

No. 674,180.

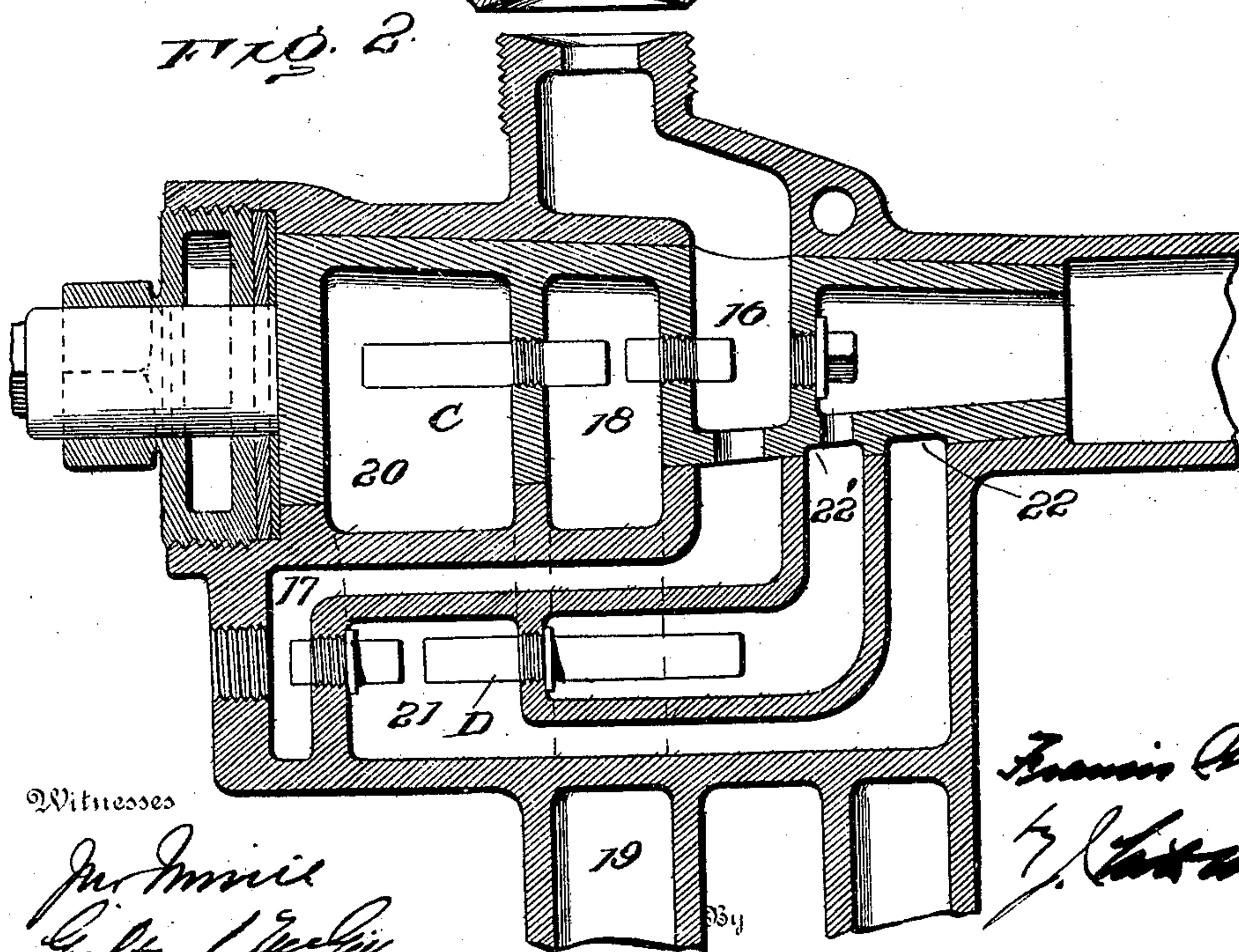
