

(Model.)

L. SCHUTTE.
Injector.

No. 238,612.

Patented March 8, 1881.

Fig. 1.

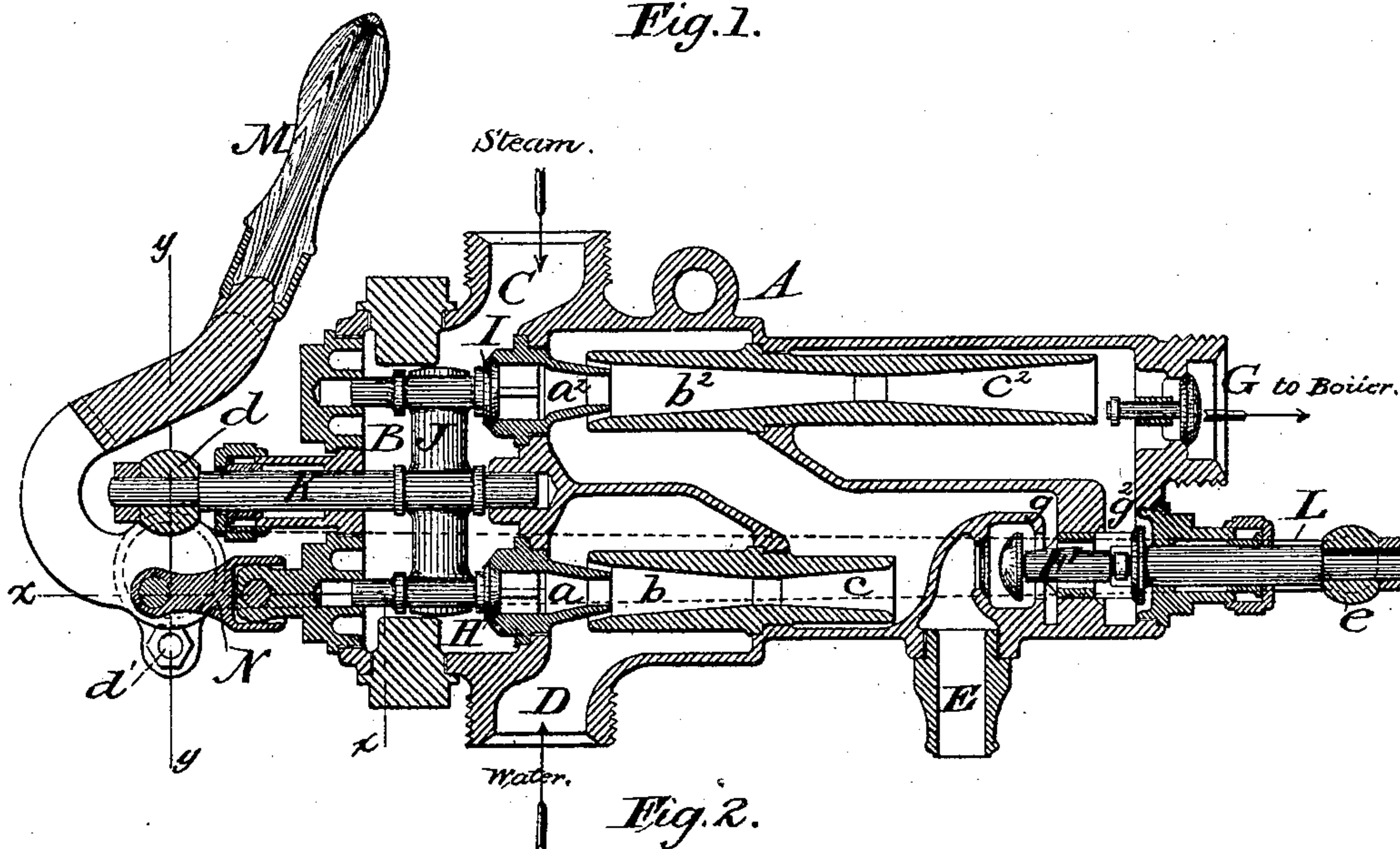


Fig. 2.

