

(No Model.)

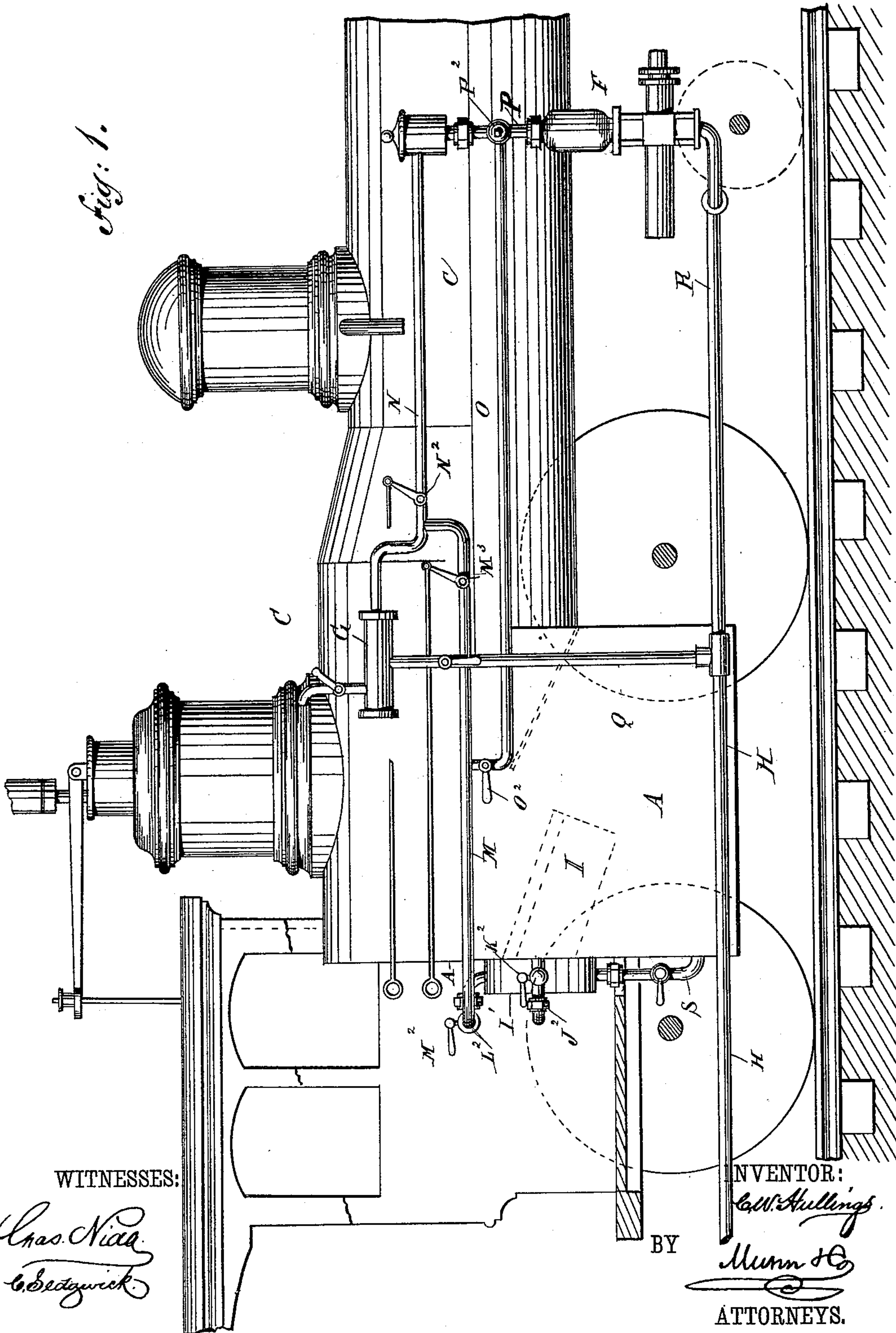
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C. W. HULLINGS.  
LOCOMOTIVE FIRE BOX.

No. 386,431.

Patented July 17, 1888.

*Fig. 1.*



WITNESSES:

*Chas. Nida*  
*C. Sedgwick*

INVENTOR:

*C. W. Hullings*

BY

*Munn & Co*

ATTORNEYS.

(No Model.)

