

**No. 688,286.**

**Patented Dec. 10, 1901.**

**J. C. BLEVNEY.**  
**WATER FEEDER FOR BOILERS.**

(Application filed Mar. 19, 1900.)

(No Model.)

[illegible]

WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN C. BLEVNEY, OF NEWARK, NEW JERSEY.

## WATER-FEEDER FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 688,286, dated December 10, 1901.

Original application filed January 29, 1900, Serial No. 3,139. Divided and this application filed March 19, 1900. Serial No. 9,186. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. BLEVNEY, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Water-Feeders for Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to devices for feeding water to boilers, and more particularly to feeders for that class of boilers shown in my application, Serial No. 3,139, filed January 29, 1900, and of which the present application is a division.

The objects of the invention are to provide means whereby the quantity of water within the boiler will be automatically maintained at a proper normal, to obtain such a device which can be accurately regulated in its action, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved water-feeder for boilers and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in both views, Figure 1 is a vertical sectional view of my improved water-feeding device as applied to a boiler, and Fig. 2 is a side elevation of the feeder on a smaller scale.

In said drawings, *a* indicates the body of a furnace, the furnace proper comprising parallel plates *f f'*, supported by said body and forming a fuel-chamber between, which is traversed by air-tubes *g*, as fully set forth in my prior application above referred to. Below the furnace is a depending air or draft director *b*, and above the furnace is the boiler B, having outer and inner walls *B' B²* and

vertical boiler-tubes *B⁶*, arranged between the opposite heads *B⁴ B⁵*. The said lower head *B⁴* is sufficiently above the furnace to provide a combustion-chamber *D*, and above the upper head *B⁵* is a chamber *E* for reducing the exhaust, said reduction being accomplished by the coiled and perforated pipe *k*, as described in said previous application.

The space between the boiler-tubes *B⁶* and the heads *B⁴ B⁵* of the boiler is to be supplied with water for the generation of steam, and it is to the means for effecting such water-supply and for regulating the same that the present application refers.

To regulate the supply of water in the boiler automatically, I have provided in connection with the boiler *B* a water-column *w* in open communication with the boiler at top and bottom by means of pipes *w' w²*. Within said water-column is arranged a float *w³*, Fig. 1, which may be of aluminium and be seated on a spring *w⁴* to counterbalance the weight thereof. Said float is provided at the top with a valve extension *w⁵*, adapted to work in a tubular valve-seat *w⁶*, having passage *w⁷*, adapted to be opened or closed by the valve extension of the float as the latter lowers or rises with the water in the water-column and boiler in open communication therewith. When the water in the boiler is at its highest point above the normal height, the float and its valve extension will have risen and closed the passage *w⁷*, so that no more steam from the boiler and the upper part of the chamber in the water-column can enter the steam-pipe *w⁸*, connecting said water-column *w* with the pump-governor *w⁹*. Condensation then takes place in the steam-pipe *w⁸* and its coil *w¹⁴*, so that the governor-valve *w¹⁰*, relieved of steam-pressure, may be easily opened by the pressure of water from the pump *w*. Thus the pump *W*, drawing the water from a tank, (not shown,) instead of forcing the water through the pipe *W'* and check-valve *W²* into the boiler *B* forces said water through the valve-opening *w¹¹* of the governor-valve into the return-pipe *w¹²* back into the tank. This movement of the water back to the tank from the pump continues until the water in the boiler lowers sufficiently to cause the float to open the valve *w⁵ w⁶*, when the steam



again enters the pipe  $w^8$  and presses against the large compression-surface of the piston  $w^{13}$  of the governor-valve  $w^{10}$ , thus holding said valve  $w^{10}$  closed against water-pressure, 5 so that the water from the pump is again caused to flow through the water-supply pipe  $W'$  and check-valve  $W^2$  to the boiler. By increasing or diminishing the drainage-space in the pipe  $w^8$  above the water-column the 10 time required for condensation of steam in said pipe  $w^8$  and the relief of pressure upon the valve-piston  $w^{13}$  will be correspondingly diminished or increased. The drainage-space referred to is that volume of chamber within 15 the pipe  $w^8$  in which the steam will be free to condense to reduce the pressure within the said pipe and from which the water of condensation will flow downward in said pipe into the chamber of the water-column through 20 the open steam-passage  $w^7$ . It will be further understood that the check-valve  $W^2$  and the governor-valve  $w^{10}$  have both an area open to water-pressure from the pump approximately equal in dimensions, and while both 25 are acted upon by equal pressure from the boiler the governor-piston  $w^{13}$  presents a greater area to such pressure, so that the valve  $w^{10}$  may be closed when the check-valve is open.

30 Notwithstanding the fact that I have shown my improved water-feeder in connection with a boiler of the construction shown in my previous application, Serial No. 3,139, it will be understood that said feeder is not limited to 35 that particular boiler, but can be used with any kind or style of boiler desired. Neither do I wish to be limited to the particular construction of governor-valve which I have shown, nor to the float and its supporting- 40 spring, since these details may be varied at will without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new is—

1. The combination with a boiler having a 45 water-column attached thereto, said column being at top and bottom in open communication with the boiler, of a pump and pipes connecting with the boiler and adapted to be connected with a reservoir or tank, whereby the 50 water from said tank may be forced from said tank either into the boiler or back into said tank, a float arranged in said water-column and having a valve at the top, a valved governor and a coiled steam-pipe leading from 55 the top of the water-column to said governor, the governor-valve being closed by pressure of steam when the float is down in the water-column and adapted to open by water-pressure when relieved from steam-pressure by 60 condensation in the coiled steam-pipe, substantially as set forth.

2. The combination with the boiler having a water-column attached thereto and in open communication therewith at top and bottom, 65 said water-column having a tubular valve-seat at the upper end thereof, a float arranged in said water-column and having a valve at the top extending up into said tubular valve-seat and a coil of steam-pipe extending from 70 said water-column to said valve-seat and adapted to be closed by the float-valve, a governor comprising a cylinder and piston and valve for closing return flow of water from the pump to the supply-tank, a pump and 75 pipes for conducting the water from the tank thereto and thence to both the boiler and tank, the coil of pipe effecting a quick condensation of steam to reduce the steam-pressure in said coil and permit an opening of the 80 governor-valve, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of March, 1900.

JOHN C. BLEVNEY.

Witnesses:

CHARLES H. PELL,  
C. B. PITNEY.