

M. D. STRICKLAND.
Injector.

No. 218,080.

Patented July 29, 1879.

FIG. 1.

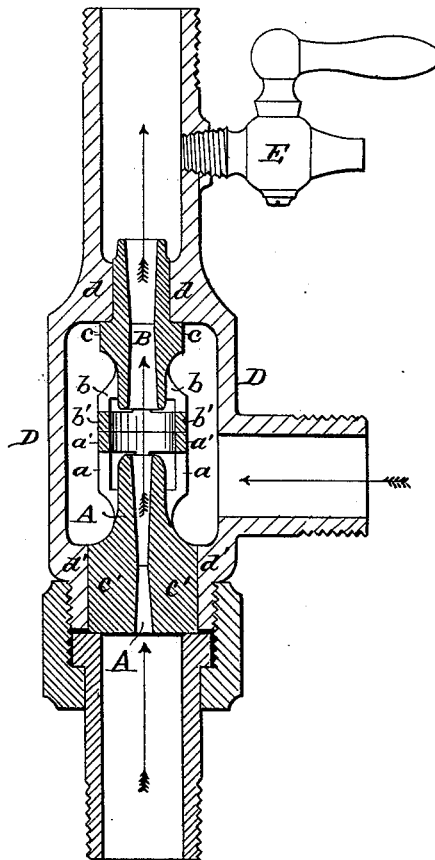


FIG. 2.

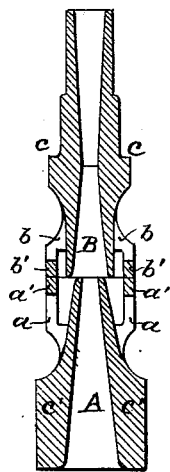
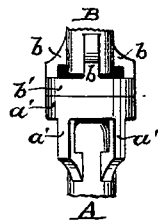


FIG. 3.



ATTEST:

Robert Burns
Louis Pauernheim

INVENTOR:

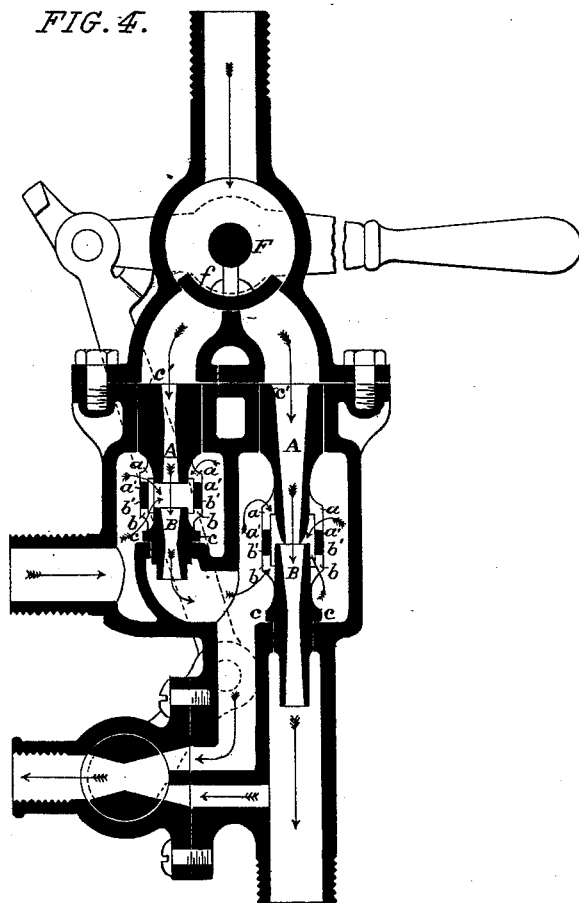
Morgan D. Strickland

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FIG. 4.



ATTEST:

INVENTOR:

Robert Burns -
Louis Dauernheim

Morgan D. Strickland

UNITED STATES PATENT OFFICE

MORGAN D. STRICKLAND, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN INJECTORS.

