(Model.) 2 Sheets—Sheet 1.

L. E. HOGUE.

INJECTOR.

No. 263,410. Patented Aug. 29, 1882.

Fig. 1.

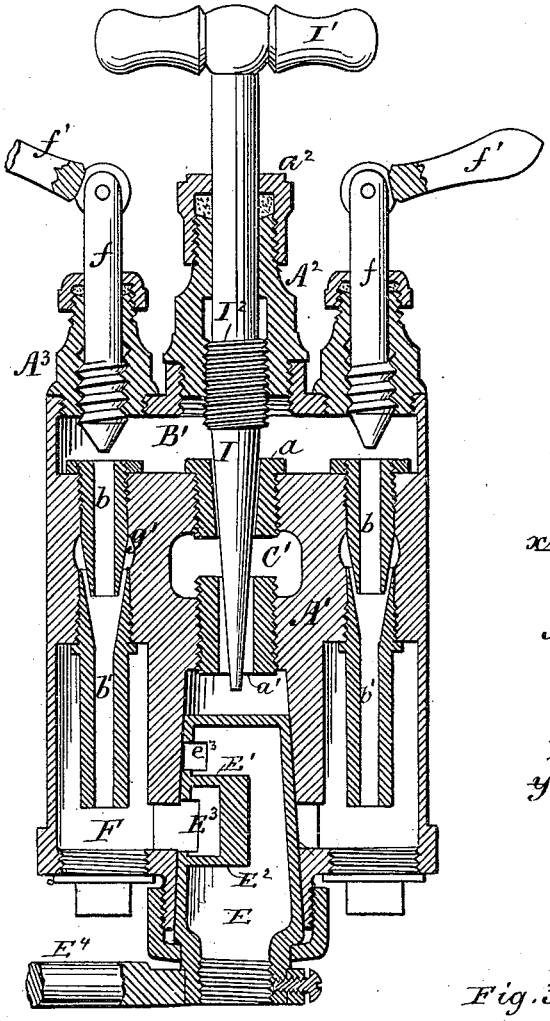


Fig. 2.

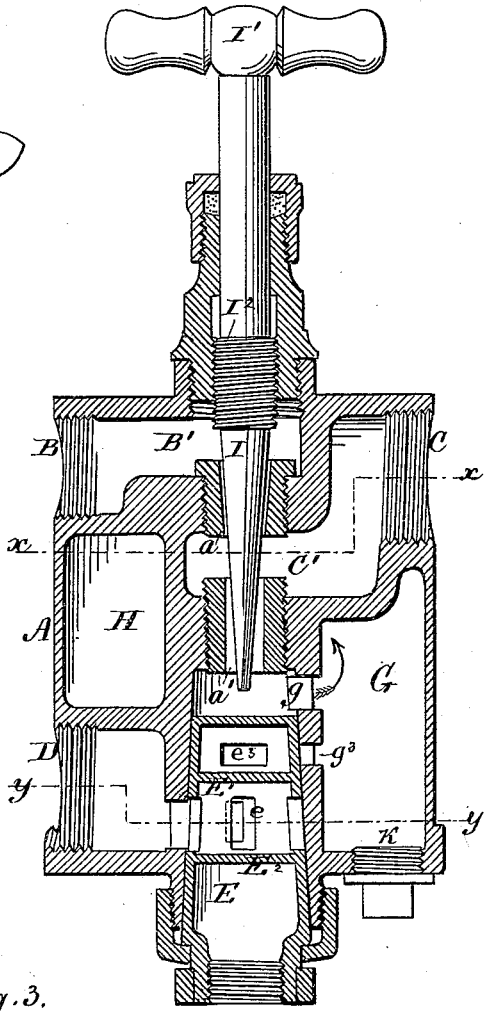
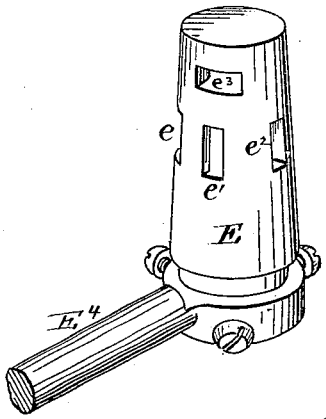


Fig. 3.