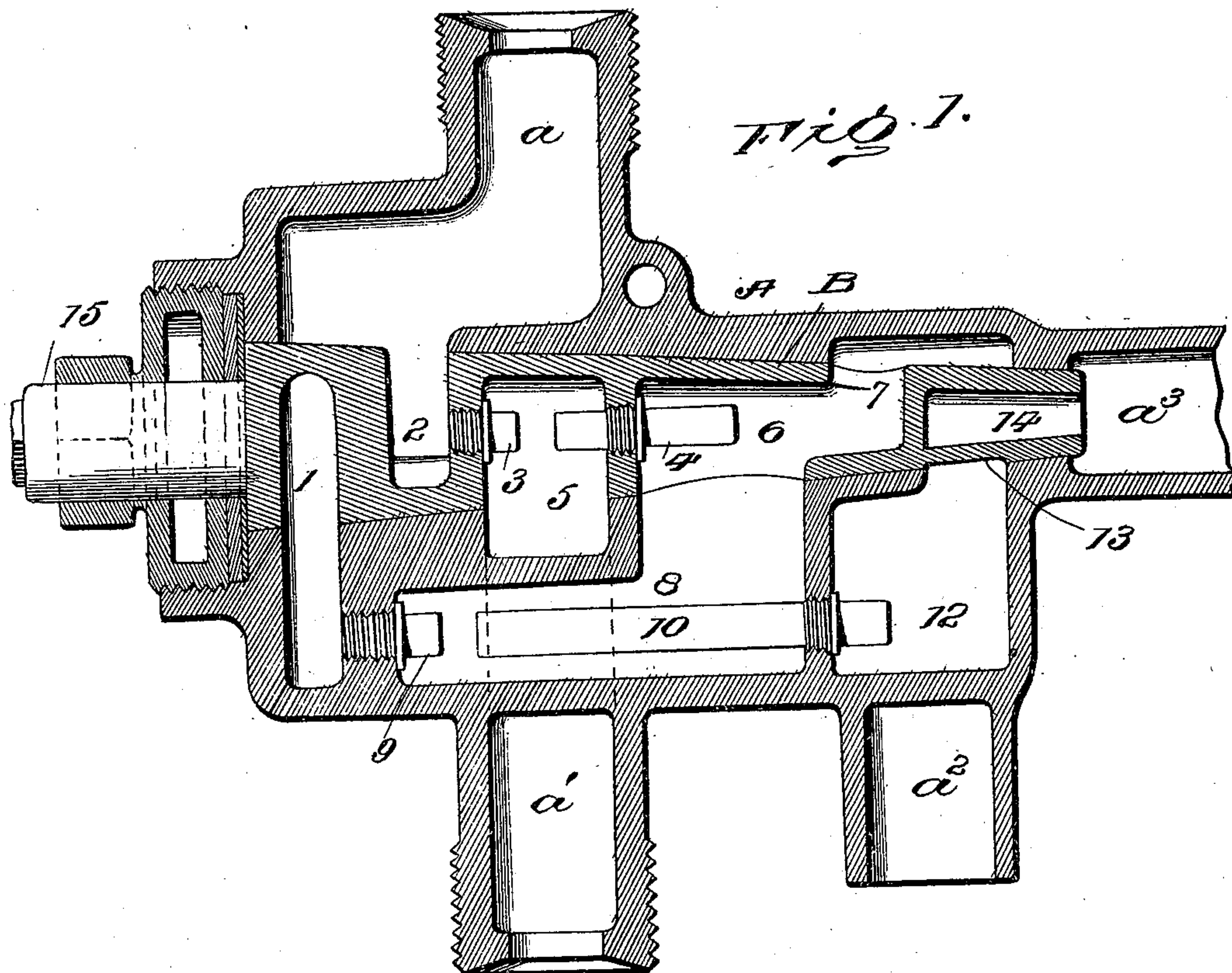
Patented May 14, 1901.

