

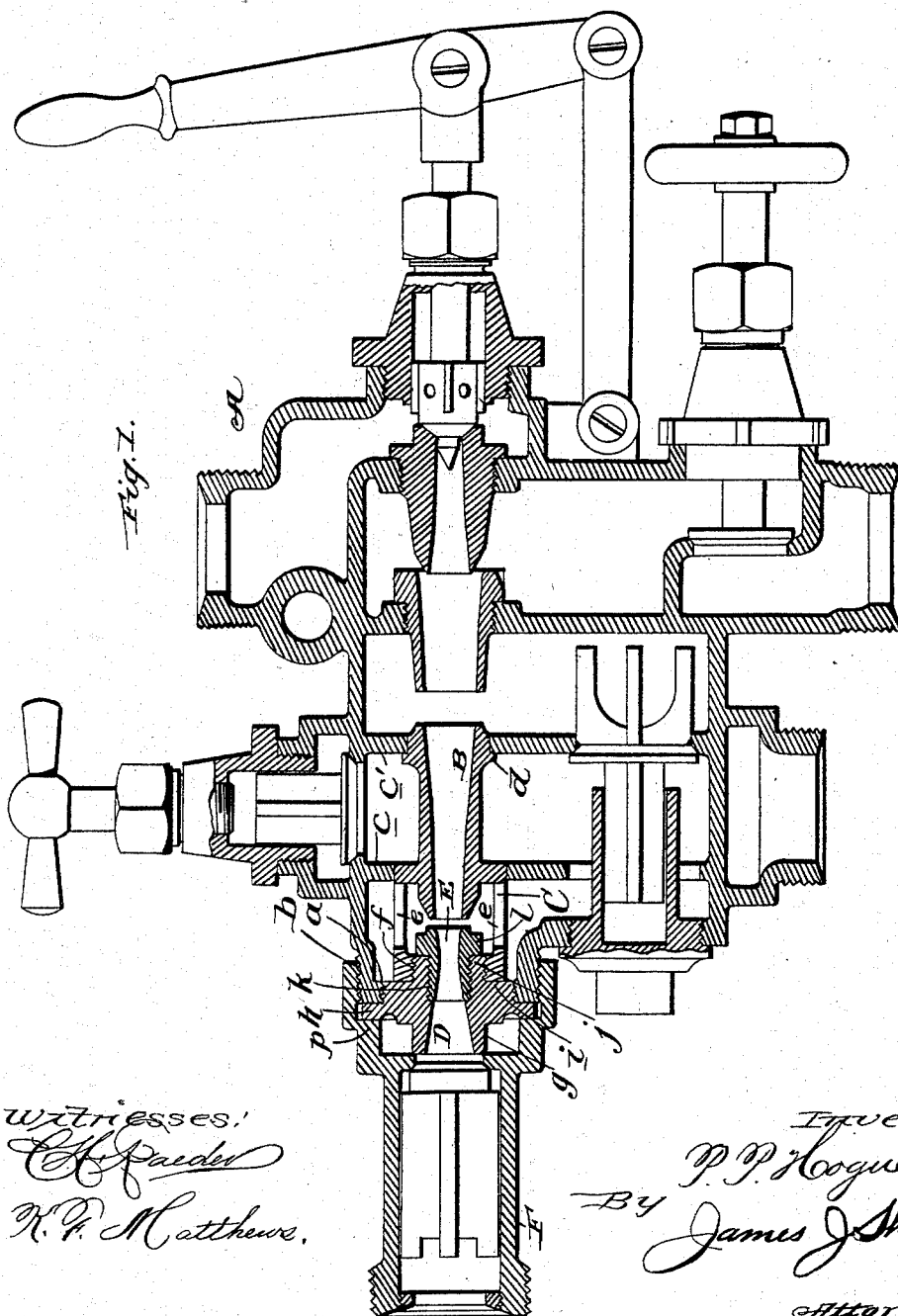
(Model.)

2 Sheets—Sheet 1.

P. P. HOGUE.
INJECTOR.

No. 527,493.

Patented Oct. 16, 1894.



