

J. DESMOND.
STEAM INJECTOR.

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STEAM-INJECTOR.

SPECIFICATION forming part of Letters Patent No. 303,366, dated August 12, 1884.

Application filed December 4, 1883. (Model.)

To all whom it may concern:

Be it known that I, JOHN DESMOND, a citizen of the United States of America, residing at Jackson, in the county of Jackson and State of Michigan, 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.

My invention relates to an improvement in steam-injectors; and it consists in the chamber A, cylindric valve-chamber B, steam-conduit C, chamber-tube *a*, nozzle *b*, steam-valve D, steam-pipe E, having pipe-coupling E', connecting-tube B', water-supply pipe F, pipe G, having pipe-coupling G', valve G'', elbow-joint pipe H, injecting-valve K, compound lever K', and in the combination and arrangement of the parts, substantially as hereinafter more fully shown and described.

In the drawings, Figure 1 is a perspective. Fig. 2 is an elevation in section, and Figs. 3 and 4 are detail views.

In the construction of my steam-injector I cast integral with chamber A the steam-conduit C, opening into the front part of chamber A at C', and into the chamber B at C'', thus connecting the front part of chamber A with the steam-valve D, and also cast integral with chamber A the steam-valve chamber D, having steam-pipe E secured thereto by means of pipe-coupling E'. Chamber A has also cast integral therewith or rigidly secured therein tube *a* in wall *a'*, and nozzle *b*, opening at one end into valve-chamber B, and from thence curved and projected to nearly connect with the nozzle *b'* of the connecting-tube B'. The water-supply pipe F, opening into chamber A, is connected therewith by means of pipe-coupling F' and the outflow-pipe G by means of pipe-coupling G', the latter pipe being provided with the outlet-valve G'', which is closed during the process of injecting water into the boiler. The cylindric steam-valve chamber B is closed on one side by the screw-cap D', having recess F'', (see Fig. 4,) which recess furnishes in part the bearings of the valve-rod *d*, having shoulder *d'*, and is closed on its opposite side by the screw-cap *d''*, having flange *d'''*, and connects with steam-pipe E, having pipe-coupling E'. The steam-valve D consists of valve-rod

d, having cast integral therewith the circular disk *e*, having recess *e'*, which disk is secured in the valve-chamber B by means of the screw-cap *d''*, and the valve is adjustable in connection with the orifice C'', leading into chamber B, and the orifice C'', opening into nozzle *b*. The connecting-tube B' is provided with the flange *g*, and it, together with pipe-coupling *g'*, Fig. 1, forms a tight joint-connection with the elbow-pipe joint H, thus preventing the possible ingress of atmospheric air. To the elbow-pipe joint H is secured the valve K, which is opened and closed simultaneously with the steam-valve D by means of the compound lever K', thus admitting outflow of water into the boiler from chamber A at the moment of applying the steam.

The operation is as follows: The valve D is first adjusted by compound lever K' to bring recess *e'* of circular disk *e* in line with the orifice C'' of the steam-conduit C, whereupon water is elevated by action of the steam from supply-pipe F, and carried forward by it as it proceeds from section-chamber M through tube *a* into a section, M', and thereupon by moving the compound lever K' the recess *e* is brought into line with the nozzle *b*. The steam proceeding from the nozzle forces the water out through connecting-tube B' and through valve K into the boiler, the valve being opened simultaneously with the alignment of recess *e'* with nozzle *b* by movement of the compound lever K', which is so arranged in connection with these valves as to perform both these operations together by one and the same movement thereof. When a sufficient quantity of water has been injected into the boiler, the outlet-valve G'' is opened, and the surplus water contained in section M' is thus permitted to flow therefrom through pipe G, thus preventing precipitation of water-sediment in said section, and its ultimate injection into the boiler with water as supplied thereto.

Having described my invention, what I claim is—

1. A steam-injector operated by means of a compound lever for simultaneously opening and closing valves for ingress of steam and egress of water to the boiler, substantially as shown and described.

2. A steam-injector, consisting of chamber A, divided into sections M M', supply and outlet water-pipes, a steam-conduit, steam and water valves, tube *a*, nozzle *b*, connecting-
5 tube B', and a compound lever for admission of steam into chamber A and egress of water therefrom to the boiler simultaneously, substantially as described.

3. The combination of chamber A, having
10 conduit C, tube *a*, nozzle *b*, connecting-tube

B', steam-valve D, injecting-valve K, supply-pipe F, emptying-pipe G, and compound lever K', substantially as shown, and for the purpose described.

In testimony whereof I affix my signature in 15
presence of two witnesses.

JOHN DESMOND.

Witnesses:

JNO. G. MUNDY,
JOHN McDEVITT.