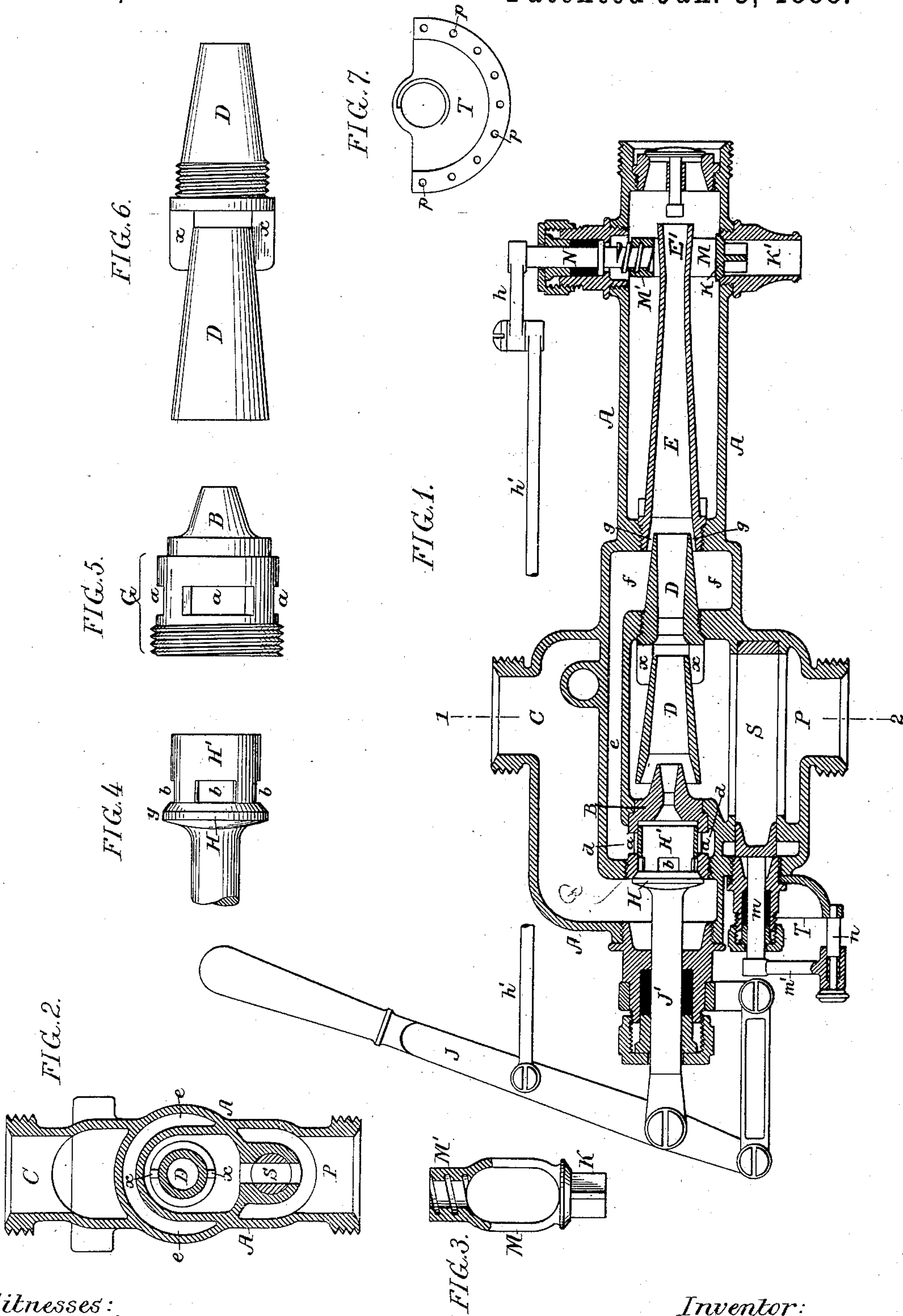


(Model.)

J. R. GOEHRING.
INJECTOR.

No. 375,810.

Patented Jan. 3, 1888.



Witnesses:
William D. Souner.
John E. Parker.

Inventor:
John R. Goehring
by his Attorneys
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UNITED STATES PATENT OFFICE.

JOHN R. GOEHRING, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
HENRY BELFIELD AND T. BROOM BELFIELD, BOTH OF SAME PLACE.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 375,810, dated January 3, 1888.

Application filed November 23, 1886. Serial No. 219,656. (Model.)

To all whom it may concern:

Be it known that I, JOHN R. GOEHRING, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain
5 Improvements in Injectors, of which the following is a specification.

My invention relates to improvements in that class of injectors which employ two steam-nozzles and two combining-tubes, and in which
10 the steam is admitted to the nozzles in succession, the objects of my invention being to render such device compact in size and to simplify the construction and operation of the steam-valve and overflow-valve.

