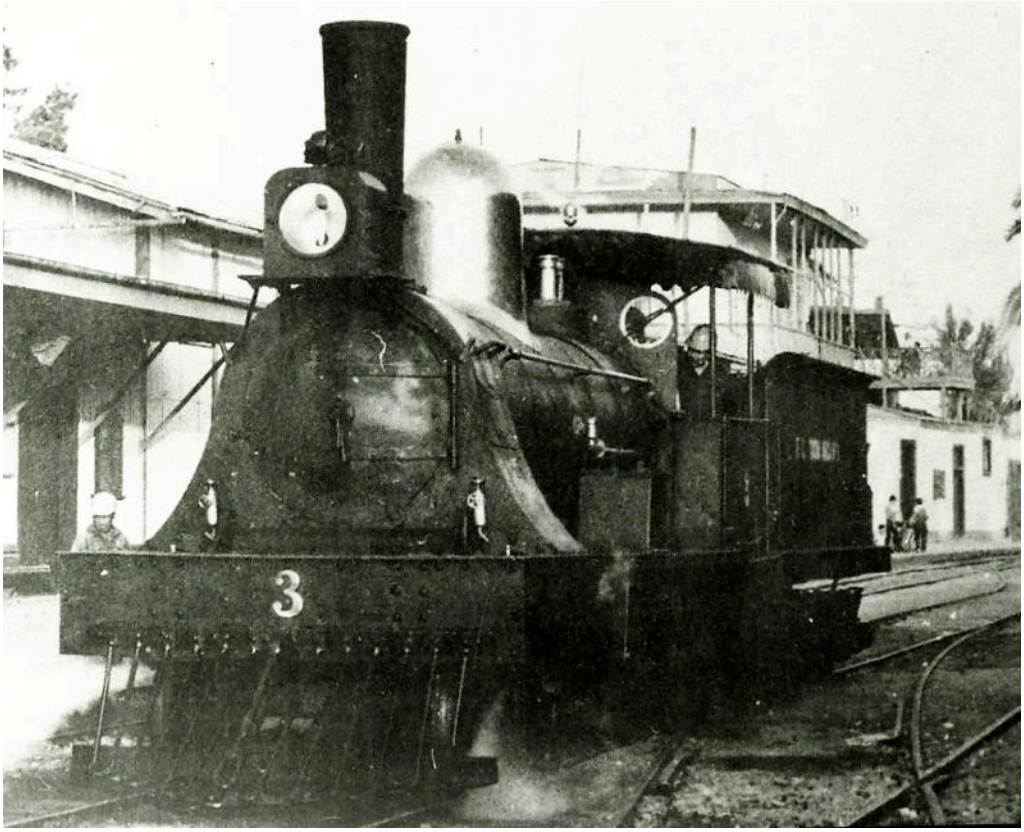

Hawthorn no. **3** seen in a still taken from a video. Note the taller chimney without a ring at the top of the base, also the tall brass safety valve case. Another shot of no. **3**, taken in 1929, has the dome painted rather than polished and the tall safety valve cover removed. By then the cabside brass number, also seen below, had been added. At that date no. **3** also retained splashers for the rear pair of bogie wheels.




No. **3** as seen by Harald Navé in the 1970s. This was presumably taken within the Tacna station compound but it is not clear whether the engine was still steamable at that date or was already a museum-piece.

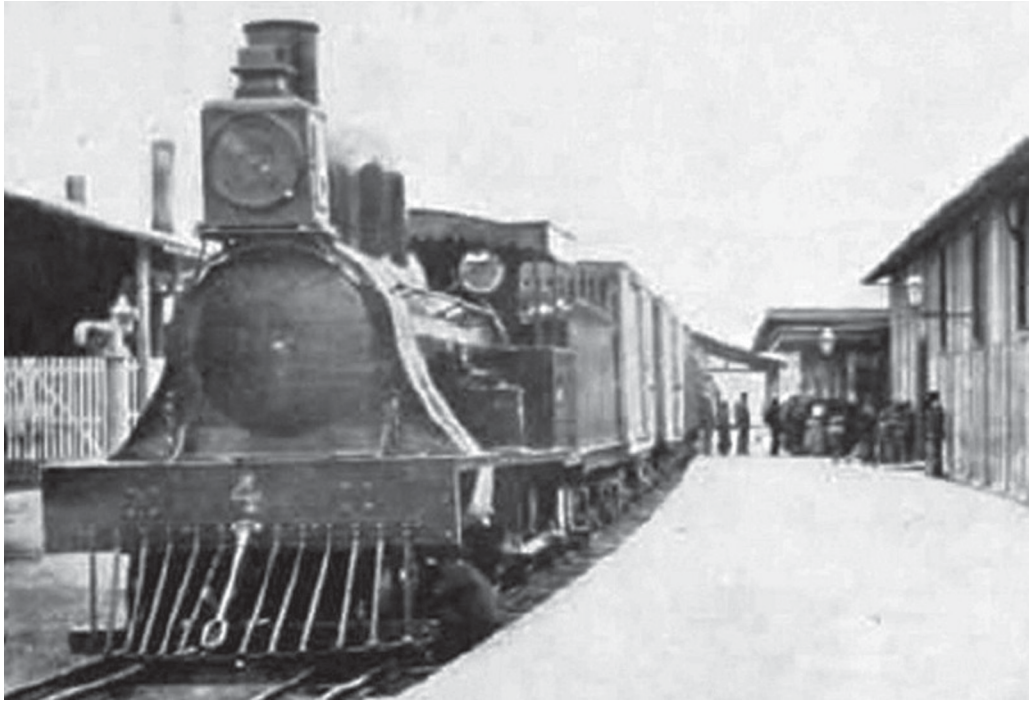



No. **3**, probably on the same occasion in the 1970s as in the previous view, and this time seeming to be in steam.

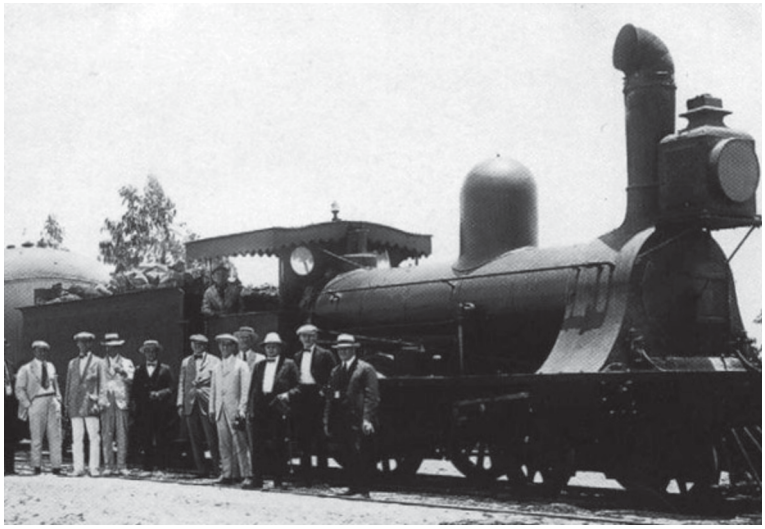



No. **3**, again at Tacna but this time facing the other way.

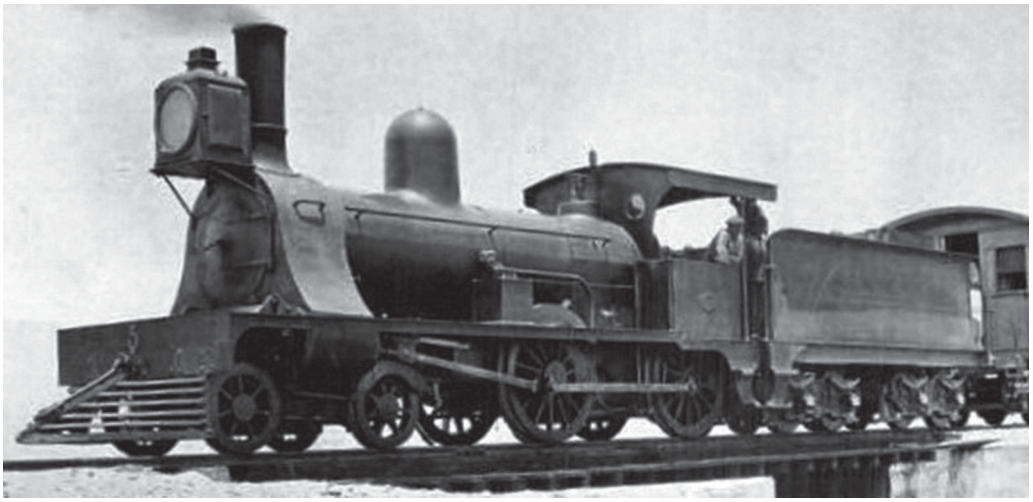

The surviving loco as plinthed in Talca in 2019 and bearing the number **3**. It is rumoured that this was the locomotive that took Colonel Francisco Francisco Bolognesi to Arica in 1880. He commanded the Peruvian forces in the Battle of Arica, and lost his life there.



No. **4**, with a Chilean-style reverse curve to the cab roof.



An image of another of these locos, no. **1**, this time carrying a chimney-top cowl, and also with the reverse curve to the cab roof. The loco certainly has four bar crosshead guides.



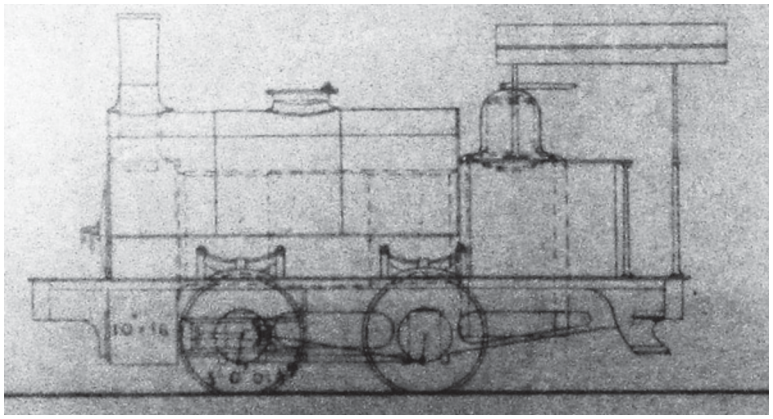
Hawthorn no. **5**, on a train. This loco carries the Argentine style cow-catcher, and has a curve at the front of the running board angle, a more forward-mounted

spectacle plate, splashers for the rear pair of bogie wheels, and single bar crosshead guides. Also note that the spectacle plate sides curve outward from a point below the base of the spectacle glasses; this is not the case in the other photos shown here.

### *0-4-0ST d/w 36", cyls. 10"x16", built by R. & W. Hawthorn in 1869.*

Ordered by John Hegan & Co. for Arica & Tacna Rly. Cylinders were confirmed 10x16", not 10x18" as evidenced by the Hawthorn order book and data from the Nitrate Railways. There were relatively few Hawthorn locos with these dimensions, and this fact aided the identification of this engine as later becoming Nitrate Railways no. **56** and then no. **1**.

**3** w/n 1480 It is difficult to work out how this loco came to be numbered **3**. It seems likely that this engine was then sold to the Nitrate Railways early in 1889, though there had been discussion about its purchase as early as 1874. It became their no. **56** but almost immediately was renumbered to **1** and was then rebuilt with an inspection saloon, as an 0-4-2T and later an 0-4-4T. There is no positive record of it on the *FCAT* in later years and only a statement that it had disappeared by 1968 in source [18].



Sketch found in P. C. Dewhurst archive at the NRM.

## Proposed line to Bolivian border

A report of 8 June 1870 suggested that the then proposed Trasandino line to the Bolivian frontier would require sixteen 35 ton six-coupled locos with d/w 46" and cyls. 18x24". [ http://hdl.handle.net/2027/uc1.$b46998 Second part p335]. Talca was to have a loco shed for twelve engines and a 16m turntable. Huaylillas station would require a loco shed for four engines and another 16m turntable, as would the station at the border. Each of these locations was also to have a coal dump and a loco repair shed. The track gauge was to be 3' 6" minimum [Ibid, p445], though very proably would have ended up built to standard gauge.

## Another catastrophe

"At Arica the people were preparing temporary fortifications to repel the threatened assault of the rebel ram "Huascar' the moment when the roar of an earthquake was heard. The shocks were very numerous and caused immense damage. The sea was suddenly perceived to recede from the beach, and a wave from ten to fifteen feet high rolled upon the shore, carrying all before it. Eight times was repeated this assult [sic] of the ocean, and four miles of the embankment of the railway melted away like sand. Locomotives, cars and rails were hustled about like so many play things, and left in a tangled mass of rubbish. …" [*Tavistock Gazette* and other UK papers, 13th July 1877.

## The fleet in 1880

Harold Middleton has commented (private communication July 2020) that "after the battle of "Campo de la Alianza" 30 km north of Tacna during the Pacific War on May 26, 1880; the Chilean forces occupied Tacna, and the military reports indicated the *FCAT* had five locomotives." The paragraphs above should give a total of six: being one original

4-4-0, four replacement 4-4-0s, and one 0-4-0ST.

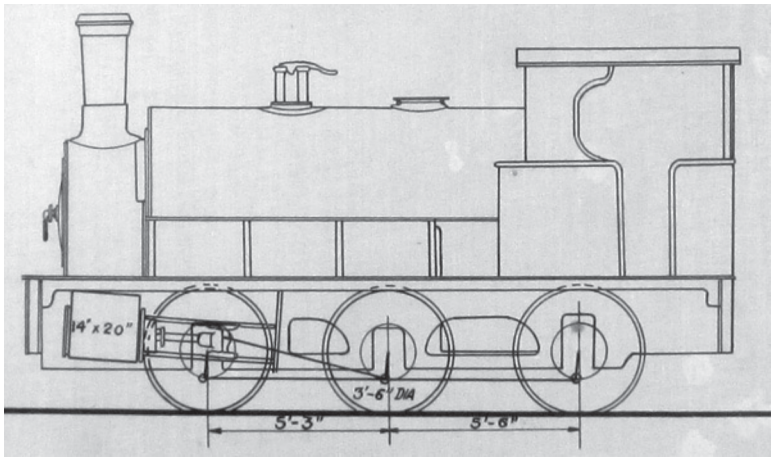
## Loco names

If the Rogers moguls were given appropriate names in Arica – **'MORRO'** and **'TACORA'** – then it seems very likely that the other engines would also have been named. No clues have yet been found as to what these might have been, however.

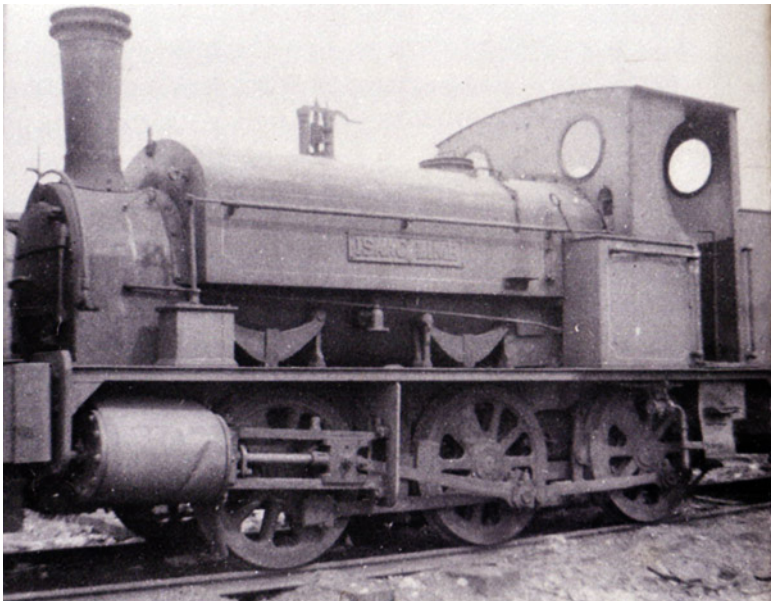
### *0-6-0ST d/w 42", cyls. 14x20", built by Black Hawthorn in 1882-3.*

P. C. Dewhurst suggests that this was a duplicate of builders' numbers 416, 503 and 517 built for use in Norfolk in 1877-81; confirmed by reply from R. & W. Hawthorn Leslie in June 1929.

**?** w/n 705




Sketch found in P. C. Dewhurst archive at the NRM. Original source unknown.



**'ISAAC LIMB'** was a very similar though slightly earlier Black Hawthorn 0-6-0ST of 1874, that worked in the UK. The only obvious difference from the *FCAT* loco is that the bunker is outside the cab back-sheet rather than contained within it. The cab may also be slightly taller.

### *2-6-0 d/w 52", cyls. 16x24", built by Hawthorn Leslie in 1885.*

Ordered for Arica & Tacna Rly. Was this really a 2-6-0? The R&WH order book has "8 wheels 4 – 4' 6"" in the Wheels column, which suggests that it was another 4-4-0. Delivered 20th (or 25th) July 1885. Tender was numbered 931 and carried 2300 (or 2500?) gallons. It looks as though this loco was to be numbered **5** but the writing is very faint.

**6** w/n 2021

## The fleet in 1909-1911

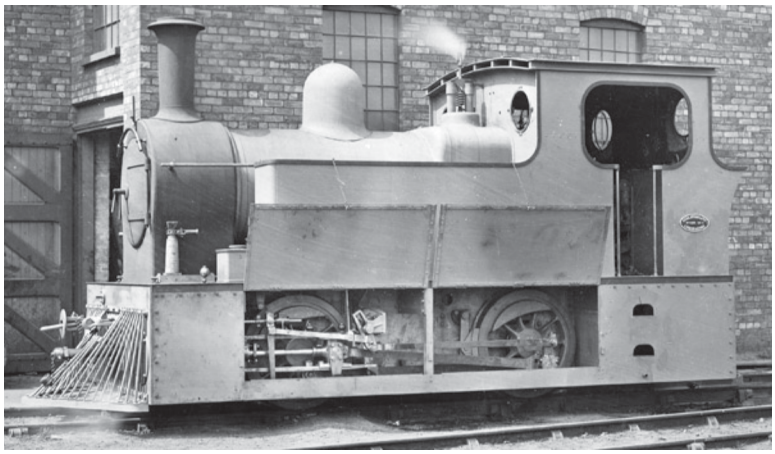
"*Mixed train locos were four-coupled (2.40m wheelbase), with four-wheeled bogie, dr. wheels 1.38m,* (approx. 54") *0.75m bogie wheels, cylinders 0.40m x 0.605m* (approx. 16x24"), *total weight 29.25 T, adhesive weight 18.660T. Tenders on two bogies, 10,000 litres plus 2 T coal, and total weight 26.500T.*" Six locos in total but not specified whether all of this type. Newest loco built 1865 [3] which was clearly incorrect.

The government publication *Estadistica de los Ferrocarriles Particulares en Explotación* states that the railway had six locos in operation, all being tender engines, and weighing on average 55.75 tonnes each. In 1909 600 tonnes of Australian coal were used.

