

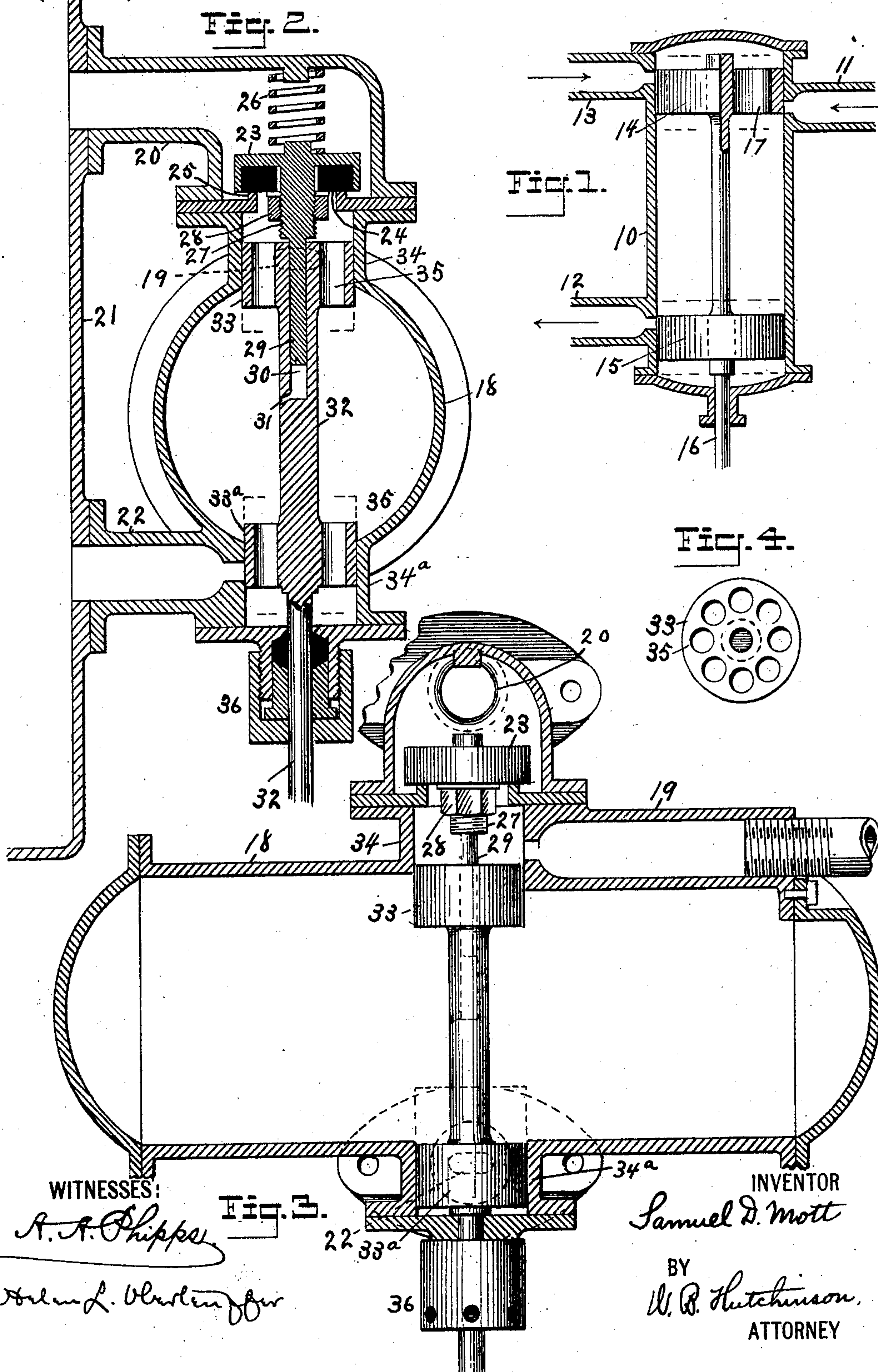
No. 682,628.

Patented Sept. 17, 1901.