Witnesses:
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C. C. Shepherd

Inventor:
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by James C. Boyce
Atty.

(Model.) 2 Sheets—Sheet 2.

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Fig. 4.

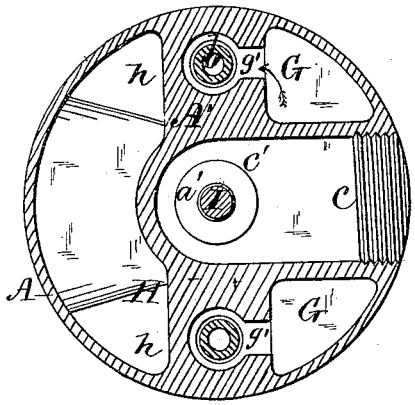
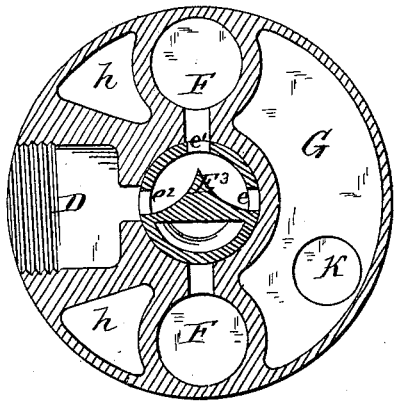


Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

LOVREN E. HOGUE, OF SANDY LAKE, PENNSYLVANIA.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 263,410, dated August 29, 1882.

Application filed February 1, 1882. (Model.)

To all whom it may concern:

Be it known that I, LOVREN E. HOGUE, a citizen of the United States, residing at Sandy Lake, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Injectors, of which the following is a specification.

My invention relates to injectors in which the amount of water passing through the device is regulated by means of a three-way cock; and the objects of my improvements are to provide an injector with a three-way cock located centrally on the axis thereof, and also to provide said device with means independent of said cock to regulate the admission of steam and water therein, and consequently the water raising or forcing power of the apparatus, as may be desired. I attain these objects by the device illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section taken through the lifting and forcing tubes of the injector. Fig. 2 is a vertical section taken at right angles with the section in Fig. 1. Fig. 3 is a perspective view of the three-way plug removed from the device. Fig. 4 is a horizontal section on line *x x* of Fig. 2, showing the water-passages leading to the lifting and forcing tubes. Fig. 5 is a horizontal section on line *y y* of Fig. 2, showing the passages controlled by the three-way cock, the latter being in this case so turned as to place one of the forcing-tubes in communication with the boiler and close the other as well as the overflow-passage.

In said drawings, A represents the shell, made in the form of a cylinder, having on one side an opening, B, for the admission of steam into the injector, the steam being conducted to said opening B through suitable pipes from the dome or other steam part of the boiler. Water is admitted into the injector through the opening C, made in the side of the shell, preferably diametrically opposite the opening B, through which steam is admitted, and the discharge-opening D is placed under but at some distance below the steam-opening B. The amount of water brought to the discharge-opening D is controlled by the cock E, placed in line with the axis of the device, said cock being provided with three openings, *e*, *e'*, and e^2, at substantially the same height to direct water from either one or both of the forcing-tubes E through the discharge-opening D, and suitable pipes leading to the bottom of the boiler or to some other point where it may be desired to have a rapid stream of water. The interior of the shell is divided vertically into two main chambers by the partition A', forming the walls of the forcing-tubes. One of these is the chamber G, made to receive the water admitted through the lifting-tube *a'*, and the other is an air-chamber, H, permanently open and in communication with the surrounding air by means of the openings *h* in the bottom of said air-chamber. The surrounding air, being thus free to pass in and out of the case, tends to keep it cool, as it is desired that it should be for the proper working of the injector. For the same reason the steam-chamber B' is made small, and the greater portion thereof lies directly on top of the air-chamber. The nozzles *a* and *a'* of the lifting-tube are controlled by the conical spindle I, forming therewith annular openings, the size of which can be regulated by turning the handle I' on top of the spindle, as said spindle carries a screw-thread, I^2, that engages with the thread cut within the interior of the cap A^2, the latter being also provided with a stuffing-box, a^2.

