

H. N. WATERS.

Imp'd Heater for Steam Boilers.

74735

PATENTED

FEB 18 1868

Fig. 1.

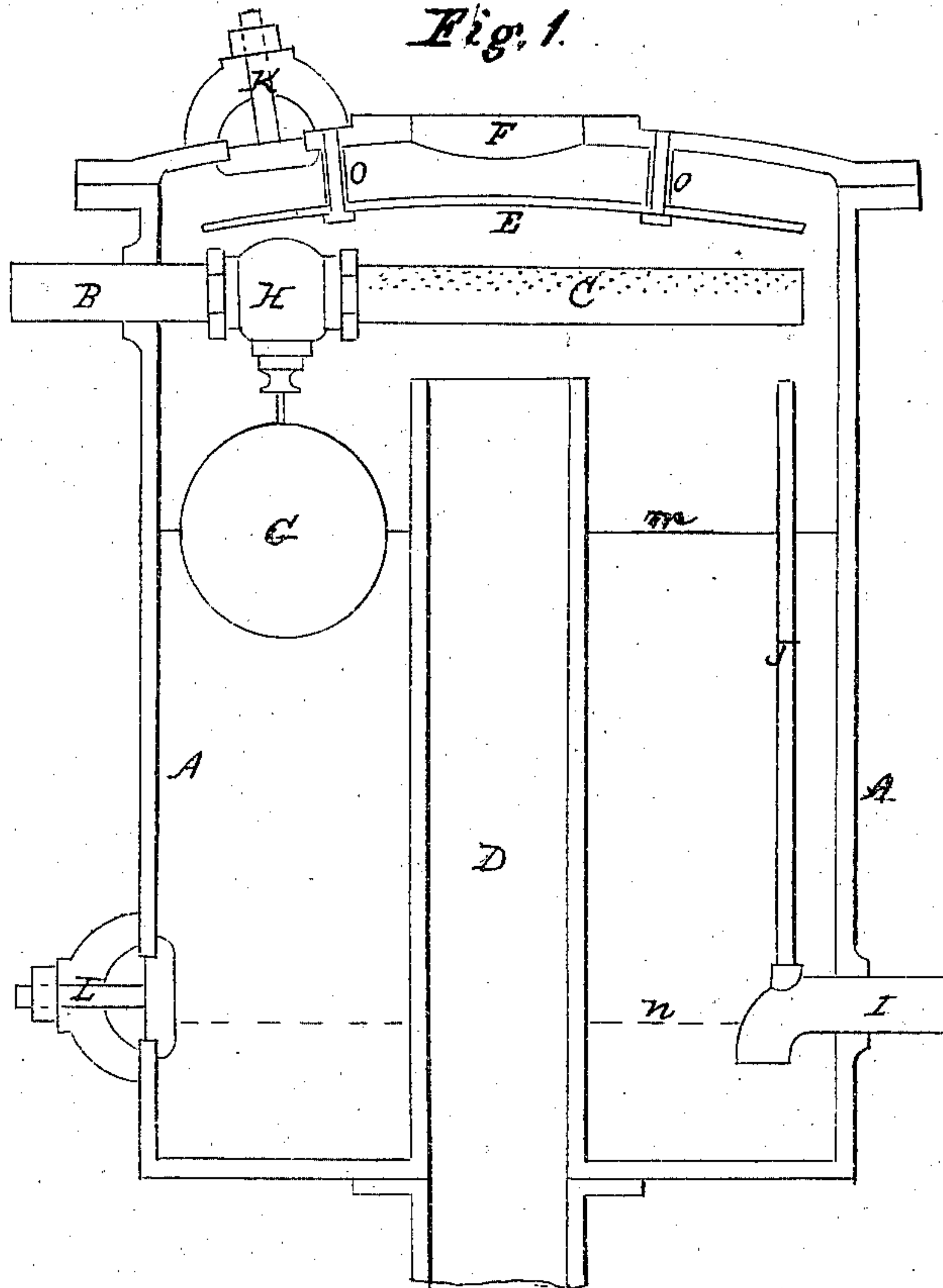
