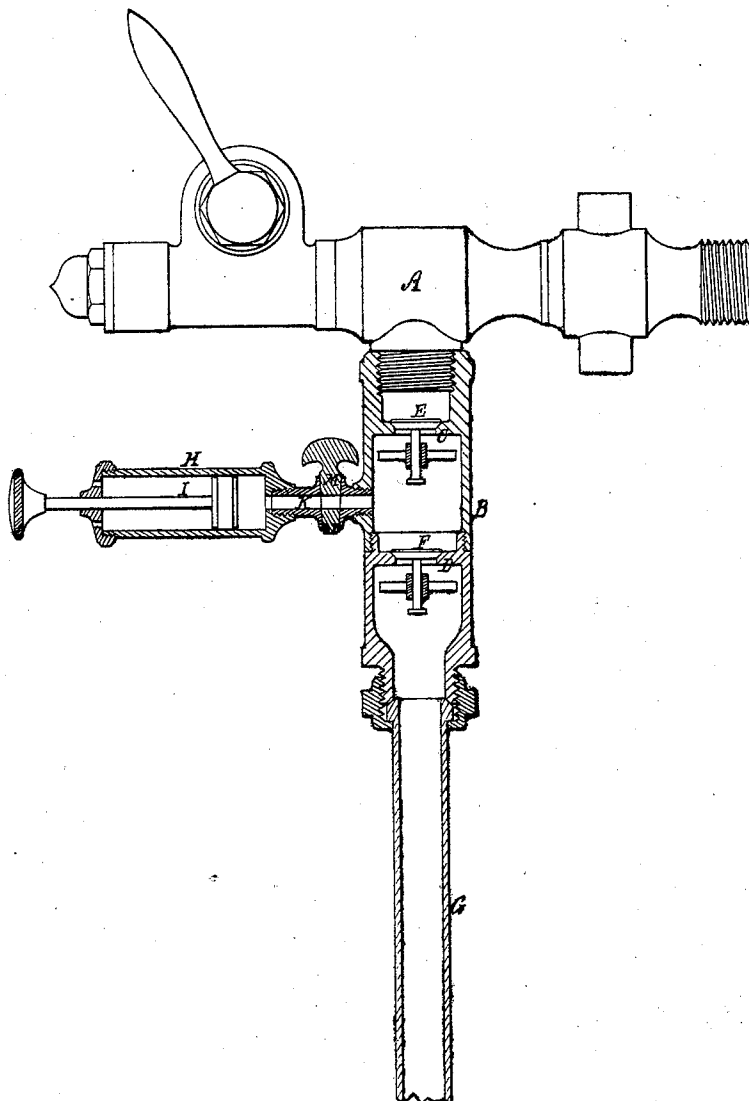


W. T. MESSINGER.
STEAM BOILER INJECTOR.

No. 170,756.

Patented Dec. 7, 1875.



Witnesses.
L. W. Piper
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UNITED STATES PATENT OFFICE.

WILLIAM T. MESSINGER, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN STEAM-BOILER INJECTORS.

Specification forming part of Letters Patent No. **170,756**, dated December 7, 1875; application filed September 21, 1875.

To all whom it may concern:

Be it known that I, WILLIAM T. MESSINGER, of Boston, of the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement on Injectors for Steam-Boilers; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, which is a side view of an injector, with my addition or additions thereto in section.

The invention is applicable to most, if not all, the steam-boiler injectors in use, and particularly to that shown in the United States Patent No. 157,105, dated November 24, 1874, and granted to William Randall.

In carrying out my invention, as hereinafter explained, I combine with an injector a force-pump applied thereto and to the water-induction pipe thereof; and, furthermore, I combine with the injector and the force-pump a cock applied to the neck of the barrel of the pump; and I compose the said force-pump of a valve-case, and valves, and a separate barrel and piston, all being arranged and applied substantially as hereinafter set forth.

In practice it is found that, after a common steam-boiler injector becomes highly heated by the steam, it is liable to be inoperative, owing to the imperfect condensation of the steam in it, and the consequent want of vacuum necessary to raise the water.

In order to obviate this difficulty, it has been customary, during its existence, to apply to the outer surface of the injector a sponge or cloth saturated with cool water.

The object of my addition to the injector is to render unnecessary such applications of cool water, all of which I accomplish by means of a force-pump applied to the induction-pipe and opening therefrom into the injector, such pump being provided with two valves.

By moving the piston of the pump-barrel back and forth therein the water will be raised in the induction-pipe and discharged into the injector, from which it will be forced by the action of the steam.

Thus, in case of the injector getting too hot, and imperfect vacuum resulting therefrom in it, we have only, by means of the pump, to force water up into the injector, whereby it will be cooled, so as to cause the steam to condense, and the water, by pressure of the atmosphere, to rise into the injector.

In the drawing, A denotes an injector, hav-

ing combined with it a valve-case, B, containing two valve-seats, C D, and two valves, E F, thereto, each valve being to open or rise upward off its seat. There is coupled to the lower end of the valve-case an induction-pipe, G, and such case is furnished with a pump-barrel, H, provided with a piston, I. This pump barrel opens into the side of the case by means of a tube or conduit, K, provided with a stop-cock, M, all being substantially as represented in the drawing.

The valve-case, furnished with one or more valves, arranged in it as shown, may, without the pump-barrel and piston, be employed to advantage with the injector and its water-induct, as, in case of imperfect vacuum resulting, the valve or valves will serve to prevent the water from falling back or down in the induction-pipe. The addition of the pump-barrel and piston, however, enables the water to be thrown up into the injector, so as to effect the proper cooling of it, and condensation of the steam, as occasion may require.

The stop-cock serves to intercept connection between the valve-case and the pump-barrel, as may be necessary to prevent air from leaking by the piston into the valve-case.

From the above it will be seen that the valve-case, its valves, valve-seats, pump-barrel, and piston constitute a force-pump interposed between the injector and its induction-pipe, and serving to raise water in such pipe and into the valve-case, and to force it from the latter into the injector.

I claim—

1. The combination of a steam-boiler injector, A, and a force-pump applied thereto and to the water-induction pipe of said injector, all being substantially as and for the purpose specified.

2. The combination of a steam-boiler injector, A, and a force-pump applied to it and its induction-pipe G, as described, with a cock, M, arranged between the pump-barrel H and its valve-case B, and in their connecting-conduit K, as specified.

3. The combination of the pump-barrel H and valve-case B, connecting-conduit K and the stop-cock M, all being arranged substantially in manner, and for application to a steam-boiler injector and its induction-pipe, as described.

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