

(Model.)

J. DESMOND.  
STEAM INJECTOR.

No. 334,354.

Patented Jan. 12, 1886.

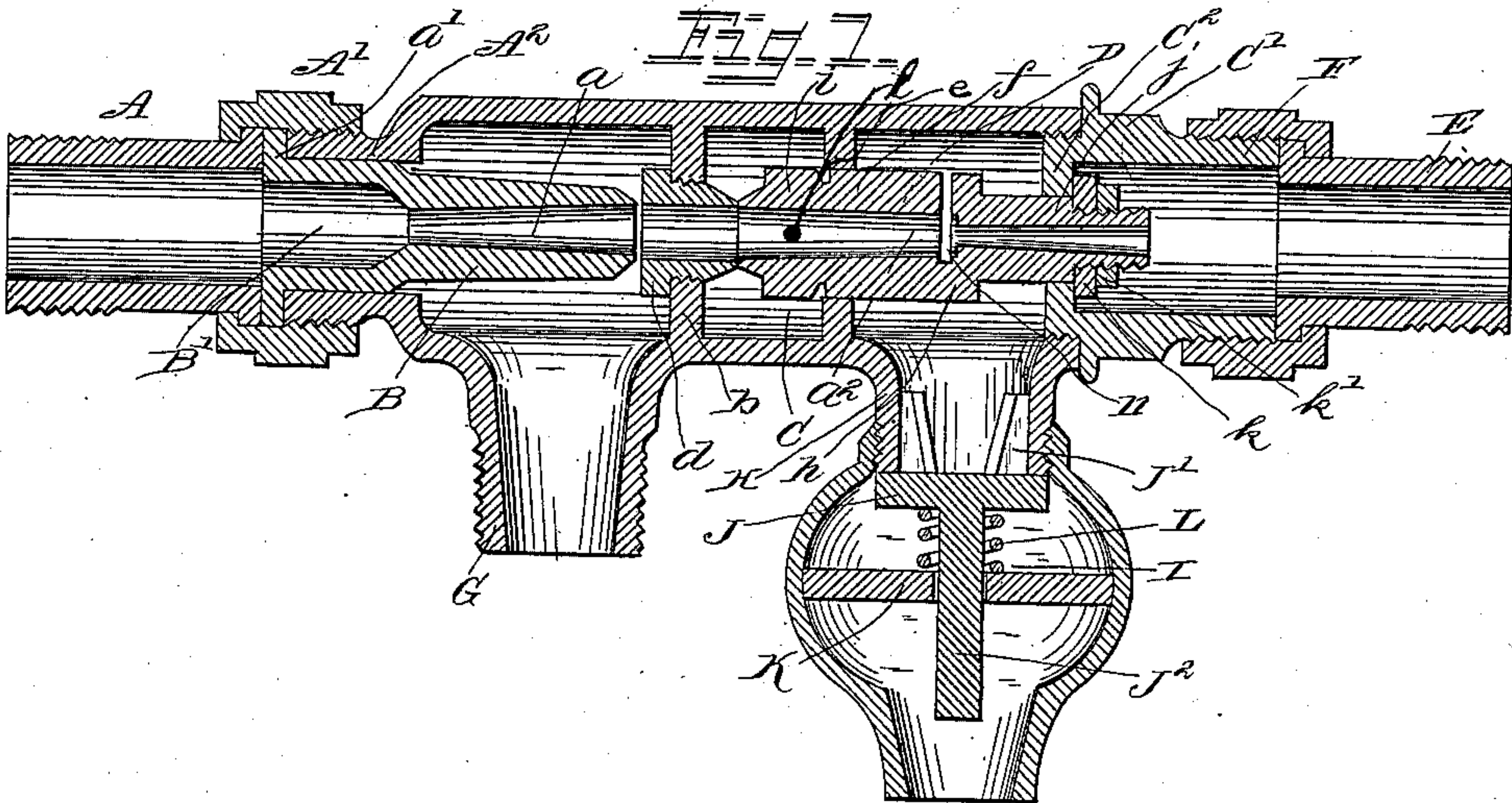


Fig. 2.

