

(No Model.)

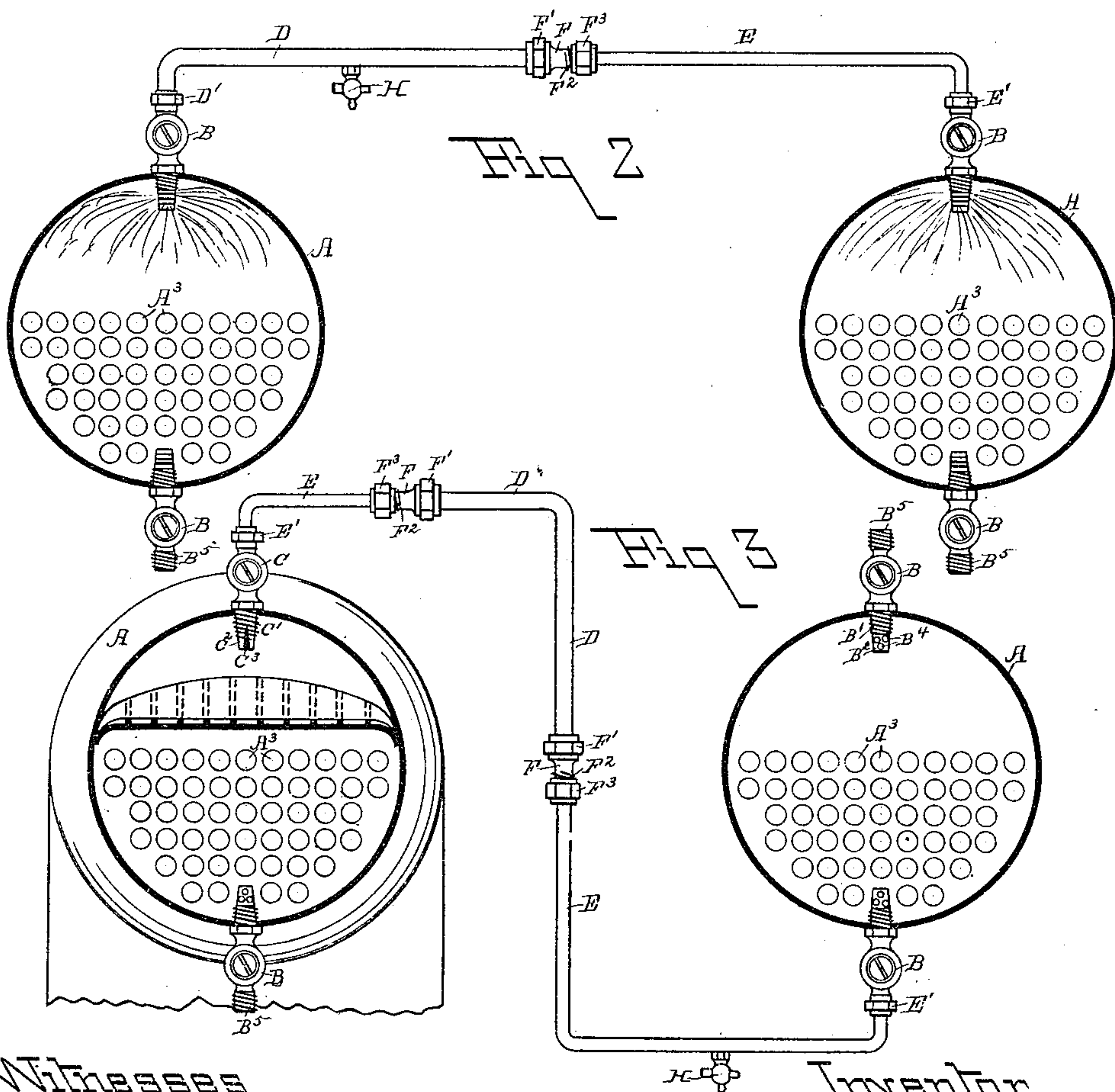
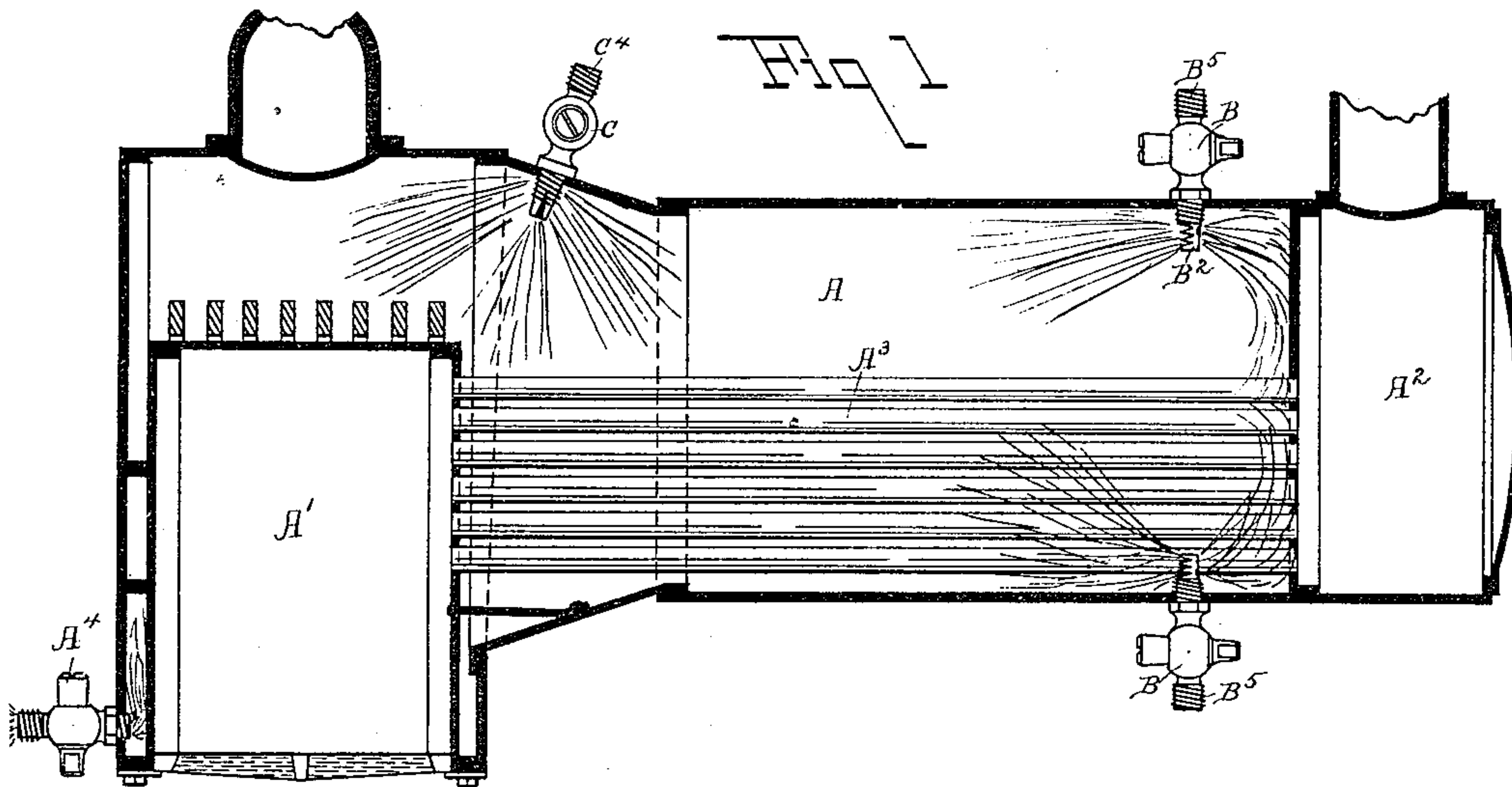
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APPARATUS FOR WASHING OUT LOCOMOTIVE BOILERS.

