(Model.)

P. P. HOGUE.

INJECTOR.

No. 436,601. Patented Sept. 16, 1890.

Fig. 1.

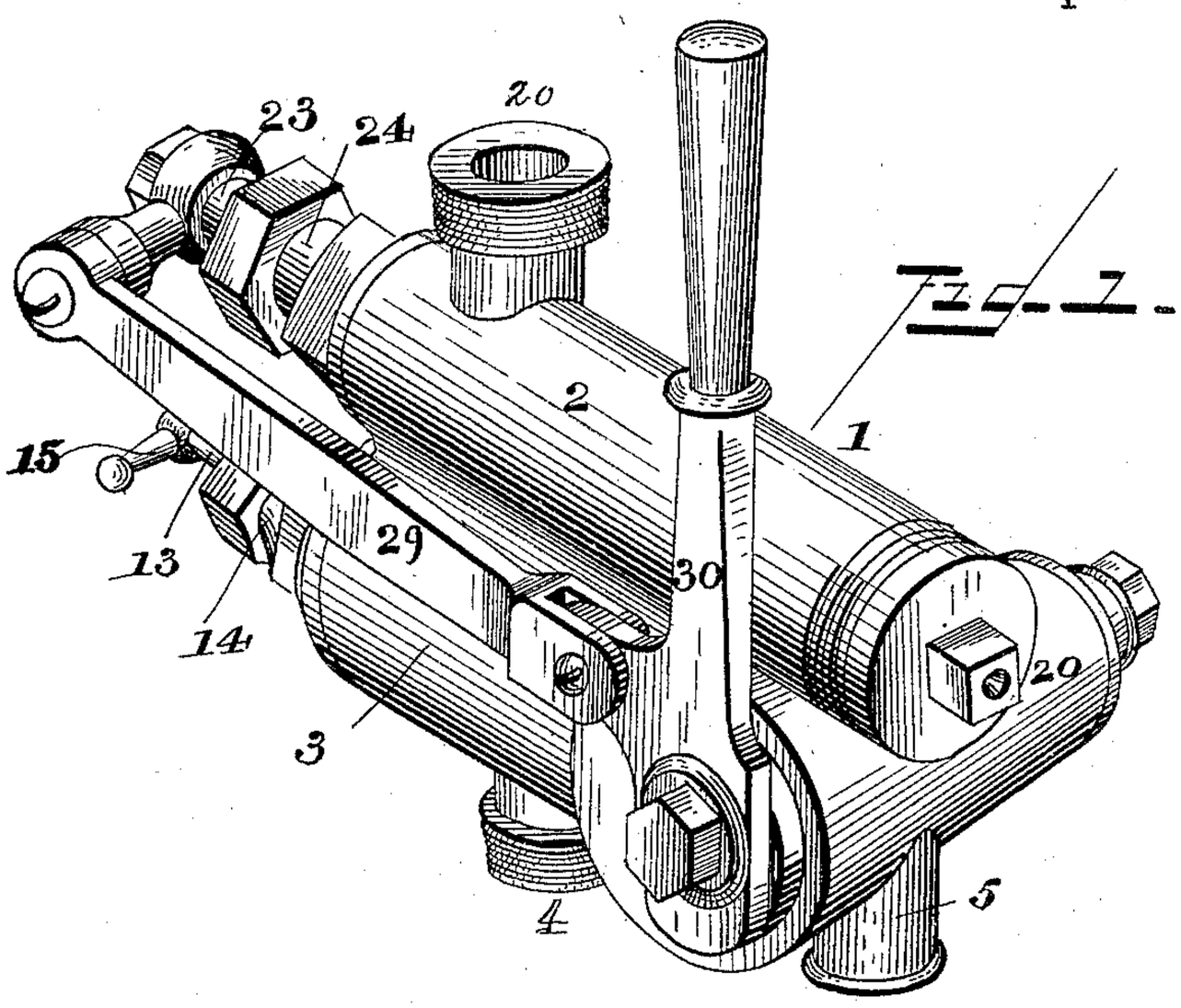
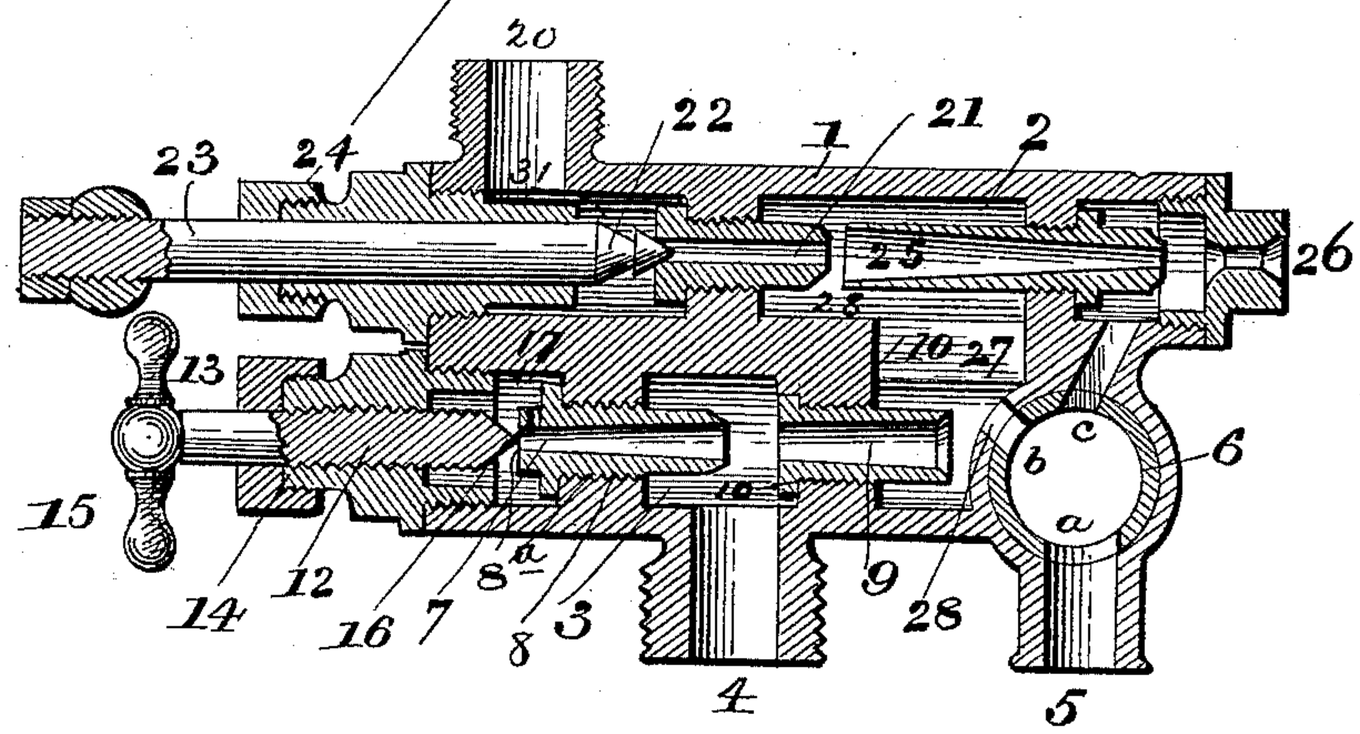