15 In the accompanying drawings, Figure 1 is a longitudinal section of an injector constructed in accordance with my invention. Fig. 2 is a transverse section of the same on the line 1 2; Fig. 3, a transverse section, partly in elevation, of the overflow-valve and its nut; Figs.
20 4, 5, and 6, side views of parts of the injector detached from the casing, and Fig. 7 an end view of parts of the device.

A represents the casing of the injector, which
25 is provided with suitable threaded partitions for the reception of the first steam-nozzle, B, the first combining-tube, D, and the second combining-tube, E, all of these being in the same axial line, as shown. The delivery-tube
30 E' is in the present instance formed by the flaring rear end of the second combining-tube, E, the first combining-tube, D, being made in sections connected by wing-pieces *x*, and the second steam-nozzle being formed by the annular
35 space *g*, intervening between the rear end of the first combining-tube and the forward end of the second combining-tube.

The steam-nozzle B has a tubular barrel, G, in which are formed a series of ports, *a*, and to
40 a seat at the forward end of this barrel is adapted the rim *y* of the valve H, which serves to cut off the flow of steam from the steam-chamber C to the nozzles, this valve having a tubular projection, H', in which are formed a
45 series of ports, *b*, located close to the rim *y* of the valve. The tubular barrel of the steam-nozzle crosses a chamber, *d*, formed in the casing, and this chamber communicates through the passage *e* with a chamber, *f*, which sur-
50 rounds the rear end of the first combining-tube,

D, and communicates with the annular space *g*, forming the second steam-nozzle. The ports *a* and *b* are so located that as the valve H is withdrawn steam will be permitted to enter the ports *b* before there is such a movement of
55 the tubular projection H' of the valve as to uncover any portion of the ports *a*; hence it will be seen that by a proper manipulation of the handle J, which is connected to the stem J' of the valve, the latter may be so operated
60 as to admit steam to the first nozzle, B, of the injector before there is any flow of steam to the second nozzle, *g*, so that when the volume of water is lifted by the action of the first nozzle a further movement of the valve will un-
65 cover or partly uncover the ports *a* and permit steam to flow to the second nozzle, the ports *b* being at the same time thrown wide open, so as to permit the flow of a full volume of steam to the first nozzle.
70

The overflow-valve K is adapted to a seat in the overflow-branch K', as usual; but as this overflow-valve is forward of the rear end of the delivery-tube of the injector, I provide it with a yoke, M, embracing said tube and
75 carrying the nut M', to which is adapted the screw of an operating-stem, N, the latter turning in a stuffing-box on the casing and having an arm, *h*, connected by a rod, *h'*, to the valve-operating lever, so that the overflow-valve will
80 be moved simultaneously with the movement of the valve which governs the flow of steam, as in other injectors of this class.

The overflow in my improved injector is wholly at the rear end of the delivery-tube—a
85 feature which I have found of advantage in the working of the injector, and which simplifies and cheapens construction.

In the water-passage P of the injector is a valve, S, the stem *m* of which passes through a
90 stuffing-box on the casing and has an arm, *m'*, provided with a spring-pin, *n*, which may be adapted to any one of a series of openings, *p*, in a segmental plate, T, secured to the casing, so that the valve S may be adjusted to any po-
95 sition which the desired volume of supply may require, and may be secured in this position by the engagement of the spring-pin *n* with one of the openings in the segmental plate.

By the construction above described I am 100

enabled to simplify the valve mechanism of the injector and reduce the number of parts composing the same as compared with the valve mechanism of other injectors of this class with which I am familiar, and by the use of the yoke connecting the overflow-valve and its operating-nut I am permitted to locate said overflow-valve forward of the rear end of the delivery-tube of the injector, so that I am enabled to arrange the steam-nozzles and combining-tubes in the same axial line without unduly increasing the length of casing of the injector.

The steam-valve may, if desired, consist of a simple ported cylinder without the rim *y*; but the use of the latter is preferred.

I claim as my invention—

1. The combination, in an injector, of forward and rear steam-nozzles, a passage leading from one to the other, a ported tubular steam-valve, and a ported barrel to which said valve is adapted, whereby as the valve is withdrawn from said barrel the steam will be admitted successively to the first and second nozzles, all substantially as specified.

2. The combination of the steam-nozzle having a ported tubular barrel with the steam-valve having a rim adapted to close against a seat at the end of said barrel and a tubular projection constructed to close the ports of the barrel and having ports adjacent to the rim, all substantially as specified.

3. The overflow-valve having an operating-nut, and a yoke supporting the latter, all substantially as specified.

4. The combination, in a double-tube injector, of the steam-nozzles, combining-tubes, and delivery-tube with an overflow-valve located forward of the rear end of said delivery-tube and having a yoke embracing said tube and carrying the operating-nut of the valve, all substantially as specified.

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

J. R. GOEHRING.

Witnesses:

WILLIAM D. CONNER,
HARRY SMITH.