No. 273,753.

Patented Mar. 13, 1883.



Witnesses  
Samuel P. Kinsey.  
Frank O. Kinsey.

Inventor  
James T. McKenna  
per Thomas P. Kinsey Atty

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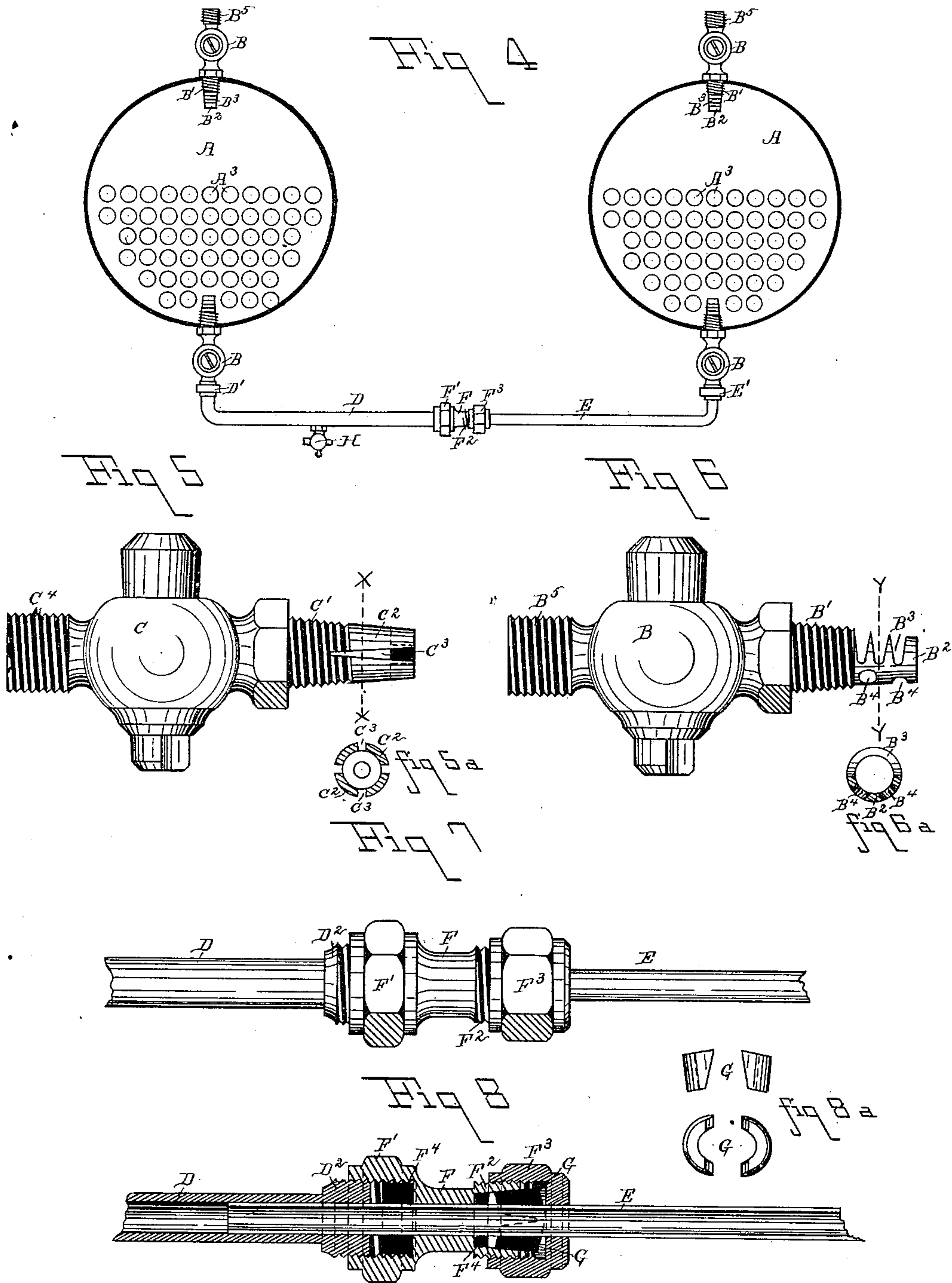
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Att'y



# UNITED STATES PATENT OFFICE.

JAMES T. McKENNA, OF READING, PENNSYLVANIA.

## APPARATUS FOR WASHING OUT LOCOMOTIVE-BOILERS.

SPECIFICATION forming part of Letters Patent No. 273,753, dated March 13, 1883.

Application filed August 22, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES T. McKENNA, of the city of Reading, county of Berks, State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Washing Out Locomotive-Boilers, of which the following is a specification.

This invention relates more particularly to locomotive-boilers, although it is applicable to boilers of all classes.

The object of the invention is to facilitate the operation of washing out locomotive-boilers without detriment to the same. The operation as usually performed being injurious, it is deferred from time to time, at the loss of a large per cent. of its steaming capacity. My apparatus and its arrangement obviate this, and the boiler may be washed out as often as is essential without injury thereto.

Referring to the accompanying drawings, in which I have given prominence only to those parts which show the apparatus, similar letters will be found designating similar parts.

