(Model.)

A. LAMBERT.

STEAM INJECTOR.

No. 401,565. Patented Apr. 16, 1889.

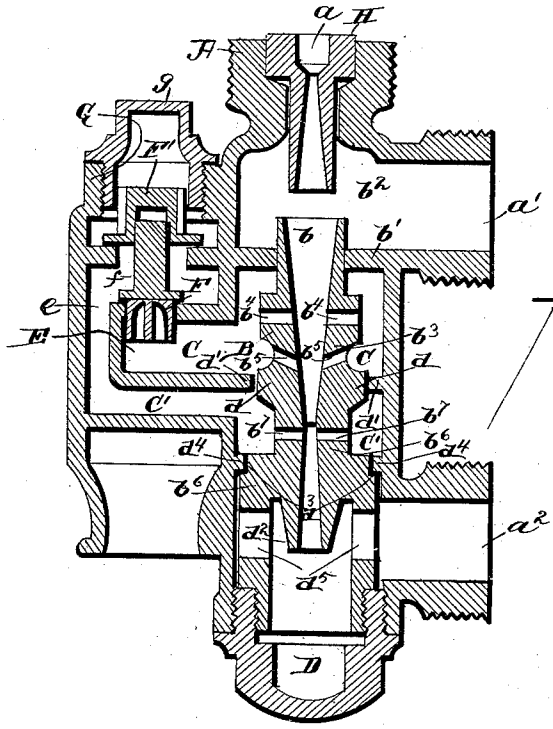


FIG. 1.

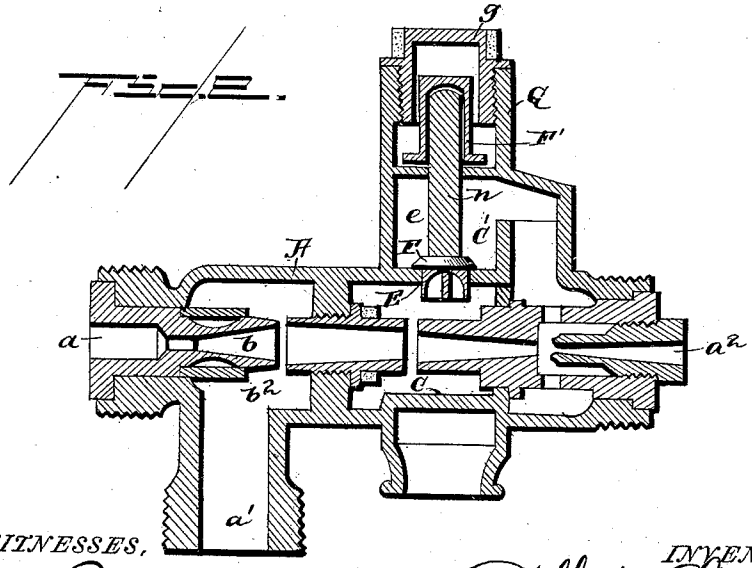


FIG. 2.

WITNESSES,

M. A. Dumphrey.

J. H. Boden

INVENTOR,

Albert Lambert

By Myers & Co

Attorneys.

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

UNITED STATES PATENT OFFICE.

ALBERT LAMBERT, OF WADSWORTH, OHIO.

STEAM-INJECTOR.

SPECIFICATION forming part of Letters Patent No. 401,565, dated April 16, 1889.

Application filed September 12, 1888. Serial No. 285,223. (Model.)

To all whom it may concern:

Be it known that I, ALBERT LAMBERT, a citizen of the United States of America, residing at Wadsworth, in the county of Medina and State of Ohio, have invented certain new and useful Improvements in Steam-Injectors, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention pertains to certain new and useful improvements in steam-injectors, having for its object the provision of an injector whose tubes are made of one piece of metal, and also the provision of two inner overflow-chambers emptying into a common overflow-pipe and having valves moving simultaneously.

