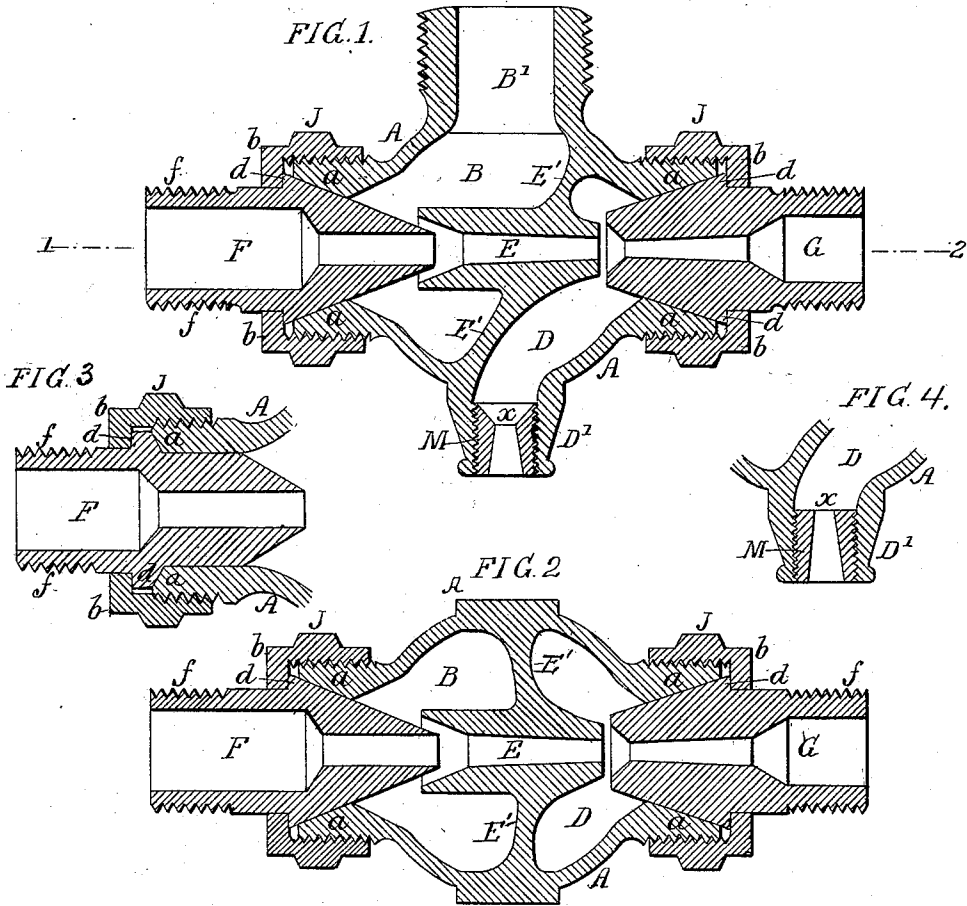


(Model.)

J. DIMELOW.
INJECTOR.

No. 280,589.

Patented July 3, 1883.



WITNESSES:
Hamilton D. Turner.
Harry Drury

INVENTOR:
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By his attys.
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UNITED STATES PATENT OFFICE.

JAMES DIMELow, OF WILMINGTON, DELAWARE, ASSIGNOR TO THE DELAWARE STEAM APPLIANCE COMPANY, OF SAME PLACE.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 280,589, dated July 3, 1883.

Application filed February 26, 1883. (Model.)

To all whom it may concern:

Be it known that I, JAMES DIMELow, a subject of the Queen of Great Britain and Ireland, and a resident of Wilmington, Delaware, have invented certain Improvements in Injectors, of which the following is a specification.

The objects of my invention are to simplify the construction of the injector, and to dispense with a valve for preventing drip from the overflow-tube when the injector is in action. These objects I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of an injector with my improvements; Fig. 2, a sectional plan of the same on the line 1 2; Figs. 3 and 4, views illustrating modifications of the invention.

In Figs. 1 and 2, A is the main shell or casing of the injector, having the usual water-chamber, B, with branch B', overflow-chamber D, with branch D', and combining-tube E, connected to the shell by the partition E' and separating the two chambers. F is the steam-cone, and G the forcing-cone, the steam and water passages of which may be constructed in any suitable manner. In each end of the casing is formed a tapering seat, *a*, that at one end of the casing being adapted for the reception of the steam-cone F and that at the opposite end for the reception of the forcing-cone G, each seat and the exterior of each cone being rendered perfectly true by grinding or otherwise, so that a steam or water tight joint will be formed when the cones are forced into their seats. This confinement of the cones to the seats is effected by means of nuts J, adapted to the threaded branches of the casing A, and having flanges *b* bearing against shoulders *d* on the cones. Each cone has a threaded projection, *f*, whereby connections can be made to the steam and discharge pipes, the usual independent couplings for this purpose being dispensed with.

In Fig. 3 I have shown a modification of the invention in which the seat in the end of the casing is adapted for the reception of a flange on the steam-cone, a portion of the body of the latter in this case being cylindrical.

In the overflow branch D' of the injector is

a plug, M, whereby the discharge-passage of said branch is contracted at *x*, the passage flaring outwardly from this point to the bottom or discharge end. The passage also flares from the contracted portion *x* to the inner end of the plug M; but this flare serves simply to direct the water to the point *x*, and is not essential, for the plug may be made as shown in Fig. 4, and yet attain the main object of this feature of my invention, which is to prevent the dripping of water from the overflow branch when the injector is in action, and yet permit a free flow of water from said branch before the flow through the injector has been established. Ordinarily a valve is used for this purpose, the valve being opened by the pressure of water in the first instance, but being closed by a light spring as soon as the flow through the injector begins. This discharge passage I make on the principle of the *vena contracta*, or, as it is sometimes termed, "ajutage," (see Knight's Dictionary, page 55)—that is to say, the passage flares at a certain angle outwardly from the contracted point *x*. It is well known that a passage of this shape will discharge water or other liquid more rapidly than a simple opening of the diameter of the portion *x*, or than a uniform passage of the same diameter; but by applying the principle to the overflow-passage of an injector I attain a double result—that is to say, I am enabled, without the use of a valve, to provide for a free flow of water from the overflow-chamber prior to the starting of the injector, and yet prevent the dripping of water after the injector has been started, for the aperture *x* can be of such limited area that the inflow of air through the same will be sufficient to prevent the escape of any water from the chamber D. A passage of the desired form may be made directly in the overflow branch D'; but the use of the plug M is preferred in all cases as the readiest means of forming the contracted passage.

I claim as my invention—

1. The shell or casing A, having the opposite water and overflow chambers B and D, with branches B' D', and having the central combining-tube, E, connected to the shell by the partition E', whereby the chambers B and D are separated from each other, as set forth.

2. The combination of the casing A, having the combining-tube E, water-chamber B, overflow-chamber D, and opposite end seats, *a a*, with the steam and forcing cones F and G, adapted to said seats *a*, and having flanges *d* and threaded projections *f*, and with the flanged nuts J, whereby said cones are secured to the opposite ends of the casing A, as set forth.
3. An injector having a valveless overflow-

chamber, the discharge-passage of which forms 10 a *vena contracta*, or ajutage, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES DIMELOW,

Witnesses:

HARRY DRURY,
HARRY SMITH.