Figure 1, Sheet 1, represents a sectional elevation in a longitudinal direction of a locomotive-boiler with my improved washer-cocks attached. Fig. 2, Sheet 1, represents a cross-sectional elevation of two boilers supposed to be standing on separate tracks, the right-hand boiler discharging steam into the left-hand boiler. Fig. 3, Sheet 1, represents the same boilers, position unchanged, the right-hand boiler discharging water into the left-hand boiler near the fire-box crown-sheet. Fig. 4, Sheet 2, represents the same boilers, the right-hand boiler discharging water into the left-hand boiler from below. Fig. 5, Sheet 2, is an elevation, and Fig. 5<sup>a</sup> is a cross-section on the line *x x*, of the spreader-cock for the fire-box end of the boiler. Fig. 6, Sheet 2, is an elevation, and Fig. 6<sup>a</sup> is a cross-section on the line *y y*, of the dislodging-cock for the smoke-box end of the boiler. Fig. 7, Sheet 2, is an elevation of the grip-adjusting pipe-coupler. Fig. 8, Sheet 2, is a sectional elevation of the same, Fig. 8<sup>a</sup> being a view of the grip-bush or cone-wedge for the pipe-coupler.

A represents the boiler; A', the fire-box; A<sup>2</sup>, the smoke-box; A<sup>3</sup>, the tubes; A<sup>4</sup>, the blow-off cock; B, dislodging and discharging cock; B', a threaded stem for its attachment to the

boiler-shell; B<sup>2</sup>, an extension of the stem (which is hollow) into the interior of the boiler; B<sup>3</sup>, oblong ports extending semi-circumferentially around the shell of the stem; B<sup>4</sup>, round ports; B<sup>5</sup>, threaded end for connection with the coupling-caps. C is a spreader dislodging-cock; C', a threaded stem for its attachment to the boiler-shell; C<sup>2</sup>, an extension of the stem, (which is hollow.) C<sup>3</sup> are longitudinal ports in the stem; C<sup>4</sup>, threaded end for connection with the coupling-caps; D, receiving-pipes; D', coupling-caps of the usual arrangement; D<sup>2</sup>, threaded end corresponding with end E of the grip-coupler; E, discharging and sliding pipe; E', ordinary coupling end; F, grip-adjustable pipe-coupler; F', internally-threaded end for coupling with D<sup>2</sup>; F<sup>2</sup>, tapered socket end for coupling with pipe E; F<sup>3</sup>, cap for coupling and gripping pipe E by pressure upon the taper plug; F<sup>4</sup>, elastic washers placed between the pipe ends and seats; G, a wedge or cone grip-bush; H, drip-cocks.

The generally-accepted mode of washing out a locomotive-boiler is as follows: The fire having been drawn, the blow-off cock is opened and the boiler emptied of its contents. When the wash-out is to be thorough, the boiler man and hand holes, together with the screwed plugs in the boiler-legs, are opened, and with a hose and cold water under pressure the same is brought to bear upon all the points which can be reached from the openings aforesaid. When it is not thorough, the water is simply filled in and run out until the discharge is comparatively clear. In neither case is the force of discharge into the boiler sufficient to dislodge the mud accumulated, and only a partial cleaning results therefrom. The injection of cold water into the boiler immediately after blowing out brings an intense contractile strain upon the lower half of the boiler-shell, while the heat retained in the upper half gives a double resistance by expansion to the effort of the lower half to retract the same. The injurious effect of a repetition of the operation is self-evident, and accounts for the infrequency of a needful performance.

With my apparatus, which I will now proceed to explain, the boiler may be blown out and immediately refilled without any injury.