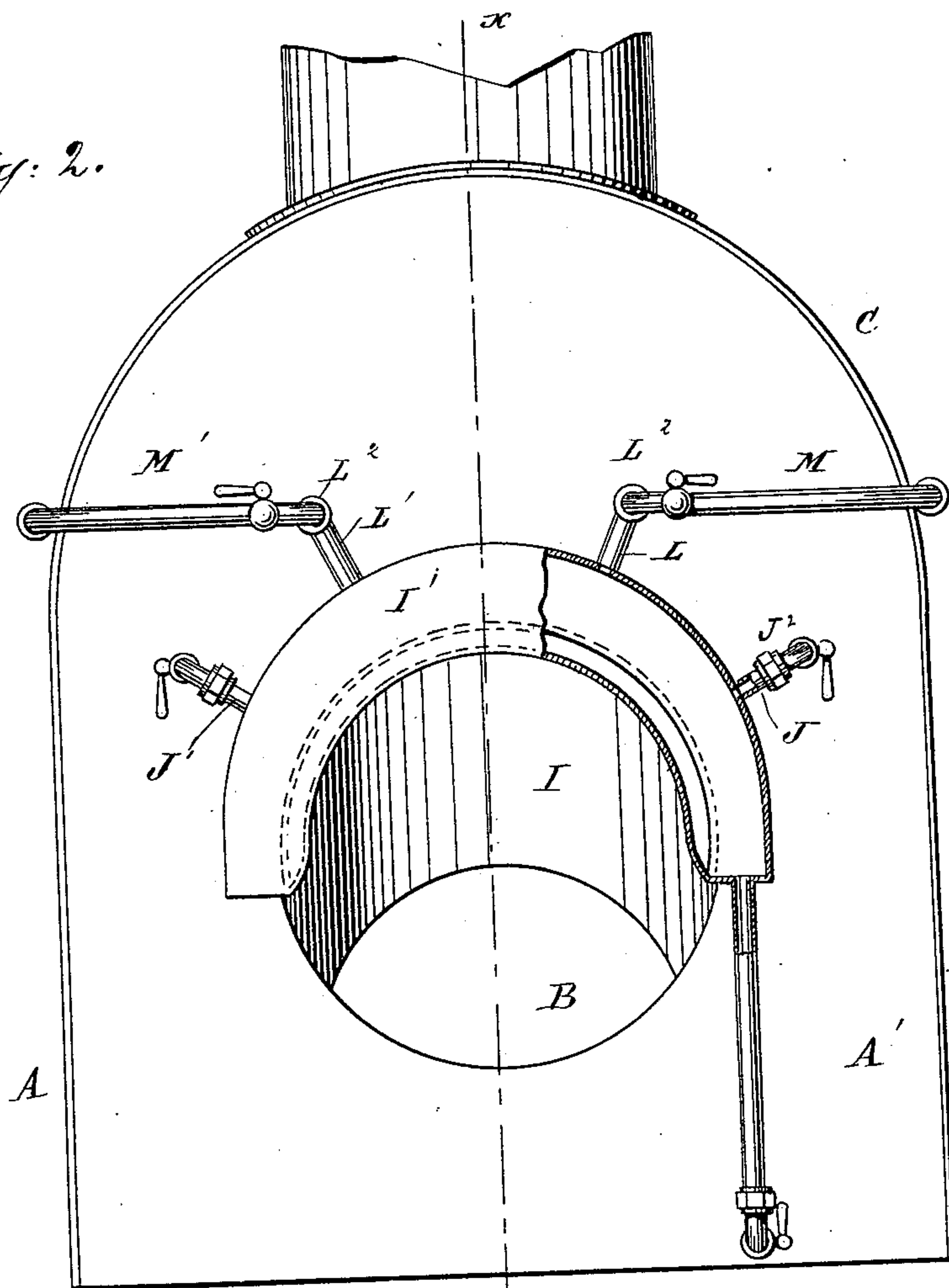
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