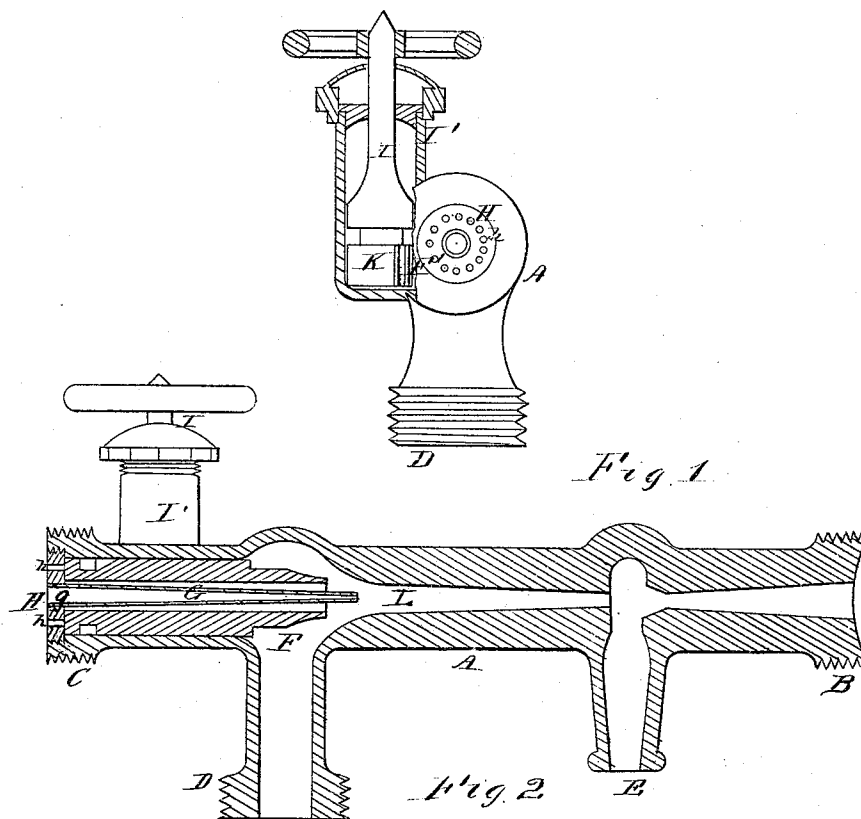


J. B. RYNER, J. FARLEY & D. FERGUS.

Injectors for Steam-Boilers.

No. 151,440.

Patented May 26, 1874.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES B. RYNER, JAMES FARLEY, AND DAVID FERGUS, OF PHILADELPHIA,
PENNSYLVANIA, ASSIGNORS OF ONE-FOURTH THEIR RIGHT TO ELIASHIP
TRACY, OF SAME PLACE.

IMPROVEMENT IN INJECTORS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **151,440**, dated May 26, 1874; application filed
March 13, 1874.

To all whom it may concern:

Be it known that we, JAMES B. RYNER, JAMES FARLEY, and DAVID FERGUS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Injectors for Steam-Boilers; and we 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a transverse section, and Fig. 2 a longitudinal section, of our invention.

Our invention has for its object to produce a cheap and simple injector for steam-boilers; and the nature of our invention consists in the peculiar construction and combination of parts, as hereinafter fully described, having reference particularly to the employment of a steam-jet operating in connection with a sliding plug, so arranged that it can be moved to control said jet by opening or closing apertures in a perforated disk or head, through which the steam is admitted.

In the accompanying drawing, A represents the body of the injector, of which B is the end that connects with the pipe leading into the boiler, and C the end by which connection is made with the steam-pipe. D is a branch connecting with the water-reservoir, and E an exit-port for the overflow. F is a tubular plug inserted in the steam end of the injector; and G is a fine tube inserted in the same end of the injector, and passing through the plug F. H is a disk or head screwed into or otherwise inserted in the end of the body A, provided with apertures or perforations, *h*, and a central opening, on which is made fast the tube or jet G. I is a shaft or spindle, fitted in a suitable box or bearing, I', and terminating in a toothed wheel or segment, K, which meshes with a rack, F', on the tubular plug F, so that on turning said shaft I by means of its handle, the plug F will be moved away from or toward the disk or head H, as may be required. The inner end of the jet or tube G extends, as is seen, beyond the end of the plug F (which is shouldered and made tapering for the purpose of reducing the supply of water to be fed into the boiler) in the tapering chamber L.

The operation is as follows: The injector being in position, the end of the plug F resting against the disk H, so as to close up the apertures *h* in said disk, steam is admitted at *g* into the jet or tube G, creating a vacuum in the chamber L, and drawing water through the pipe at D, which at first passes out of the overflow-port E. The handle I is then turned, moving the plug F away from the disk H, and allowing the steam to enter through the orifices *h*, and pass through said plug into the tapering chamber L. The motion of the shaft I is continued, and the plug F moved away from the disk H until water ceases to escape from the plug-flow port, at which stage the injecting operation will be progressing in a perfect manner.

While injecting is going on, should water begin to flow from the port E, the handle I will be turned to move the plug F toward the disk H until the overflow ceases.

The advantages of our improvements are briefly as follows: First, the arrangement of the plug F, moved by the toothed spindle, is such that the jarring motion to which locomotive-engines are constantly subjected will not disturb the operation of the injector, which will thus be always ready for work. Second, the same jet serves to create the vacuum and to assist to carry the water into the pipe leading to the boiler; nor is it necessary, as in other cases, to have a vacuum-jet and a separate valve to introduce a current of steam to raise and carry the water. Third, the jet being stationary, it is always in the proper position to produce a vacuum, and the additional steam necessary to carry the water into the boiler is obtained by simply moving the sliding plug without affecting the position or operation of the jet.

What we claim as our invention is—

The combination, with a stationary perforated disk, H, applied to an injector, as shown, of an adjustable plug, F, inclosing the steam-jet G, as shown and described.

In testimony that we claim the foregoing we have hereunto set our hands this 24th day of February, 1874.

JAMES B. RYNER.
JAMES FARLEY.
DAVID FERGUS.

Witnesses:
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T. A. CONNOLLY.