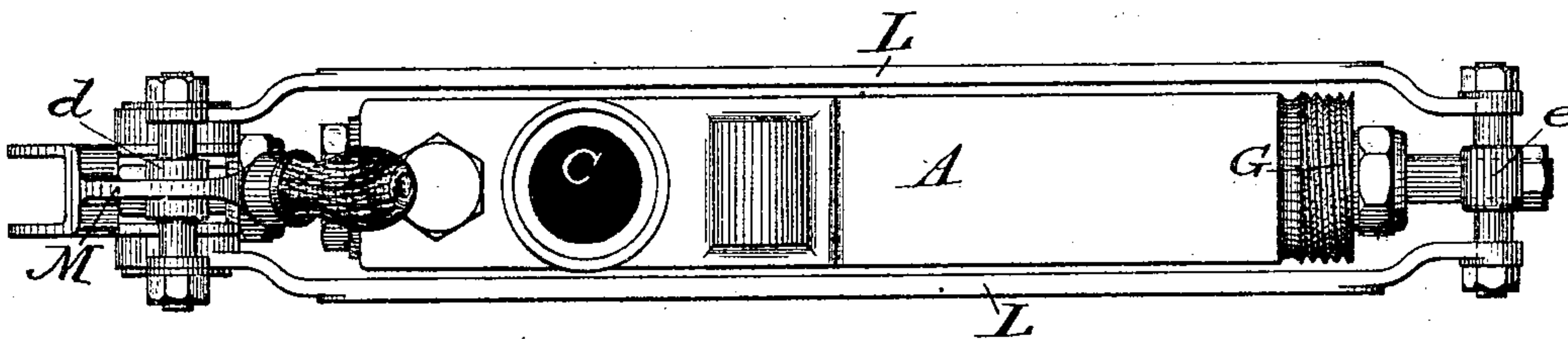


Fig. 3.