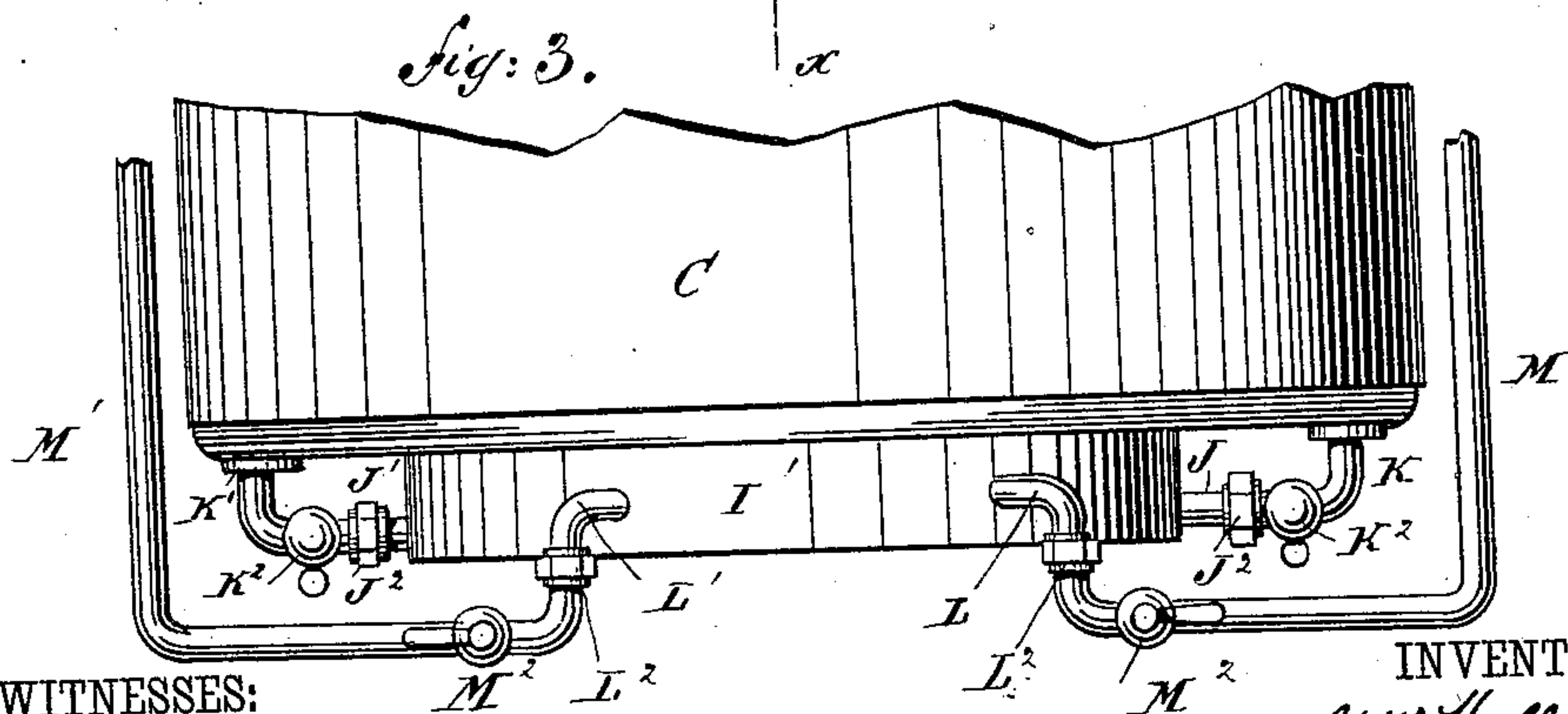
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*Fig: 2.*