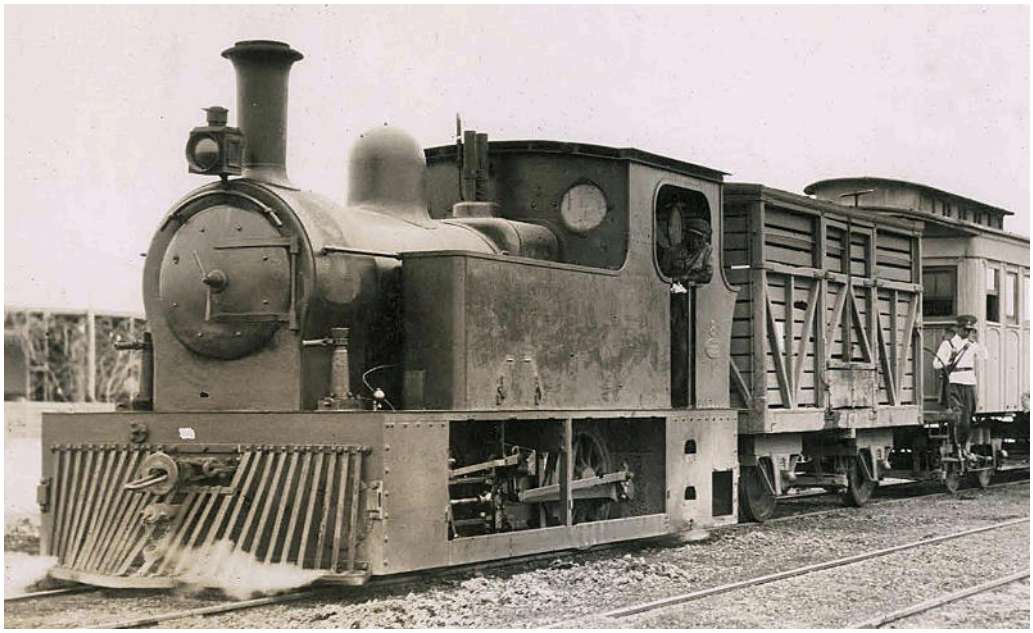
## *0-4-0TT railmotors d/w ?, cyls. 10"x16", built by Kerr Stuart in 1911*

These were not articulated single units, but rather 0-4-0Ts with side skirts against the desert dust, each designed to be close-coupled to a passenger coach which also contained a supplementary loco water tank. The KS order book mentions pipe connections from the locos to the coaches with a pump to lift the water, and that the locos should have cow-catchers at both ends to obviate turning at the end of a journey. It seems that a semi-permanent bar coupling had been envisaged initially, but this was changed to a normal link and pin coupler to facilitate use with other coaches. The coach bodies were to be built by Birmingham RC&W Co. onto underframes and bogies constructed by KS. One loco at least was later in use as an 0-4-0T shunter. The order book notes: "Please note that the engine underframing &c is to be shipped in grey paint & that paint & varnish for finishing in chocolate color is to be sent." There were also a vast number of varied notes recording conversations with the agents, with Liveseys, and with the Birmingham RCW Co. who were to build the coach bodies.

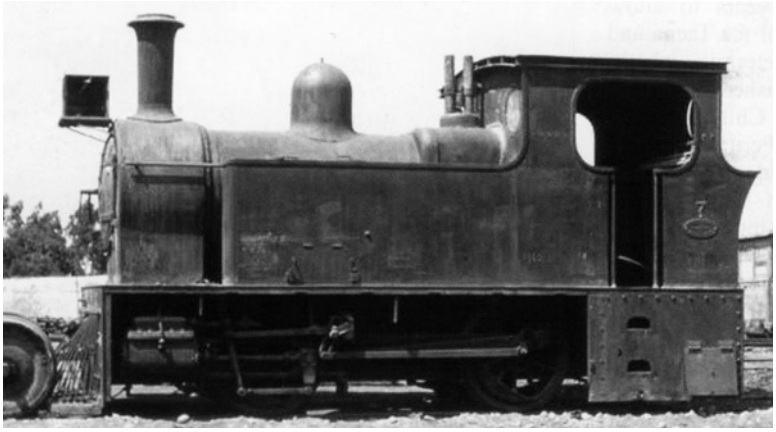
| | |
|---|---|
| **7** | w/n 1204 |
| **8** | w/n 1205 |



KS builder's photo, from Hunslet archive at Statfold Barn Farm.



No. **8** is seen here in 1929, with the side skirt doors removed but not yet having lost the remainder of the skirting. Photo kindly supplied by Sr. Pablo Moraga.



Later in its life no. **7** seems to have become a humble shunter. Apart from the loss of most of its skirting it seems little changed. Photo found in the late Bob Whetham's *Railways of Peru* volume 2.

as an asset of extremely doubtful value.

The steam autocars or motor-coaches sent out have proved a great success. They started running in the month of January last, and neither at the time of their erection, nor subsequently, has any criticism been passed upon them—a fact which reflects great credit on the makers, Messrs. Kerr, Stuart and Co. All accounts that reach us tend to show that the improved and accelerated service between Tacna and Arica is greatly appreciated.

As stated two years ago, this accelerated service of trains neces-

A paragraph from *The Railway Times'* report of the company's AGM in 1912 (issue of June 29th 1912 p649).

## The fleet in 1927 and up to the 1942 takeover

The US report dated 1930, recording the state of affairs at the end of 1927, stated that the railway then had "seven locos weighing 60 tons each. These locomotives are of the 4-wheel type having cylinders 16 by 24 inches." Again this information seems to be over-simplified. The seven locos could be made up of the sole survivor of the first batch of 4-4-0s, the four later 4-4-0s, the single Hawthorn 2-6-0 and the Black Hawthorn 0-6-0T. The Kerr Stuarts may not have been considered as separate locomotives, rather being thought of as steam railmotors. This suggests that none of the-

later second-hand engines listed below had as yet been acquired. An examination of the directors' reports to the shareholders for the following years suggests that the impoverished railway of the 1930s was extremely unlikely to have purchased even secondhand extra engines. Thus the additional locos listed below probably all arrived after the takeover by the Peruvian government in 1942, and possibly not until the 1950s or '60s.

## Later post-1942 arrivals

Thus the additional locos listed below probably all arrived after the takeover by the Peruvian government in 1942, and possibly not until the 1950s or '60s.

### *2-8-0 d/w 58", cyls. 16.5"x26", built by ALCo-Schenectady in 1914*

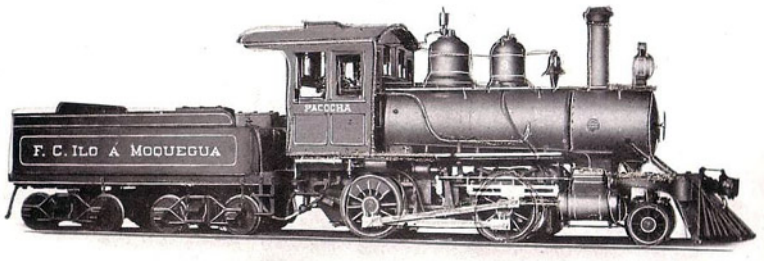
Built for the Southern Railway of Peru, and then sold to the *FCAT*. Still present on *FC del Sur* when 1926 US report was compiled.

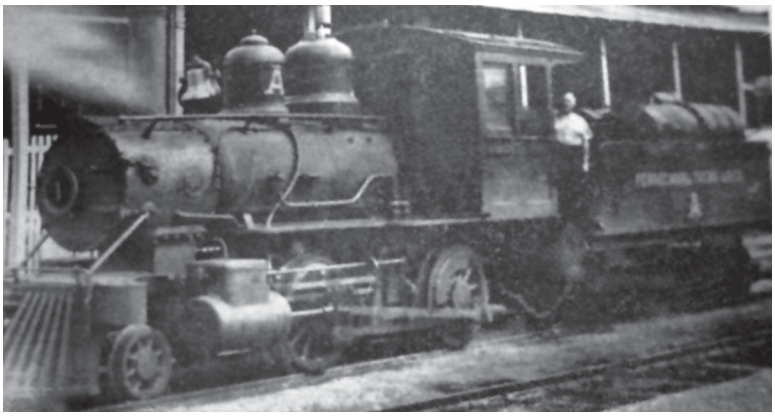
**93** w/n 54535 ex *FCS* no. **93**. Loco survives in the railway's museum.

### *2-4-0 d/w 44", cyls. 13"x20", built by Baldwin in 1908*

Built for *FC Ilo a Moquegua*, no. **3 'DOCOCHA'** or possibly **'PACOCHA'**. Transferred to *FCAT* as no. **1**. Still present on *FCIM* when 1926 US report was compiled. BLW class 06-20C no. 7. Spec. is in 32 p250.

**1** w/n 32845 Loco survives in the railway's museum.



The same loco, bearing a no. **1** plate on the smokebox but carrying a large letter A on dome and tender side. Note also that the tender is rather taller than that shown above, reaching to the bottom of the cab windows. As preserved at Tacna museum nowadays, it has regained its original low height tender.

### *2-6-0 d/w 46", cyls. 16"x24", built by Baldwin in 1908*

Built for *FC Ilo a Moquegua*, no. **2 'MOQUEGUA'**. Transferred to *FCAT* as no. **2**, though BLW list says it became *FCAT* no. **24**. that may be a literal for **2A**, which Allen Copeland suggests was its new number on the *FCAT*. Still present on *FCIM* when 1926 US report was compiled. BLW class 08-26D no. 185. Spec. is in vol. 32 p303.

**2** or maybe **2A** w/n 32983 Loco survives in the railway's museum.

### *2-6-0 d/w 54", cyls. 16"x24", built by ALCo-Rogers in 1908*

Built for the *FC Ilo a Moquegua* in Peru as their no. **1 'ILO'**, and later sold to the *FCAT*. When the 1926 US report was compiled the *FCIM* did have a 2-6-0 with those cylinder dimensions but it was shown as no. **4** in the railway's fleet and no. **1** was shown as a 4-6-0.

**9** w/n 44954 Loco survives in the railway's museum.


## Ex-steam Sentinel railcars

The diesel railmotor currently used to provide a twice daily passenger service along the line, *'Autowagon 261'*, was built by Sentinel as a steam railmotor for the Central Railway of Peru in 1936. It and several of its sisters were converted to Saurer diesel power in 1938 and then later brought to Tacna. They too should be listed here, for their origins if not their current motive power units. Information below from 'EddieB' on RMWeb quoting James Hefner's *Surviving World Steam* project.

### *Bogie railcars built by Sentinel in 1934 (first three) and 1936 (last two) for the FC Central del Peru.*

All converted to diesel by Wickham in 1938.

| | | |
|---|---|---|
| **2** on *FCC*, became **0251** on *FCAT* | w/n 8983 | Arrived on *FCAT* in 1967 according to *ENAFER* stocklists consulted by Bob Whetham. |
| **4** on *FCC*, became **0252** on *FCAT* | w/n 8985 | Arrived on *FCAT* in 1967 according to *ENAFER* stocklists consulted by Bob Whetham. |
| **5** on *FCC*, became **0260** on *FCAT* | w/n 8986 | |
| **6** on *FCC*, became **0257** on *FCAT* | w/n ???? | Operational relatively recently. |
| **7** on *FCC*, became **0261** on *FCAT* | w/n ???? | Rebuilt with a modern (Volvo?) engine, bonded windows, and air-conditioning, and is still in service in 2020. |


Several ex-steam Sentinel railcars at Tacna depot in April 2019. The rear corner of **261** is at extreme left, **257**(?) is propped on blocks in the centre, and two others are within the shed in the background.

An image of autowagon **261** running along the beach in Arica before its makeover. Photographer unknown.


Railcar **261** in its present guise. Whilst the windows, paintwork and roof-mounted AC units suggest radical changes, it seems likely that the bogies, frame and basic body structure date right back to the vehicle's construction in 1936.

## Another ex-Sentinel railcar being re-constructed

In late 2024 photos have emerged on Facebook showing that a second railcar is nearing the end of its very protracted rebuild.

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## 13.5.5 The proposed railway from Tacna *á la frontera Boliviana*

### Background

Gauge: "*El ancho de la via será cuando menos de tres piés seis pulgadas inglesas, pudiendo aumentarse basta cuatro piés ocho y media pulgadas si la empresa lo estima conveniente, consultando en todo caso la comodidad y seguridad de los pasajeros y del servicio público en general.*" However, as investigations developed it seems that opinion moved towards the use of the standard gauge rather than 3' 6".

This seems to have been another scheme by Henry Meiggs. A good deal of preparatory work was done, but as far as is known no actual breaking of ground. It is likely that the intended terminus was Visviri, where the later *FC Arica a La Paz* crossed the border into Bolivia. However, it is not clear whether there was a matching Bolivian route to carry traffic onward to La Paz.

### Proposed locomotive fleet

Source [24] page 730 gives the following basic specs for the locos that would have been required.

D. *Equipo del camino ó material rodante.*

16. Locomotoras de peso de 35 toneladas, cilindros de 18 pulgadas de diámetro y 24 de manga, con tres pares de ruedas motrices de 46" de diámetro capaces de arrastrar 50 toneladas de peso neto en la gradiente mínima de 3 ‰ en curvas de 106 metros de radio mínimum. Velocidad mínima en subida 10 millas por hora.

Ocho coches para pasajeros de 1ª clase.

Diez y seis idem 2ª clase.

Sesenta carros de carga (house-cars.)

Sesenta idem de plataforma.

Seis idem equipaje (cerrados.)

Seis idem de mano.

Ocho idem para conduccion de ganados.

Dos carros á vapor (steamers) capaces de arrastrar 5 toneladas de peso neto en gradiente de 3 ‰ y de 106 metros de radio mínimum. El carácter del material rodante será del sistema americano (trucks and chilled wheels.)

The above specification states that sixteen locomotives would be needed, and a later section says that Tacna was to have a shed for twelve locomotives and a turntable 16m in diameter, whilst the other terminus at the Bolivian border was to have a loco shed for four machines and a similar turntable. The turntables were similar in size to those to be installed at Ilo and Moquegua on the *FCIM*.

The dimensions given are very close to those of many US-built 2-6-0s supplied by various builders to the Lima & Oroya and Mejia / Arequipá / Puno systems at the beginning of the 1870s, though most of those had driving wheels slightly larger than 46" diameter. Note that whilst the road loco driving wheel diameter is given here as 46", a page or two earlier in the same document the locos for the Ilo to Moquegua railway were to have had wheels of 4' 6". It is likely that one or other figure was a type-setting mistake.

The two proposed *carros á vapor* would probably have been like the Rogers steamcars built for the Mejía y Arequipá and Ilo á Moquegua lines.

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## 13.6 The lost province of Tarapacá

### Background

Peru used to stretch much further south and was adjoined by Bolivia's coastal provinces. All this was absorbed into Chile after the War of the Pacific, 1879-1884. Tarapacá province was immensely rich in nitrates, which had led the Montero brothers to create the Nitrate Railways running from the nitrate pampa at a height of 2000' down to the two ports of Iquique and Pisagua. Although created within Peru, the majority of NR history unfolded within Chile, and thus the locomotives are covered in file 2 on Chile's intermediate gauge railways.

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# 13.7 Industrial locomotives

## *T. Brassey & Co., Callao*

### Background

Standard gauge. A construction or civil engineering company that worked on improving the port of Callao.

### *0-4-0T d/w 33", cyls. 9x14", built by Manning Wardle in 1871*

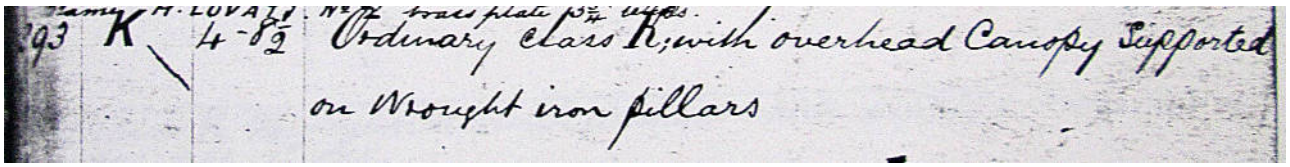
Ordered by ?

**? 'BRASSEY'** w/n 348

### *0-6-0T d/w 37½", cyls. 12x17", built by Manning Wardle in 1871*

Ordered by Thomas Brassey & Co., Callao Docks. MW class K.

**?** w/n 393

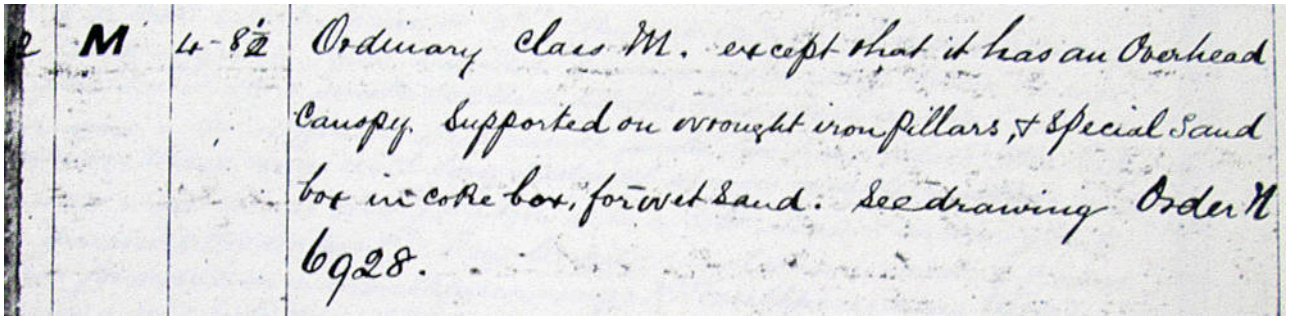

93 K 4-8½ Ordinary class K; with overhead Canopy Supported on Wrought iron pillars

Manning Wardle note re loco 393.

### *0-6-0T d/w 36", cyls. 13x18", built by Manning Wardle in 1871*

Ordered by Thomas Brassey & Co., Callao Docks. MW class M.

**?** w/n 402


M 4-8½ Ordinary class M. except that it has an Overhead Canopy Supported on wrought iron pillars, & Special Sand box in coke box, for wet Sand. See drawing Order N 6928.

Manning Wardle note re loco 402.

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## Pacific Steam Co., Callao

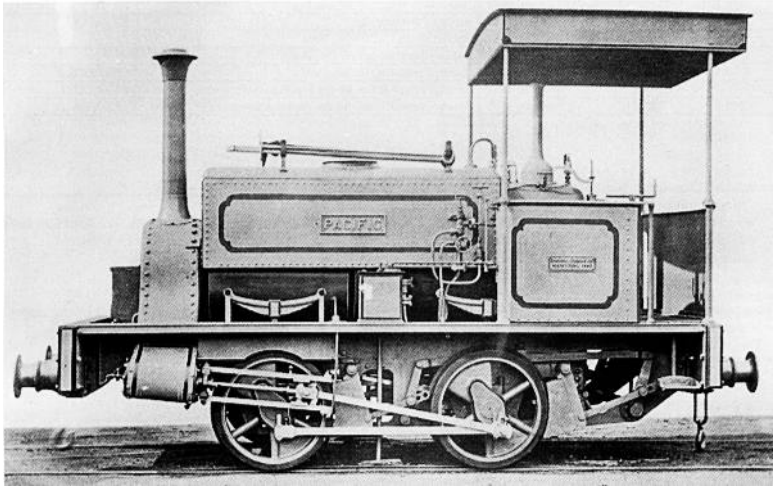
### Background

Standard gauge. This may have been the Pacific Steam Navigation Co. They ran a line of steamships and would have needed substantial coal stocks at Callao. They certainly owned a loco or two further south at Valparaiso and it may be that the engines at both locations were used for the movement of coal wagons or possibly for shunting mainline wagons close to the docksides.