S. D. MOTT.
WATER FEED FOR BOILERS.

(Application filed Dec. 4, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

SAMUEL D. MOTT, OF PASSAIC, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MOTORMOBILE COMPANY, OF JERSEY CITY, NEW JERSEY.

WATER-FEED FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 682,628, dated September 17, 1901.

Application filed December 4, 1900. Serial No. 38,699. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL D. MOTT, of Passaic, Passaic county, New Jersey, have invented certain new and useful Improvements in Water-Feeds for Boilers, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of devices which supply water to steam-boilers; and the object of my invention is to produce a very simple, positive, and inexpensive device which can be applied to any ordinary steam-boiler, but which is particularly adapted for use in connection with automobile-boilers or boilers which are required to make steam at different rates, one of the especial features of the invention being that it will adapt itself to the steaming requirements of the boiler and feed water faster or slower according as the vehicle is driven faster or slower.

Other objects of my invention are to produce a device of this character which has a reliable automatic gravity-feed—that is, a feed that will supply water to the boiler when it is needed and will not supply it unless it is needed.

To these ends my invention consists of certain features of construction and combination of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar figures of reference refer to similar parts throughout the several views.

Figure 1 is a detail vertical section of a device in a simple form, illustrating the principle of my invention, but not made with the necessary details for practical use. Fig. 2 is a central vertical section of my invention as applied to a boiler. Fig. 3 is a vertical section taken at right angles to that illustrated in Fig. 2, and Fig. 4 is a plan of one of the piston-valves forming a part of the invention.

Fig. 1 illustrates the invention in its simplest form; but the device here shown is not so practical as that illustrated in the other figures, for the reason that it is difficult to keep the piston-valves tight. This figure shows the principle of the invention, however, and

here the vertical receptacle 10 has a suitable water-inlet 11 near the top and connections 12 and 13, adapted to communicate with the water and steam portions of a steam-boiler, the device being located so that the normal boiler water-level would lie between the parts 12 and 13. The parts represented by the water-inlet 11 and steam-inlet 13 are closed and opened by the piston-valve 14, while the part represented by the boiler connection 12 is closed by the piston 15, these two pistons 14 and 15 being similar in structure and having vertical holes 17 extending through them. Both pistons or valves are connected to a stem or rod 16, which reciprocates vertically in the receptacle 10, being worked by any means either manual or mechanical, so that the piston-valves 14 and 15 move between the points indicated by the dotted lines in the drawings. It will be noticed that when the piston-valves are moved up the boiler connections 12 and 13 are closed, but the water-inlet 11 is opened, so that the receptacle 10 can be filled. When the piston-valves move downward, however, the connections 12 and 13 are opened and the water-inlet closed, so that the steam will enter through the pipe 13, and thus make the pressure in the receptacle 10 the same as it is in the boiler, and the water will then of course gravitate through the pipe 12 until the level of the water is the same in the boiler as it is in the receptacle 10.

For practical purposes, however, the structure shown in Figs. 2 and 3 is preferable, because more reliable. Referring to Figs. 2 and 3, the receptacle 18 has a water-inlet 19, by which it can be filled, and has connections 20 and 22 with the steam and water portions of the boiler 21, the receptacle being located, as before, at a point approximating the ordinary water-level of the boiler. The steam connection to the receptacle 18 is normally closed by an inverted-cup-shaped valve 23, which has on the under side a seating part 24, which seats against the valve-seat 25, the valve being pressed down by a spring 26, which acts before there is any considerable steam-pressure, after which of course the steam will be sufficient to normally close the valve. Extending centrally