*Fig: 3.*



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*Chas. Nida*  
*C. Sedgwick*

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*C. W. Hullings*

BY

*Munn & Co*

ATTORNEYS.

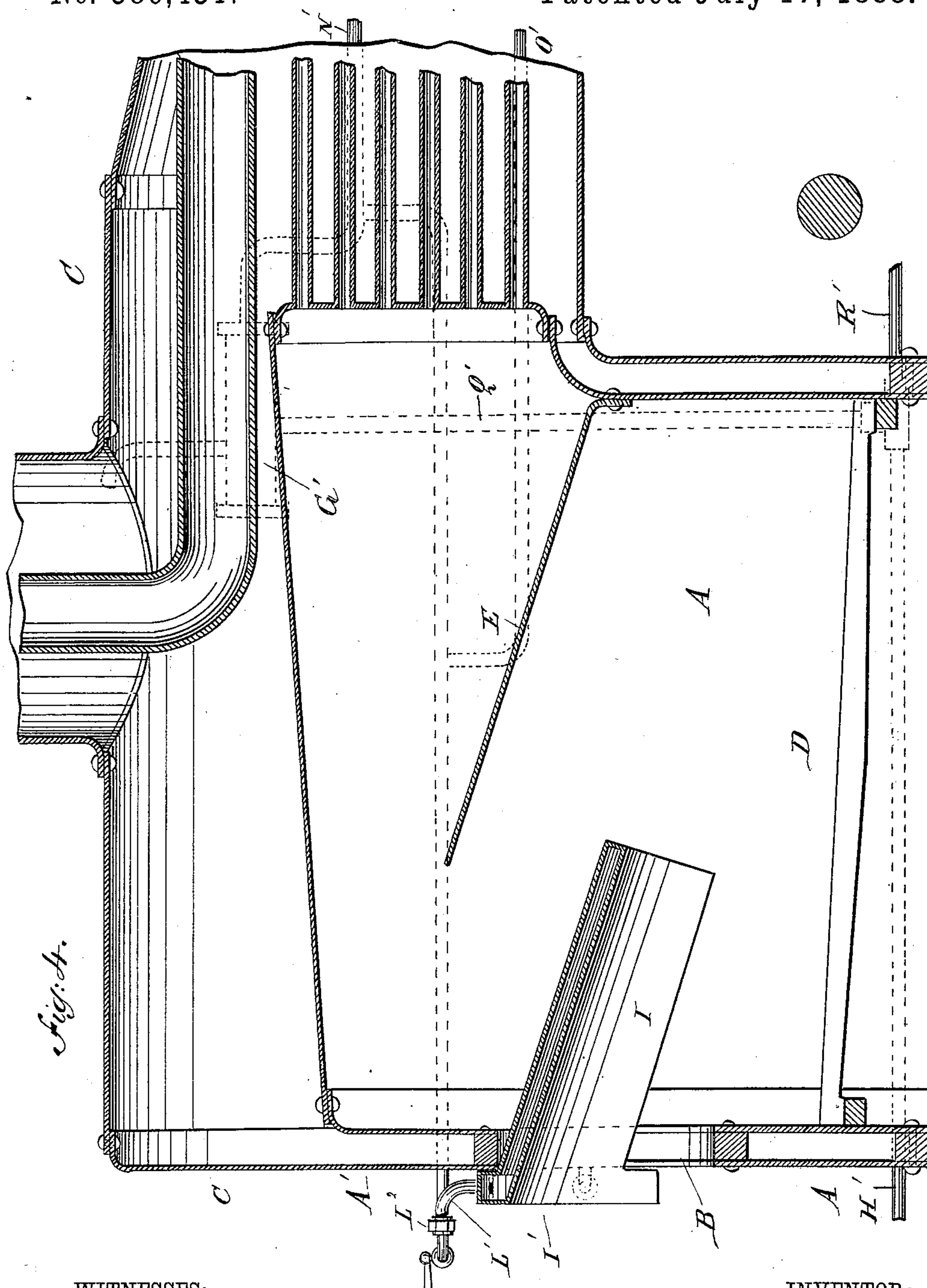
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*Munn & Co.*  
ATTORNEYS.

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# UNITED STATES PATENT OFFICE.

CHARLES W. HULLINGS, OF BURLINGTON, NEW JERSEY.

## LOCOMOTIVE FIRE-BOX.

SPECIFICATION forming part of Letters Patent No. 386,431, dated July 17, 1888.

Application filed February 15, 1888. Serial No. 264,107. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. HULLINGS, of Burlington, in the county of Burlington and State of New Jersey, have invented a new and  
5 useful Improvement in Locomotive Fire-Boxes, of which the following is a full, clear, and exact description.

This invention relates particularly to an improvement in the fire-boxes of locomotives in  
10 which an arched hollow baffler-plate extends from the top of the furnace-opening, in lieu of a door, inward and downward over the grate, so as to prevent the cold air entering at the opening from striking the crown-sheet, and  
15 thus to consume the smoke and cinders in the furnace, and is supplied with water from the water-tank, so as to guard against burning out.

The objects of my invention are to secure a circulation of water through the hollow baffler-plate, so as to effectually prevent its burning out, and to facilitate its removal for repairs or renewal.

The invention consists of certain novel features of construction and combinations of parts,  
25 hereinafter fully described, and distinctly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate  
30 corresponding parts in all the figures.

Figure 1 is a side (partly sectional) elevation of a part of a locomotive to which my improvement has been applied. Fig. 2 is an enlarged rear end elevation of the furnace and boiler of  
35 same. Fig. 3 is a plan view of the rear part of the boiler and furnace. Fig. 4 is a sectional side elevation of the same on the line *x x*, Fig. 2.

A designates the furnace; B, the furnace-opening; C, the boiler; D, the grate; E, the furnace-deflector; F, one of the two boiler feed-pumps; G, one of the two injectors, and  
40 H H' the two supply-pipes leading from the water-tanks of a locomotive, all of which parts may be of the ordinary description shown.

From the top of the furnace-opening B a transversely-arched hollow baffler-plate, I, constructed, by preference, of copper, is arranged to project inward and downward to  
50 near the normal level of the fuel on the grate D, for the well-known purpose of deflecting the air entering the opening B upon the fire

and consuming the gas and sparks produced thereby.

