(Model.)

J. DESMOND.

INJECTOR.

No. 336,398. Patented Feb. 16, 1886.

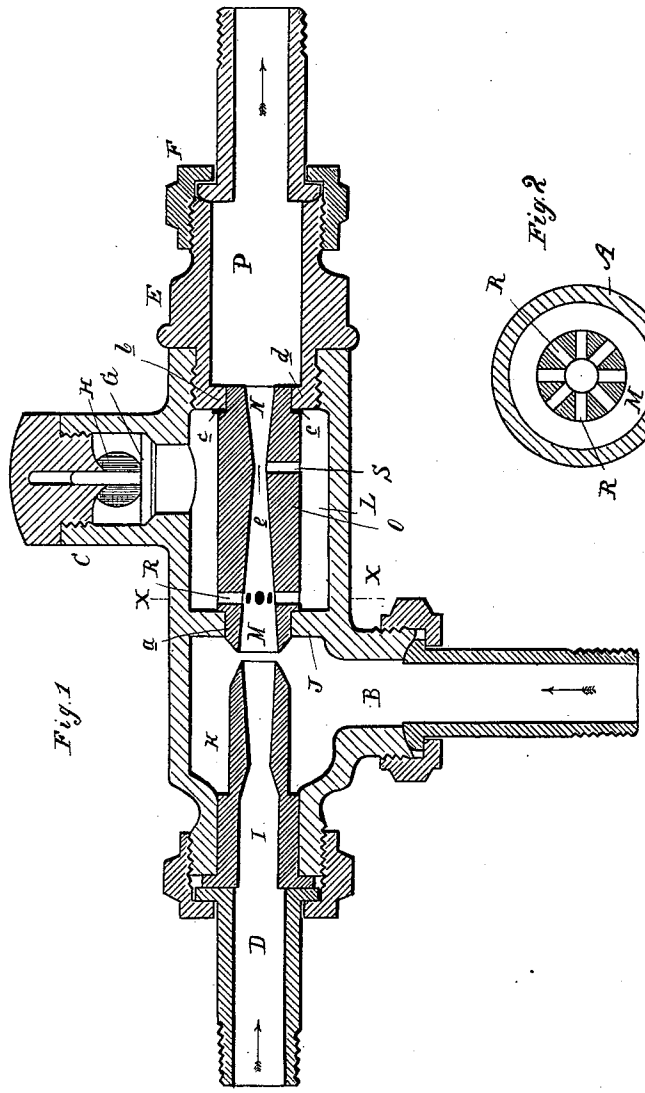


Fig. 1

Fig. 2

Attest:
John Schuman.
Thos. J. Sprague

Inventor:
John Desmond.
by his Att'y
Thos. J. Sprague

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN DESMOND, OF DETROIT, MICHIGAN, ASSIGNOR TO ROE STEPHENS, OF SAME PLACE.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 336,398, dated February 16, 1886.

Application filed October 8, 1885. Serial No. 179,307. (Model.)

To all whom it may concern:

Be it known that I, JOHN DESMOND, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Injectors; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a new and useful improvement in injectors for feeding boilers; and the invention consists in the peculiar arrangement and construction of the parts, as hereinafter described, and pointed out in the claims.

The object of my invention is to construct a lifting injector composed of fewer parts and of a simpler construction than any heretofore constructed.

In the drawings which accompany this specification, Figure 1 is a vertical central longitudinal section of my improved injector. Fig. 2 is a cross-section on the line *x x* in Fig. 1.

A is the tubular main casting or shell of the injector. This is provided with inlet and discharge openings at the ends, and has the lateral branches B and C.

D is a suitable coupling by means of which the steam-pipe which conveys the steam from the boiler is connected to the inlet-opening of the shell.

E is a hollow screw-plug secured in the discharge-opening of the shell A, and forms a discharge-chamber, P.

F is another suitable coupling, by means of which the discharge end of the hollow screw-plug E is connected to the feed-pipe which conveys the feed-water into the boiler.

The lateral branch B forms the inlet-opening for the supply-water and connects with the water-supply pipe to the well.

The lateral branch C forms a chamber and seat for the overflow-valve G, and is provided with the outflow H for the overflow.

I is the steam-nozzle, removably secured in the inlet-opening of the shell.

J is a diaphragm-plate formed integrally with the shell A. It divides the chamber K, which communicates with the water-supply from the overflow-chamber L, which communicates with the overflow-outlet H whenever the overflow-valve G is raised off its seat.

M is the combining-tube, and N is the discharge-tube. These tubes are combined into one piece, O, of cylindrical form, provided with necks *a* and *b* at the ends.

The diaphragm-plate J is provided with a central opening, into which the neck *a* of the tube O is fitted, so as to make the forward end of the combining-tube project slightly within the chamber K, and in proximity to and directly opposite and in line with the discharge end of the steam-nozzle. The neck *b* of the tube O is fitted into a corresponding opening of the flange-bushing *d*, which latter is formed at the inner end of the screw-plug E, and packing *c* may be used to form a tight joint.

The cylindrical tube O forms a dividing-wall between the annular overflow-chamber L and between the combining-tube M and delivery-tube N, through which the following passages are provided. Near the base of the combining-tube M communication is established between the interior of the combining-tube and the overflow-chamber L by means of a series of radial holes, R, formed through the wall of the combining-tube as near its base as practicable.

S is an overflow-passage formed through the wall of the tube O and affording communication between the overflow-chamber L and the throat *e*, which forms the intermediate connection between the combining-tube and discharge-tube.

The operation of the injector is as follows: Steam being at once fully admitted into the injector it will quickly force its way through the steam-nozzle into the combining-tube and from there through the passages R into the overflow-chamber, and, after raising the valve G, out into the air through the opening H. As there is an ample and free exit for the steam which passes through the steam-nozzle into the combining-tube, there will be a strong aspiration into the combining-tube and the water in the supply-pipe will be raised. If the distance is within the ordinary limit, the water will be raised into the water-chamber K, and from there be drawn through the combining-tube into the overflow-chamber, and escape

through the opening H. As the velocity of the water in the combining-tube increases, the port S, in affording further relief, will throw the whole combining-tube into operation until the velocity of the water becomes sufficient to force it against the boiler-pressure, when the overflow ceases, and the valve G will close under the action of the vacuum created.

The advantage of the simplicity of my apparatus is not only evident in point of manufacture, but in its operation it will keep its priming much longer than a more complicated one.

What I claim as my invention is—

1. In an injector, the combination, with the inclosing-case, of a diaphragm-partition forming a division-wall between the water-inlet chamber and the overflow-chamber, and combining and discharge cones made in one piece, and having relief-passages R and S within the overflow-chamber, substantially as and for the purposes specified.

2. In an injector, the combination, with the inclosing-case having the diaphragm-partition J, provided with a central opening, of combining and discharging cones made in one piece, and provided with the necks *a b* of the plug E, having flanged bushing *d*, all arranged substantially as described.

3. In an injector, the combination of the main casting A, having inlet and discharge openings and lateral branches B C, of a diaphragm-plate forming a water-inlet chamber at one end and an overflow-chamber at the other end, of a steam-nozzle secured in the water-chamber, of combining and discharge cones made in one piece, and provided with relief-passages R and S, of the plug E, having the flanged bushing *d*, and of the overflow-valve G, all arranged substantially as shown and described.

JOHN DESMOND.

Witnesses:
A. BARTHEL,
H. S. SPRAGUE.