Witnesses:

C. Paeder

H. P. Matthews.

Inventor

P. P. Hogue

By

James J. Shuchy

Attorney

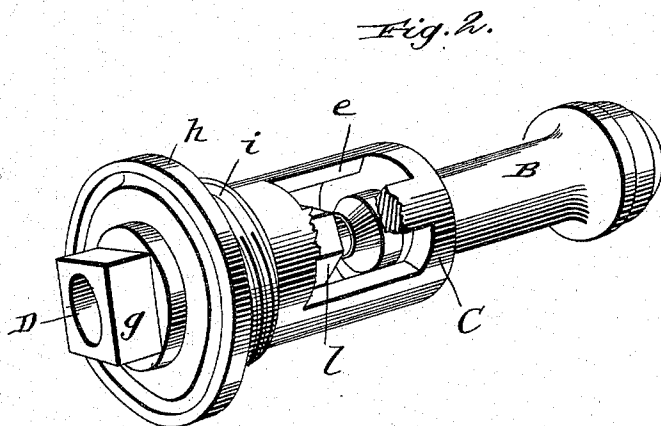
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R. F. Matthews.

Inventor

P. P. Hogue

By James J. Sheehy

Attorney

UNITED STATES PATENT OFFICE.

PARKER PILLSBURY HOGUE, OF CINCINNATI, OHIO, ASSIGNOR TO THE
AUTOMATIC INJECTOR COMPANY, OF OHIO.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 527,493, dated October 16, 1894.

Application filed April 24, 1894. Serial No. 508,833. (Model.)

To all whom it may concern:

Be it known that I, PARKER PILLSBURY HOGUE, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Injectors; and I do 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 appertains to make and use the same.

My invention relates to improvements in feed water injectors for steam boilers; and it has for its general object to provide an injector embodying a removable end-piece or bushing carrying a removable delivery tube and detachably connected to a removable combining tube, whereby the combining tube and the delivery tube may be removed together from the shell or casing of the injector by simply removing the end-piece or bushing and may then be readily and separately disconnected from said end-piece or bushing for repairs or to give place to new parts.

With the foregoing ends in view the invention will be fully understood from the following description and claims when taken in connection with the accompanying drawings, in which—

Figure 1, is a longitudinal section of an injector embodying my invention, and Fig. 2, is a detail perspective view illustrating the end piece or bushing, the delivery tube and the combining tube as they appear when removed together from the shell or casing of the injector.

The injector A, illustrated in the said drawings is similar in general principle and construction to that disclosed in my Letters Patent No. 501,422 of July 11, 1893, and it is provided at the feed end of its shell or casing with interior and exterior threads *a*, *b*, and is also provided with apertured partition walls *c*, *c'*, in which is mounted the removable combining tube B. This combining tube B, is provided adjacent to its inner end with a shoulder *d*, designed to limit its inward movement, and it is also provided with the forwardly extended cylindrical portion C, which has ports as *e*, communicating with one of the chambers of the shell or casing, and interior

threads *f*, which latter are designed for the engagement of the end piece or bushing D whereby it will be seen that the end piece or bushing may be directly connected to the combining tube, that is to say without the connection of another part between them. The said bushing or end piece D, is provided with a squared portion *g*, designed to afford an engagement for a wrench, and with the flange *h*, designed to abut against the feed end of the injector casing, and it has the reduced and threaded portion *i*, designed to engage the threads *a*, of said casing, and the further reduced and threaded portion *j*, which is designed to engage the threads in the portion C, of the combining tube so as to effect a detachable connection between the end piece or bushing and the tube. The nut or bushing D, is furthermore provided with a threaded bore as *k*, for the reception of the exteriorly threaded delivery tube E, which rests adjacent to the discharge end of the combining tube and has an angular shoulder or head as *l*, designed to bear against the inner end of the nut or bushing and also designed to afford a hold for a wrench. This delivery tube E, on account of the velocity of the water passing through it, is more likely to wear than any other part of the injector, and I therefore contemplate making it of hard metal in order to prolong its usefulness. This may be done without materially increasing the cost of the injector as my improved delivery tube, on account of its small size, embodies but a small amount of metal; and when desired an engineer can conveniently carry one or more of the delivery tubes in his pocket so that he can readily replace the tube in the injector when necessity demands it.

E, indicates the line check or pipe which is arranged intermediate of the feed end of the injector casing and the boiler. This line check or pipe is provided at one end with interior threads designed to engage the exterior threads *b*, of the injector casing, and it is also provided with a shoulder *p*, which bears against the flange *h*, of the end piece or bushing D, so as to make a tight joint and prevent said end piece or bushing from working loose.