The outer end of the hollow baffler-plate I  
55 is formed with a hollow upward and laterally-projecting flange, I', the closed chamber of which forms an extension of that in the baffler-plate, and which is arranged to rest against the outside of the furnace-wall A', around the  
60 top of the opening B therein.

To opposite sides of the hollow flange are rigidly attached short tubes J J', communicating with the interior thereof, and adapted for connection, by unions J<sup>2</sup>, with short bent  
65 tubes K K', respectively fixed to the furnace-wall A' and communicating with the boiler, so that the baffler-plate is thereby both put in connection with the boiler and removably supported in position.

The fixed tubes K K' are each provided  
70 with a cock, K<sup>2</sup>, so that they can be readily closed previous to detaching the baffler-plate.

From the top of the hollow flange I', on either side, lead other short tubes, L L', also  
75 adapted for detachable connection, by unions L<sup>2</sup>, with the ends of pipes M M', which are carried laterally and oppositely along the outside of the wall A', and forward on opposite sides of the boiler to a connection with  
80 the pipes N N', which discharge, as usual, from the two injectors G into the boiler C at the forward part thereof.

The ends of the pipes M M' adjacent to the unions L<sup>2</sup> are provided with cocks M<sup>2</sup>, for closing them previous to detaching the baffler-plate.

Pipes O O', provided with cocks O<sup>2</sup>, are also run from the pipes M M' to the feed-pipes P, having cocks P<sup>2</sup>, leading from the pumps F into  
90 the boiler in the ordinary manner, the pipes M M' having long-handled cocks M<sup>3</sup> adjacent to their connections with the discharge feed-pipes N N', and the pipes N N' also having long-handled cocks N<sup>2</sup> between said connections and their boiler-connections.

The injectors and pumps are connected, as usual, with the water-supply pipes H H' by valved pipes Q Q' and R R', respectively, and a discharge-pipe, S, is arranged to lead from  
100 the bottom of the hollow flange on the baffler-plate out upon the ash-pan, for emptying the baffler-plate when the same is to be detached.

With the arrangement described, when the



boiler is to be fed by the injectors G, by closing the cocks N<sup>2</sup> and opening the cocks M<sup>2</sup>, the fluid drawn from the water-tank through the pipes H H' and Q Q' will be discharged through the pipes N N' and M M' and tubes L L' into the baffler-plate, and thence through the tubes J J' and K K' into the boiler, so that the desired circulation through the baffler-plate will be obtained.

When the boiler is to be fed by the pumps F, by closing the cocks P<sup>2</sup> and opening the cocks O<sup>2</sup>, the water drawn from the supply-pipes H H' and R R' will be pumped through the pipes O O' and M M' and tubes L L' into the baffler-plate, and thence, as before, into the boiler, so that in this way also a circulation of water through the baffler-plate may be obtained.

By closing the cocks M<sup>2</sup> and O<sup>2</sup> and opening the cocks N<sup>2</sup> and P<sup>2</sup> the injector and pump may be caused to feed directly into the forward part of the boiler, when so desired.

All the baffler-plate connections, feed pipes, and valves being located outside the boiler, the baffler-plate may be readily detached and replaced without the necessity of putting out the fire.

By thus causing the water to circulate through the baffler-plate it may with perfect safety be brought so close to the fire as to deflect all the air thereupon, and thus entirely consume all smoke and cinders.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the locomotive-boiler and fire-box provided with a fuel-opening, of the hollow baffler extending through the upper part of the fuel-opening and detachably connected at its outer exposed end with the boiler, whereby it may be readily removed without drawing the fire or emptying the boiler, substantially as set forth.

2. In a locomotive-engine, the combination, with the fire-box having a fuel-opening, B, and the boiler, of the arched hollow baffler extending through the upper end of the fuel-opening into the fire-box and detachably connected at its outer exposed end to the boiler by valved connections, and valved connections between the water-supply pipes and the outer exposed end of said baffler, whereby the valves in said connections may be closed and the baffler removed without interfering with or drawing the fire or emptying the boiler, substantially as set forth.

3. The combination, with the boiler, the fire-box having a fuel-opening, B, the water-supply, injector, and feed-water pipes H H', N N', and P, and the valved pipes Q Q', of the hollow baffler I, extending through the fuel-opening B, valved exterior attaching-connections J J' between the baffler and the boiler, valved pipes M M', leading from pipes N N' to the baffler, and valved pipes O O', leading from pipes M M' to feed-pipe P, substantially as set forth.

CHARLES W. HULLINGS.

Witnesses:

GEO. F. COLEMAN,  
JOSHUA TAYLOR.