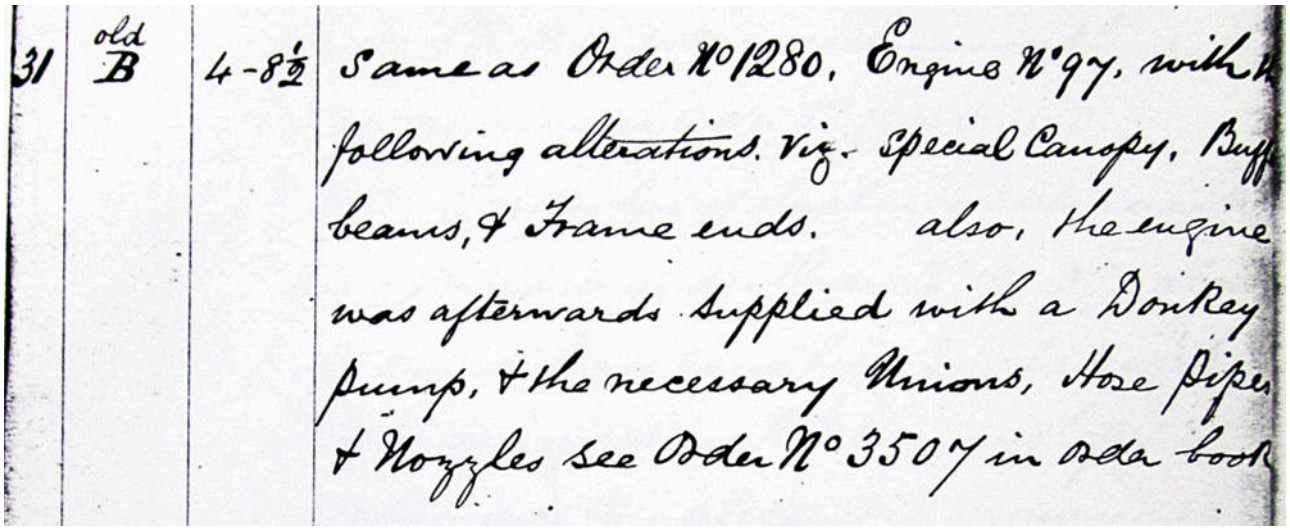
### *0-4-0ST d/w 30", cyls. 6x12" and 7½x12", built by Manning Wardle in 1868 and 1870*

Ordered by Pacific Steam Co., Callao. NB Both MW 322 and 349 were named **'CHUCUITO'** and arrived in Peru in 1870-1. The first was ordered by the Pacific Steam Navigation Co., and the second via Dreyfus Freres for the government, probably for the *FC Callao á La Punta* (see section 13.2.1). One eventually went to the *FCLCC*, but which is not certain. Whilst they were both built to MW's class B, no. 349 had a larger than normal saddle tank which dropped right down to running plate level on each side.

| | | |
|---|---|---|
| **'PACIFIC'** | w/n 231 | Later sold to Lima Railway Co. or possibly direct to the FCC where it was working in 1889. |
| **'CHUCUITO'** | w/n 322 | |




An MW builders' photo of their no. **231 'PACIFIC'**.



| | | | |
|---|---|---|---|
| 31 | old B | 4-8½ | Same as Order No 1280. Engine No 97. with the following alterations. Viz. Special Canopy, Buff beams, & Frame ends. also, the engine was afterwards supplied with a Donkey pump, & the necessary Unions, Hose Pipes & Nozzles see Order No 3507 in order book |

The Manning Wardle notes about loco 231.

| | | | |
|---|---|---|---|
| 322 | alteration of C 7½ cyl. | 4-8½ | This engine is the same as No 231, with the alterations rendered necessary by the increased diameter of the Cylinders. The following were made to new drawings, viz. Slide bars, - Brackets for ends of do. - Crossheads. - Buffer beams. - Crank pins. - Connecting & Coupling rods. - Piston. - Cylinder Covers. - Valve bridle. - Drag hooks. - Case for Timepiece. - Covering plates for Motion & Slide bars. - & Unions &c for Hose pipes. - The Canopy & Frame ends were the same as Order No 3170. Engine No 231. The Wheels. Axles. Axlebores. Eccentrics, & the Link motion were the same as Order No 1280. Engine No 97. |

Manning Wardle's notes re loco 322.

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## *La sucraria de Supé*

### Background

***0-6-0T d/w ?, cyls. ?, built by ? in 1889 and 1915***

Ordered by ?

| | |
|---|---|
| **?** | w/n 492 |
| **?** | w/n 1704 |

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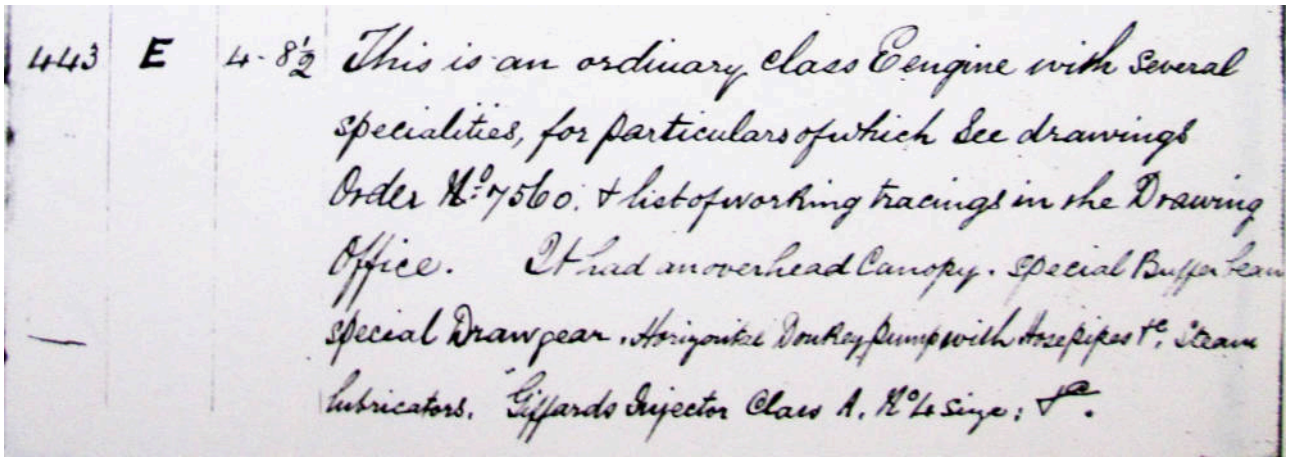
## 13.8 Unidentified locomotives

***0-4-0ST d/w 31", cyls. 9x14", built by Manning Wardle in 1873***

Ordered via Ismay Imrie & Co. of Callao.

**'JESUS'** w/n 443



443 E 4-8½ This is an ordinary class E engine with several specialities, for particulars of which see drawings Order No. 7560. & list of working tracings in the Drawing Office. Ind. overhead Canopy. Special Buffer beam special Draw gear. Horizontal Donkey pump with hose pipes &c. Steam lubricators. Giffards Injector Class A. No 4 size; &c.

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# 13.9 Index of Peruvian steam locos by builder

For this index please see the Peruvian narrow gauge locos file.  Both narrow and standard gauge engines are listed at the back of that file.

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# 13.10 Appendices

## 13.10.1 *FC Central* internal rulebook 1894

### Background

The full set of rules can be found in [11, 1894 pp101-120].

**CAPITULO V.**
**DE LAS REGLAS A QUE DEBEN SUJETARSE LOS MAQUINISTAS Y FOGONEROS**
**EN EL MANEJO DE LA MAQUINA.**
**XV.**

122. Los maquinistas recibiran sus instrucciones del ingeniero mecánico. Mientras se hallen en la via estaran bajo las ordenes del despachador de trenes y del conductor, a no ser que tales ordenes pongan en peligro su tren ó no esten en consonancia con el Reglamento, pues en tal caso el maquinista y el conductor seran ambos responsables.
123. Estaran provistos de un buen reloj que indique la hora oficial, y lo compararan con el del Conductor de su tren antes de emprender su viaje.
124. Deben estar igualmente provistos del itinerario y ademas de un juego completo de señales, que tendran listo para poderlas usar en un momento dado.
125. Deben presentarse al servicio, a lo menos media Nora antes de la salida y cuidar de que su maquina este en perfecto estado y provista de todo lo necesario, y ayudaran á formar su tren, si asi fuera preciso.
126. No abandonaran a su maquina estando en servicio sino cuando sea absolutamente necesario, y entances el Fogonero o alguna persona competente debe quedarse a cargo de ella.
127. Al fin de cada dia remitiran al Superintendente un informe detallado de todo accidente que haya ocurrido.
128. El Maquinista hai a tambien las veces del Conductor, cuando el tren carezca de este empleado, debiendo desempeñar sus funciones.
129. El Maquinista debe cerciorarse de que la cuerda de la campana de la maquina este debidamente colocada y no quitada antes del termino del viaje.
I30. El Maquinista tomara todas las precauciones posibles para impedir que su maquina arroje chispas al pasar por cañaverales u otro material suceptibe de incendiarse.
131. No pondran su tren en movimiento hasta recibir órdenes para ello de su conductor.
132. Deben acercarse siempre a las estaciones y cambios con mucha cautela y convencerse de que estos altimos esten bien colocados antes de usarlos. Al aproximarse á una estacion y a un kilómetro y medio de distancia daran la señal de precaución.
133. Los maquinistas deben obediencia absoluta a inmediata a las señales reglamentarias que les hagan tanto los empleados del tren y de las estaciones, como los guardianes del camino.

XV1—Fogoneros.
134. Los Fogoneros recibiran sus órdenes del Jefe Mecánico y durante el viaje estaran bajo las ordenes del Maquinista.
135. No les es permitido manejar la maquina sin instrucciones para ello del ingeniero mecanico, a no ser que en un caso imprevisto el Conductor ó algún empleado autorizado asi lo ordenase.
136. En ausencia del Maquinista cuidaran de la maquina y no la abandonaran hasta que vuelva aquel, ni permitiran a persona alguna subir en ella.

**CHAPTER V.**
**OF THE RULES TO WHICH THE DRIVERS AND FIREMEN**
**MUST BE SUBJECT IN THE OPERATION OF THE LOCOMOTIVE.**

## XV.

122. Machinists will receive their instructions from the mechanical engineer. While they are on the track, they will be under the orders of the train dispatcher and the conductor, unless such orders endanger their train or are not in accordance with the Regulations, since in such case the engineer and the conductor will be both responsible.
123. They will be provided with a good clock that indicates the official time, and they will compare it with that of the Conductor of their train before starting their trip.
124. They must also be provided with the itinerary and in addition to a complete set of signs, which they will have ready to use at any given time.
125. They must report to the service, at least half a Nora before departure and take care that their machine is in perfect condition and provided with everything necessary, and they will help to form their train, if necessary.
126. They will not abandon their machine while it is in service except when it is absolutely necessary, and the Stoker or some competent person must remain in charge of it.
127. At the end of each day they will send the Superintendent a detailed report of every accident that has occurred.
128. The Engineer also acts as the Driver, when the train lacks this employee, having to carry out his duties.
129. The Driver must make sure that the machine's bell rope is properly positioned and not removed before the end of the trip.
I30. The Machinist will take all possible precautions to prevent his machine from throwing sparks when passing through cane fields or other material liable to catch fire.
131. They will not put their train in motion until they receive orders to do so from their driver.
132. They should always approach the seasons and changes with great caution and make sure that these heights are well placed before using them. When approaching a station and a kilometer and a half away they will give the warning signal.
133. The drivers must absolute and immediate obedience to the regulatory signals made to them by both the train and station employees, as well as the guardians of the road.

XV1 — Foguneros.
134. The Stokers will receive their orders from the Chief Mechanic and during the trip they will be under the orders of the Engineer.
135. They are not allowed to operate the machine without instructions from the mechanical engineer, unless in an unforeseen case the Driver or an authorized employee so orders.
136. In the absence of the Engineer, they will take care of the machine and will not abandon it until he returns, nor will they allow anyone to get on it.

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## 13.10.2 The *FCLCC* boiler explosion report April 1896

### Background

Hawthorn 4-4-0 no. **13 'PARDO'**, of the *FC Lima, Callao y Chorrillos*, suffered a boiler explosion on 8th April 1896 at Barranco station during a journey from Chorrillos. The following is the subsequent report of the government inspector, Sr. S. D. F. Arancibia, first in the original Spanish and then in an English auto-translation.

*Accidente ferroviario acaecido en el Barranco.*
*Lima, Abril 9 de 1896.*
*Senor Director de Obras Públicas.*
*S. D. Dando cumplimiento a la orden de US. fecha de ayer, me fui por tren de 10 am a la Estacion del Barranco y procedi inmediatamente al examen de Ia locomotora número **13**, cuyo caldero habia hecho explosion dos horas antes. Haciendo abstraccion por completo de los daños causados por el accidente, me concretare, en este informe, a la description de los efectos de la explosion en la locomotora misma y a consignar mis observaciones y los datos pertinentes de todo genero que he adquirido, de todo lo cual deducire mi opinion sobre el origen del suceso.*
*Ante todo, la explosion se ha limitado al cuerpo del caldero, habiendo quedado casi intactas la caja de fuego y Ia caja de humo que limitan aquel; pero la destrucción de dicho cuerpo ha sido completa: solo han quedado de el, los tubos interiores, sujetos en los dos extremos citados. De las planchas que constituian el caldero, no ha quedado en su lugar absolutamente nada. Todo habia volado en pedazos mas ó menos grandes y en diversas direcciones, a distancias variables que no he medido. Solo un pedazo de plancha de menos de un metro cuadrado de superficie, desprendido de Ia parte inferior del caldero contiguo a la caja de humo, halle muy cerca del lugar que antes ocupaba: la explosion lo habia lanzado hacia abajo y quedó contenido por uno de los ejes y pietas transversales de Ia maquinaria, que le impidieron llegar at suelo. El resto de la parte inferior del caldero no se encontraba alli, lo que prueba que vole) hacia arriba ó hacia á los lados. La plancha que he mencionado primero, se desprendio, por consiguiente, del resto, desgarrandose de los costados, mientras que el resto ha debido abrirse por abajo, para poder salir por uno y otro lado ó hacia arriba. Llamo la atencion de US. sobre esa diferencia, porque tendre que rememorarla mas adelante.*
*El espacio de la via en que encontre los restos de la locomotora, estaba bastante mojado por parte del agua del caldero, siendo presumible que mayor cantidad haya sido lanzada en todas direcciones.*
*El sitio en que halle la locomotora debe ser casi el mismo que ocupaba antes de la explosion, pues, interrogando al maquinista en la tarde, en compañia del senor Juez del Crimen, me dijo que no cree que su maquina haya llegado a andar ni un metro y medio. Recuerda perfectamente haber dado la serial de partida con el silbato, y abierto despues la llave del vapor para ponerse en marcha. El fogonero estima en tres varas (sic) el espacio recorrido antes de la explosion. No insisto en cual de esas dos apreciaciones sea mas exacta, pero si en que estan acordes en que la locomotora llegó a andar go antes de la explosion.*
*No halle tubo indicador del nivel del agua en el caldero, pero el máquinista, en su interrogatorio, asegura que existia y funcionaba bien antes del suceso, to mismo que las llaves que lo suplen. El manómetro marcaba ccro par supuesto, pero el ya mencionado maquinista, dijo que salió de Chorrillos, como siempre, con 150 libras de presión en el caldero. Momentos despues el jefe inmediato de los mecanicos corredores, nos dijo que no les era permitido a estos tener mas presion que 130 libras. Hoy estuve en los talleres de reparación, en el Callao, y preguntando al jefe de ellos sobre Ia presión a que se regulaban las valvulas de seguridad de los calderos, me dijo que para las maquinas nuevas era a 150 libras, pero para las locomotoras viejas, como la No. **13**, el maximum era de 135 libras. Luego, por la declaration del corredor de esta, se viene en conocimiento de que esa maquina tenia, en el momento de la explosion, una presión mayor que la reglamentaria. Y como la valvula de seguridad habria dejado escapar vapor desde que la presion llego a 135 libras, para conseguir 150, el maquinista ha debido tocar el resorte de dicha valvula.*
*En el libro de Ia maestranza en que se consignan todas las reparaciones que se hacen en las maquinas, he encontrado en mi visita de hoy a los talleres, que la última reparación algo seria hecha en la N.° **13**, tuvo lugar en Noviembre del alio 1895. En esa reparación, la parte pertinente dice que los tubos del caldero fueron sacados y vueltos a colocar con anillos nuevos. No consta que, una vez quitados los tubos y libre por consiguiente el interior del caldero, se hu-*

*biese examinado prolijamente este, y haciendolo observar yo, se me dijo que no se hacia constar porque era de reglamento hacer ese examen, asi como Ia prueba, con agua, una vez armado el caldero.*
*En el mismo libro de la maestranza he encontrado como hecho en el mes de Febrero último, pero sin precisar dia, lo siguiente: referente siempre a la No. 13: "Reparado el manómetro". En el lado izquierdo del cuerpo del caldero, cerca de la caja de humo, colocado un parche de 3 pies de larro por 6 a 7 pulgadas de ancho. Pregunte la causa de esa reparación y se me dijo que algún remache de la costura dejaba salir agua.*
*En el deposito de locomotoras de la estación de la Encarnación, existe un libro en el cual los conductores de máquinas inscriben las observaciones que creen deber hacer, tocante a la locomotora que manejan, los defectos que notan y las reparaciones que, a su juicio, deba hacerse en ella. En ese libro, entre otras anotaciones que no vienen al caso, hay una que es pertinente, pues se refiere a la locomotora N° **13** y lieva la fecha 28 de Febrero; dice, asi: "El caldero gotea por debajo, cerca de la caja de humo. Conviene buscar de donde proviene ese goteo. Yo creo que puede provenir del tapón que hay en la parte superior, en el agujero que antes fue soplador" (Firmado)—Reliz.*
*Antes de ir mas adelante, hare constar que este nombre es el que mas a menudo se lee en el libro de observaciones de los maquinistas corredores, lo que prueba que se fija en su maquina y hace constar sus defectos, no siendo siempre la número **13** la que maneja.*
*Antes del 28 de Febrero habia ya hecho mention del goteo de la número **13**, en el libro ya citado, y probablemente, es debido a esa observacion, que se hizo la reparacion que he mencionado mas arriba, de poner un parche al caldero, cerca de la caja de humo, en el mes de Febrero. La ultima observación de Reliz, que acabo de trascribir, casi literalmente, hecha el 28 del mismo mes, manifiesta que el parche no remedió el defecto que con el se quiso evitar. Un mecanico Ojara, empleado, seglin entiendo, en el deposito de locomotoras de la Encarnacion, en vista de la indicación de Reliz, relativa a la posibilidad de que el origen del goteo fuera el tapón de la parte superior, trato de remediar el mal apretando dicho tapon. Al ver esa operación el jefe mecanico Soulsby, le ordenó que la suspendiera. Esto consta de las declaraciones acordes del mecanico Ojara, del maquinista Reliz y de su fogonero. Parece, pues, que de esa orden de suspension, de un trabajo que tenia por objeto evitar el goteo, se desprendiera un serio cargo contra Soulsby; pero basta fijarse en que por la parte superior del caldero, donde estaba fijado el mencionado tapón, jamas podia salir agua sino vapor, para comprender que la indicación de Reliz era erronea, a inutil por consiguiente el trabajo que hacia Ojara, y por fin, oportuna la orden de suspension de dicho trabajo dada por Soulsby. En lo que si puede encontrarse Culpabilidad par? este, es en el hecho de no haber tratado de indagar el verdadero origen del goteo, ya que el parche puesto en la Maestranza, probablemente por su orden, no lo habia hecho desaparecer. Verdad es tambien que en todo el mes de Marzo, Reliz no ha vuelto a mencionarlo en ninguna de las observaciones asentadas de su puño y letra en el libro de la Estacion, en las cuales seliala otros defectos de menor importancia en diversas partes del organismo de la No. **13**. Dice Reliz y su fogonero, que verbalmente han seguido haciendo mention del goteo, pero, repito, esto no consta por escrito.*
*El libro de la Maestranza del Callao no tiene consignado ningún trabajo hecho en el mes de Marzo, en la No. **13**; pero se me mostró el borrador de lo que debe asentarse en el por dicho mes, escrito con lapiz en una hoja suelta. En ese borrador estan consignadas varias reparaciones ligeras, pero nada que se relacione con el caldero. Si, pues, fuera verdad que Reliz ha seguido llamando verbalmente la atencion sobre el persistente goteo del caldero, puede asegurarse que sus observaciones no fueron tomadas en consideración durante el mes de Marzo.*
*En fin, en la mañana de ayer, antes de salir de Chorrillos, el fogonero al aceitar ciertas piezas de to maquina, debajo del caldero, notó que la cantidad de agua que goteaba era mayor, a tal punto que le quemó la espalda, y asi lo hizo presente al maquinista. Este dice que se proponia consignar el hecho, por escrito, al llegar a Lima. ¡Lastima que no se le ocurriera, desde luego, disminuir la presion de 150 libras que habia en su caldero!*
*Me resta tan solo consignar la siguiente observacion, relativa al aspecto que presenta el fierro del caldero en los diversos fragmentos que he visto. Examinando los bordes, se nota que el espesor de media pulgada que tenian las planchas, parece compuesto de varias fracciones u hojas superpuestas. La estructura del fierro parece, pues, hojosa. En algunos pedazos solo se nota dos laminas de 1/4 de pulgada de espesor cada una, y separadas visiblemente una de otra, hasta poder introducir la hoja de una cuchilla entre las dos. Fijando mas la atencia en esas dos laminas superpuestas, que forman el espesor total, se observa que el borde de la rotura de la lamina interior, presenta un aspecto*

*gris mate, sin brillo, en tanto que la lamina exterior tiene la superficie de rotura alas clara y brillante. No recuerdo haber visto antes una plancha de hierro que presentara la textura laminosa que acabo de mencionar, y menos aun la diferencia de color y brillo entre las dos mitades del espesor de la misma plancha. Verdad es tambien que jamas he visto ni tenido noticia de una explosion de caldero, del cual no haya quedado absolutamente nada de toda la superficie del cilindro que lo constituia.*