Fig. 2.



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UNITED STATES PATENT OFFICE.

PARKER P. HOGUE, OF PITTSBURG, PENNSYLVANIA.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 436,601, dated September 16, 1890.

Application filed May 16, 1890. Serial No. 352,011. (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 Pittsburg, in the county of Allegheny and State of Pennsylvania, 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 injectors for steam-boilers, and its object is to provide a simple and economical device of this class which shall possess advantages over and be superior to others now in use.

The invention consists in the novel construction and combination of parts hereinafter fully described, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 represents a perspective view of an injector constructed in accordance with my invention. Fig. 2 is a central vertical section of the same.

In the said drawings, the reference-numeral 1 designates the casing of my improved device, consisting of two tubes or cylinders 2 and 3, connected together with passages or communications therebetween, as will hereinafter appear. The cylinder 2, which contains the devices for ejecting or lifting the water from the source of supply, is provided with a water-entrance 4 and an overflow 5, in the latter of which is arranged a three-way cock 6, having the ports or openings *a b c*. At the inner end of the water-entrance is secured a steam-jet pipe 7, by means of the screw-threads 8, and between this jet-pipe and the overflow is a water-delivery pipe 9, similarly connected with the casing by means of screw-threads 10, and terminating a short distance in front of the overflow. The tube or pipe 7 has a tapering bore, and its inlet is closed by means of conical valve 12, formed by beveling or tapering the end of the valve-stem 13, so as to fit therein. This valve-stem works through a stuffing-box 14, and is provided with an operating-handle 15. Upon its upper side, just in front of the inlet-opening, the tube 7 is provided with a smaller opening 16. Both of these openings communicate with the steam-passage 17, the opening 8^a being closed when high steam is employed, the smaller opening 16 then serving as the inlet. When low steam is used, the opening or inlet 8^a is opened, and both openings then serve as inlets. The casing 3 is provided with a steam-entrance 20, connected with the steam-space of the boiler by means of a tube provided with an ordinary stop-cock. (Not shown.) The casing is provided with a steam-jet tube 21, which is closed by means of the double-tapered valve 22, formed on the end of valve-stem 23, working in a stuffing-box 24. This tube 21 terminates just in front of the tapered delivery-tube 25, which in turn communicates with the ejector-tube 26, leading to the boiler, a passage 27 being between the feed and delivery tubes and communicating with the three-way cock in the overflow. A passage 28 is also between the jet and delivery tubes, which leads to the water-delivery tube 9, and also communicates with the three-way cock. The valve-stem 23 is connected by means of rod 29 with a lever 30, secured to the stem of the three-way cock, so that said valve-stem and cock are actuated simultaneously by operating said lever.

The operation of the device will be readily understood. Steam being admitted to casing 3 through the steam-ports, will pass by passage 31 to the steam-jet tube 7, which will cause water from the water-supply to be ejected into casing 2 and be forced out through the ports *a* and *c* of the three-way cock. If the lever 30 be now actuated to open the valve in the steam-jet pipe 21, the ports *a* and *b* of the three-way cock will be closed and the water will be forced through delivery-tube 25 into feed-tube 26, and from thence be injected into the boiler.

From the foregoing it will be seen that there is no pressure against the three-way cock, and it also serves the twofold purpose of closing port *a* and shutting off communication with the water-passage in the casing, and it also closes port *b*, whereby air is prevented from being ejected into the boiler. It will also be noted that by means of the differential openings in the jet-tube 7 provision is made for using either high or lower pressure steam, thus enabling a higher lift to be made with

lower steam than is possible in devices of this class in ordinary use. The double taper of the valve 22 also causes the same to be automatically sealed by steam-pressure should the valve be moved a trifle from its seat. By means of the front taper also the steam is admitted slowly in starting, which is an important advantage.

There are other advantages possessed by my invention which will be apparent to those skilled in the art, and which need not be enumerated here.

Having thus described my invention, what I claim is—

1. The combination, with the duplex casings or cylinders having steam and water entrances and overflow, of the three-way cock located in the overflow, the steam-jet tube with differential openings located in the casing in proximity to the water-entrance, a water-delivery tube, and a valve and valve-rod for opening and closing one of said differential openings, substantially as described.

2. The combination, with the duplex casings or cylinders having the steam and water entrances and overflow, of a three-way cock located in the overflow, a steam-jet tube and water-delivery tube located in proximity to the water-entrance, a steam-jet tube and delivery and feed pipes in the other casing, a double tapering valve for opening and closing said last-mentioned steam-jet tube, and a connecting rod and lever for actuating said valve and the three-way cock simultaneously, 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:

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