F. STICKER.
STEAM INJECTOR.

(Application filed Apr. 24, 1900.)

2 Sheets—Sheet 1.

(Model.)



Witnesses

J. M. M. M.
Chas. L. M. M.

Inventor

Francis Sticker,
J. L. M. M.
Attorney

No. 674,180.

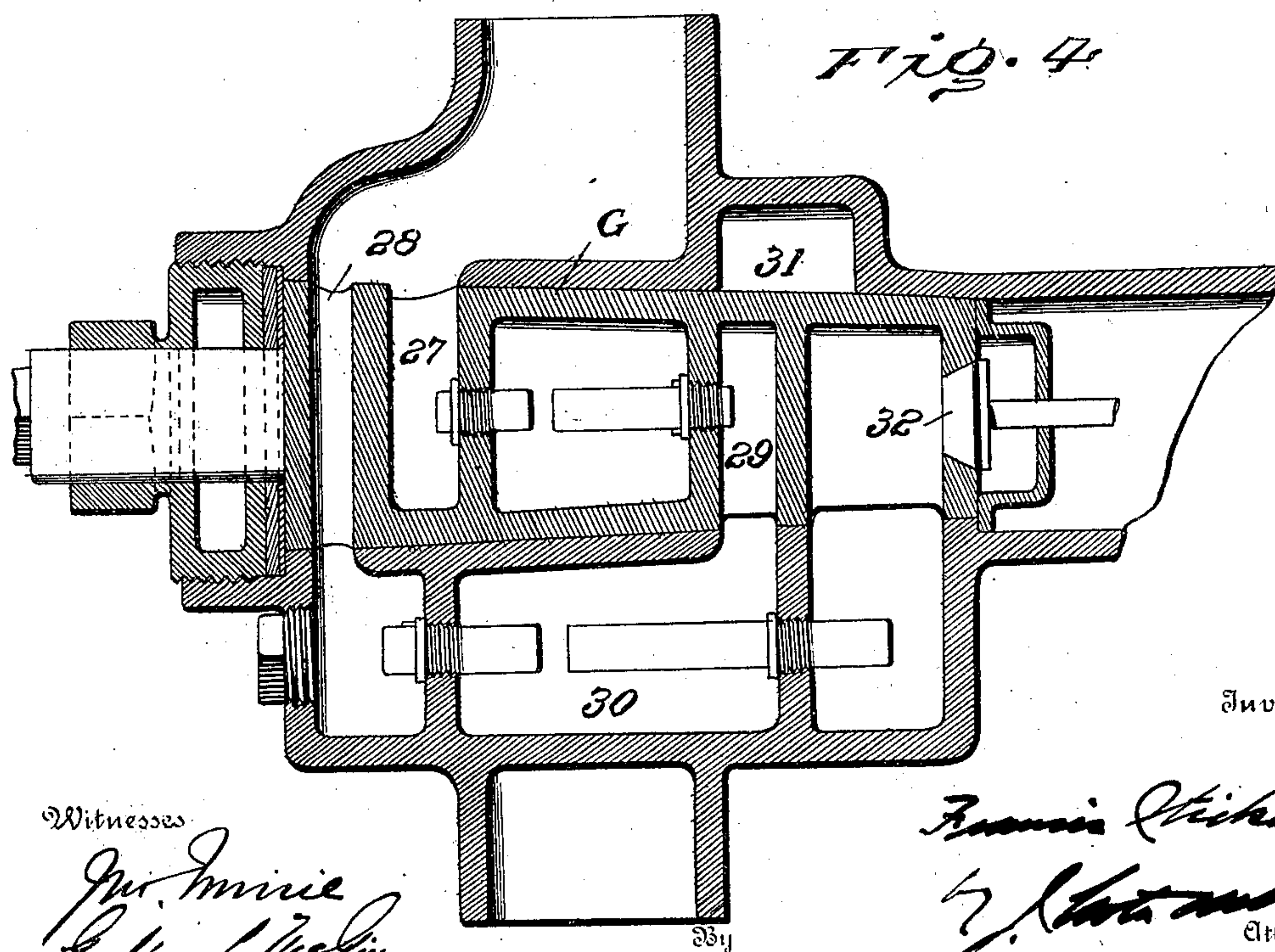
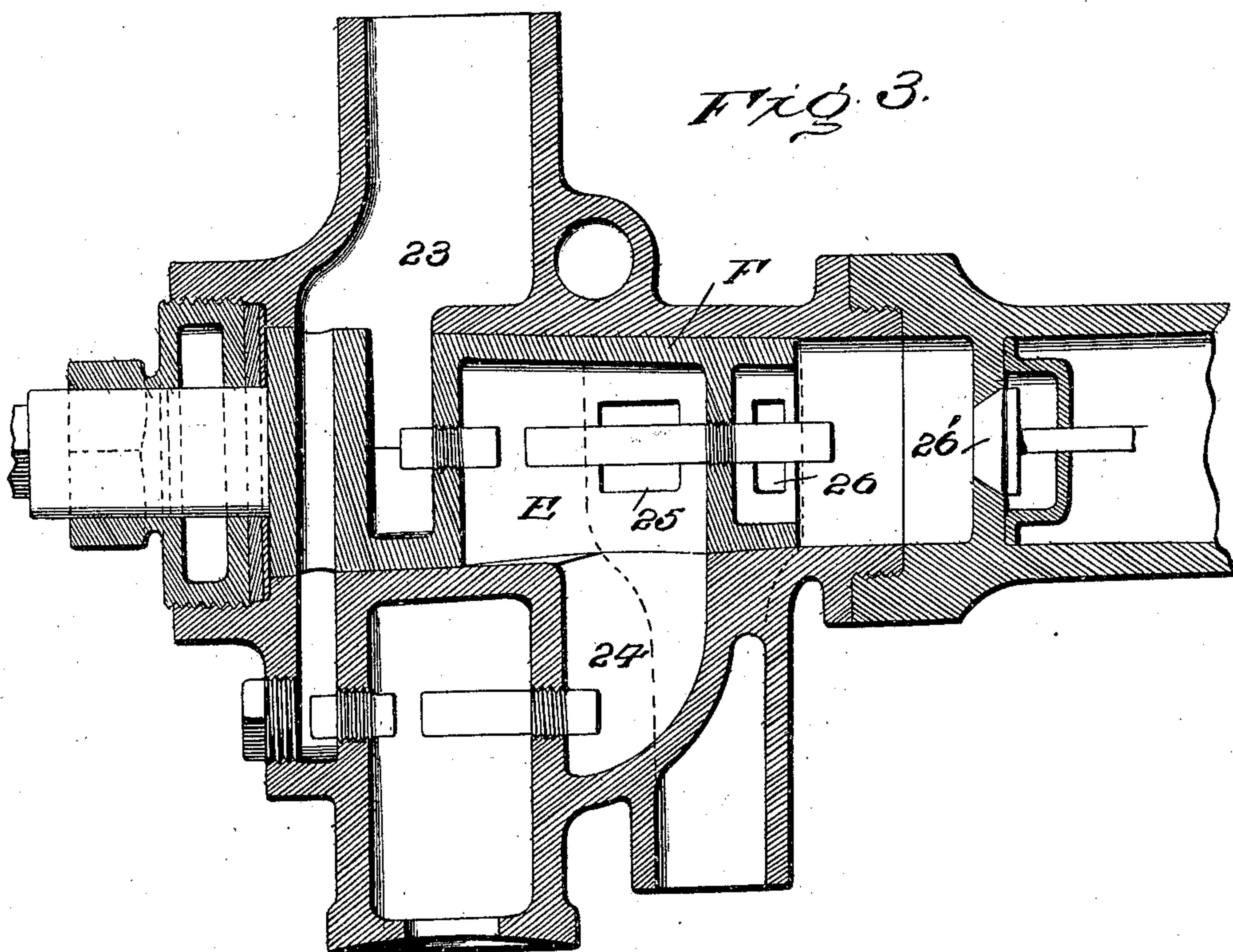
Patented May 14, 1901.