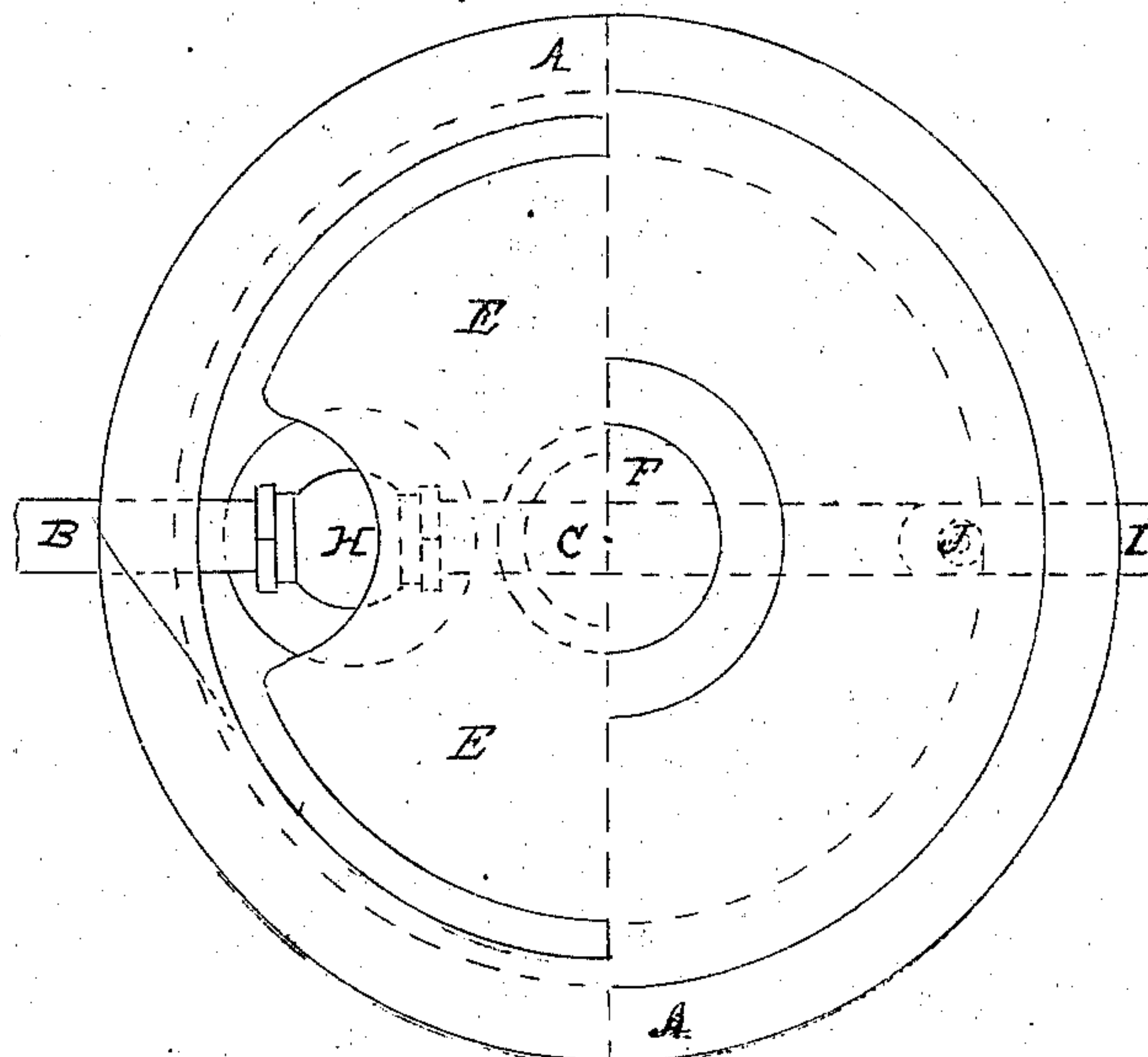


Fig. 2.



Witnesses.

Newton Case
Geo. B. Ellis

Inventor.