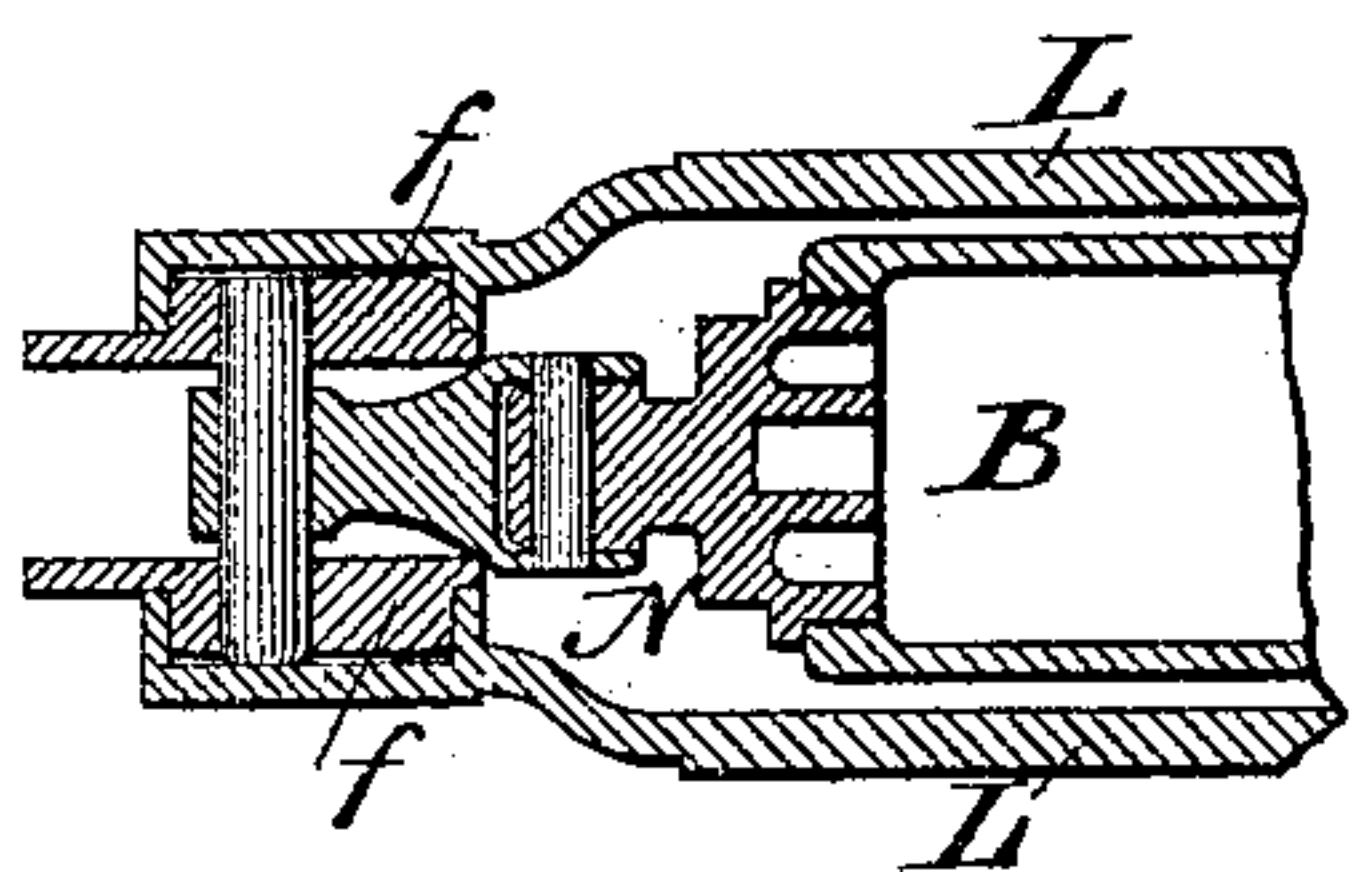
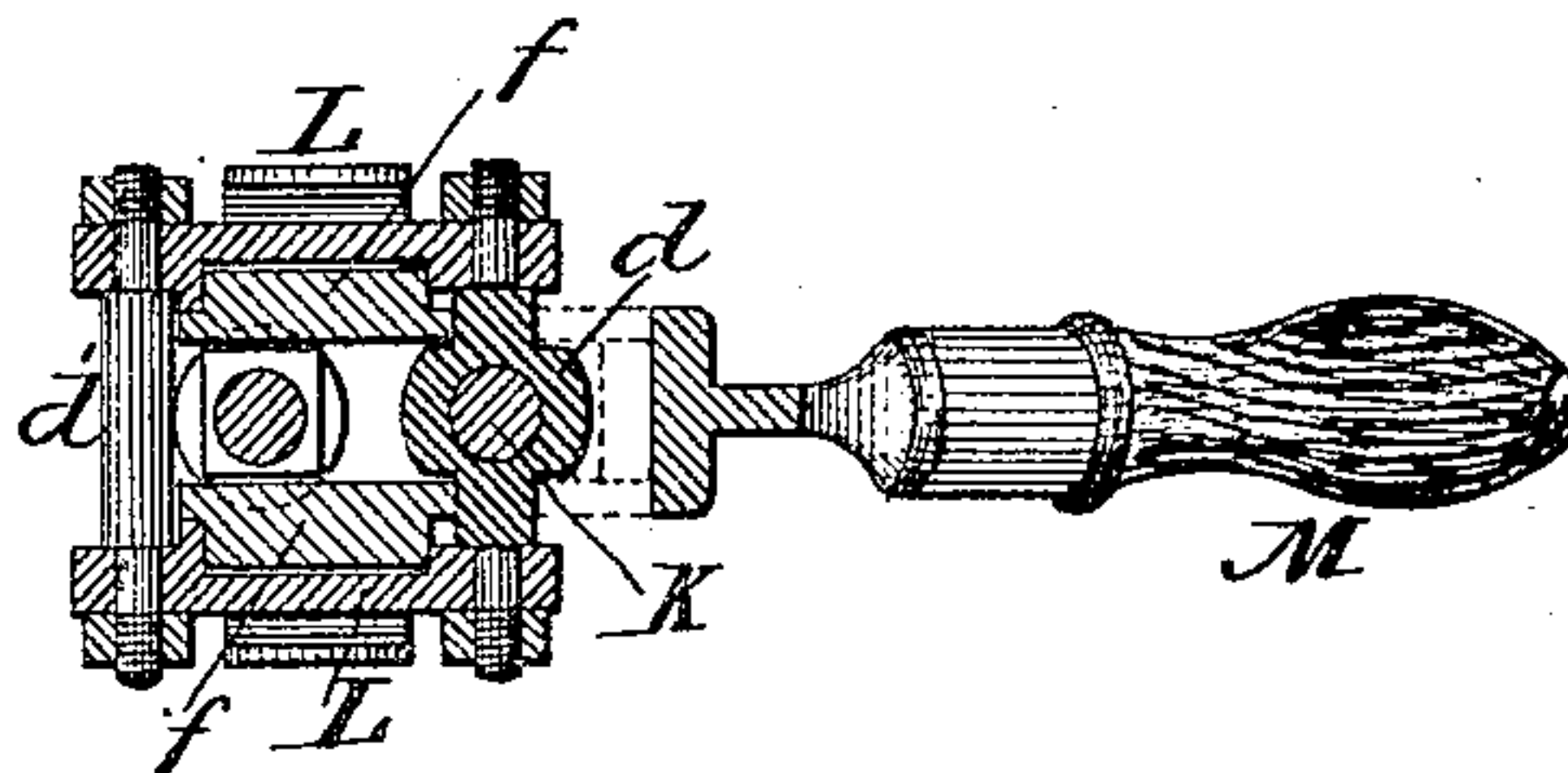