downward from the valve 23 is a stem 27, on which is a nut 28 to hold the Jenkins metal 24 in place, and this stem has a reduced extension 29, extending into the bore 30 of the main piston-valve stem or rod 32, so that the valve is always suitably guided. The bore 31 (shown in Fig. 2) is merely a vent for the bore 30. The stem 27 abuts with the upper end of the main piston-rod or valve-stem 32, which carries at its upper and lower ends the main piston-valves 33 and 33^a, these working in cylindrical chambers 34 and 34^a, formed at the top and bottom of the receptacle 18. The piston-valves 33 and 33^a are each pierced by the vertical holes 35, which permit water and steam to pass through them, and the lower end of the stem or rod 32 is reduced and extends downward through a suitable stuffing-box 36. It will be noticed by referring to Figs. 2 and 3 that when the piston-valves 33 and 33^a are moved downward to the position shown in Fig. 3 the water can freely enter through the inlet 19 to fill the receptacle 18, and when the piston-valves are moved up the inlet 19 is closed. The piston-valves can be moved up and down by any mechanical means acting on the rod or stem 32 and against the steam-pressure and against the pressure of the spring 26, and when this upward movement is sufficient to lift the valve 23 from its seat the inlet 19 will still be closed, but the valve 33^a will uncover the connection to the pipe 22, while the valve 23 will be lifted so as to open the steam-pipe 20. Consequently the boiler-pressure will enter the receptacle 18 and the water in the receptacle will find its level with the water in the boiler. It will of course be understood that suitable mechanical means—such, for instance, as that shown in my application, Serial No. 38,701, for a patent on boiler, filed simultaneously with this—can be attached to any vehicle or even to any stationary boiler for moving the valves 33 33^a and valve stem or rod 32, so as to provide for the described water-feed.

From the foregoing description it will be seen that I provide a simple and positive means by which water is fed by gravity into the boiler, and it will be noticed that the water will not be fed except when it is required. It will be noticed, too, that in either form when the water-inlet to the reservoir is open the reservoir can fill, and after this the water will feed from the reservoir to the boiler faster or slower, as is required—that is, supposing it to be attached to an automobile if the vehicle runs fast the boiler will necessarily make steam fast and will require more water, and as the valves are operated by some driving part of the automobile they will be moved with sufficient rapidity to permit the requisite flow of water to the boiler. It will of course be understood that if the boiler is full to a point above the top of the receptacle 18 no water-feed will take place;

but when the water-level of the boiler gets below the top of the receptacle the feed will begin. Attention is also called to the fact that the steam in the receptacle 18 will condense very rapidly, particularly in cool weather, and if this condensation is required to be very rapid the receptacle may be water-jacketed. The result of this rapid condensation is to produce a partial vacuum in the receptacle 18, so that when the inlet 19 is opened the water will rush in positively and quickly, even though the supply be at a lower level than the receptacle 18.

I do not wish to confine myself to the precise structure shown in this application. For instance, the valve might be modified to a certain extent and the inlet 19 may be opposite the lower valve 33^a instead of opposite the upper valve 33.

It will be observed that my invention as described and shown has the valves controlling the steam and water for effecting the feed positively driven—that is, they are operated without regard to steam or water pressure by external means—and in the claims I shall use the term “mechanically driven” to distinguish the valve mechanism from that class of water-feed in which valves are operated at varying intervals by weights, steam-pressure, the weight of the water in the feeding-receptacle, and analogous devices.

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

1. In a device of the kind described, the combination with the receptacle having a water-inlet and boiler connections near the top and bottom, of a pair of reciprocating valves adapted to open and close the steam connection and water-inlet, and an independent valve adapted to close the steam connection, the said independent valve being moved up by the upstroke of the first-mentioned valves.

2. A device of the kind described, comprising a receptacle having steam and water connections near the top and bottom respectively with a boiler, a valve seated in the steam connection so as to normally close it, a pair of connected ported valves movable over the water-inlet and over the water connection to the boiler, and means for opening the valve in the steam connection by the upstroke of the two ported valves.

3. A device of the kind described, comprising a receptacle having steam and water connections near the top and bottom respectively with a boiler, a pair of vertically-ported connected valves reciprocating over the water-inlet and the water connection to the boiler, a valve controlling the steam connection, and means for lifting and opening the valve in the steam connection by the upward movement of the connected valves.

4. A device of the kind described, comprising a receptacle having steam and water connections near the top and bottom respectively,

and a pair of vertically-ported connected
valves movable in unison over the water-inlet
and the water connection to the boiler, and
a check-valve having a depending stem ex-
5 tending downward into the path of the stem
of the ported valves whereby the upstroke of
the latter raises the check-valve.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

SAMUEL D. MOTT.

Witnesses:

JOHN D. GRIFFEN,
W. B. HUTCHINSON.