*Creo, pues, senor Director, que el caldero estaba en mal estado, por el mucho tiempo de servicio que tenia; que ha habido descuido punible al no buscar, hasta encontrarlo, el origen de la gotera señalada por el maquinista Reliz por escrito, el 28 de Febrero, sabiendo que el caldero era viejo. Por esta misma razón, no ha debido usarse nunca en el, una presion mayor de 130 libras, siendo asi que, por declaración del mismo maquinista, salio de Chorrillos con 150 libras. En este punto la responsabilidad sera toda de Reliz, si se llega a probar lo que se me ha dicho, de que las valvulas de seguridad de las maquinas viejas son ajustadas en la Maestranza 135 libras; de lo contrario, es decir, si se permitia a los corredores usar mas de 135 libras en las maquinas viejas, Ia culpabilidad recaera sobre los empleados superiores de la Maestranza ó Superintendencia de maquinas.*

*En cuanto a la causa determinante de la explosion, me parece que debe buscarsela en un aumento repentino de la presion en el caldero, originado por un desarrollo instantaneo de vapor. Dado el momento en que se produjo el accidente, es decir, al arrancar o poner en marcha el tren, solo dos causas a mi modo de ver, pueden producir ese desarrollo instantaneo de vapor: 1a. la introducción de agua fria en el caldero, estando este sin la dotacion indispensable, lo que ha podido ser originado por el funcionamiento de una bomba, al moverse la maquina; y 2a. la apertura de golpe de toda Ia Valvula de admisión de vapor a los cilindros.*

*La primera causa es indudablemente la mas energica y la única que explicaria satisfactoríamente la enerjia de la explosion; pero para aceptarla, es presiso admitir que el maquinista Reliz, no solo falto a su deber teniendo en su caldero una presión demasiado fuerte para su estado, sino que, ademas, se descuidó por completo de ver el nivel del agua en el tubo indicador y comprobarlo con las llaves que lo acompañan. Preguntado Reliz sobre el estado de dicho tubo y de las llaves, dijo que estaban corrientes hasta el último momento; y sobre el nivel del agua, asegura haber salido de Chorrillos con su dotacion completa, bien acusada en el tubo de nivel. Me inclino a creer verdadera la aserción del maquinista, dados sus buenos antecedentes y su larga experiencia en el oficio.*

*Pero es necesario tener presente tambien que si realmente no hubiera cuidado de tener el agua suficiente en su caldero, no lo confesaria palmariamente previendo las responsabilidades y pena consiguientes que su descuido le acarrearia.*

*La segunda causa posible como determinante de la evaporation instantinea en el caldero, es la única que queda si se descarta la primera. Como he dicho, ella consiste en la apertura, de golpe, de la llave de admision, seguida de la cerradura, tambien de golpe, cosa que he visto hacer con demasiada frecuencia a algunos maquinistas, para arrancar un convoy algo pesado, He preguntado a Reliz si procedio asi y me ha asegurado que abrió muy despacio la llave, no alcanzando a abrir ni la mitad cuando tuvo lugar la explosion.*

*En cuanto a la prescription contenida en el articulo 76 del Reglamento General de Ferrocarriles, que US. me indica en su citado oficio, debo decir lo siguiente:*

*Reconocida la maquina número **13**, al mismo tiempo que las demas por el ingeniero senor Guevara, nombrado al efecto en comision especial por el Gobierno, el año 1889, la encontre en mal estado y prescribió se la retirata del servicio, para ser reparada. Terminada la reparacion general que se le hizo, fue probada de diversos modos por otro ingeniero del Estado, a fines de 1890, resultando de la prueba que estaba en muy buen estado de servicio, y asi lo declare el Gobierno por decreto de Noviembre de dicho año de 1890. Desde entonces ha estado en la Maestranza varias veces y ha sido objeto de reparaciones bastante serial; según consta del libro respectivo; pero no ha vuelto a ser examinada ni probada por un ingeniero del Estado como lo manda el articulo 76 que US. cita, y los de su referencia.*

*Ese articulo fija en tres años el limite de servicio activo de una locomotora, al cabo del cual debe ser revisada por completo y aprobada por un ingeniero del Estado, antes de volver a entrar en servicio. Por los datos que acabo de consignar, esa revision seguida de la prueba oficial, ha debido tener lugar principios de 1894, lo que no ha sucedido; habiendose por consiguiente exedido en dos años, el tiempo de servicio activo de la número **13**, sin el requisito reglamentario de que me ocupo.*

*Resumiendo lo expuesto en este informe, se Ilega a las conclusiones siguientes:*
*1o. La máquina número **13**, puesta en servicio el año 1872, probada fines de 1890, no ha recibido la prueba oficial que prescribe el Reglamento General de Ferrocarriles en su articulo 76, a principios del ano 1894.*
*2o. El caldero estaba en mal estado, todo el, localizandose el mal en un punto cerca de la caja de humo, que no se compuso debidamente en tiempo apesar de la indicación escrita del maquinista Reliz, fecha 28 de Febrero.*
*3o. La presión del vapor en un caldero que se hallaba en tan malas condiciones, no debió pasar de 130 libras, y, sin embargo, fue de 150 al salir de Chorrillos y ha podido aumentar durante la parada en arranco.*
*4o. La causa determinante de la explosion, dado el momenta en que se produjo, puede imputarse ó a la falta de agua en el caldero hasta el nivel necesario, ó a la abertura brusca y completa de la llave de admisión del vapor.*
*Dios guarde a US.*
*S. D. F. ARANCIBIA. Ingeniero del Estado.*

Railway accident that occurred in the Barranco.
Lima, April 9, 1896.
Mr. Director of Public Works.
Fulfilling your order. Yesterday's date, I went by train at 10 am to the Barranco Station and immediately proceeded to examine the locomotive number 13, whose boiler had exploded two hours earlier.
Completely abstracting from the damage caused by the accident, I will focus, in this report, on a description of the effects of the explosion on the locomotive itself, and will record my observations and the pertinent data of every genre that I have acquired, of everything, from which I will deduce my opinion about the origin of the event.
First of all, the explosion has been limited to the body of the boiler, the firebox and the smokebox that limit it having remained almost intact; but the destruction of said body has been complete: only the inner tubes remain, attached at the two ends mentioned. Of the plates that made up the boiler, absolutely nothing has remained in place. Everything had flown in more or less large pieces and in different directions, at varying distances that I have not measured. Only a piece of plate of less than one square meter of surface, detached from the lower part of the boiler adjacent to the smoke box, is very close to the place it used to occupy: the explosion had thrown it down and it was contained by one of the the axles and transversal pietas of the machinery, which prevented it from reaching the ground. The rest of the lower part of the boiler was not there, which proves that it flew up or to the sides. The plate that I mentioned first, therefore detached itself from the rest, tearing at the sides, while the rest had to be opened at the bottom, to be able to come out on either side or up. I get the attention of you about that difference, because I will have to recall it later.
The space of the track where I found the remains of the locomotive was quite wet from the water in the boiler, and it is presumably that more has been thrown in all directions.
The location of the locomotive must be almost the same as the one it occupied before the explosion, because, questioning the driver in the afternoon, in the company of the Judge of Crime, he told me that he does not believe that his machine has come to work. not a meter and a half. He perfectly remembers giving the starting signal with the whistle, and then opening the steam tap to get going. The stoker estimates the space traveled before the explosion at three rods (sic). I do not insist on which of these two observations is more exact, but on which they agree with the fact that the locomotive was able to run before the explosion.
There was no water level indicator tube in the cauldron, but the driver, in his interrogation, assures that it existed and was working well before the event, as well as the keys that supply it. The pressure gauge indicated a certain amount, but the aforementioned driver said that he left Chorrillos, as always, with 150 pounds of pressure in the cauldron. Moments later the immediate chief of the running mechanics told us that they were not allowed to have more pressure than 130 pounds. Today I was in the repair shops, in Callao, and asking their boss about the pressure at which the safety valves of the boilers were regulated, he told me that for new machines it was 150 pounds, but for old locomotives Like No. 13, the maximum was 135 pounds. Then, by the declaration of the corridor of this, it is known that this machine had, at the moment of the explosion, a pressure greater than the regulation. And since the safety valve would have let steam escape since the pressure reached 135 pounds, to get 150, the machinist had to touch the spring of said valve.

In the book of the workshop in which all the repairs made to the machines are recorded, I have found in my visit to the workshops today that the last somewhat serious repair made at No. 13 took place in November of the year 1895. In that repair, the pertinent part says that the tubes of the cauldron were removed and replaced with new rings. There is no evidence that one. Once the tubes had been removed and therefore the interior of the cauldron had been freed, it would have been carefully examined, and making myself observe it, I was told that it was not stated because it was the regulation to do this test, as well as the test, with water, armed the cauldron.

In the same book of the maestranza I have found, as a fact in the month of last February, but without specifying the day, the following: always referring to No. 13: "Repaired the manometer." On the left side of the cauldron body, near the smoke box, place a patch 3 feet long by 6 to 7 inches wide. I asked the cause of that repair and was told that some rivet in the seam was leaking water.

In the locomotive depot of the Encarnación station, there is a book in which the machine drivers record the observations they think they should make, regarding the locomotive they drive, the defects they notice and the repairs that, in their opinion, should be done in it. In that book, among other annotations that are irrelevant, there is one that is pertinent, since it refers to locomotive No. 13 and is dated February 28; says so:

“The cauldron is leaking from underneath, near the smoke box. It is convenient to look for where this drip comes from. I think it could come from the plug at the top, in the hole that used to be a blower ”(Signed) —Reliz.

Before going any further, I will state that this name is the one that is most often read in the book of observations of the race drivers, which proves that it is fixed on your machine and states its defects, not always being number 13 the one who drives.

Before February 28, I had already made mention of the dripping of number 13, in the book already cited, and probably, it is due to that observation, that the repair that I mentioned above was made, of putting a patch on the cauldron, near of the smoke box, in the month of February. The last observation by Reliz, which I have just transcribed, almost literally, made on the 28th of the same month, states that the patch did not remedy the defect that it was intended to avoid. An Ojara mechanic, employed, as I understand it, in the Encarnacion locomotive depot, in view of Reliz’s indication, relative to the possibility that the source of the drip was the top cap, tried to remedy the problem by tightening said plug. Seeing this operation, the chief mechanic Soulsby ordered him to suspend it. This consists of the chord statements of the mechanic Ojara, the machinist Reliz and his stoker. It seems, therefore, that from that order of suspension, of a work that was intended to prevent dripping, a serious charge was drawn against Soulsby; But it is enough to note that the upper part of the cauldron, where the aforementioned stopper was fixed, could never come out water but steam, to understand that Reliz’s indication was wrong, therefore the work that Ojara was doing was useless, and finally, timely the order of suspension of said work given by Soulsby. In what if guilt can be found? This is due to the fact that he had not tried to investigate the true origin of the drip, since the patch put on the Maestranza, probably by his order, had not made it disappear. It is also true that in the entire month of March, Reliz has not mentioned it again in any of the observations recorded in his own handwriting in the book of the Station, in which he points out other minor defects in various parts of the organism of No. 13. Say Reliz and his stoker, who have continued to make verbal mention of the drip, but, I repeat, this is not in writing.

The book of the Maestranza del Callao does not have recorded any work done in the month of March, in No. 13; but I was shown the draft of what should be settled in for that month, written in pencil on a loose leaf. In that draft are consigned several light repairs, but nothing that relates to the cauldron. If, then, it is true that Reliz has continued to verbally call attention to the persistent dripping of the cauldron, it can be assured that his observations were not taken into account during the month of March.

Anyway, yesterday morning, before leaving Chorrillos, the stoker when oiling certain parts of the machine under the cauldron, noticed that the amount of water that was dripping was greater, to the point that it burned his back, and so he made it present to the driver. He says that he intended to record the fact, in writing, when he arrived in Lima. Too bad it didn’t occur to him, of course, to lower the 150-pound pressure that he had in his boiler!

It only remains for me to record the following observation, relative to the appearance of the iron of the cauldron in the various fragments that I have seen. Examining the edges, it is noted that the half-inch thickness of the plates appears to be composed of several overlapping fractions or sheets. The structure of the iron seems, therefore, leafy. In some

pieces you can only see two sheets of 1/4 inch thick each, and visibly separated from each other, until you can insert the blade of a knife between the two. Focusing more closely on these two superimposed sheets, which form the total thickness, it is observed that the edge of the tear of the inner sheet, presents a matte gray appearance, without gloss, while the outer sheet has the tear surface wings. clear and bright. I do not remember ever having seen an iron plate that had the lamellar texture that I just mentioned, and even less the difference in color and brightness between the two halves of the thickness of the same plate. It is also true that I have never seen or had news of a boiler explosion, of which there has been absolutely nothing left of the entire surface of the cylinder that constituted it.

I think, then, Mr. Director, that the boiler was in bad condition, due to the long service it had; that there has been punishable negligence in not searching, until finding it, the origin of the leak indicated by the machinist Reliz in writing, on February 28, knowing that the cauldron was old. For this same reason, a pressure greater than 130 pounds should never have been used in it, so that, by declaration of the same machinist, he left Chorrillos with 150 pounds. At this point the responsibility will be all of Reliz, if it comes to prove what I have been told, that the safety valves of the old machines are adjusted in the Maestranza 135 pounds; otherwise, that is, if the runners were allowed to use more than 135 pounds in the old machines, the guilt would fall on the superior employees of the Maestranza or Superintendency of machines.

As for the determining cause of the explosion, it seems to me that it must be sought in a sudden increase in pressure in the cauldron, caused by an instantaneous development of steam. Given the moment in which the accident occurred, that is, when starting or starting the train, only two causes in my view can produce this instantaneous development of steam: 1st. the introduction of cold water into the kettle, this being without the necessary equipment, which could have been caused by the operation of a pump, when the machine moves; and 2nd. the sudden opening of the entire steam admission valve to the cylinders.

The first cause is undoubtedly the most energetic and the only one that would satisfactorily explain the energy of the explosion; But to accept it, it is necessary to admit that the engineer Reliz, not only did not do his duty, having in his cauldron a pressure that was too strong for his condition, but also completely neglected to see the water level in the indicator tube and check it with the accompanying keys. Asked Reliz about the state of said tube and the keys, he said that they were current until the last moment; and on the water level, he claims to have left Chorrillos with his full supply, well marked in the level tube. I am inclined to believe the assertion of the machinist to be true, given his good background and his long experience in the trade.

But it is also necessary to bear in mind that if he had not really taken care of having enough water in his cauldron, he would not openly confess it, foreseeing the responsibilities and consequent pain that his neglect would entail.

The second possible cause as a determinant of instant evaporation in the cauldron is the only one that remains if the first is ruled out. As I have said, it consists of the opening, suddenly, of the admission key, followed by the lock, also suddenly, something that I have seen some machinists do too often, to start a somewhat heavy convoy. Reliz did proceed like this and has assured me that he opened the faucet very slowly, not managing to open even half when the explosion took place.

Regarding the prescription contained in article 76 of the General Railroad Regulations, that you indicates to me in his aforementioned office, I must say the following:

Machine number 13 recognized, at the same time as the others, by the engineer Mr. Guevara, appointed for this purpose in a special commission by the Government, in 1889, I found it in poor condition and prescribed it to be withdrawn from service, to be repaired. After the general repair that was done, it was tested in various ways by another State engineer, at the end of 1890, resulting from the proof that it was in a very good state of service, and so declared by the Government by decree of November of said year of 1890. Since then it has been in the Maestranza several times and it has undergone fairly serial repairs; as stated in the respective book; but it has not been examined or tested again by a State engineer as required by article 76 of the US. quote, and those of your reference. This article sets the active service limit of a locomotive at three years, after which it must be completely revised and approved by a State engineer, before it is put back into service. From the data that I have just consigned, this review followed by the official test must have taken place at the beginning of 1894, which has not happened; having therefore exceeded by two years, the time of active duty of the number 13, without the statutory requirement that I deal with.

Summarizing what is stated in this report, the following conclusions are reached:

1st. Machine number 13, put into service in 1872, tested at the end of 1890, has not received the official test prescribed by the General Regulations of Railways in its article 76, at the beginning of the year 1894.

2nd. The cauldron was in bad condition, all of it, locating the evil in a point near the smoke box, which was not properly composed in time despite the written indication of the machinist Reliz, dated February 28.

3rd. The steam pressure in a cauldron that was in such poor condition should not have exceeded 130 pounds, and yet it was 150 when leaving Chorrillos and has been able to increase during the start stop.

4th. The determining cause of the explosion, given the moment in which it occurred, can be attributed either to the lack of water in the kettle to the necessary level, or to the abrupt and complete opening of the steam inlet valve.

God save you.

S. D. F. ARANCIBIA. State Engineer.

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## 13.10.3 The Río Blanco accident on the *FC Central* in 1902

This report was found in *Informaciones y memorias de la Sociedad de Ingenieros del Peru* v.3-4 1901-02. The report is in volume 4, pp290-294. https://babel.hathitrust.org/cgi/pt?id=uc1.b2870084&view=1up&seq=295&skin=2021

*Accidente ferrocarrilero en el río Blanco*
Railroad accident at Río Blanco

*El 12 de Abril del presente año tuvo lugar, en la línea del Ferrocarril Central un accidente de alguna importancia de cuya descripción voy á ocuparme:*
On April 12 of this year, an accident of some importance took place on the Central Railroad line, the description of which I will deal with:

*Según datos que obtuve en el terreno, el día anterior, al pasar un tren de carga sobre el puente del río Blanco, rompiose una rueda de un track de uno de los carros de carga que formaba parte del convoy y como consecuencia quedaron averiados algunos durmientes cerca del primer machón de la orilla izquieda, durmientes que una cuadrilla de peones, bajo las inmediatas órdenes del sobrestante Francisco Suarez, procedió á cambiar el día 12 y para el efecto se levantaron los dos primeros rieles del principio del puente.*
According to data I obtained on the ground, the day before, when a freight train passed over the Blanco River bridge, a wheel on a track of one of the freight cars that was part of the convoy broke and as a consequence some sleepers were damaged. near the first buttress on the left bank, sleepers that a gang of labourers, under the immediate orders of Overseer Francisco Suarez, proceeded to change on the 12th and for this purpose the first two rails at the beginning of the bridge were raised.

*Por declaración de Suarez, antes de empezar su trabajo, que fué una vez que hubo pasado el tren de pasajeros á las 11.50 a. m. puso una bandera roja á 600 m. á ambos lados del puente en obedecimiento al art. 71 del Reglamento Especial de este ferrocarril.*
By declaration of Suarez, before beginning his work, which was once the passenger train had passed at 11:50 a.m. (he) put a red flag at 600 m. on both sides of the bridge in compliance with art. 71 of the Special Regulations of this railway.