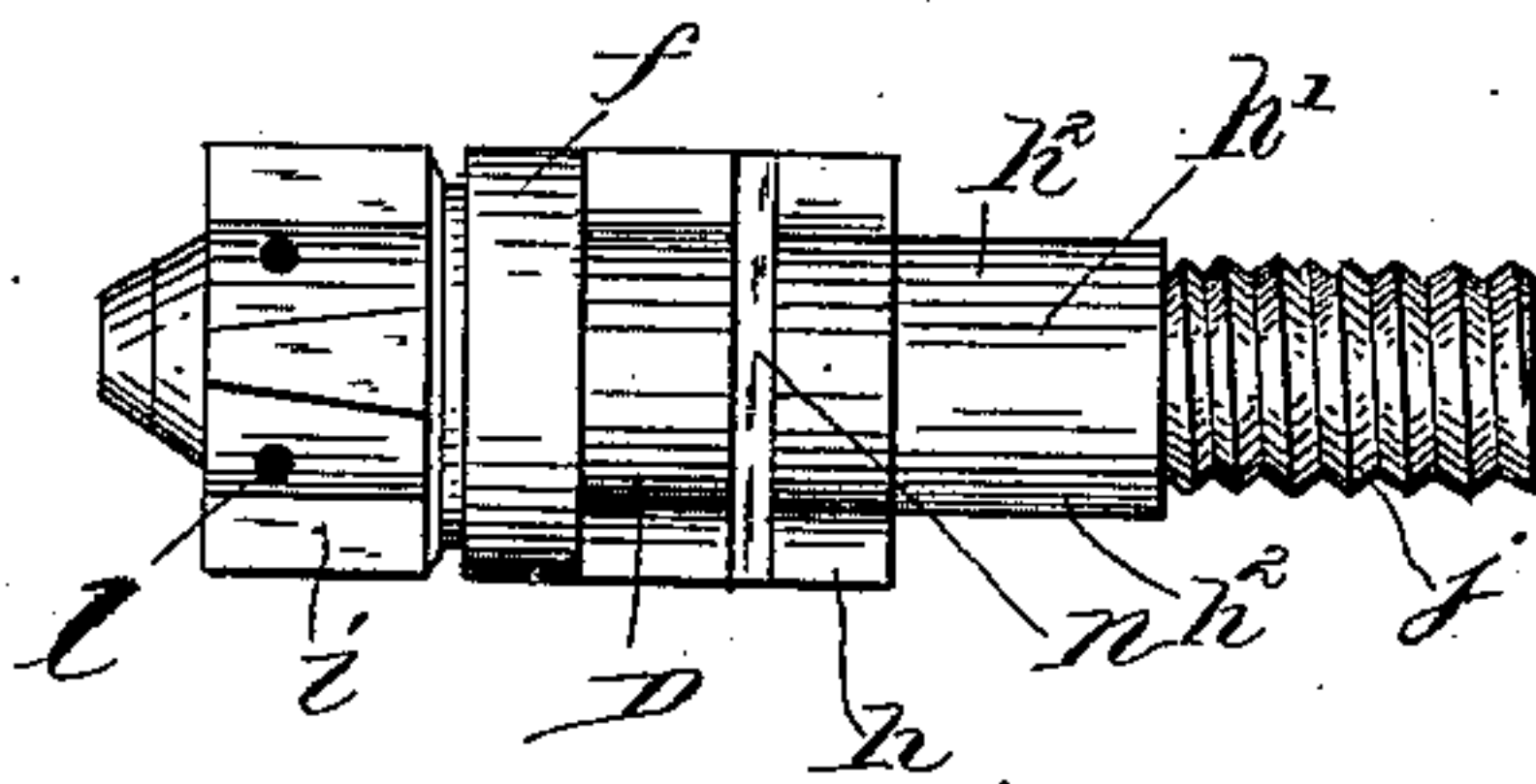


Fig. 3.