H. N. Waters

UNITED STATES PATENT OFFICE.

HORATIO N. WATERS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO HIMSELF
AND NEWTON CASE, OF SAME PLACE.

IMPROVEMENT IN FEED-WATER HEATERS OF STEAM-GENERATORS.

Specification forming part of Letters Patent No. 74,735, dated February 18, 1868.

To all whom it may concern:

Be it known that I, HORATIO N. WATERS, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Heaters for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 shows a vertical section through the middle of the improved heater. Fig. 2 shows a top view of the same, the left-hand half having the top removed, so as to show the interior parts.

Like letters in the figures indicate the same parts.

My invention consists in heating the water which is intended to be pumped into the boiler up to a high temperature with the exhaust-steam from the engine, and at the same time separate the sediment and floating impurities which it may contain, by the mechanism and apparatus that I will proceed to describe.

A is the reservoir for the heated water, into which the cold water passes, from a cistern or other receptacle, through the pipe B, and is forced through the sprinkler C in a number of fine jets. The total area of the small holes for the jets is about equal to that of the pipe B.

H is a valve, operated by the float G, which opens it when the water falls below the line *m*, and closes it when the water reaches that level. D is the pipe by which the steam enters the apparatus.

E is a deflector, attached by the bolts O O to the top of the reservoir, and against which the steam strikes, and is deflected downward against the sprinkler C. It then passes around the edges of E to the aperture F in the top of the apparatus, through which it passes out, by another pipe, into the atmosphere.

I is the feed-pipe, leading to the boiler-pumps. It has the end inside the reservoir turned down, as shown in the drawings, and at a sufficient height above the bottom of the reservoir not to draw in the sediment which collects there.

J is an upright pipe, entering at the top of the pipe I, and extending above the level *m* of the water in the reservoir. This pipe is for

the purpose of admitting air or steam to the pumps through the pipe I, when the water falls below the pipe I to the level *n*, so that the pump shall not draw out the water from the reservoir below that level.

K and L are hand-holes for getting at the interior of the reservoir to adjust the parts and clean it out. A part of the deflector E is cut away under the hole K to allow access to the valve H.

The operation of my invention is as follows: The exhaust-steam from the engine enters through the pipe D, and strikes against the curved deflector E, by which it is deflected downward, so as to remain for an instant in contact with the fine jets of cold water from the sprinkler C. A part of the steam is condensed and heats the water to a high temperature, which then falls down into the reservoir A. The waste-steam passes around the edge of the deflector, and escapes through a pipe in the top of the reservoir at F.

When the water rises to the proper height, *m*, in the reservoir A, the ball G floats up with it, and closes the valve H, so that no water passes from the pipe B into the sprinkler C. As soon as the water falls below the level *m*, the weight of G opens the valve H, and admits the water to C, so that the reservoir is again filled.

The end of the pipe I is turned down inside the reservoir, and is furnished with the pipe J to admit the air, for the purpose of keeping the water in the reservoir always above the mouth of the pipe I, so that no oil or other substance floating upon the surface can enter the pipe. When the water falls to the level *n* the pump draws air or steam through the pipe J, and no water enters the pump, leaving the reservoir full up to the level *n*, or, if the pump is placed above the pipe I, nearly up to the level of the top of the inside of I. If the pump is below I, the water will flow out to the level *n* of the bottom of the inside of the pipe. The water being heated to a very high temperature, and the sediment thereby in a great measure separated therefrom, it falls to the bottom of the reservoir, where it can be removed, when necessary, through the hole L.

By means of my invention, clean hot water can be fed into the boiler, separated from the sediment, and from all floating impurities.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The device I J, for the purpose of preventing the water in the reservoir from being drawn down to the level of the orifice of the feed-pipe, substantially as herein specified.

2. The combination of the devices A, B, C, D, E, F, G, H, I, and J, for the purposes of a

heater for steam-boilers, substantially as specified.

3. The combination of the devices C, D, E, and F, substantially as herein described.

H. N. WATERS.

Witnesses:

NEWTON CASE,
THEO. G. ELLIS.