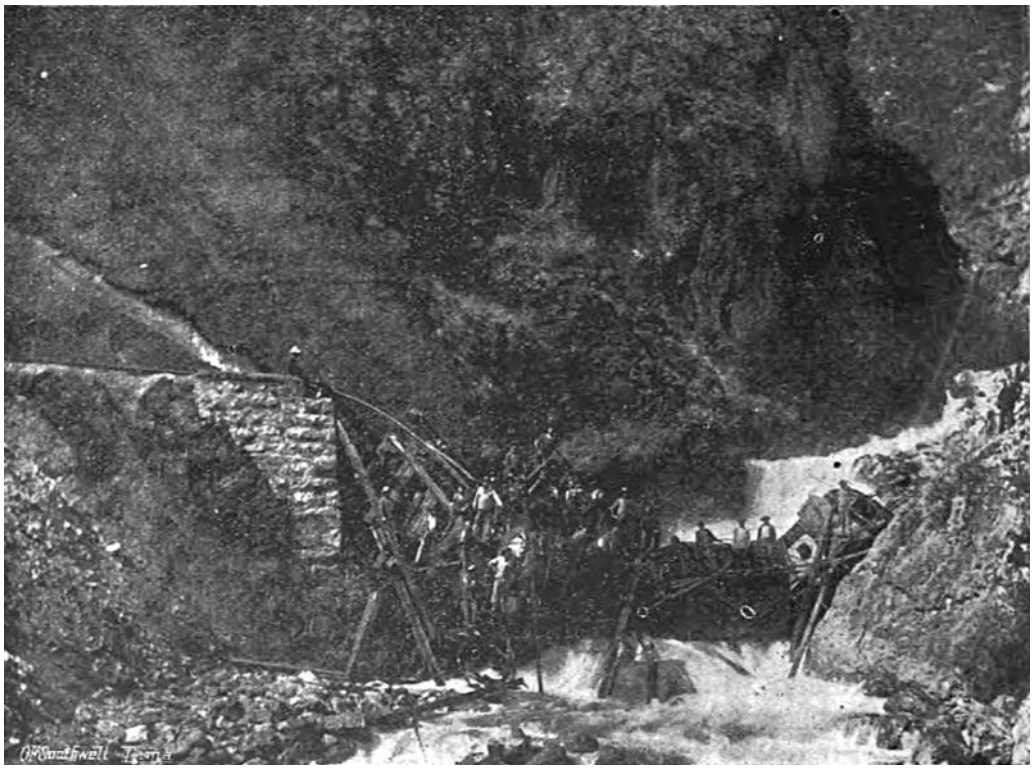
*A las 2 y 25 p. m, llegaba al tunel número 36 un tren extraordinario de carga compuesto de la locomotora "Yauli" número 34 y su tender con el peso 18.T 946, una.bodega cargada con dinamita con el peso de 17T 723 kgs. (carga comprendida), tres carros con coke con el peso de 40.T 390 kgs. (carga inclusive) y un carro vacío del peso de 1.T 550 (véase el diágrama del convoy adjunto.)*
At 2:25 p.m., arrived at tunnel number 36 an extra freight train made up of locomotive "Yauli" number 34 and its tender weighing 18.T 946, a van loaded with dynamite weighing 17T 723 kgs. (load included), three cars with coke weighing 40.T 390 kgs. (load inclusive) and an empty car weighing 1.T 550 (see attached convoy diagram.)

*Antes de seguir adelante, es conveniente dar una idea de la topografía del terreno. A partir del K. 135, la línea férrea describe una herradura (véase el plano adjunto) en cuyo vértice se encuentra el puente número 4, donde tuvo lugar el accidente; el lado derecho de la herradura está formado por otro puente (el número 3) sobre el mismo rio, y á los 36 metros de distancia, está la boca del tunel número 36 cuya longitud es de 170 metros que junto con el puente número 3 cuva longitud es de 24 metros, forman el lado derecho de la herradura. A los 32 metros de la boca de salida, que como se vé está en curva, se encuentra el puente número 4 de 14 m. de largo, donde ocurrió el accidente.*
Before proceeding further, it is convenient to give an idea of the topography of the terrain. Starting from K. 135, the railway line describes a horseshoe (see attached plan) at whose apex is bridge number 4, where the accident took place; the right side of the horseshoe is formed by another bridge (number 3) over the same river, and 36 meters away,

is the mouth of tunnel number 36 whose length is 170 meters which, together with bridge number 3, covers length is 24 meters, they form the right side of the horseshoe. At 32 meters from the exit mouth, which as you can see is curved, there is bridge number 4 of 14 m. long, where the accident occurred.

*Por la descripción que acabo de hacer, se comprenderá que pasado el primer puente y dentro del tunel, no se puede divisar el segundo puente, sino cuando se está casi encima de él y por consiguiente si no se vé la señal reglamentaria antes de entrar al tunel, es casi imposible detenerse antes de pasar el puente, puesto que sólo hay una distancia de 32 metros que salvar. El convoy salió del tunel y pasó al puente donde se habían quitado los dos primeros rieles del lado de la entrada; como consecuencia inmediata, la locomotora se descarrilo y fué á estrellarse contra una de las armaduras de contensión (la izquierda) que sostienen el puente, el cual giró sobre el larguero de la derecha y haciendo un movimiento de rotación todo el puente al rededor de dicho larguero como eje, se precipitó junto con la locomotora al río, cayendo ésta al fondo sobre los peñascos que forman su lecho; en su caída arrastró también al tender y con él el carro cargado de dinamita que rompiendo las amarras que lo sujetaba montóse sobre ésta el tender, destrozándose el track delantero; el posterior quedó apoyado sobre el machón y sujeto en parte por las amarras con el resto del convoy que no llegó á entrar al puente.*

From the description that I have just given, it will be understood that after passing the first bridge and inside the tunnel, you cannot see the second bridge, but when you are almost on top of it and therefore if you do not see the regulatory signal before entering the tunnel, it is almost impossible to stop before crossing the bridge, since there is only a distance of 32 meters to cover. The convoy exited the tunnel and passed onto the bridge where the first two rails on the entrance side had been removed; As an immediate consequence, the locomotive derailed and crashed into one of the containment reinforcements (the left) that support the bridge, which turned on the stringer on the right and making a rotation movement around the entire bridge around said stringer as an axis, rushed along with the locomotive into the river, falling to the bottom on the rocks that form its bed ; in its fall it also dragged the tender and with it the car loaded with dynamite which, breaking the couplings that held it, mounted the tender on top of it, destroying the front track; the rear one was supported on the buttress and partially held by the couplings with the rest of the convoy that did not get to enter the bridge.



*F. C. Central.—Accidente de Río Blanco (Fot. del Ing.° Basureo)*

F. C. Central.—Río Blanco Accident (Photo by Ing.° Basureo)

*La escena que se produjo debió ser espantosa; la salvación del maquinista y del fogonero, cayendo desde una altura de 25 piés, dentro de un río que merece el nombre de torrente, es algo prodigioso. Por suerte al voltearse el puente rompió el silvato de la locomotora y junto con él las válvulas de seguridad. Feliz coincidencia que evitó reventara el caldero y con ello la explosión de 8.T 700 kgs. de dinamita. El maquinista y fogonero, se lanzaron al río, con riesgo de morir destrozados contra los peñascos. El conductor del tren venía dentro de la bodega, lo cual es prohibido terminantemente por el reglamento, donde fué fuertemente golpeado por los cajones al derrumbarse con la caída del carro. Asímismo, sufrieron fuertes contusiones dos brequeros, uno de los cuales iba dentro de la locomotora, lo cual también esta terminantemente prohibido.*
The scene that ensued must have been appalling; The salvation of the engineer and the stoker, falling from a height of 25 feet, into a river that deserves the name of a torrent, is something prodigious. Luckily, when the bridge overturned, it broke the locomotive's whistle and, along with it, the safety valves. Happy coincidence that prevented the cauldron from bursting and with it the explosion of 8.T 700 kgs. of dynamite. The driver and stoker threw themselves into the river, at the risk of being crushed to death against the rocks. The train guard was inside the van, which is strictly prohibited by the regulations, where he was strongly hit by the crates when he collapsed with the fall of the car. Likewise, two brequeros suffered severe contusions, one of which was on board the locomotive, which is also strictly prohibited.

*Causa del accidente.-- Un descuido culpable de los empleados de la empresa, que la justicia debe aclarar y que el Gobierno está en el deber de evitar vuelva á repetirse en lo sucesivo, porque pudiera ocasionar desgracias de proporciones difíciles de imaginar siquiera.*
Cause of the accident.-- A culpable oversight of the company's employees, which must be clarified by the courts and which the Government has the duty to prevent from happening again in the future, because it could cause misfortunes of proportions that are difficult to even imagine.

*Respecto á responsabilidades el dilema es el siguiente: ó se colocó bandera roja y no fué vista, ó no se colocó; en el primer caso el culpable es el maquinista, que además olvidó dar la se-ñal de atención antes de entrar al tunel, como lo prescribe el artículo 112 del reglamento del Ferrocarril Central, y digo que se olvidó, porque es de suponer que el sobrestante hubiera tenido tiempo de correr hácia el tren antes de salir del tunel y detenerlo sin que llegase al puente. Si no se colocó la bandera roja, el culpable fué el sobrestante.*
Regarding responsibilities, the dilemma is as follows: either a red flag was placed and it was not seen, or it was not placed; In the first case, the culprit is the driver, who also forgot to give the warning signal before entering the tunnel, as prescribed in article 112 of the Central Railway regulations, and I say that he forgot, because presumably the Overseer would have had time to run towards the train before exiting the tunnel and stop it before it reached the bridge. If the red flag was not raised, the culprit was the foreman.

*En resúmen la causa ha sido un descuido, tanto más punible cuanto que pudo producir una verdadera catástrofe. Modo de evitar que se repitan accidentes análogos. El Reglamento General de señales para Ferrocarriles prescribe en su artículo 4.°, que la bandera roja desplegada por el empleado, significará peligro y á su vista se detendrá el tren. El artículo 5.° dice: "Si en ausencia del empleado respectivo " el maquinista viese al lado de la vía una bandera verde ó roja, " colocada como para llamarle la atención, obedecerá á esta señal, como si la hiciese personalmente el empleado".*
In short, the cause has been an oversight, all the more punishable as it could produce a real catastrophe.
How to prevent similar accidents from happening again. The General Signal Regulation for Railways prescribes in its article 4, that the red flag displayed by the employee, will mean danger and in sight of it the train will stop.
Article 5 says: "If, in the absence of the respective employee, "the driver sees a green or red flag on the side of the road, "placed as if to call his attention, he will obey this signal, as if the employee had made it personally." .

*Resulta pues, que el Reglamento se pone en el caso de que falte el empleado momentaneamente por una causa*

*imprevista, pero no autoriza para que se abandone las señales á su propia suerte ó sea el colocar las señales á 600 metros de distancia del lugar del peligro sin vigilancia, como ha sido costumbre hacerlo, y tiene que ser así, porque una ráfaga de viento, un animal, un inocente niño ó un malvado, puede ocasionar numerosas víctimas.*
It turns out, then, that the Regulation is put in the event that the employee is temporarily absent due to an unforeseen cause, but it does not authorize the signals to be abandoned to their own fate, that is, to place the signs 600 meters away from the place of danger. unattended, as has been customary, and it has to be, because a gust of wind, an animal, an innocent child or an evildoer, can cause numerous victims.

*Sería pues conveniente que el Ministerio de Fomento expidiera un decreto por el que se prohiba á las Empresas ferrocarrileras, la colocación de señales que no sean vigiladas por empleados, que en ningún caso y por ningún motivo puedan separarse de ellas un sólo instante, quedando así modificado el artículo 5.° del Reglamento de Señales en vigencia, cuya mala interpretación ha dado origen indirectamente al accidente ferroviario materia de este artículo.*
It would therefore be convenient for the Ministry of Public Works to issue a decree that prohibits railway companies from placing signals that are not supervised by employees, and that in no case and for no reason can they be separated from them for a single moment, thus remaining amended Article 5 of the Signal Regulations in force, whose misinterpretation has indirectly given rise to the railway accident that is the subject of this article.

*SANTIAGO M. BASURCO.*
SANTIAGO M. BASURCO.

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## 13.10.4 Sections of the very critical 1909 *FCC* report

These were the loco-related sections of the critical *Informe sobre el material y organización de servicios del Ferrocarril Central*, written in 1909 and published in *Informaciones y memorias de la Sociedad de Ingenieros del Perú* in 1913, pp271-298.

LOCOMOTORAS
LOCOMOTIVES

*La comisión ha dado mucha importancia al exámen de las locomotoras, llenando prolijamente el programa acordado.*
The commission has attached great importance to the examination of the locomotives, carefully filling out the agreed programme.

*Clasificacion.—Aunque á causa del hundimiento del puente de Chaupichaca, el tráfico de pasajeros en la sección Chaupichaca—Oroya, ha tenido que hacerse con las máquinas más grandes y pesadas de carga, que quedaron en esa sección; debemos, sin embargo, clasificar las locomotoras de que dispone la Empresa para el servicio de la Sierra, en máquinas para trenes de pasajeros y máquinas para trenes de carga; desde que está establecido y no conviene modificar este sistema, que no corran trenes mixtos en esta sección. Pero hay que tener en cuenta que las locomotoras que consideramos como de pasajeros, no lo serían en otras líneas de gradientes ordinarias no superiores al 2%; pues, la clasificación no toma por base la velocidad de los trenes, que aquí no puede ser nunca grande, sino más bien el poder de tracción de las máquinas. Es así como las de 4 pares de ruedas acopladas, serán consideradas como de carga; y las de 3 ruedas acopladas, como de pasajeros. Puede añadirse que hay poca diferencia en los diámetros de las ruedas de una y otra clase de máquinas.*
Classification.—Although because of the collapse of the Chaupichaca bridge, passenger traffic in the Chaupichaca-Oroya section has had to take over the largest and heaviest cargo machines, which remained in that section; We must, however, classify the locomotives available to the Company for servicing the Sierra, in machines for passenger trains and machines for freight trains; since it is established and it is not convenient to modify this system, that mixed trains do not run in this section. But it must be taken into account that the locomotives that we consider to be passenger locomotives would not be so on other lines with ordinary gradients not greater than 2%; thus, the classification is not based on the speed of the trains, which here can never be great, but rather on the traction power of the machines. This is how those with 4 coupled pairs of wheels will be considered as freight; and those with 3 coupled wheels, as passengers. It may be added that there is little difference in the diameters of the wheels of the two kinds of machines.

*Si no se cuenta el lote de nuevas locomotoras que se están recibiendo [18 de carga y 6 de pasajeros] de las que algunas ya están armándose, puede decirse que para el tráfico de la Sierra, la Empresa cuenta ahora con 21 locomotoras, de las cuales 10 para carga y 11 para pasajeros. Las primeras son todas de la fábrica de Rogers [moderna]; pesan 110 toneladas, tender comprendido, y son de tipo y construcción poco recomendables. Todas están provistas del freno Westinghouse. Las segundas, de pasajeros, son de las fábricas Rogers [antigua], y Baldwin; pesan 85 toneladas—tender comprendido—y son de tipo y construcción apropiadas. Sólo tres de entre ellas, están provistas del freno Westinghouse.*
If the batch of new locomotives that are being received [18 freight and 6 passenger] are not counted, some of which are already being assembled, it can be said that for Sierra traffic, the Company now has 21 locomotives, of which 10 for cargo and 11 for passengers. The former are all from the [modern] Rogers factory; they weigh 110 tons, tender included, and are of an unrecommended type and construction. All are equipped with the Westinghouse brake. The second, for passengers, are from the [old] Rogers and Baldwin factories; they weigh 85 tons—tender included—and are of proper type and construction. Only three of them are equipped with the Westinghouse brake.

*Las máquinas nuevas que se están armando, son todas de la fábrica escocesa North British Locomotive Co. y son de*

*tipos apropiados y excelente construcción. Las de carga, en orden de marcha, pesarán 103 toneladas y las de pasajeros 70 T. Ni unas ni otras, están provistas del freno Westinghouse: paro sí del de vapor.*
The new machines being assembled are all of the North British Locomotive Co., in Scotland, and are of the proper types and excellent construction. The cargo ones, in running order, will weigh 103 tons and the passenger ones 70 tons. Neither of them are equipped with the Westinghouse brake: but they do have the steam brake.

*Como se vé la dotación actual es de:*

| | |
|---|---|
| *Máquinas de carga* | *10* |
| *Máquinas de pasajeros* | *11* |
| | *21* |

*La dotación próxima, de:*

| | |
|---|---|
| *Máquinas de carga* | *28* |
| *Máquinas de pasajeros* | *17* |
| | *45* |

*Es decir que el número de máquinas destinadas al servicio de la Sierra, será próximamente más que suficiente para el tráfico probable.*
As you can see, the current endowment is:

| | |
|---|---|
| Loading machines | 10 |
| Passenger machines | 11 |
| | 21 |

The future fleet, of:

| | |
|---|---|
| Loading machines | 28 |
| Passenger machines | 17 |
| | 45 |

In other words, the number of machines assigned to the Sierra service will soon be more than sufficient for the probable traffic.

*Con los datos característicos principales de las 21 máquinas de que la Empresa dispone actualmente, hemos formado el cuadro N.° 1. que no comprende las nuevas locomotoras que se están recibiendo. Como puede ves se en este cuadro, y como va lo hemos dicho, todas las máquinas de carga están provistas de frenos Westinghouse, fuera de los de mano y agua. Además, dos de ellas, lo están del freno de vacío ninguna del freno de vapor: mientras que de las máquinas de pasajeros, sólo tres están dotadas de los Westinghouse, 8 del de vacío, 8 del de vapor. 9 del de agua y, naturalmente, todas del de mano. Resulta, pues, de allí, que hay varias máquinas de carga y muchas de pasajeros, provistas á la vez de 4 diferentes clases de frenos.*
With the main characteristic data of the 21 machines that the Company currently has, we have compiled table No. 1, which does not include the new locomotives that are being received. As can be seen in this table, and as we have already said, all lfreight machines are equipped with Westinghouse brakes, apart from hand and water brakes. In addition, two of them are equipped with the vacuum brake, none with the steam brake: while of the passenger machines, only three are equipped with the Westinghouse, 8 with the vacuum, 8 with the steam. 9 of the water and, naturally, all with hand brakes. It follows, therefore, that there are several freight machines and many passenger machines, provided at the same time with 4 different kinds of brakes.

*En cuanto al est do en que se encuentran las diferentes locomotoras, debemos decir, desde luego, que de las 10 máquinas de carga, hay 7 en reparación ó fuera de uso, y una recién reparada: mientras que de las de pasajeros, hay*

*cuatro en reparación séria y 1 en reparación ligera. De suerte que, cuando se concluyó el exámen, las máquinas en servicio, sólo eran 11:*

*De carga 3*

*De pasajeros 8*

*y tenemos que añadir que el estado de conservación de estas 11 máquinas es, en general, deficiente y aún malo en algunas, principalmente de las que hacen el tráfico entre Chaupichaca y la Oroya. Podría explicarse esta circunstancia, porque están usando carbón malo, piritoso; y también porque no existiendo factoría en la Oroya, pues, la que antes hubo fué desarmada, no se hacen allí las reparaciones de importancia que serían indispensables.*

As for the state in which the different locomotives are found, we must say, of course, that of the 10 freight engines, there are 7 under repair or out of use, and one recently repaired: while of the passenger ones, there are four under serious repair and 1 in light repair. So that, when the examination was concluded, the machines in service were only 11:

Freight 3

Passenger 8

and we have to add that the state of conservation of these 11 machines is, in general, deficient and even bad in some, mainly those that make traffic between Chaupichaca and La Oroya. This circumstance could be explained, because they are using bad, pyrite coal; and also because there is no workshop in Oroya, well, the one that existed before was dismantled, the important repairs that would be indispensable are not made there.

*La comisión ha examinado el estado de las locomotoras en servicio, y el de las que han estado concluyendo de repararse en Guadalupe; consignando los resultados que iba obteniendo sucesivamente, en el cuadro No. 2 que acompañamos, el que concuerda con las observaciones siguientes:*

The commission has examined the state of the locomotives in service, and that of those that have been finishing repairs in Guadeloupe; consigning the results that were obtained successively, in table No. 2 that we accompany, which agrees with the following observations:

*Con respecto á las cajas de fuego en general están éstas en buenas ó regulares condiciones, teniendo parches sólo 3 de ellas.*

With respect to the fireboxes, in general, these are in good or regular conditions, only 3 of them having patches.

*Los estays se encuentran bastante hien, en la mayor parte, excepto en tres de las máquinas en que se manifiestan salidas de agua más ó menos considerables, sobre todo en las Nos.* ***46, 49*** *y* ***58****, que trabajan en la sección Chaupichaca-Oroya.*

The stays are quite good, in most of them, except in three of the machines in which more or less considerable water leaks are manifested, especially in Nos. **46, 49** and **58**, which work in the Chaupichaca-Oroya section.

*No hay observación que hacer sobre los tapones fusibles, y casi no la hay sobre los tubos que, salvo en las máquinas* ***46, 49*** *y* ***58*** *se encuentran en buenas condiciones. Ninguna tampoco sobre las llaves de prueba.*

There is no observation to make on the fusible plugs, and almost none on the tubes, which, except for machines **46, 49** and **58**, are in good condition. Nor about the test cocks.

*Con respecto á las incrustaciones formadas en el caldero, casi de un modo general, hemos podido comprobar un espesor de 1-1/2 á 3 milímetros y aún mayores en la de la sección Chaupichaca-Oroya.*

With respect to the incrustations formed in the boilers, almost in a general way, we have been able to verify a thickness of 1-1/2 to 3 millimeters and even greater in that of the Chaupichaca-Oroya section.