Fig. 4.



Attest.

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UNITED STATES PATENT OFFICE.

LOUIS SCHUTTE, OF PHILADELPHIA, PENNSYLVANIA.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 238,612, dated March 8, 1881.

Application filed December 20, 1880. (Model.)

To all whom it may concern:

Be it known that I, LOUIS SCHUTTE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain
5 Improvements in Injectors, of which the following is a specification.

This invention relates to that class of injectors for which Letters Patent were granted to Ernst Körting, November 21, 1876, numbered
10 184,631, in which two devices are combined, one feeding into the other, and more especially to that form of said apparatus for which Letters Patent were granted to me bearing date November 12, 1878, numbered 211,267, the
15 present invention consisting in a novel arrangement of mechanism for operating the valves in starting, operating, and stopping the device, hereinafter described.

Referring to the accompanying drawings,
20 Figure 1 represents a longitudinal central section of the apparatus; Fig. 2, a face or edge view of the same; Fig. 3, a section on the line $x x$ of Fig. 1; Fig. 4, a section on the line $y y$ of the same figure.

25 In my former patent, above referred to, the connection between the steam-valves was made by means of a yoke, which formed, also, a bearing for the crank or eccentric by which the lifting of the valves was effected. Under my
30 present construction I separate the lifting crank or eccentric from the connecting-bar between the steam-valves, leaving the connecting-bar inside of the steam-chamber and placing the crank or eccentric outside. The move-
35 ments of the steam-valves and the starting-valve being fixed relatively one with another, I also connect the rod or stem by which the connecting-bar between the two steam-valves is lifted directly with the stem of the overflow or
40 starting valve by means of rods or links, thereby dispensing with the crank and lever before employed. By this improved construction the relative positions of the steam-valves and the
45 starting-valve are rendered positive and independent of the wear of cranks and eccentric, and lost motion in the eccentric of the operating-lever does not affect the relative position of the parts. The location of the working
50 parts outside of the injector is also advantageous in that they are accessible at all times, and may be conveniently oiled or repaired.