Each forcing-tube is composed of two nozzles, *b* and *b'*, screwed one above the other in an opening formed within the partition A'. The water-passage *g'*, leading from the water-chamber G, being just above the top of the lower nozzle, *b'*, the water is admitted in an annular stream around the lower end of the upper or steam nozzle, *b*. Each one of these steam-nozzles *b* is controlled by the conical extremity of a screw-spindle, *f*, passing through a cap, A^3, secured to the top of the injector. Each cap is provided with a stuffing-box, and each spindle *f* has a handle, *f'*, by which means it can be operated and the size of the opening admitting steam into the nozzle *b* be regulated.

The cock E has two transverse partitions, E' and E^2, extending about two-thirds across its interior above and under an angular or pointed vertical partition, E^3, to direct the water issuing from the side of either one or both

of the forcing-tubes to the delivery-opening D. The cock E is also provided with an opening, e^3, that can be put in communication with the opening g^3, leading from the water-chamber, and allow the overflow of said chamber to escape in the rear of the partition E and out through the bottom of the cock adjacent to the handle E^4.

In the bottom of the water-chamber there is a screw-tapped opening, K, to which a hose may be attached for use in case of fire or for other purposes; or it may be used for overflow and may be provided with a stop-cock.

In operating with this injector the opening B is put in communication with the steam-space of a boiler, the opening D with the water-space of the boiler, and the opening C with the source of water-supply. Then both of the forcing-tubes' nozzles *b* being closed, the long spindle I is elevated sufficiently to admit an annular stream of steam through the nozzle *a*. The steam draws the water into the chamber C′, and forces it through the nozzle *a′* upon the top of the cock E and through the side opening, *g*, into the water-chamber G, and from the top of the latter (see Fig. 4) through the passages *g′*, leading into the forcing-tubes, and from either one or both of the forcing-tubes through the openings *e*, *e′*, or e^2, and chamber formed by the partitions E′, E^2, and E^3 of the cock to the opening D, leading to the boiler.

The drawing Fig. 5 shows the cock E turned so as to put only one of the forcing-tubes in connection with the boiler; but it is clear that it can be turned so as to put both forcing-tubes in connection with the boiler.

Having now fully described my invention, I claim—

1. In an injector, the combination of a cylindrical shell provided with steam and water passages, a lifting-tube and forcing-tubes, and a conical spindle in the axis of said shell at one end and a three-way cock at the other end, substantially as and for the purposes described.

2. In an injector, the combination of a shell provided with steam and water passages and a steam-chamber at one end with a partition, A′, provided with forcing-tubes, a water-chamber, G, on one side of said partition, and an air-chamber, H, provided with openings *h*, substantially as and for the purposes set forth.

3. In an injector, the combination of a shell provided with steam and water passages, two forcing-tubes controlled by independent spindles, a lifting-tube spindle entering the nozzles *a* and *a′* between the forcing-tubes, and a three-way cock, substantially as and for the purposes described.

4. In an injector, the combination of a lifting-tube and forcing-tubes controlled by independent spindles with a cock provided with transverse partitions E′ and E^2, and longitudinal angular guide E^3, substantially as and for the purpose described.

5. In an injector, the combination of a lifting-tube and forcing-tubes controlled by independent spindles with a cock provided with three openings, *e e′* e^2, in the same transverse plane, substantially as and for the purpose set forth.

LOVREN E. HOGUE.

Witnesses:
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