*En cuanto á los manómetros, sólo hemos encontrado diferencia notable en el de la máquina N.°* ***44****, cuyo manómetro. examinado al día siguiente de haber la máquina llegado á Guadalupe, de la Sierra, ofreció una diferencia de 25*

*libras en menos de lo que debía marcar. Debemos añadir también, que estando sujeta una máquina á ser indistintamente manejada por uno ú otro maquinista, y siendo diferentes las presiones que los calderos pueden soportar, será muy conveniente que el manómetro de cada caldero, tenga marcada con una línea roja, la presión máxima que puede usar el maquinista; presión que debe coincidir con la que haga levantar las válvulas de seguridad. Esta indicación, hecha verbalmente, ha principiado á ponerse en práctica por el Jefe de la Factoría.*
As for the pressure gauges, we have only found a notable difference in that of machine No. **44**, whose pressure gauge. examined the day after the machine arrived at Guadalupe, from the mountains, it offered a difference of 25 pounds in less than it should have marked. We must also add that, since a machine is subject to being handled indistinctly by one or another machinist, and the pressures that the cauldrons can withstand are different, it will be very convenient that the pressure gauge of each cauldron has a red line marking the maximum pressure. that the driver can use; pressure that must coincide with that which makes the safety valves lift. This indication, made verbally, has begun to be put into practice by the Head of the Factory.

*Con respecto al desgaste de las llantas, no hemos encontrado exceso sino en las máquinas **34, 40** y **44**.*
Regarding tire wear, we have not found excess except on the **34, 40** and **44** machines.

*Sobre los areneros, hay observación general importante por hacer: El examen que hemos practicado en las diferentes máquinas, recién reparadas en Guadalupe, ó en las que están en servicio, nos permite asegurar que en la Maestranza, no se dá suficiente importancia á la dotación y funcionamiento de los areneros; y que, casi generalmente, ni los maquinistas corredores, ni los empleados del tráfico, parecen das la ni á la provisión de buena arena, ni á la dotación del número de tubos necesarios. Y como se sabe, no puede exagerarse la importancia que ofrece esta parte de la máquina, cuya falta podría explicar, tal vez, la causa, no precisada aún, de algunos accidentes recientes. Hemos encontrado diversas máquinas á las que falta tubos areneros para detrás de las ruedas; otras en que la posición de las bocas de los tubos, ha-cía, caer la mayor parte de la arena fuera del riel; otras en servi-cio, desprovistas de arena; otras, también en servicio, provistas de arena húmeda, que no podra caer á lo largo de los tubos. Por último, en diversas estaciones, hemos encontrarlo los depósitos llenos exclusivamente de arena húmeda.*
About the sandboxes, there is an important general observation to make: The examination that we have practiced in the different machines, recently repaired in Guadalupe, or in those that are in service, allows us to assure that in the Maestranza, not enough importance is given to the equipment and operation of the sandboxes; and that, almost generally, neither the corridor drivers nor the traffic employees seem to care neither for the supply of good sand nor for the supply of the necessary number of tubes. And as is known, the importance of this part of the machine cannot be exaggerated, the lack of which could perhaps explain the cause, not yet specified, of some recent accidents. We have found several machines that lack sand tubes for behind the wheels; others in which the position of the tube mouths made most of the sand fall out of the rail; others in service, without sand; others, also in service, provided with moist sand, which could not fall along the tubes. Finally, in various seasons, we have found the deposits filled exclusively with wet sand.

*Con respecto á los frenos, necesitames dejar sentado el criterio de la comisión, para fundar las pruebas verificadas y las exigencias que formule:*
With regard to the brakes, we need to state the criteria of the commission, to base the verified tests and the demands that it formulates:

*Desde luego, nada hay que decir sobre el freno de mano de que, naturalmente, está dotada toda máquina, freno que constituye en realidad un órgano de reserva. Nada tampoco sobre el antiguo freno de agua de Le Chatelier, aparato que debería llamarse más bien moderador de velocidad y cuyo empleo permanente en las pendientes fuertes y continuas, tiene siempre ventaja y no se opone al empleo de un verdadero freno mecánico. Pero, sí tenemos que discutir el empleo de los frenos de vapor, de vacío y de aire, de que están provistas muchas máquinas, aún simultáneamente.*

Of course, nothing needs to be said about the handbrake with which, naturally, every machine is equipped, a brake which is actually a reserve organ. Nothing either about the old Le Chatelier water brake, a device that should rather be called speed moderator and whose permanent use on steep and continuous slopes always has an advantage and is not opposed to the use of a true mechanical brake. But we do have to discuss the use of steam, vacuum, and air brakes, with which many machines are provided, even simultaneously.

*El freno de vapor, es, en realidad, un freno sencillo y poderoso; pero que no se aplica sino á la máquina ó á la máquina y al tender. No es aplicable á los carros y coches que formen un tren. Estas condiciones lo caracterizan como un excelente freno para máquinas de maniobras ó de patio; y así se usa, en general, en Europa y Estados Unidos. Puede aún ser aprovechable para un tren de carga, desprovisto de freno mecánico contínua pudiendo entonces hacer la misma máquina las necesarias maniobras de estación, cuando, como sucede en esta línea, no existe en cada estación, una máquina especial de patio. Pero no permitirá nunca detener rápidamente un tren de carga, en caso de presentación repentina de un obstaculo en la vía, como puede suceder por la presencia de otro tren ó por derrumbe visto demasiado tarde. Este efecto no puedo obtenerse, naturalmente, sino por un freno contínuo.*
The steam brake is actually a simple and powerful brake; but that applies only to the machine or to the machine and to the tender. It is not applicable to cars and coaches that form a train. These conditions characterize it as an excellent brake for maneuvering or patio machines; and so it is used, in general, in Europe and the United States. It can still be used for a freight train, lacking a continuous mechanical brake, so the same machine can then make the necessary station maneuvers, when, as happens on this line, there is not a special yard machine at each station. But it will never allow a freight train to stop quickly, in the event of a sudden presentation of an obstacle on the track, as can happen due to the presence of another train or due to a collapse seen too late. This effect can not be obtained, naturally, but by a continuous brake.

*En cuanto á los frenos de vacío y de aire comprimido, el primero de algún sistema moderno y el segundo del sistema Westinghouse; éstos si responden perfectamente á las exigencias de la seguridad en los trenes de pasajeros, siempre que llenen las condi-ciones de estar en buen estado de uso, y de saberlos manejar el maquinista. Pero creemos absolutamente inconveniente, y hasta peligrosa, la adopción simultánea de las dos clases; no sólo por la complicación que en los carros y coches exija la posibilidad de emplear indistintamente uno ú otro sistema, sino también por la vacilación del maquinista que podría ser fatal, en el momento de necesitar el freno con urgencia, para decidir cuál de las llaves bajo su mano debe accionar. Es conveniente, al contrario. que el maquinista conozca, en todos sus detalles, uno sólo de estos frenos complicados y no esté acostumbrado á servirse sino de uno; sobre todo, si se tiene en cuenta que, en general, es deficiente su instrucción.*
As for the vacuum and compressed air brakes, the former from some modern system and the latter from the Westinghouse; these do respond perfectly to the requirements of safety in passenger trains, provided that they meet the conditions of being in good condition for use, and that the driver knows how to handle them. But we believe that the simultaneous adoption of the two classes is absolutely inconvenient, and even dangerous; not only because of the complication that cars and cars require the possibility of using one or the other system indistinctly, but also because of the driver's hesitation, which could be fatal, at the moment of needing the brake urgently, to decide which of the keys under his hand he must act. It is convenient, on the contrary. that the engineer knows, in all the details of it, only one of these complicated brakes and is not accustomed to using but one; above all, if one takes into account that, in general, his instruction is deficient.

*De esta disensión, nos parece que resultaba bien establecido, desde luego:*
*Que prescindiendo del freno de mano y del de agua, de que siempre están dotadas, no es conveniente que tengan las locomotoras varias clases de frenos mecánicos; y que, al contrario, conviene que sólo tengan de una clase: y enseguida,*
From this dissension, it seems to us that it was well established, of course:
That apart from the handbrake and the waterbrake, with which they are always equipped, it is not advisable for

locomotives to have various kinds of mechanical brakes; and that, on the contrary, it is convenient that they only have one kind: and immediately,

*Que el freno de vapor, no es aparente para las locomotoras destinadas al servicio de pasajeros; pero, que dada la necesidad de conservar siempre el uso de los frenos de mano y guarda frenos ó brequeros, podría, aceptarse, por ahora, el freno de vapor, sólo para los trenes de carga;*
That the steam brake is not apparent for locomotives intended for passenger service; but, given the need to always maintain the use of hand brakes and brake guards or brakes, the steam brake could be accepted, for now, only for freight trains;

*Que las locomotoras de pasajeros, deben estar todas provistas de un sólo freno contínuo, ya sea de vacío perfeccionado, ya de presión de aire, como el de Westinghouse, casi generalmente preferido.*
That passenger locomotives must all be provided with a single continuous brake, either perfected vacuum or air pressure, like that of Westinghouse, almost generally preferred.

*Resulta así evidente, que se ha procedido sin juicio al escoger la dotación de frenos de las máquinas de la Empresa, pues, las que se encuentran provistas del freno Westinghouse, son todas de carga que no lo necesitan, puesto que, los carros de carga no tienen esta clase de frenos; mientras que las de pasajeros, tienen toda clase de frenos. ménos el Westinghouse, que es el que le convendría, salvo 3 de ellas. Debemos añadir que el lote de máquinas nuevas que se está armando, está dotado con freno mecánico, únicamente del de vapor, tanto para las de carga como para las de pasajeros, lo cual tampoco es correcto.*
It is thus evident that it has proceeded without judgment when choosing the provision of brakes for the Company's machines, since those that are provided with the Westinghouse brake are all cargo that do not need it, since the cargo cars they don't have this kind of brakes; while the passenger ones have all kinds of brakes. except for the Westinghouse, which is the one that would suit you, except for 3 of them. We must add that the batch of new machines that is being assembled is equipped with a mechanical brake, only the steam one, both for cargo and for passengers, which is not correct either.

*Nos parece, pues indispensable exigir, como medio de seguridad en el tráfico, dando un plazo prudencial para que se llene esta exigencia:*
It seems to us, therefore, essential to demand, as a means of safety in traffic, giving a prudential term for this requirement to be fulfilled:

*1o.—Que se provea á todas las máquinas de carga del freno de vapor, excluyendo los de vacío ó de aire comprimido que pudieran tener.*
1st.—That all cargo machines be provided with a steam brake, excluding those of vacuum or air tablet they might have.

*2o.—Que se provea á todas las máquinas de pasajeros (para el servicio de la Sierra) del freno Westinghouse, con exclusión del freno de vapor y del de vacío.*
2nd.—That all passenger engines (for servicing the Sierra) be provided with the Westinghouse brake, excluding the steam and vacuum brakes.

*FRENOS WESTINGHOUSE*
WESTINGHOUSE BRAKES

*Reducidos así los frenos en el servicio de la Sierra, al de vapor y al de aire comprimido, la comisión se ha*

*preocupado de averiguar, si el segundo de estos frenos era bastante conocido de todos los maquinistas corredores, como para que pudieran emplearlo juiciosamente, aún en casos de accidente; y se ha convencido por observaciones personales y por interrogaciones directas de que, desgraciadamente, muchos de éllos no lo conocen bastante. Y esto está, además, confirmado por declaración de algunos maquinistas. aceptada sin observación por el Inspector de frenos señor Harry Wall, persona muy entendida en su especialidad.*

Having thus reduced the brakes in the service of the Sierra, to steam and compressed air, the commission has been concerned to find out if the second of these brakes was sufficiently known to all the mainline drivers, so that they could use it judiciously, even in cases of accident; and he has been convinced by personal observation and direct questioning that, unfortunately, many of them do not know it well enough. And this is, furthermore, confirmed by the statement of some train drivers. accepted without observation by the Brake Inspector Mr. Harry Wall, a person very knowledgeable in his specialty.

*La empresa ha establecido, sin embargo, en Guadalupe, una instalación para la enseñanza práctica del manejo del Westinghouse, dotada de todos los elementos necesarios; pero, ya sea por la complicación del sistema, ya por la falta de diagramas é ins-trucciones impresas apropiadas, ya por falta de ejercicio repetido, ó por la multiplicidad de los sistemas de frenos de que están provistas las máquinas; el hecho es que todos los maquinistas no conocen bien el Westinghouse.*

The company has, however, established in Guadeloupe a facility for the practical teaching of Westinghouse management, equipped with all the necessary elements; but, either because of the complication of the system, or because of the lack of appropriate printed diagrams and instructions, or because of the lack of repeated exercise, or because of the multiplicity of the braking systems with which the machines are provided; The fact is that not all drivers know the Westinghouse well.

*En cuanto á la complicación del sistema, ella es evidente; y tánto mayor, cuanto que para escoger la combinación más apropiada á lo accidentado del perfil de la línea, ha tornado con razón la Empresa, un tipo de freno de doble tubo general de aire, no siquiera descrito en el único manual impreso que posee la Empresa, en el que se describen, sin embargo, separadamente, casi todos los tipos de frenos Westinghouse con sus diferentes elementos. De manera, pues, que ese manual no puede servir sino para enredar al maquinista que quisiera con su lectura aclarar el conocimiento del sistema que usa. Ves por eso que debe pronto llenarse el vacío, confeccionando un cuaderno de instrucciones impresas, con los diagramas necesarios, sólo para que los maquinistas aprendan el malicio de este freno, en los diferentes casos que puedan ocurrir en la práctica, sin descripciones detalladas inútiles. Todos los ferrocarriles que usan freno mecánico, tienen establecidas instrucciones semejantes.*

As for the complication of the system, it is evident; and all the more so since, in order to choose the most appropriate combination for the roughness of the profile of the line, the Company has rightly adopted a type of brake with a general double air tube, not even described in the only printed manual that the company has, in which, however, almost all types of Westinghouse brakes with their different elements are described separately. Therefore, this manual can only serve to entangle the driver who would like to clarify the knowledge of the system that he uses by reading it. You see why the void must soon be filled, by making a book of printed instructions, with the necessary diagrams, just so that the drivers learn the tricks of this brake, in the different cases that may occur in practice, without useless detailed descriptions. All railways that use mechanical brakes have established similar instructions.

*En cuanto al modo cómo funcionan los frenos en actual uso, esto es, sus condiciones de efectividad, la comisión ha examinado si funcionan normalmente en los de las máquinas en servicio, cuyos resultados quedan consignados en el cuadro No. 2; y ha verificado también experimentos especiales con una máquina provista de Westinghouse, halando un convoy de tres carros en fuerte pendiente, con el objeto de aclarar la idea de si es ó nó indispensable á una máquina sóla, como lo exige la Maestranza de Guadalupe, aunque nó el Reglamento interior, en este caso, el aditamento de un par de carros provistos de frenos á mano, para evitar el riesgo de que la máquina se desboque y se pierda la acción del freno. Los resultados obtenidos en la máquina No. **47**, entre los Kms. 58 y 61, halando 4 carros*

*cargados, con peso total de 100 toneladas y á los que han asistido el Jefe de la Maestranza Sr. Lowes y el inspector de breques Sr. Wall, procediendo con tiempo seco y usando arena, han sido los siguientes:*
Regarding the way in which the brakes in current use work, that is, their effectiveness conditions, the commission has examined whether they work normally in those of the machines in service, the results of which are consigned in table No. 2; and he has also carried out special experiments with a machine supplied by Westinghouse, pulling a convoy of three cars on a steep slope, in order to clarify the idea of whether or not it is essential to a single machine, as required by the Maestranza de Guadalupe, although not the Internal Regulations, in this case, the addition of a pair of cars provided with hand brakes, to avoid the risk of the machine running out of control and the brake action being lost. The results obtained in machine No. **47**, between Kms. 58 and 61, pulling 4 loaded cars, with a total weight of 100 tons and which have been attended by the Head of the Maestranza Mr. Lowes and the inspector of brakes Mr. Wall, proceeding in dry weather and using sand, have been the following:

*1o.—Tren ordinario de bajada en 4%, corriendo á sólo 15 kms. por hora, puede disminuir considerablemente su velocidad y hasta parar por la aplicación del freno de agua, sin ayuda de ningún otro.*
1st.—Ordinary train with a 4% descent, running only 15 kms. per hour, it can considerably reduce its speed and even stop by applying the water brake, without the help of any other.

*2o.—Arrastrada la máquina de bajada hasta la velocidad de 20 kms., y aplicando el Westinghouse en la forma de servicio, esto es sin violencia, el tren paró después de recorrer 230 m. un una pendiente de 4%.*
2nd.—Dragging the machine down to a speed of 20 kms., and applying the Westinghouse in the form of service, that is without violence, the train stopped after traveling 230 m. a slope of 4%.

*3o.—Bajando en la forma ordinaria, sobre 4%, á lo velocidad de 30 kms. empleando el freno de agua y Westinghouse, en aplicación de servicio, paró el tren en 200 m.*
3rd.—Lowering in the ordinary way, over 4%, at a speed of 30 kms. using the water brake and Westinghouse, in service application, stopped the train in 200 m.

*4o.—Bajando en iguales condiciones, pero empleando los tres frenos, de mano en los carros, el de agua y el de Westinghouse, paró en 175 m.*
4th.—Going down in the same conditions, but using the three hand brakes on the cars, the water car and the Westinghouse car, it stopped in 175 m.

*5o.—Bajando en las mismas condiciones, pero á 35 kms, los frenos de mano sólo redujeron la velocidad, pero no pudieron parar el tren sin ayuda del Westinghouse.*
5th.—Going down under the same conditions, but at 35 kms, the handbrakes only reduced the speed, but could not stop the train without the help of the Westinghouse.

*Resultaría de estas experimentos que ni el freno de mano, ni el de agua, son suficientes para dominar y parar un tren de bajada, si no se ayudan con otros frenos poderosos como el Westinghouse (ó el de vapor) aplicados, sin embargo, sólo á la máquina y al tender. Pero que hasta la velocidad de 35 km. el Westing-house, ayudado de los frenos de mano de los carros, es suficiente para detener e] tren.*
It would result from these experiments that neither the hand brake nor the water brake are sufficient to control and stop a downhill train, if they are not helped by other powerful brakes such as the Westinghouse (or the steam) applied, however, only to the machine and to the tender. But that up to the speed of 35 km. the Westinghouse, aided by the handbrakes of the cars, is enough to stop the train.

*No se ha creído prudente experimentar con velocidades mayo-res de 35 kms., apesar de disponer de un alineamiento recto, suficientemente largo, porque se sabe que cuando la velocidad pasa de ciertos límites, es muy dudosa la acción*

*del freno: y hay que suponer que los maquinistas no permitan nunca que un tren de bajada tome una velocidad mayor de 35 kms., en una línea tan accidentada como la del Central.*
It has not been considered prudent to experiment with speeds greater than 35 kms., despite having a sufficiently long straight alignment, because it is known that when the speed exceeds certain limits, the action of the brake is very doubtful: and it is necessary to suppose that the train drivers never allow a lowering train to reach a speed greater than 35 km, on a line as rugged as the Central one.

*El estudio teórico de la acción de los frenos, usando la fórmula dada por el reputado manual italiano de Colombo, y suponiendo que fuera aplicable á una pendiente de 4.25%, como existe en algunos tramos de este ferrocarril; ese estudio, decimos, hecho para una velocidad del tren de 35 kins. y suponiendo que la máquina, tender y carros, estuvieran provistos del Westinghouse, permite fijar en 82 metros la distancia necesaria para que se detenga el tren, á partir del momento en que, bajo la acción de los frenos, las ruedas quedan enrayadas ó bloqueadas. Pero este resultado, obtenido por el cálculo, no es aplicable al F. C Central, en que los carros de carga no están provistos del Westinghouse.*
The theoretical study of the action of the brakes, using the formula given by the renowned Italian manual of Colombo, and supposing that it was applicable to a slope of 4.25%, as it exists in some sections of this railway; that study, we say, made for a train speed of 35 kins. and supposing that the machine, tender and carts were provided with the Westinghouse, it allows us to set the necessary distance at 82 meters for it to be determined. have the train, from the moment in which, under the action of the brakes, the wheels are scratched or blocked. But this result, obtained by the calculation, is not applicable to the F. C Central, in which the freight cars are not provided with the Westinghouse.