Referring, now, to the drawings, A represents the injector, which in its general construction and method of operation remains the same as in my former patent, it being provided
55 with a steam-chamber, B, common to both parts of the apparatus, a steam-inlet, C, water-inlet D, overflow E, starting-valve F, and discharge G. The injector is further provided with a first apparatus, consisting of a steam-
60 nozzle, a , combining-tube b , and diverging-tube c , and a second apparatus, consisting of a steam-nozzle, a^2 , combining tube b^2 , and diverging-tube c^2 , the nozzles a and a^2 , being respectively furnished with valves H and I to
65 control the admission of steam.

For the purpose of operating the valves H I, which are opened successively, as in the former patent, they are provided with slotted or recessed stems, in which are seated the ends
70 of a connecting cross bar or yoke, J, carried in the slotted inner end of a rod or stem, K, passing through a packing-gland to the outside of the body, as shown. The ends and central
75 portion of the bar or yoke, or the ends of the slots, are rounded, as shown, to permit either end of the bar or yoke to rise or fall while the other stands still. The valve I is made, as before, of larger area than the valve
80 H, and both being in the common steam-chamber B the valve I is, of course, held to its seat with greater force than valve H. Hence, when the stem K is retracted the valve H is first
opened, the end of the yoke J within the stem of valve I serving as the pivot or center of
85 motion. As the stem of valve H reaches its limit of movement and comes in contact with a stop provided for that purpose the center of motion is transferred to the opposite end of the bar or yoke J within the stem of valve
90 H, whereupon the valve I is elevated.

In order that the stem or rod K and the starting-valve F may be simultaneously operated by the same lever, the starting-valve is arranged to work in the same line with the
95 valves H I and stem or rod K—that is to say, longitudinally of the body A, as shown—instead of being arranged at right angles therewith, as in any former case; and the rod or stem K and stem of valve F are furnished
100 with cross-rods d and e , which are connected by links or bars L, as shown in Fig. 2.

For the purpose of operating or opening and closing the parts thus connected I provide a hand-lever, M, which is pivoted or sustained at its forward end in a swinging or jointed support, N, and is furnished on its side faces with eccentrics f , which fit in recesses or seats formed for their reception in the upper ends of the links or bars L, which latter are drawn together and caused to encircle the eccentrics f by means of the cross-rod or bolt d , and a similar rod or bolt, d' , at the opposite side of the eccentrics, as shown in Fig. 4.

When the parts are thus constructed and arranged the outward movement of the lever M causes the rod K to be withdrawn, whereby the valve H is opened and steam permitted to pass through the nozzle a , the overflow-valve being at the same time moved sufficiently to open communication between the first apparatus and the atmosphere through the passage g and overflow E. The further movement of the lever then opens valve I and closes the passage g , at the same time, however, opening communication between the second apparatus $a^2 b^2 c^2$ and the atmosphere through the passage g^2 and overflow E, and a slight additional movement of the lever finally closing all communication with the atmosphere in the same manner precisely as in my patent before referred to, and causing the water to pass directly through discharge G into the boiler.

As the construction of the overflow-valve forms no part of the present invention it is not deemed necessary to describe it in detail, reference being made to my former patent for such particulars as are not fully set out in this description.

Having thus described my invention, what I claim is—

1. In a duplex injector, substantially such as shown, the combination of two separate steam-inlet valves and a loose bar or lever connecting said valves, all inclosed within the injector, and an operating device located on the outside of the injector and united with the device connecting the valves, substantially as described and shown.

2. In a duplex injector, the combination of two steam-admission valves, a loose bar or lever forming a direct connection between said valves and starting-valve, and a rigid direct connection between the starting-valve and the bar which connects the steam-valves, substantially as described and shown.

3. The herein-described injector, consisting of two parts, one discharging into the other, steam-valves controlling said parts and connected by a loose bar, a starting-valve, and an operating-lever connected by rods or links directly with the starting-valve and with the loose connecting-bar, as set forth.

4. In an injector substantially such as shown, an operating-lever pivoted to a jointed support, and provided with eccentric lugs and links encircling said lugs, and connected directly with the starting-valve and operating-stem of the steam-valves, substantially as set forth.

LOUIS SCHUTTE.

Witnesses:

J. W. HEMILL,
WM. H. KASSEL.