The locomotive-boilers having been supplied



with the dislodging and spreader cocks B and C, (a set of the connecting extension and adjusting pipes, D E, with couplers F, being stored at convenient points along the line, or carried by each engine upon its tank,) then, whenever it is thought desirable to have a boiler washed out, another locomotive, being within reach and having the time to spare for the operation, is run alongside of the locomotive to be operated on, and the attachment of pipes D E with the cocks B C is made, connecting the boilers with each other. The boiler to be washed is then blown out, the cocks B C on the top of the boilers are then opened, when the steam rushing into the empty boiler is deflected upon the crown-sheet and fire-box tube-sheet by the spreader-port openings of cock C and the dislodged mud driven into the boiler-leg; or the round dislodging-ports B<sup>4</sup> in the cock B will operate upon the smoke-box tube-sheets in a similar manner, the semi-circumferential ports B<sup>3</sup> catching the dislodged material in its rebound, together with the accumulation upon the tubes, and drives the same also toward the boiler-leg. This done, the connection is broken between the boilers and changed to the form shown in Fig. 3, only in the order of precedence the connection is the reverse of that. Steam is then driven through the lower cock B into the lower half of the boiler, which completes the dislodging process. The connection is again broken and reversed to the form shown in Fig. 3, and warm or hot water is driven into the boiler until the top portion is cleaned, cocks are again closed, and a final connection made similar to that shown in Fig. 4. Hot water is then driven into the lower half until it is thoroughly washed out, and the boiler is then filled up to steaming-gage, cocks closed, connecting-pipes removed, fire is rebuilt, and in a few minutes the cleaned boiler is ready for active service. It is understood that the blow-off cock is kept more or less open during the cleaning process, and that the back screw-plugs are taken out prior to the steaming process and are not returned to place until the boiler is cleansed. These several openings create such a circulation toward the same that there will be no accumulation of mud to remove, requiring opening of hand or man hole plates, or the remaking of joints before the boiler can be refilled.

In place of removing the connecting-pipes, they may be retained, and the washed-out boiler may become the washer, and thus both locomotives may have their boilers cleansed.

The cocks may be placed as shown in the drawings, or the spreader C be used for the top of the shell and the dislodging and discharging cock B for the bottom of the shell, to which arrangement I give the preference.

It will be apparent from the above description that the boiler operated on does not become cooled, and therefore there is none of the injurious effects of expansion and contrac-

tion to shorten the life of the boiler, as under the usual system of washing out.

At stations provided upon the line stationary boilers with hot-water-circulating heaters will be set up, which will take the place of the active locomotive.

The pipes may by ordinary couplings be increased to any length, as the distance of the boiler being washed from the boiler (locomotive or stationary) doing the work is, within reasonable limits, immaterial. The pipes are furnished with drip-cocks H at suitable points to drain the pipes after the cocks B C are closed, and before uncoupling, to prevent the scalding of the party doing the same.

I make no claim to the peculiar coupling shown in Figs. 7, 8, and 8<sup>a</sup>, Sheet 2, in this application, having illustrated thereby a form of coupling, to which I give the preference, for the purpose described. In many cases a good rubber hose will answer every purpose, the metal pipes, however, being the most reliable.

The cocks B C, being permanently attached to the boilers, become alternatively discharging or receiving cocks, as the boilers to which they are attached become a washing or washed-out boiler.

The drawings and description will enable any locomotive-engineer to comprehend and make use of my improvement. Therefore

I desire to claim as follows:

1. The combination of the cocks B C with the shell of a locomotive or other boiler, having a temporary connection through the same, with a steam and hot-water reservoir under pressure, as shown and described, whereby the said boiler may be washed out and thoroughly cleaned, substantially as and for the purpose set forth.

2. An apparatus, as described, adapted to be connected with boilers—locomotive or stationary—composed of the following elements in combination: cocks B C, attached to the boilers, and pipes D E, with grip-adjusting coupling F, provided with split-cone bush G, the pipes having drip-cocks H, substantially as shown, and for the purpose specified.

3. The dislodging and discharging cocks B, provided at their outer ends with threaded portion B<sup>5</sup>, for connection with caps of pipes D and E, their inner ends, B<sup>2</sup>, projected as hollow tubes within the boiler, and secured thereto by a threaded portion, B<sup>1</sup>, one-half of the face of the stem projected within the boiler, perforated by three circular holes, B<sup>4</sup>, one central, the other at an equal angle of forty-five degrees therefrom, the opposite half-face provided with three or more oblong semi-circumferential ports, B<sup>3</sup>, in combination with boiler A, pipes D and E, and coupler F, substantially as shown, and for the purpose set forth.

4. The dislodging and discharging spreader-cocks C, provided at their outer ends with a threaded surface, C<sup>4</sup>, for connection with pipe-caps D' E', and at their inner ends with a



threaded surface, C<sup>1</sup>, for connection with the boiler A, and a projected hollow stem, C<sup>2</sup>, having four or more vertical tapered ports, C<sup>3</sup>, extending from the threaded portion C' to the  
5 extreme end of the stem and supplemented by a central perforation in the end, in combination with boiler A, pipes D E, and coupling

F, substantially as shown, and for the purpose set forth.

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Witnesses:

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