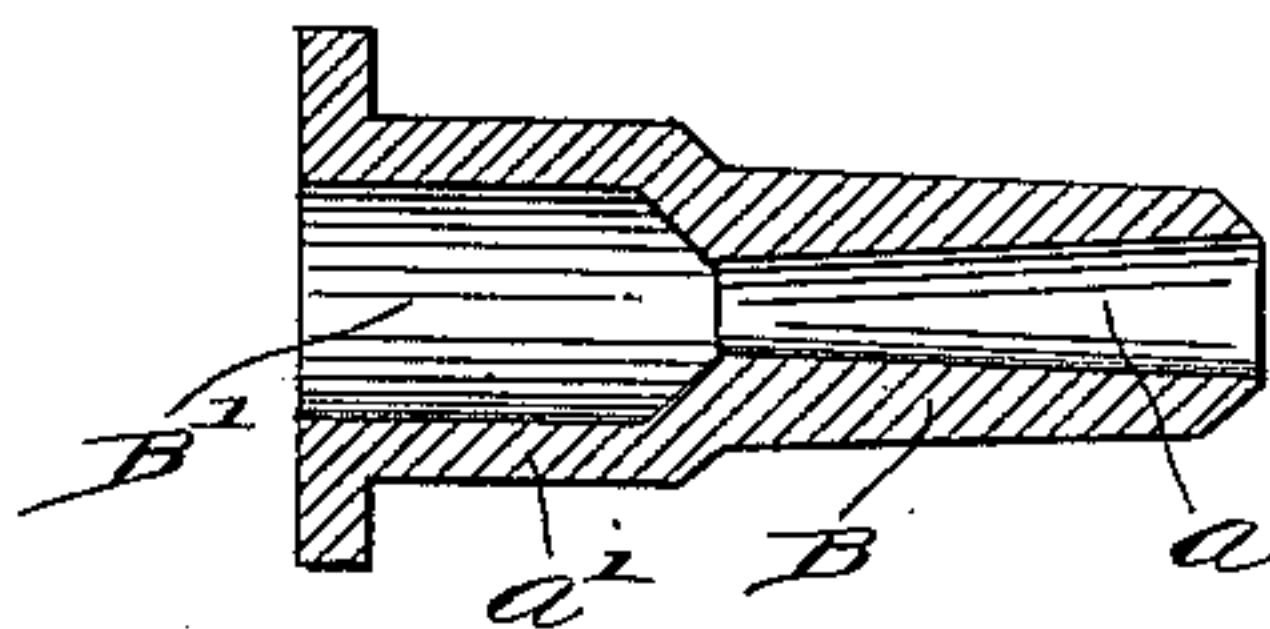
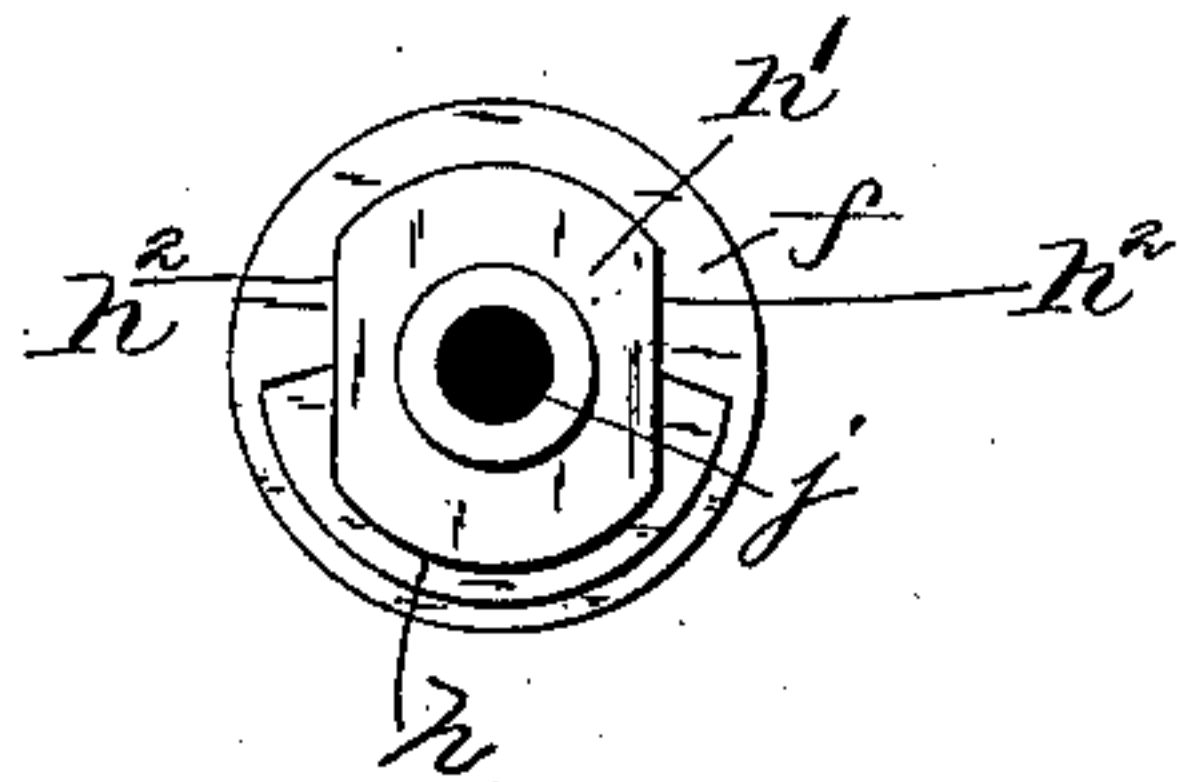


Fig. 4.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

JOHN DESMOND, OF CLEVELAND, OHIO, ASSIGNOR TO ROE STEPHENS, OF  
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## STEAM-INJECTOR.

SPECIFICATION forming part of Letters Patent No. 334,354, dated January 12, 1886.

Application filed September 26, 1885. Serial No. 178,264. (Model.)