F. STICKER.
STEAM INJECTOR.

(Application filed Apr. 24, 1900.)

2 Sheets—Sheet 2.

(Model.)



Witnesses

Wm. M. M. M.
Chas. L. M. M.

Inventor

F. Sticker
J. M. M. M.
Attorney

UNITED STATES PATENT OFFICE.

FRANCIS STICKER, OF NEW YORK, N. Y., ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO CHARLES A. DRUCKLIEB, OF SAME PLACE.

STEAM-INJECTOR.

SPECIFICATION forming part of Letters Patent No. 674,180, dated May 14, 1901.

Application filed April 24, 1900. Serial No. 14,126. (Model.)

To all whom it may concern:

Be it known that I, FRANCIS STICKER, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Steam-Injectors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to steam-injectors.

The primary object of the present improvements is to provide a single cock or valve for controlling the steam and water inlets and the primary and auxiliary overflows and also in some instances the boiler-outlet.

A further object is to provide for the ready removal of one set of tubes in a manner which will render unnecessary the handling of each tube.

These features may be introduced into a single or double jet machine, and in the latter class the lifter may be located above the forcer, as shown and described in Letters Patent No. 600,456, issued to me March 8, 1898.

There are various ways by which the present invention may be carried out embracing means for controlling the operation of a machine by regulating the supply of steam or water, or both.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of an injector constructed in accordance with the present improvements, the lifter being shown above the forcer. Fig. 2 shows a similar view with a slight modification. Fig. 3 is a central longitudinal sectional view of an injector in which the tubes of the forcer are shown as mounted in a controlling valve or cock. Fig. 4 is a view of a modification in which the lifter is located above the forcer.

Referring to the drawings, A designates the casing, having steam-inlet a , water-inlet a' , overflow a^2 , and boiler-outlet a^3 .

B is a single cock or valve conically outlined, held by any suitable means within a correspondingly-tapered opening extended

longitudinally of the casing. This cock is formed with steam ports or chambers 1 and 2 for the forcer and lifter, respectively, steam-tube 3 and combining and delivery tube 4 of the lifter being mounted in partitions of the cock, the opposed ends of said tubes opening into the water-chamber 5. This chamber receives its supply of water through side ways leading from the inlet a' . The delivery-tube empties into the discharge-chamber 6, which in starting registers through a port 7 with the overflow a^2 . This chamber 6 also discharges into a lower water-chamber 8 of the forcer, which latter has its steam-jet 9 and combining and delivery tube 10. The forcer opens into discharge-chamber 12, which until the jet is established has communication with overflow a^2 through a port 13; but when the cock is turned the jet passes from chamber 12 through a port 14 in the cock directly to the boiler-outlet. The stem 15 of the cock may be manipulated by any suitable means, preferably a hand-lever.

It will be noticed that the cock B carries the tubes of the lifter and also that it controls the steam and water inlets and the primary and auxiliary overflows. In the form indicated in Fig. 1 it also controls the boiler-outlet, in that port 14 is not brought into play until the overflow 13 is closed. In practice steam is first admitted through inlet a and the cock is turned sufficiently to allow the steam to enter chamber 2 thereof and then pass through the tubes of the lifter to the overflow, and upon reaching the outside atmosphere a vacuum is created within the casing, and especially within the water-chamber 5, whereupon water is lifted, and the steam in the combining-tube being condensed the water will be taken up and upon being discharged into chamber 6 a portion will pass into the overflow and the remainder into chamber 8 of the forcer. The cock being by this time turned sufficiently to admit steam through chamber 1 to the tubes of the forcer, the water will be discharged by the latter into chamber 12. The jet being fully established, the operator further turns the cock, closing the overflows through ports 7 and 13 and opening up communication between the chamber 12 and the outlet to the boiler. By turning

the cock I am able to regulate the extent of the steam-supply and also the extent of the water taken up by the lifter and the discharge of the latter into the water-chamber of the forcer. Not only do I obtain the advantage of controlling the inlet and outlet passages, but by mounting one set of tubes in the cock access may be readily had to them for the purpose of inspecting, cleansing, or substitution by merely withdrawing the cock from the casing.