To these ends the invention comprises the details of construction, combination, and arrangement of parts, substantially as hereinafter fully set forth, and particularly pointed out in the claim.

In the accompanying drawings, Figure 1 is a vertical sectional view of my improved steam-injector, showing the same in an upright or vertical position. Fig. 2 is a longitudinal sectional view of a modified form of my invention, showing the same in a horizontal position.

Referring to the drawings, A indicates the shell or casing; a, the steam-inlet arm; a', the water-inlet arm, and a^2 the delivery-arm.

B designates the series of tubes made in one piece of metal. The lifting-tube b fits snugly in an aperture of wall b', and opens into the water-supply chamber b^2. The combining-tube b^3 projects from this lifting-tube, a series of overflow-ports, b^4, making the point of connection between said lifting and combining tubes. A second series of ports, b^5, are formed in combining-tube b^3, and these and the ports b^4 open into the overflow-chamber C. A circular flange, d, of combining-tube b^3 bears against flanges d' of shell or casing A, thus dividing said shell centrally into the overflow-chamber C and the exhaust-chamber C'. The delivery-tube b^6 projects from combining-tube b^3, a third series of ports, b^7, making the point of connection. These latter ports open into exhaust-chamber C'. The lower portion d^2 of delivery-tube b^6 is diametrically enlarged, and its shoulder d^3 bears firmly against a flange, d^4, of shell A. This enlarged portion d^2 of the delivery-tube is extended beyond the inner tubular portion of said tube, and is provided with a series of holes or apertures, d^5, opening into the delivery-arm a^2, leading to the boiler. The lower end of this enlarged portion d^2 is externally screw-threaded, and a plug, D, is screwed thereon and then screwed into the end of the injector, whereby the tubes are held in their proper positions.

An overflow passage-way, E, extends from chamber C, while a similar passage-way, e, extends from exhaust-chamber C', and into this latter passage-way opens the former through an opening controlled by a valve, F, the spindle f of which works in an upper valve, F', located over an opening that leads to the overflow arm or branch G, made or formed with one side of the injector. From this it will be seen that the overflow from chamber C will effect the raising of valve F, which will cause the elevation of the upper valve, F', the movement of which is guided by a plug, g, screwed in said overflow arm or branch. The overflow from chamber C' can effect the raising of the upper valve, F', independent of valve F, as is obvious.

The advantages of this invention will be apparent, and it will be seen that upon starting the injector steam entering through the inlet jet-tube H will enter the forcing and combining tubes, and passing through their overflow-ports will effect the raising of valves F F', causing a vacuum in the water-supply chamber and the elevation of water thereinto.

In the establishment of the jet some water will pass through ports b^7 into the exhaust-chamber and from thence out through the overflow. When the jet is established, the valves F F' will close and the water will be forced with the steam to the boiler. By making the tubes solid or in one piece the same can be readily removed for cleansing or renewal.

In Fig. 2 I have shown a modification of my invention, the injector being placed in a horizontal position. In this form of my invention the passage-way E, leading from overflow-chamber C, is formed immediately over the latter, and into it opens the passage-way e from exhaust-chamber C'. The lower overflow-valve, F, has an elongated stem, n, fitting

in the upper overflow-valve, F′, so as to effect the simultaneous moving of said valves.

I have herein shown the series of jets and tubes separate, as it is obvious that the same can be used in lieu of the connected tubes.

I claim as my invention—

In an injector, the combination of the casing having the upper and lower overflow-chambers, *c c′*, the overflow arm or branch formed at one side of said casing, the passage-ways E *e*, leading from said overflow-chambers, the lower valve, F, having a projecting spindle, and the upper valve wherein said spindle works, said valve being seated over the respective openings of the passage-ways E *e*, substantially as set forth.

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

ALBERT LAMBERT.

Witnesses:

F. W. KREMER,

JOHN A. CLARK.