*To all whom it may concern:*

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

My improvement in steam-injectors is designed not only to facilitate the operation of supplying water to steam-boilers, but also to prevent its outflow and waste through the overflow-pipe until the boiler is first supplied, to obviate the use of elastic and perishable washers, and to render the injecting operation in all respects more reliable and efficient; and it consists in the peculiar construction, combination, and arrangement of the parts, substantially as hereinafter more fully shown and described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my steam-injector, and Figs. 2, 3, and 4 are detail views thereof.

In constructing my steam-injector to accomplish its purposes aforesaid, I secure the steam-port A to the injector by means of the threaded pipe-coupling A', the injector being correspondingly threaded at A<sup>2</sup>, as shown. Into the coupling-neck A<sup>2</sup> is inserted steam-inlet tube B, having recess B'. (See Fig. 2.) The tapering tubular orifice *a* of tube B opens into said recess, and the diameter of the tube is correspondingly diminished beyond recess B'. Its inner projecting end is beveled, as shown, and its outer end is provided with the annular flange *a'*, which fits flush against the lateral wall of the coupling-neck A<sup>2</sup>. Into the threaded partition-wall *b* of the injector-chamber C is inserted the threaded tube *d*. The annular wall or flange *e*, which projects but a short distance from the inner wall of chamber C, forms a circular opening which registers with disk *f* of the slide-valve D, although disk *f* is a few lines smaller than the circular opening formed by said flange. The slide-valve D is provided with a central tubular orifice, *a*<sup>2</sup>, disk *f*, flange or projection *h*, projecting from the lower side of said disk, and wings *i*, integral therewith and also with

the threaded end *j*, projecting from a disk, *h'*, having its opposite sides flattened, as at *h*<sup>2</sup>, (see Fig. 4,) and said threaded end has thereon washer *k*, secured by nut *k'*. It is also provided with apertures *l*, which open into the tube *a*<sup>2</sup>, which are arranged one between each pair of wings *i* or at edge of same, also the slot or recess *n*, formed centrally in the side opposite to the flange or projection *h*, and opening into the tube *a*<sup>2</sup>. The washer *k* is secured by nut *k'* on the end of slide-valve D, as shown, after its said end is inserted in chamber C', chamber C' having a threaded periphery where it is inserted in the correspondingly-threaded end of chamber C.

The action of the steam on slide-valve D as it enters steam-port A is to cause its arm *h* to impinge against flange C<sup>2</sup>, which opens the valve, and disk *f* of slide-valve D registers with wall or flange *e*, and washer *k* impinges against the inner projecting flange, C<sup>2</sup>, of section C' at the moment when slide-valve D is impelled backward toward steam-port A, and thus closed.

As a means of preventing water which ascends into the injector-chambers from the well through supply-pipe G from being wasted by exit through outflow-pipe H prior to supplying the boiler, I employ valve I, having disk J and lugs J' integral with valve-rod J<sup>2</sup>, the end of the valve-rod being projected through a coincident orifice in cross-bar K, and the rod J<sup>2</sup>, with its disk and lugs, having its bearings upon coiled spring L, rod J<sup>2</sup> being projected through the spring, and the latter being interposed between the cross-bar K and disk J, as clearly shown. The tension of spring L, whereon disk J has its bearings, is such as to cause disk J to close the orifice of pipe H until such time as the boiler, being supplied with water, its weight, together with the steam-pressure, compresses spring L, and in thus lowering disk J opens the valve and admits escape of the water through the outflow-pipe. Thus constructed the tension of spring L, and hence the action of the valve, is so adjusted as to remain closed to admit the full flow of the water from the injector into the boiler, and to open under weight and pressure to admit the water to be wasted when the boiler has been supplied, and as an additional

means to prevent backing and to facilitate outflow of the water the pipe is greatly enlarged into a globular form, as shown, where cross-bar K is disposed therein.

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

1. In a steam-injector, the slide-valve D, comprising a flange or projection, *h*, a slot or  
10 recess, *n*, a disk, *f*, and a washer, *k*, and apertured and tubular, and constructed and arranged to register with flanges or inner walls of the valve-chambers C and C', substantially as shown and described.

15 2. The combination of slide-valve D, having a threaded end, *j*, with a washer, *k*, secured thereon, and a flange or projection, *h*, and a disk, *f*, in combination with flange C<sup>2</sup> and *e*,

substantially as shown and for the purpose described. 20

3. In a steam-injector, the slide-valve D, having a disk, *f*, flange or projection *h*, disk *h'*, having flattened sides, the slot or recess *n*, and tubular orifice *a*<sup>2</sup>, substantially as shown and described. 25

4. In a steam-injector, the combination, with the chambers C and C' and the valved outflow-pipe, of the valve D, having disks *f* and *h'*, slot or recess *n*, and tubular orifice *a*<sup>2</sup>, substantially as shown and described. 30

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

JOHN DESMOND.

Witnesses:

ANDREW McLELLAN,  
GEO. ANDERSON.