Specification forming part of Letters Patent No. **218,080**, dated July 29, 1879; application filed May 9, 1879.

To all whom it may concern:

Be it known that I, MORGAN D. STRICKLAND, of the city of St. Louis, in the State of Missouri, 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 same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates to an injector of a cheap, durable, and effective construction, and which is not liable to become disarranged or inoperative when in use or in putting the device together; and this invention consists in providing both the steam-nozzle or jet-tube and the water-nozzle or combining-tube with skeleton connecting or distance pieces on the adjoining ends, so that after the tubes are properly bored and finished said distance-pieces can be brazed or otherwise united to them, to form the said jet-tube and combining-tube into a single piece or fixture, which, when placed in a suitable casing, can be used as an injector, as will hereinafter more fully appear.

In the drawings, Figure 1 is a vertical section illustrating my invention arranged as a single-acting injector. Fig. 2 is a vertical section of the steam-jet and combining-tube specially constructed for injectors purposes. Fig. 3 is a detail side elevation of the same. Fig. 4 is a vertical section, showing my invention as applied to a double-acting injector.

As shown in the drawings, the steam-jet tube A is provided at its end with skeleton-arms *a*, at the end of which is an annular rim or flange, *a'*, and similarly the water or combining tube B is provided with skeleton-arms *b* and rim or flange *b'*. The flanges or rims *a'* *b'*, after the tubes A B are properly bored and finished, are brazed together, so as to form a single fixture.

The preferred manner of carrying out my invention, as shown in the drawings, consists in forming an annular ring, *a' b'*, at the end of the tubes A B, which are brazed together, as before described; but it is evident that the ends of the skeleton-arms *a b* can be constructed so as to screw or be bolted together and effect the same purpose.

The combined steam-jet and combining-tube so formed is provided with shoulder *c* and enlarged head *c'*, so that it will fit the contracted portions *d d'* of the casing D, and be held in position therein when the parts are connected together.

In Fig. 1 I show a casing, D, which, with the jet and combining tubes A B, constructed as shown in said figure, can be used as a steam water-elevator, and when the tubes constructed as shown in Fig. 2 are substituted, with the addition of an overflow-pipe and valve E, the device can be used as an injector or boiler-feeder when the water-supply is above the boiler.

In Fig. 4 I have shown my invention as applied to the construction of injectors for which Letters Patent of the United States No. 208,437 were issued to me September 24, 1878. Both the water-elevating tubes and the water-forcing tubes are formed under my improved construction, and are held in position by the steam-passage castings, as indicated in the drawings.

In the said Fig. 4 I have shown a modification of the plug-valve used to control the direction of the steam to the injector. It consists of a curved plate or slide, *f*, having side lugs, between which engages a bar projection of the operating-stem F.

By this construction it will be seen that the force of the steam tends to keep the valve to its seat, and that any liability of the valve sticking in its seat by expansion is entirely prevented, which was a very objectionable feature met with in the construction of valve shown in my former patent.

The advantages of my improved construction are as follows: First, the tubes can be adjusted and arranged when manufactured for proper and effective working, and then permanently secured in such position, and thus avoid the danger of being again improperly adjusted when the apparatus is taken apart for cleaning, &c.; second, the tubes can be easily and readily removed when worn, and new ones substituted in their place; third, it is cheaper and more durable, and there is less likelihood of the tubes being set out of line with each other.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The steam-jet and combining tubes A B, held in proper relative position by skeleton uniting-arms, substantially as and for the purpose set forth.

2. The combination of the tubes A B and skeleton-arms *a b*, with annular rings *a' b'*, brazed together, as and for the purpose set forth.

3. The combination of the steam-jet and combining tubes A B, having shoulder *c* and head *c'*, with the casing D, having contracted portions *d d'*, as and for the purpose set forth.

In testimony of said invention I have hereunto set my hand.

MORGAN D. STRICKLAND.

In presence of—

ROBERT BURNS,

LOUIS DAUMHEIM.