*De todo lo anterior, modificado por inducción de prudencia, podemos deducir que, aunque no dejando al tren tomar velocidad de bajada, sobre pendiente de 4%, el freno Westinghouse sería suficiente. usando arena seca, para detener la máquina sóla aún halando un tren; no sería prudente confiar sobre este resultado, que puede no obtenerse por causa de humedad de los rieles ó porque falle la arena, y que, por lo mismo, no conviene levantar la prohibición de que máquinas sólas puedan bajar en fuertes pendientes. Pero, á nuestro juicio, podría autorizarse el uso de un sólo carro cargado de 20 T y provisto de un buen freno de mano, siempre que la máquina estuviera dotada del Westinghouse, ó de dos de estos carros si sólo tuviera el freno de vapor; y cuidando siempre de no dejarla tomar una velocidad superior á 20 kms.*
From all of the above, modified by induction of prudence, we can deduce that, although not allowing the train to pick up speed downhill, on a 4% gradient, the Westinghouse brake would be sufficient. using dry sand, to stop the machine by itself even pulling a train; It would not be prudent to rely on this result, which may not be obtained due to moisture in the rails or because the sand fails, and that, for the same reason, it is not convenient to lift the prohibition that machines alone can go down steep slopes. But, in our opinion, the use of a single car loaded with 20 tons and provided with a good handbrake could be authorized, provided that the machine was equipped with the Westinghouse, or of two of these cars if it only had a steam brake; and always taking care not to let it take a speed greater than 20 kms.

*MAESTRANZA DE GUADALUPE*
WORKSHOPS OF GUADALUPE

*La comisión se ha ocupado particularmente de la existencia en la Maestranza del Registro especial de locomotoras, impuesto por el articulo 13 del Reglamento interior, de acuerdo con el Reglamento General de Ferrocarriles; libro indispensable para conocer la historia de cada locomotora, con las diversas reparaciones que se le han hecho en distintas época grandes y ligeras; el recorrido kilométrico desde la última reparación general;- juzgarse á cada momento del estado probable en que debe encontrarse cada uno de sus organos principales. Sentimos declarar que hemos encontrado incompleto este registro, el que suspendido desde hace varios años, se ha trazado de principiar de nuevo desde Enero de este año, aunque con tan o apuro, que hemos podido comprobar, en lo ya pasado en limpio al*

*nuevo libro, muchas omisiones importantes. Por lo demas, habiendose perdido la continuidad, no ofrece el actual Registro, todas las interesantes informaciones que son exigibles. Entendemos que desde el nombramiento de esta comisión, se trabaja activamente por buscar los antecedentesy completar relativo á los periodos que aún faltan. Por otra parte, nos ha mostrado el Sr. Jefe de la Factoría, los cuadros impresos, aún en blanco, destinados á registrar el kilometraje de cada locomotora y de cada carro, que principiará proximamente á llenar, sacandolos de los informes respectivo-, para este año en curso.*

The commission has taken particular care of the existence in the Maestranza of the Special Register of Locomotives, imposed by article 13 of the Internal Regulations, in accordance with the General Railway Regulations; essential book to know the history of each locomotive, with the various repairs that have been made at different times large and light; the kilometric route since the last general repair; - judge at each moment of the probable state in which each of its main organs must be found. We regret to declare that I have found this record incomplete, the one that has been suspended for several years, has planned to start again since January of this year, although with such a rush, that we have been able to verify, in what has already been passed cleanly to the new book, many omissions important. For the rest, having lost continuity, the current Registry does not offer all the interesting information that is required. We understand that since the appointment of this commission, active work is being done to search for the background and complete the periods that are still missing. On the other hand, Mr. Head of the Factory has shown us the printed charts, still blank, intended to record the mileage of each locomotive and each car, which he will soon begin to fill out, taking them out of the respective reports, to this current year.

*La comisión ha examinado tambien el libro de reparaciones que lleva la Rotonda de máquinas y lo ha encontrado conforme: pero no así los partes de los maquinistas que no contienen todos los datos consgnados en las instrucciones especiales vigentes, dictadas por la Empresa en 1896 y especialmente los consignados en los de los artículos 6 y 12.*

The commission has also examined the repair book kept by the Roundabout of machines and has found it to be in agreement: but not so the reports of the train drivers that do not contain all the data consigned in the special instructions in force, issued by the Company in 1896 and especially those set forth in articles 6 and 12.

*Tampoco lleva la factoría, un Registro de personnel á su servicio, de suerte que no hay medio racionalmente rápido y segur o de averiguar las diversas epocas en que ha servido un mismo individuo; los cargos sucesivos que ha tenido y las factas de consideración que hubiera come ido; de manera que el Jefe de la Factoria, no posee medio seguro de averiguar los antecedentes de los maquinistas y fogoneros. Se explica así que apesar de haberse dado de baja últimamente á muchos de estos empleados. los haya todavía que no ofrecen garantías de idoneidad; y que haya muchos maquinistas nuevos. fogoneros anteriormente, sin tiempo suficiente de práctica; y que otros, que han sido maquinistas en la sección Callao-Chosica y sin conocimiento práctico suficiente de la línea—tan difícil y peligrosa aún para los que la conocen bastante--han pasado á correr máquinas en la Sierra. Por último, muchos de ellos no conocen bastante el uso de los frenos Westinghouse, como ya lo hemos dicho.*

Nor does the factory keep a registry of personnel at its service, so that there is no rationally fast and safe means of ascertaining the various periods in which the same individual has served; the successive charges that he has had and the facts of consideration that he would have eaten; so that the Head of the Factory does not have a sure way to find out the background of the drivers and stokers. It is thus explained that despite the fact that many of these employees have recently been discharged. there are still those that do not offer guarantees of suitability; and that there are many new drivers. stokers before, without enough practice time; and that others, who have been machinists on the Callao-Chosica section and without sufficient practical knowledge of the line—so difficult and dangerous even for those who know it well enough—have gone on to run machines in the Sierra. Finally, many of them do not know enough about the use of Westinghouse brakes, as we have already said.

*La lista de maquinistas y fogoneros empleados en los viajes á la Sierra, que hemos solicitado de la factoría desde principios de Marzo, con los antecedentes de cada uno, sólo hemos podido recibirla el 22 de este mes de Abril y en ella se indican los meses y años en que cada uno paso de un servicio al siguiente. Pero esta lista que no se ha tomado*

*de un registro autentico, que no existe, y solo ha podido formularse por referencias dadas por los mismos interesados, no hace fé. En ella, se han incluido los nombres de todos los maquinistas que hacen el servicio de Lima á A1con y del Callao al Chosica, que no nos interesan, de suerte que no podemos deducir si los que hacen el servicio de la Sierra, han adquirido ó nó préviamente el conocimiento completo de la línea; pues no es aceptable que á un maquinista práctico en la costa, pero que no conozca bien la línea de la Sierra, se le encargue de una máquina que hace este último servicio. Por referencias fidedignas particulares, podríamos, sin embargo, hacer muchas observaciones sobre este personal de maquínistas, de entre las cuales formularemos sólo las siguientes, para demostrar que el personal no está bien escogido:*

The list of drivers and stokers employed on the trips to the Sierra, which we have requested from the factory since the beginning of March, with the background of each one, we have only been able to receive it on the 22nd of this month of April and it indicates the months and years in which each passed from one service to the next. But this list, which has not been taken from an authentic registry, which does not exist, and has only been able to be formulated by references given by the interested parties themselves, is not credible. In it, the names of all the machinists who provide the service from Lima to Alcon and from Callao to Chosica have been included, which do not interest us, so that we cannot deduce if those who provide the service from the Sierra, have acquired or not previously the complete knowledge of the line; well,  It is not acceptable that a practical machinist on the coast, but who does not know the Sierra line well, be put in charge of a machine that performs this last service. By particular reliable references, we could, however, make many observations about this staff of train drivers, among which we will formulate only the following, to show that the staff is not well chosen:

*Narvaez.—Servicio constante en máquinas de patio; nunca en la Sierra.*
*Angúlo.—Hasta el año 1906, no fué sino encendedor de máquinas y fogonero.*
*Delgado.—Por su edad, no parece tener experiencia suficiente,*
Narvaez.—Constant service on patio machines; never in the Sierra.
Angúlo.—Until 1906, he was nothing more than a lighter for machines and a stoker.
Delgado.—Because of his age, he doesn't seem to have enough experience,

*No podemos dejar de hablar de una experiencia relacionada con la Factoría y con los dos últimos siniestros ocurridos respectivamente en Chaupichaca y en la bajada de Casapalca. En ambos casos, la locomotora bajando sóla. esto es, sin carro alguno, sobre fuertes pendientes (de más de 4%) se ha desbocado, puede decirse; ó ha resbala lo desobedeciendo á toda acción del maquinista, especialmente al empleo de los frenos. Ahora bien, desde hace muchos años fue dictada, como necesaría, una medida por el Jefe de la Factoría de Guadalupe, que el jefe actual ha seguido apoyando, por la cual se prohibía á todo maquinista, bajo pena de separación del puesto, el viajar le bajada, sin por lo ménos un par de carros, cuyos frenos de mano asegurasen el dominio sobre la velocidad del convoy. Y sin embargo, además de las dos veces que corresponden á los siniestros recordados, hay constancia en los partes escritos de los conductores de la Sección de Tráfico no la hay en los de los maquinistas, al Jefe de la Maestranza, que de vez tu cuando se acostumbriba hacer estos viajes de máquinas sólas; lo que no ha permitido á este último Jefe, la aplicación de la pena prevista de separación. Precisaremos este cargo, citando los partes pasados por el conductor Viera en 5, 9 y 30 de Enero de este año, en sus viajes entre Tamboraque y Chaupichaca.*

We cannot stop talking about an experience related to the Factory and to the last two incidents that occurred respectively in Chaupichaca and in the Casapalca descent. In both cases, the locomotive going down alone. that is, without any car, on steep slopes (of more than 4%) it has run amok, it can be said; or he has slipped disobeying every action of the driver, especially the use of the brakes. Now, many years ago, as was necessary, a measure was dictated by the Chief of the Guadalupe Factory, which the present chief has continued to support, by which any machinist was prohibited, under penalty of dismissal from his post, from traveling downhill, without at least a couple of cars, whose handbrakes ensured control over the speed of the convoy. And yet, in addition to the two times that correspond to the remembered accidents, there is evidence in the written reports of the drivers of the Traffic Section, there is not in those of the machinists, to the Head of the Maestranza, that from time to time you it was customary to make these trips of

machines alone; which has not allowed this last Chief, the application of the foreseen penalty of separation. We will specify this charge, citing the reports passed by the driver Viera on January 5, 9 and 30 of this year, on his trips between Tamboraque and Chaupichaca.

*Podría citarse el caso de haberse ordenado al maquinista Martínez, por un delegado del tráfico, que hiciera con máquina sóla el viaje entre Ocatara y Chaupichaca.*
One could cite the case of having ordered the driver Martínez, by a traffic delegate, to make the journey between Ocatara and Chaupichaca with only the engine.

*No se explica por qué la Sección de Tráfico—que conoce bien la existencia de la disposición anotada-- no haya puesto el hecho en conocimiento de la Factoría: ni tampoco por qué, la misma Factoría, no haya exigido que sus maquinistas dejen constancia escrita en sus partes, del número de carros con que han corrido, en cada tramo, para ver si se cumplía ó nó disposición de tánta trascendencia.*
It is not explained why the Traffic Section—which is well aware of the existence of the noted provision—has not brought the fact to the attention of the Factory: nor why, the Factory itself, has not demanded that its drivers leave a written record in its parts, of the number of cars with which they have run, in each section, to see if it was fulfilled or not, a provision of such importance.

*Por último, de los pocos partes de maquinistas que hemos revisado. resulta que, con alguna frecuencia, se repite el caso de que un maquinista, ó más frecuentemente un fogonero, hace en días sucesivos, un servicio de más ole 18 y aún 23 horas, con la máquina en presión día y noche. Citamos, por ejemplo, el caso de la máquina No. 45, el 8 y 9 de Enero último. Es apenas necesario hacer notar lo ?ie?goso que resulta este surmernage, capaz de dar lugar á toda clase de accidentes y que, por lo mismo, debe evitarse con la mayor inflexibilidad.*
Lastly, of the few machinists' parts we've reviewed. It turns out that, with some frequency, the case is repeated that a machinist, or more frequently a stoker, performs on successive days, a service of more than 18 and even 23 hours, with the engine in pressure day and night. We cite, for example, the case of machine No. 45, last January 8 and 9. It is hardly necessary to point out how risky this surmenage is, capable of giving rise to all kinds of accidents and which, for the same reason, must be avoided with the greatest inflexibility.

*CONCLUSIONES*
CONCLUSIONS

*Con respecto á las locomotoras, la, comisión ha encontrado que las que están en servicio, se encuentran, en su mayor parte, en condiciones malas ó desfavorables; que están dotadas de una profusión de frenos inconveniente, costosa y peligrosa; que las de carga están provistas del freno Westinghouse, que no les correspon-de; mientras que las de pasajeros, que deberían tenerlo, no lo tienen; y añade, que la Empresa ha principiado á recibir y armar un lote numeroso de esplendidas locomotoras de carga y de pasajeros; y concluye recomendando á la Empresa:*
With regard to locomotives, the commission has found that those in service are, for the most part, in poor or unfavorable condition; that they are equipped with a profusion of inconvenient, expensive and dangerous brakes; that the cargo ones are provided with the Westinghouse brake, which does not correspond to them; while those for passengers, which should have it, do not; and he adds that the Company has begun to receive and assemble a large batch of splendid freight and passenger locomotives; and concludes by recommending to the Company:

*1o.—Mayor prolijidad en la conservación de las locomotoras, creando, si fuera necesario, una factoría sucursal en la Oroya, como antes existía; una revisión periódica de los manómetros y también de los areneros, cuyo funcionamient o, más general, ha sido encontrado defectuoso;*
1st.—Greater care in the conservation of the locomotives, creating, if necessary, a branch factory in La Oroya, as it existed before; a periodic revision of the manometers and also of the sandboxes, whose operation, more generally, has

been found to be defective;

*2o.—Que se adopte un sólo freno mecánico para las máquinas que hacen el servicio de la Sierra, en el plazo de un año, reemplazando en las de carga el Westinghouse por freno de vapor y dotando á las de pasajeros del Westinghouse, con exclusión del de vacío y del de vapor; esto sin perjuicio de los frenos de mano y de agua;*
2nd.—That a single mechanical brake be adopted for the machines that serve the Sierra, within a year, replacing the Westinghouse with a steam brake in the cargo machines and equipping the passenger machines with the Westinghouse, excluding of vacuum and steam; this without prejudice to the hand and water brakes;

*3o.—Que se redacte é imprima en castellano, un manual de instrucciones destinado á los maquinistas, para el manejo de los frenos Westinghouse, adoptados por la Empresa, claro, conciso y suficiente; pero sin descripciones inútiles.*
3rd.—That a clear, concise and sufficient instruction manual for drivers use Westinghouse brakes, adopted by the Company, be drafted and printed in Spanish; but without useless descriptions.

*Con referencia á la Maestranza, de Guadalupe, la comisión encuentra que hay deficiencia en la organización de servicios, pues, á pesar de tener un jefe competente, no hay suficiente control establecido sobre el personal, tal vez por las distancias tan largas que separa á muchos empleados del jefe, y tal vez también, por la dificultad de encontrar empleados idóneos. Tenemos observaciones hechas sobre la falta del Registro de Locomotoras, en la forma y con la continuidad que exigen los Reglamentos vigentes; sobre Registro de Personal; sobre los partes de los maquinistas; y sobre el recargo de las horas de trabajo, principalmente en los fogoneros; y pedimos:*
With reference to the Maestranza, of Guadalupe, the commission finds that there is a deficiency in the organization of services, because, despite having a competent chief, there is not enough control established over the personnel, perhaps because of the long distances that separate the many employees of the boss, and perhaps also because of the difficulty of finding suitable employees. We have observations made about the lack of the Locomotive Registry, in the form and with the continuity required by the current Regulations; on Personnel Registration; on the train drivers' reports; and on the surcharge of working hours, mainly in the stokers; and we ask:

*1o.—Que se complete el Registro de Locomotor.as, con los datos relativos á los anos pasados, y con los referentes, completos, al período del actual jefe de la Maestranza y material rodante;*
1st.—That the Register of Locomotives be completed, with the data relating to past years, and with those relating, in full, to the period of the current head of the Maestranza and rolling stock;

*2o.—Que se establezca un Registro de personal de maquinistas y fogoneros, para tener constancia de la experiencia que pueda tener adquirida cada uno: y de sus antecedentes, como buenos ó malos cumplidores de sus obligaciones:*
2nd.—That a Registry of train drivers and stokers be established, to record the experience that each one may have acquired: and their background, as good or bad performers of their obligations:

*3o.—Que se haga una selección de maquinistas, teniendo en cuenta estas circunstancias, asi como el perfecto conocimiento del Westinghouse, tan necesario para el tráfico de la Sierra:*
3rd.—That a selection of drivers be made, taking into account these circumstances, as well as the perfect knowledge of Westinghouse, so necessary for traffic in the Sierra:

*4o.—Que se establezca una sucursal de la factoría en la Oroya, ó siquiera en Rio Blanco.*
4th.—That a branch of the workshops be established in La Oroya, or even in Rio Blanco.

The report was dated 26 de abril de 1909, at Lima and was over the names of Sres. Alejandro Guevara, Roberto Reid, Augusto Pautrat, Alex Norris and Joaquín Rigau.

# ANEXO N. 1

## LOCOMOTORAS QUE HACEN EL TRÁFICO ENTRE CHOSICA Y LIMA

*Datos característicos*

| Clase de servicio | No. de la máquina | FABRICANTE | Peso de la locomotora y tender | Pares de ruedas acopladas | CALDERA | | | FRENOS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Placa tubular | Caja de fuego | Presión de trabajo | Westinghouse | Vacío | Vapor | Agua | De mano |
| | | | T | | | | lbs | | | | | |
| PASAJEROS | 34 | Rogers | 85 | 3 | ac. ½" | cb. ½" | 155 | nó | nó | sí | sí | sí |
| | 35 | ,, | 85 | 3 | ,, ½" | ,, ½" | 155 | nó | sí | sí | sí | sí |
| | 37 | Baldwin | 85 | 3 | ,, ½" | ,, ½" | 155 | nó | nó | sí | sí | sí |
| | 39 | Rogers | 85 | 3 | ,, ½" | ac. ⅜" | 160 | nó | sí | sí | nó | sí |
| | 40 | ,, | 85 | 3 | ,, ½" | ,, ⅜" | 155 | nó | sí | sí | sí | sí |
| | 41 | ,, | 85 | 3 | ,, ½" | ,, ⅜" | ,, | nó | sí | sí | sí | sí |
| | 43 | Balwin | 85 | 3 | ,, ½" | ,, ⅜" | 160 | nó | sí | sí | nó | sí |
| | 44 | ,, | 85 | 3 | ,, ½" | cb. ½" | 160 | sí | nó | nó | sí | sí |
| | 45 | ,, | 85 | 3 | ,, ½" | ,, ½" | 155 | nó | sí | sí | sí | sí |
| | 46 | ,, | 85 | 3 | ,, ½" | ,, ½" | 160 | sí | sí | nó | sí | sí |
| | 47 | ,, | 85 | 3 | ,, ½" | ,, ½" | 170 | sí | sí | nó | sí | sí |
| CARGA | 49 | Rogers | 110 | 4 | ,, ½" | | 175 | sí | nó | nó | sí | sí |
| | 50 | ,, | 110 | 4 | ,, ½" | | 175 | sí | nó | nó | sí | sí |
| | 51 | ,, | 110 | 4 | ,, ½" | | 175 | sí | nó | nó | sí | sí |
| | 52 | ,, | 110 | 4 | ,, ½" | | 175 | sí | nó | ó | sí | sí |
| | 53 | ,, | 110 | 4 | ,, ½" | | 175 | sí | nó | nó | sí | sí |
| | 54 | ,, | 110 | 4 | ,, ½" | | 175 | sí | nó | nó | sí | sí |
| | 55 | ,, | 110 | 4 | ,, ½" | | 175 | sí | nó | nó | sí | sí |
| | 56 | ,, | 110 | 4 | ,, ½" | | 175 | sí | nó | nó | sí | sí |
| | 57 | ,, | 110 | 4 | ,, ½" | | 175 | sí | sí | nó | sí | sí |
| | 58 | ,, | 110 | 4 | ,, ½" | | 175 | sí | nó | nó | sí | sí |

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## 13.10.5 A 1951 report on the future of the *FCC* Garratts

APPENDIX "E".

