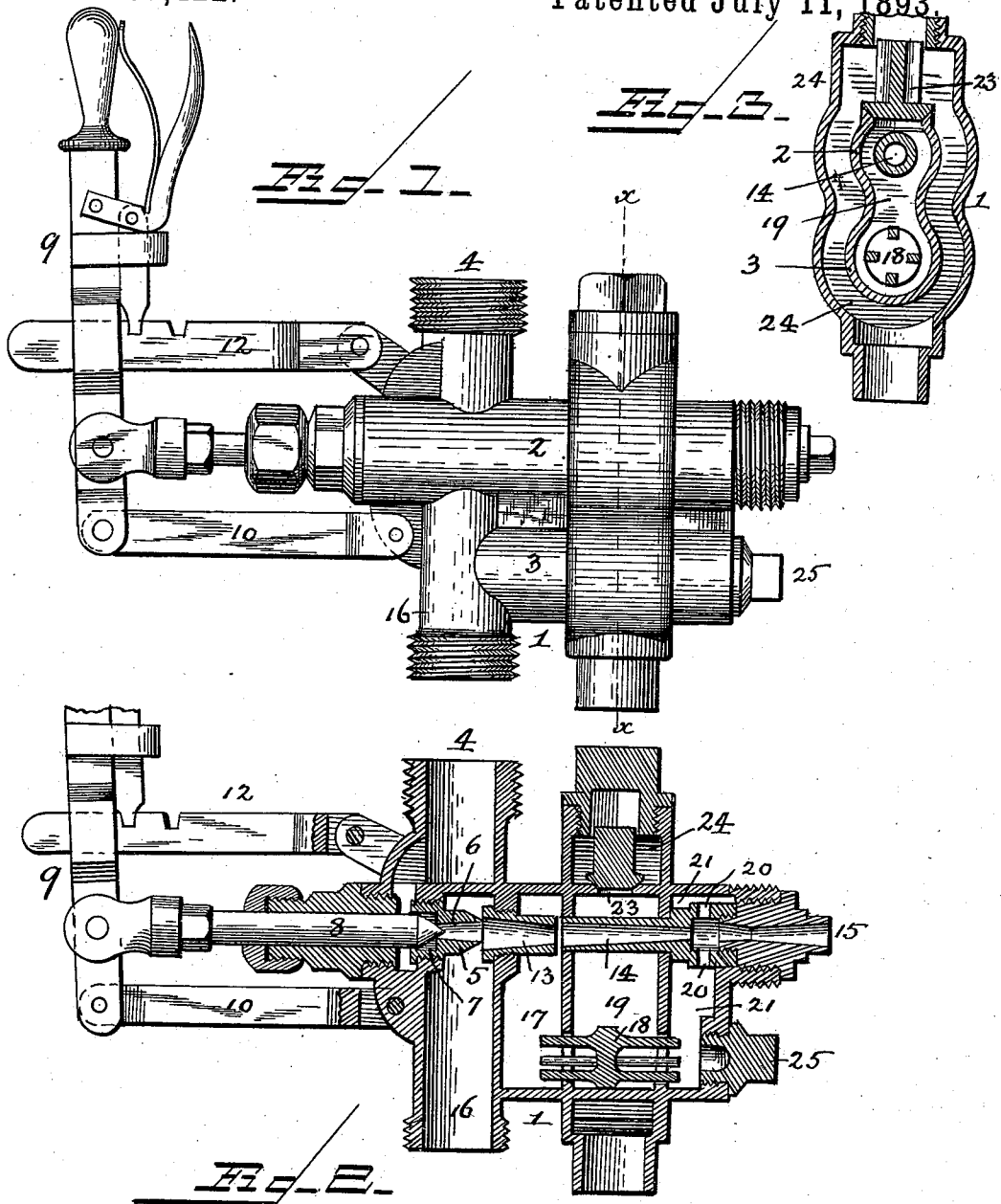


(Model.)

P. P. HOGUE.
INJECTOR.

No. 501,422.

Patented July 11, 1893.



WITNESSES
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UNITED STATES PATENT OFFICE.

PARKER P. HOGUE, OF CINCINNATI, OHIO.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 501,422, dated July 11, 1893.

Application filed April 29, 1893. Serial No. 472,421. (Model.)