It will be understood from the foregoing that the combining tube is simply mounted in and not connected to the partition walls of the injector, and it will therefore be seen that when the line check or pipe is disconnected, the combining tube may be removed with the end piece or bushing by simply applying a wrench to the portion *g*, of the latter and turning the same outwardly. When the directly connected piece or bushing and the combining tube are removed from the shell or casing, the combining tube alone may be disconnected from the end piece or bushing and a new combining tube placed in position without disturbing any of the other parts. When the combining tube has been disconnected from the end piece, the delivery tube which embodies but a minimum amount of metal and is not connected to the combining tube, may be readily disconnected from the end piece or bushing and a new delivery tube may be placed in position if necessary.

The removal of the connected parts from the shell or casing and their after disconnection as well as the connection of a new part when necessary, may be effected without the aid of any implement other than a common wrench, and it will therefore be appreciated that an engineer can repair the injector when it fails to work without loss of time, which is a desideratum.

By reason of my improvements the injector can be quickly and easily repaired by the engineer at but a slight cost and the usefulness of the injector as a whole prolonged for an indefinite period of time, which is the desideratum in this class of devices.

While I prefer to arrange the delivery tube *E*, with its head *l*, bearing against the inner end of the end piece or bushing as before described, I do not desire to be understood as confining myself to such disposition of the tube as in some cases it may be arranged with its head *l*, bearing against the outer end of the end piece or bushing so as to admit of its being removed without disconnecting the end piece or bushing from the combining tube.

I have in some respects specifically described the construction and relative arrangement of the parts comprised in my improvements, in order to impart a full and exact understanding of the same, but I do not desire to be understood as confining myself to such specific construction and arrangement as such changes or modifications may be made in practice as fairly fall within the scope of my invention. I also do not desire to be understood as confining myself to the use of my improvements in the type of injector shown in the drawings, as they may be employed in any injector to which they are applicable.

Having described my invention, what I claim is—

1. A feed water injector for steam boilers comprising a removable end piece or bushing having a threaded bore, and an exteriorly-threaded and removable delivery tube arranged in said bore and connected to the end piece or bushing alone and not connected to or engaging any other part, substantially as specified.

2. A feed water injector for steam boilers comprising a shell or casing having interior and exterior threads at its feed end, a removable end piece or bushing carrying a removable delivery tube and having exterior threads to engage the interior threads of the casing and also having a flange *h* adapted to abut against the end of said casing, and the line check or pipe having interior threads to engage the exterior threads of the casing and also having a shoulder *p*, adapted to bear against the flange of the end piece or bushing, substantially as and for the purpose set forth.

3. A feed water injector for steam boilers comprising a casing, a removable combining tube, and a removable end piece detachably connected directly to the combining tube, whereby the end piece and combining tube may be together removed from the casing and then disconnected, substantially as specified.

4. A feed water injector for steam boilers comprising a casing, a removable combining tube arranged in said casing, a removable end piece or bushing detachably connected directly to the combining tube, and a delivery tube carried by and detachably connected to the end piece or bushing, whereby the combining tube, the end piece or bushing, and the delivery tube may be together removed from the casing and the combining tube and delivery tube then disconnected from the end piece or bushing, substantially as specified.

5. A feed water injector for steam boilers comprising a casing, a removable combining tube arranged in said casing and having the extended and interiorly threaded cylindrical portion *C*, the removable end piece or bushing detachably connected to the casing and having exterior threads to engage the threads of the portion *C*, and also having an interior threaded bore, and an exteriorly threaded delivery tube arranged in the bore of the end piece or bushing, substantially as specified.

6. The herein described feed water injector for steam boilers comprising a shell or casing having interior threads at its feed end, the removable combining tube arranged in the shell or casing and having the extended and interiorly threaded cylindrical portion *C*, the end piece or bushing *D*, having exterior threads to engage the threads of the casing and tube portion *C*, and also having the angular portion *g*, and flange *h*, and the interior threaded bore, and the exteriorly threaded delivery tube adapted to take into said bore and having an angular head or shoulder, substantially as and for the purpose set forth.

7. A feed water injector for steam boilers comprising a casing, a removable combining tube arranged in said casing and having the extended and interiorly threaded cylindrical
5 portion C, and the removable end piece or bushing detachably connected to the casing and having exterior threads to engage the threads of the casing and also exterior threads

to engage the portion C, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

PARKER PILLSBURY HOGUE.

Witnesses:

W. J. DAVIDSON,
GEORGE ROST.

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