Notes on discussion re Garrett
Locomotives held at Guadalupe on Feb. 1st 1951.

Present:

Mr. Morkill- General Manager )
Mr. Ashton - Loco.Supt. ) Central Railway.
Mr. Isaacs - Running Supt. )

Mr. van Eeghen )
Sir Donald McMullen. ) Peruvian Corporation Ltd.

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1. A general superficial examination was made of the four Garretts in the Yard where they were stabled awaiting decision.

A general discussion followed, taking the sections of the locomotive bit by bit, to see what really were the causes of their troubles, why they were not successful on the Central Railway and why it was thought they would be suitable for the Southern Railway.

2. Engine frame cylinders and motion. These are of robust modern design and showed very little wear considering the mileage that had been run. It was agreed that these parts gave no trouble and required only normal maintenance.

3. Pivots and rubbing plates. The old type pivots fitted to these Engines do suffer considerable wear and slackening of rivets and bolts due to the racking strains of taking abrupt vertical curves at changes of grade particularly at the Zig Zags and for the twisting caused on reverse curves with alternating cant such as are frequent on the Central Railway.

It is possible Messrs. Beyer Peacock may be able to suggest some improvement or modification of these centres.

4. The boilers. Except for the new boiler supplied from U.K. some time ago with the shallow design of firebox considerable boiler trouble has been experienced with broken stays and poor circulation.

Except for the boiler referred to above all the 3 others require new fireboxes.

The boilers were stated to steam well and there was no evidence of failure from shortage of steam.

5. General operating characteristics. The essential operating conditions for a successful use of a heavy articulated engine of nearly double the tractive effort of the normal freight locomotive is to have a longish continual run up heavy grades and with no restriction as to length of train and if possible sufficient line capacity for the heavy locomotive to work at an economical speed.

None of these conditions exist on the Central Railway. In the first place the Zigzags limit the length of train that can be handled without splitting, the zigzags in themselves causing stops and reversing of trains mitigate against the economic use of an articulated locomotive and the very intense line occupation on the Central Railway owing to no night running on much of the Mountain section and the very heavy freight traffic also make the use of a different characteristic locomotive a great operating disadvantage.

6. Possible use on the Southern Railway.

Many of the conditions mentioned in paragraph 5 above which have mitigated against the successful use of the Garretts on the Central Railway do not apply on the Southern. There are no zigzags, a continuous run over long distances is possible, there is not quite the same problem of frequent acute vertical curves as there are no zigzags, there is a 24 hour a day running, and this 24 hour running, together with the use of much heavier trains that would be possible, line occupation is not so intense and hence Garrett characteristics could be accommodated without dislocation of the rest of the service.

It is suggested they could haul some 400 tons from Mollendo to Pillones, say starting from Arequipa about noon, work down to Mollendo, pick up a load leaving PM change crews at Arequipa and arrive top of the hill in the morning returning to Arequipa but there are no doubt many other turns which can be worked out.

7. Conclusion.

Compared to most of our stock these four locomotives are much too modern to be considered for scrapping. On the other hand if these engines are to be used satisfactorily a considerable sum of money (probably £10,000 per locomotive) must be spent on their proper overhaul and modernization. We therefore recommend that first one should be repaired at Guadalupe as quickly as possible and fitted with new design boiler which exists.

This engine to be used on the Central to help cope with the increased traffic until such time as further new 200 class locomotives are delivered.

That the chassis of the remaining three be fully repaired at Guadalupe shops using new parts from U.K. as may be required and then shipped to Mollendo.

That the three boilers not yet modernised should have their fireboxes complete with wrapper plates removed at Guadalupe and that the 3 boiler shells should be shipped to Mollendo and that 3 new design fireboxes completely rivetted into new design wrapper plates etc. (i.e. a new back end to the boiler) should be shipped direct from U.K. to Mollendo, to be followed later by the fourth locomotive that will have been in use on the Central.

8. Replacement of Southern Railway old and obsolete locomotives.

There is naturally a fear on the Southern Railway that any transfer of Garratts to them will affect their chances of getting new 200 type locomotives in the next order.

We do not recommend that this should be so. The Southern have many extremely old locomotives long due for scrapping and in any case it will be some considerable time until the four Garretts can be put into service.

We therefore recommend that the Southern should be supplied with their present requirements of 200 class locomotives but that the transfer of the Garretts should be considered as an expenditure against the need for further new locomotives in the future and that the Garretts should be considered as replacing old locomotives due for scrapping which will still have to be kept working even after the new 200 class are delivered.

It may be considered that the expenditure on the Garretts will give us the equivalent of 4 x 1.6 = 6.4 new locomotives.

(sgd) D.J. McMullen. (sgd) W.H. van Eeghen.

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## 13.10.6 A 1951 trip up the *FCS* on a 200 class 'Andes' loco

APPENDIX "O"

Report on the trial of Engine No.202 from Mollendo to Arequipa with a load of 227-3/4 tons behind the tender.

1. Engine 202 was straight off shed in the ordinary way of service and neither the shed staff nor the driver had had previous warning of any test run for their train. The test was therefore a fair test without any special preparation.

2. The run on the level from Mollendo to Ensenada (20 kms.) was accomplished in the normal timing with a maximum speed of 60 kms. per hour. Immediately after leaving Ensenada there is a climb of 4½% for some 4 kiloms. mainly on the straight. This was the toughest pull on the run but with full throttle and the gear lever gradually dropped to 80% cut off we kept up a steady speed of about 20 kiloms. per hour with no slipping. As the grade eased to 3½% the gear lever was notched up to 65% being dropped at times to 70% and occasionally 75% cut off.

   Steam pressure was easily maintained right on the 200 lb. mark, if it dropped one or two pounds a notch on the fuel lever brought it up again and this notch had soon to be taken off and so on. Water level was maintained by the use of the exhaust steam injector alone. No trouble was experienced till the last section before Cachendo where we ran into drifting mist. Here we started to slip on the curves in places. More often than not there were only two or three revolutions of slip when she would grip again of her own accord. If slipping showed signs of continuing application of the air-sander by the driver soon cured the trouble.

   I got off the footplate at Cachendo (Km.56) and finally left the train for the autocarril at Vitor. However, examination of the trains run to Arequipa showed that it had slightly improved on the standard timing.

3. I recommend that the Mechanical Department should carry out one or two more tests with a 220-ton load and that if these are satisfactory that the standard load for the 200 class on this

Section should be raised to 215 tons, giving a percentage margin. The 200 class with 52" wheels should take about 5% more load on a grade than the 100 class with 56" wheels, provided their boiler can keep up the steam pressure - this it easily does.

(signed) D.J. McMULLEN

8-3-51

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## 13.10.7 *FCLCC* specification for Robert Stephenson locos 1815-6 of 1866

Lima & Callao Railway

July 16 / 66.
Two locos. Nos. 1815-1816.
Engines & tenders similar to No. 1408 and to specn. To be put in hand at once and one delivered in January and the other in February next.
Cowcatcher at tender end as well as engine front.
Firebox stays to be of copper
Links for lifting
??????? at both sides.
July 16 / 66 Mr Simpson(?)

Copy of specn. – Recd. June 26 / 66 from Lima Rly Co and on which we based our specn. – See pencil corrections on(?) spec. for 1408
Gauge – Engine & tender to be made for a 4-8½ gauge
Boiler – With low firebox, steam drums in centre of boiler
Tubes – to be 2" diam outside, this size most suitable for using up the present stock of tubes in store
Wheels – Driving & trailing wheels to be 5' 0" diam completed(?). The engines to be so constructed, that the trailing wheels, axles & cranks (?) of engine no. 1408 (Stephenson's) will fit as it will then be unnecessary to send spare driving & trailing wheels from Europe. The leading wheels to be 3-6 diam. & two pairs of spare leading wheels & tires (?) to be sent, also one full set of tires for both engines (additional)
Cylinders – To be 16 diam with a 22" stroke
Link motion. – To be on the same principle as Engine no. 817 with the exception that there be two lifting links to the quadrant.
Con. & coupling rods. – Motion & cross heads to be on the same principle as Engine. no. 817 The crosshead to be of cast steel, motion bars to be of steel, or faced with steel.
?????. – to be of wrot iron (Low Moor) or of an equal quality.
Stanchions. – For ??? plates on footplates to be left sufficiently long, so as to serve for awning stanchions & two stanchions of the same height for the tender with an eye in them for the end of awning rods built in. *
Awning – to be of canvass or prepared cloth.
Tenders. – To be of the same class, as attached to by the(?) no. 1408 with the exception that the brakes are to be worked on the left hand side.
Cow catchers. – On both engines and tenders, as the tenders frequently run first ; the cow catchers not to project more than 2' 9" from the buffer planks, the ???-hook on coupling to be so made as to serve for American or English coaches.
We had better fit awnings on both the engine and tender like Delhi. WO.
We had better give them 2 pumps & 1 injector as they had a donkey before.
Say chimney 13-6 from rail – this is higher than 1408 but the chimney is 2" shorter ie. 1408 was 4' 10 ½" 7 this will be 4' 8 ½" from s. box top.
Oct 3 / 66

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## 13.10.8 An *FC Central* fleet list from 1945

FERROCARRIL

CENTRAL DEL PERU

CLASIFICACION

DEL

MATERIAL RODANTE

INCLUYENDO AUTOMOVILES, CARROS Y DIVERSOS

JEFE INGENIERO MECANICO

30 DE JUNIO DE 1945

# RESUMEN

| | | | | |
|---|---|---|---|---|
| Locomotoras a Vapor | MANIOBRAS | | 9 | |
| | PASAJEROS | | 2 | |
| | " | 1 CARGA | 26 | 41 46 |
| | CARGA | | 4 | |
| " Eléctricas | PASAJEROS | | | 7 |
| | 1 CARGA | | | |
| Vehículos de Inspección, Equipaje y Diversos | | | | 54 72 |
| Coches para Pasajeros | | | | 52 49 |
| Vagones para Carga | | | | 921 891 |
| Vehículos de Propulsión Propia | | | | 20 |
| Total | | | | 1095 |

NOTA: FIGURAN EN ESTA CLASIFICACION 11 CARROS DE MANO, AL SERVICIO DE INSPECCION, QUE NO ESTAN CONSIDERADOS EN EL TOTAL DE ESTE RESUMEN.

# LOCOMOTORAS A VAPOR

| Nº | Fabricantes | Fecha de Const. | Tipo | Diametro etc. de los Cilindros | Presion Caldero en Lbs | Ruedas Nº Acop. | Ruedas Dia. | Capacidad del Tender Petrol Litros | Capacidad del Tender Agua Kilos | Breques Vapor | Breques Vacuum o West | Breques Agua | Breques Mano | Peso en Kilos Maquina | Peso en Kilos Tender | Peso en Kilos Total | Poder de Traccion en Lbs al 85 % Pres. Caldero | Caballos de Fuerza | Servicio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | Beyer & Peacock | 1913 | 0-4-0 | 13"X21" | 160 | 4 | 3'3 1/2" | 862 | 2353 | " | — | — | " | 22640 | — | 22640 | 10781 | 455 | Maniobras |
| 26 | " " | 1913 | 0-4-0 | 13"X21" | 160 | 4 | 3'3 1/2" | 862 | 2270 | " | — | — | " | 22640 | — | 22640 | 10781 | 455 | " |
| 27 | " " | 1913 | 0-4-0 | 13"X21" | 160 | 4 | 3'3 1/2" | 862 | 2270 | " | — | — | " | 22640 | — | 22640 | 10781 | 455 | " |
| 29 | " " | 1909 | 0-4-0 | 13"X21" | 160 | 4 | 3'3 1/2" | 862 | 2270 | " | — | — | " | 22883 | — | 22883 | 10781 | 455 | " |
| 32 | W.G. Bagnall Ltd. | 1929 | 0-6-0 | 18 1/2" X24" | 180 | 6 | 4'-0" | 1248 | 4540 | " | V. | — | " | 52000 | — | 52000 | 23102 | 985 | Maniobras |
| 33 | " " " " | 1929 | 0-6-0 | 18 1/2" X24" | 180 | 6 | 4'-0" | 1248 | 4540 | " | " | — | " | 52000 | — | 52000 | 23102 | 985 | " |
| 34 | " " " " | 1929 | 0-6-0 | 18 1/2" X24" | 180 | 6 | 4'-0" | 1248 | 4540 | " | " | — | " | 52000 | — | 52000 | 23102 | 985 | " |
| 40 | Beyer & Peacock | 1935 | 2-8-0 | 20"X28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | W | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | Pasajeros i Carga |
| 41 | " " | 1935 | 2-8-0 | 20"X28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 42 | " " | 1935 | 2-8-0 | 20"X28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 43 | " " | 1936 | 2-8-0 | 20"X28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 44 | " " | 1936 | 2-8-0 | 20"X28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 45 | " " | 1936 | 2-8-0 | 20"X28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 46 | " " | 1937 | 2-8-0 | 20"X28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 47 | " " | 1937 | 2-8-0 | 20"X28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 48 | " " | 1937 | 2-8-0 | 20"X28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 49 | " " | 1946 | 2-8-0 | 20"x28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 50 | " " | 1946 | 2-8-0 | 20"x28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 51 | " " | 1946 | 2-8-0 | 20"x28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 52 | " " | 1946 | 2-8-0 | 20"x28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 53 | " " | 1946 | 2-8-0 | 20"x28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 54 | " " | 1946 | 2-8-0 | 20"x28" | 200 | 8 | 4'-4" | 6651 | 12031 | — | " | " | " | 75276 | 38294 | 113570 | 32308 | 1378 | " |
| 98 | North British | 1909 | 2-8-0 | 19 1/4"X24" | 180 | 8 | 4'-0" | 3496 | 14000 | " | V. | " | " | 66365 | 42380 | 108745 | 26329 | 1123 | Maniobras |
| [illegible] | " " | 1908 | 2-8-0 | 19 1/4"X24" | 180 | 8 | 4'-0" | 4209 | 14000 | " | " | " | " | 69405 | 37917 | 107322 | 26329 | 1123 | " |

# LOCOMOTORAS A VAPOR

| Nº | Fabricantes | Fecha de Const. | Tipo | Diametro etc. de los Cilindros | Presion Caldero en Lbs. | Ruedas Nº Ejes | Ruedas Dia. | Capacidad del Tender Petrol Litros | Capacidad del Tender Agua Kilos | Breques Vapor | Breques Vacuum W. Est. | Breques Agua | Breques Mano | Peso en Kilos Maquina | Peso en Kilos Tender | Peso en Kilos Total | Poder de Traccion en Lbs al 75% P. del Caldero | Caballos de Fuerza | Servicio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | Rogers Loco. | 1907 | 2-8-0 | 20"x28" | 180 | 8 | 4'-4" | 7950 | 14000 | " | W. | " | " | 70235 | 40230 | 110465 | 29076 | 1240 | Pasajeros i Carga |
| 71 | " " | 1907 | 2-8-0 | 20"x28" | 180 | 8 | 4'-4" | 9105 | 14000 | " | W. | " | " | 71260 | 40230 | 111490 | 29076 | 1240 | " |
| 72 | " " | 1907 | 2-8-0 | 20"x28" | 180 | 8 | 4'-4" | 8995 | 14000 | " | W. | " | " | 72050 | 40520 | 112570 | 29076 | 1240 | " |
| 73 | " " | 1906 | 2-8-0 | 20"x28" | 180 | 8 | 4'-4" | 8900 | 14000 | " | V. | " | " | 71260 | 40200 | 111460 | 29076 | 1240 | " |
| 74 | " " | 1907 | 2-8-0 | 20"x28" | 180 | 8 | 4'-4" | 9105 | 14000 | " | W. | " | " | 71260 | 40200 | 111460 | 29076 | 1240 | " |
| 75 | " " | 1934 | 2-8-0 | 20"x28" | 180 | 8 | 4'-4" | 8131 | 14000 | " | " | " | " | 71975 | 40520 | 112495 | 29076 | 1240 | " |
| 80 | American Loco | 1944 | 2-8-0 | 19"x26" | 225 | 8 | 4'-9" | 6816 | 24614 | — | W. | — | — | 73640 | 50410 | 124050 | 27787 | 1185 | Pasajeros i Carga |
| 81 | " " | 1944 | 2-8-0 | 19"x26" | 225 | 8 | 4'-9" | 6816 | 24614 | — | W. | — | — | 73640 | 50410 | 124050 | 27787 | 1185 | " |
| 82 | Kitson + Co. Ltd | 1925 | 0-6-2 | 19½"x24" | 170 | 6 | 4'-7" | 1680 | 6941 | — | W. | — | " | 58158 | — | 58158 | 21155 | 903 | Pasajeros |
| 90 | Rogers Loco. | 1907 | 4-6-0 | 19"x26" | 180 | 6 | 4'-10" | 7585 | 15325 | " | W. | " | " | 63635 | 40500 | 104135 | 21846 | 932 | Pasajeros |
| 101 | American Loco | 1913 | 2-8-2 | 20"x28" | 180 | 8 | 4'-4" | 7920 | 18172 | " | " | " | " | 83550 | 40517 | 124067 | 29076 | 1240 | Pasajeros i Carga |
| 103 | " " | 1913 | 2-8-2 | 20"x28" | 180 | 8 | 4'-4" | 7730 | 18172 | " | " | " | " | 82123 | 40517 | 122640 | 29076 | 1240 | " |
| 104 | " " | 1913 | 2-8-2 | 20"x28" | 180 | 8 | 4'-4" | 7750 | 18172 | " | W. | " | " | 82123 | 42150 | 124273 | 29076 | 1240 | " |
| 102 105 | " " | 1913 | 2-8-2 | 20"x28" | 180 | 8 | 4'-4" | 7090 | 18178 | " | W. | " | " | 82123 | 40517 | 122640 | 29076 | 1240 | " |
| 110 | Yorkshire Eng. Co. | 1924 | 4-8-2 | 20"x28" | 180 | 8 | 4'-4" | 5650 | 17575 | " | W. | " | " | 78535 | 41155 | 119690 | 29884 | 1275 | Pasajeros i Carga |
| 111 | " " | 1939 | 4-8-0 | 20"x28" | 185 | 8 | 4'-4" | 7383 | 17575 | — | " | " | " | 78350 | 40940 | 119290 | 29884 | 1275 | " |
| 112 | " " | 1939 | 4-8-0 | 20"x28" | 185 | 8 | 4'-4" | 7383 | 17575 | — | " | " | " | 78350 | 40940 | 119290 | 29884 | 1275 | " |
| 113 | " " | 1938 | 4-8-0 | 20"x28" | 185 | 8 | 4'-4" | 7383 | 17575 | " | " | " | " | 78350 | 40940 | 119290 | 29884 | 1275 | " |
| 114 | " " | 1924 | 4-8-0 | 20"x28" | 185 | 8 | 4'-4" | 5520 | 17575 | — | " | " | " | 77500 | 41155 | 118655 | 29884 | 1275 | " |
| 122 | Beyer + Peacock | 1930 | 2-8-2+2-8-2 | 19½"x22" | 205 | 8+8 | 3'-9" | 7071 | 24943 | " | W. | — | " | 180000 | — | 180000 | 57160 | 2519 | Carga |
| 123 | " " | 1930 | 2-8-2+2-8-2 | 19½"x22" | 205 | 8+8 | 3'-9" | 7071 | 24943 | — | " | — | " | 180000 | — | 180000 | 57160 | 2519 | " |
| 124 | " " | 1930 | 2-8-2+2-8-2 | 19½"x22" | 205 | 8+8 | 3'-9" | 7071 | 24943 | — | " | — | " | 180000 | — | 180000 | 57160 | 2519 | " |
| 125 | " " | 1933 | 2-8-2+2-8-2 | 19½"x22" | 205 | 8+8 | 3'-9" | 6942 | 24034 | " | " | — | " | 184000 | — | 184000 | 57160 | 2519 | " |

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