To all whom it may concern:

Be it known that I, PARKER P. HOGUE, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Injectors; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in injectors for steam boilers and its object is to provide a novel and a new construction of the same whereby superior results are obtained with respect to efficiency in operation.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings: Figure 1 is an elevation of an injector constructed in accordance with my invention. Fig. 2 is a central longitudinal section of the same. Fig. 3 is a cross section on the line $x-x$, Fig. 1.

In the said drawings the reference numeral 1 designates the shell or case of the injector, comprising two barrels, an upper barrel 2 and a lower barrel 3.

The numeral 4 designates the steam supply pipe or tube adapted to be connected with a steam boiler, and communicating with the steam jet pipe 5, located in the upper barrel. This pipe is formed with the usual flaring mouth, and also with a cylindrical counter-bore 7, to receive the needle pointed end of a cylindrical valve 8, connected with an operating lever 9, pivoted to a bar 10 secured to the injector case. Passing through a slot in this lever is a bar 12, pivoted to the injector case and formed with a series of notches with which engages a spring actuated latch pivoted to said lever. The object of the counter-bore in the steam jet pipe is to aid in making a steam tight joint when the valve is closed.

Located in front of the steam jet pipe is the water lifting tube 13, and in front of this tube is the combining tube 14, communicating with the delivery tube 15 leading to the boiler.

The numeral 16 denotes the water supply

tube connected with any suitable source of water supply.

Communicating with the upper barrel, just in front of the water lifting tube is an exhaust chamber 17, leading to the lower barrel and communicating by means of a wing valve 18, with a chamber or passage-way 19 leading around and above the combining tube. In front of the combining tube the upper barrel is formed with openings 20 communicating therewith and also with an exhaust chamber or passage-way 21 leading to and communicating with chamber 19. The lower walls of this chamber are formed with apertures in which is seated the horizontally movable wing valve 18, and in the upper end of the chamber is a vertically movable valve 23, by which communication is opened and closed with a chamber or passage-way 24, extending around the upper and lower barrels and communicating with the atmosphere at the under side of the lower barrel.

The numeral 25 designates a removable screw plug to allow the valve 18 to be inserted in place and also forms a stop for said valve.

The operation is as follows: Steam is admitted into the steam jet through steam supply pipe by unlatching the handle and by a backward movement thereof opening the needle valve. The steam will then pass through the water lifting tube, and through the combining tube and down through exhaust chamber 17, moving valve 18 off its seat and establishing communication with exhaust chamber 19, as also does the steam which passes through the combining tube and escapes through the openings 20 into the chamber 21. The steam thus admitted to the chamber 19 passes up around the combining tube, out of relief valve 23, into chamber 24 and down and around the two barrels and out into the atmosphere. When the steam has passed through the jets and exhaust chambers a sufficient length of time to exhaust the air from the pipe connected with the water supply, the water will flow up to the injector through the lifting tube and the greater portion of it will pass through the combining tube, out through the openings 20, down through exhaust chamber 21, into chamber 19, closing check valve 18, and holding it to its seat until the water

gets sufficient velocity to overcome the boiler pressure. It will then continue on through the delivery tube into the boiler and as the water ceases to flow through the chambers 17, 21 and 19 valve 18 is left seated submerged in water and remains seated until the device is stopped or started or by accident the water supply ceases.

In locating valve 18 underneath the relief valve a great advantage is gained in that should any dirt get on the seat of valve 18, and relief valve should seat properly the injector would work with good results, but should there be an independent opening out into the air, the injector would not work, and such result would also follow should the relief valve from any cause be held from its seat. It will therefore be seen that the injector has two chances in which to work, and that the check valve 18 is especially advantageous in starting the injector, as it keeps the water from working back through the combining tube.

From the above it will be seen that I provide an injector, prompt and energetic in its

action when started and entirely automatic in its operation. Scale, dirt and other impurities are also prevented from accumulating on the check valve seat so that said valve when seated always forms a tight joint.

Having thus described my invention, what I claim is—

In an injector the combination of the two barrels, located one above the other, and the steam jet, lifting jet and combining tube all in the upper barrel. Of the chamber surrounding the combining tube having a vertically movable valve in its upper end and an automatic horizontally movable valve at its lower end in said lower barrel and the chambers at each side of said chamber communicating respectively with the lifting and combining tubes; substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses:

PARKER P. HOGUE.

Witnesses:

W. E. RANDLE,
D. C. DUGAN.