I do not intend to limit myself to any particular form of embodiment of the special features of this case. It is obvious that substantially the same results may be obtained in various ways without departing from the spirit or scope of my invention.

In Fig. 2 the relative direction of passage of the steam and water through the tubes of the lifter C is reversed after the manner shown in Letters Patent No. 600,455, issued to me March 8, 1898. By turning the cock steam is admitted to steam-chambers 16 and 17 of the lifter and forcer, respectively. The water-chamber 18 is connected by side ways with the water-inlet 19, and the discharge-chamber 20 of the lifter empties into the water-chamber 21 of the forcer D. This latter chamber will in starting allow the discharge through port 22 to the overflow-opening and also what is termed the "primary" discharge of the forcer through a port 22'; but when the jet is established the cock is turned so as to cut off both ports 22 22' and allow the jet to pass from the forcer into the extended end of the cock and thence to the boiler. In Fig. 3 I have shown the tubes of the forcer E located in the cock F, which latter controls the steam from inlet 23, water from the discharge-chamber 24 of the lifter, and also the overflows, which latter are had through ports 25 and 26 for the lifter and forcer, respectively. Hence by turning the cock, with the tubes of the forcer mounted therein, I am enabled to control the steam and water supplies and both the primary and auxiliary overflows after the manner hereinbefore described. I have indicated a check-valve at 26', which is normally held to its seat by the boiler-pressure.

The tubes of the lifter are shown in Fig. 4 as being located in cock G, having, like the forms shown in Fig. 1, two steam-chambers 27 and 28, the discharge-chamber 29 of the lifter opening into the water-chamber 30 of the forcer. The discharge of the lifter and that of the forcer into overflow 31 are con-

trolled by turning the cock. When these overflows are closed, the established jet will unseat check-valve 32, which is shown as having its seat on the inner end of the cock.

The advantages of my present improvements are apparent. It is obvious that, as hereinbefore stated and as demonstrated by both the specification and drawings, various modifications of the underlying feature may be readily adapted. In some instances one or more direct ways for the passage of the steam and water are provided, and in consequence there is but small loss from friction, heat, and pressure.

I claim as my invention—

1. In a steam-injector, a chambered valve or cock removably held within the injector, and a series of tubes mounted in said valve or cock and opening into some of the chambers thereof, as set forth.

2. In a steam-injector, a single valve or cock having a series of chambers with dividing-partitions, and a series of tubes mounted in some of said partitions, and means for turning such valve or cock.

3. A steam-injector provided with a steam-inlet, water-inlet, and primary and auxiliary overflows, and a single valve for controlling said inlets and said overflows.

4. A steam-injector provided with a steam-inlet, a water-inlet, a water-overflow, and a boiler-outlet, and a single valve or cock for controlling said inlets, overflow and boiler-outlet.

5. The combination with the casing, of the sets of forcer and lifter tubes, and a single valve or cock in which one set of tubes is mounted, said valve or cock having ports and chambers therein for controlling the inlet of steam and water and the overflow of both the lifter and forcer, substantially as set forth.

6. The combination with the casing, of the forcer having its tubes mounted in said casing, a single valve or cock fitted in the latter and having ports and chambers, and the lifter having its tubes mounted in said valve or cock, which latter by being axially turned will control the steam and water inlets and the overflows of the lifter and forcer.

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

FRANCIS STICKER.

Witnesses:

GRAFTON L. MCGILL,
FRANK S. MAGUIRE.