

(No Model.)

2 Sheets—Sheet 1.

H. M. BROWNE.
SEWER OR OTHER TRAP.

No. 426,429.

Patented Apr. 29, 1890.

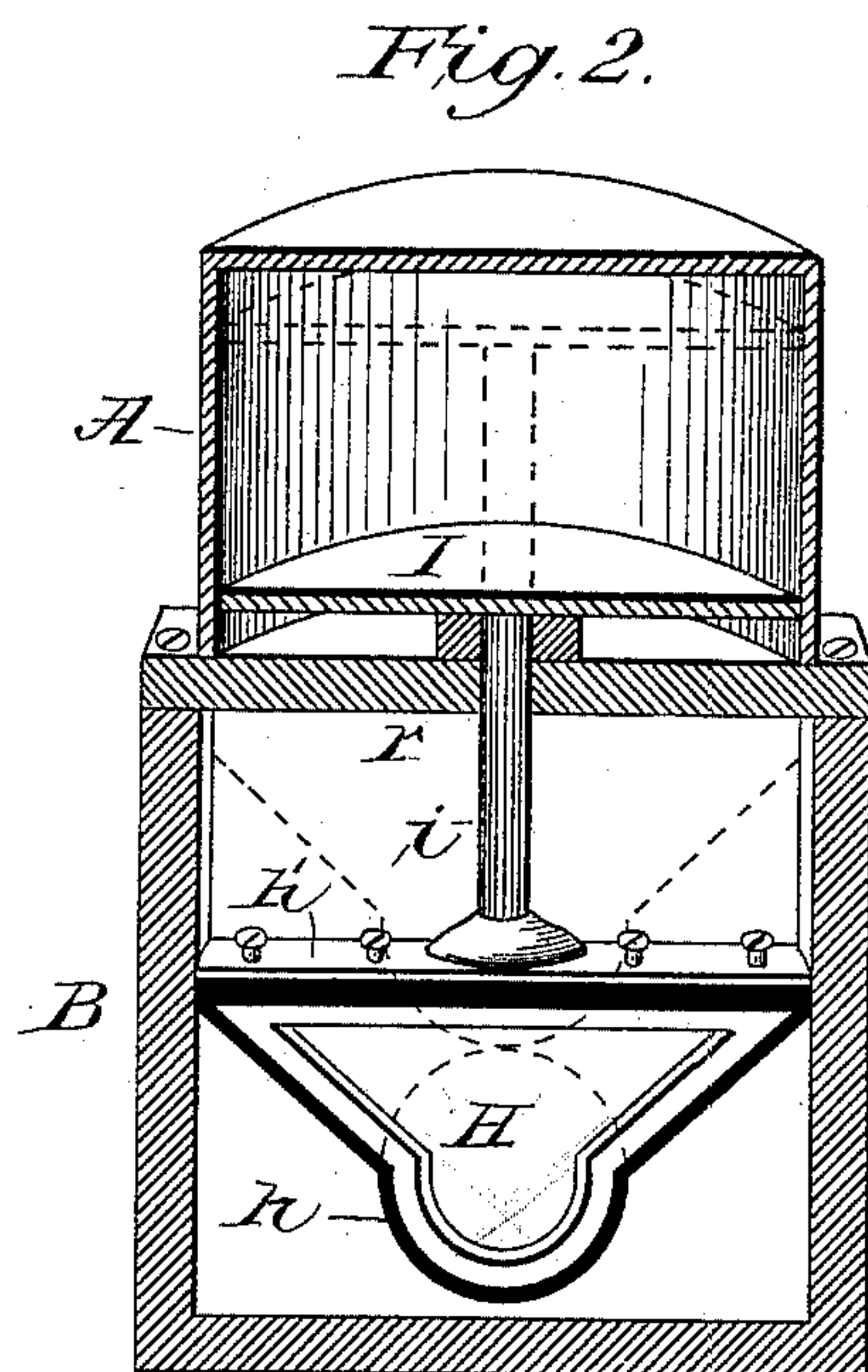
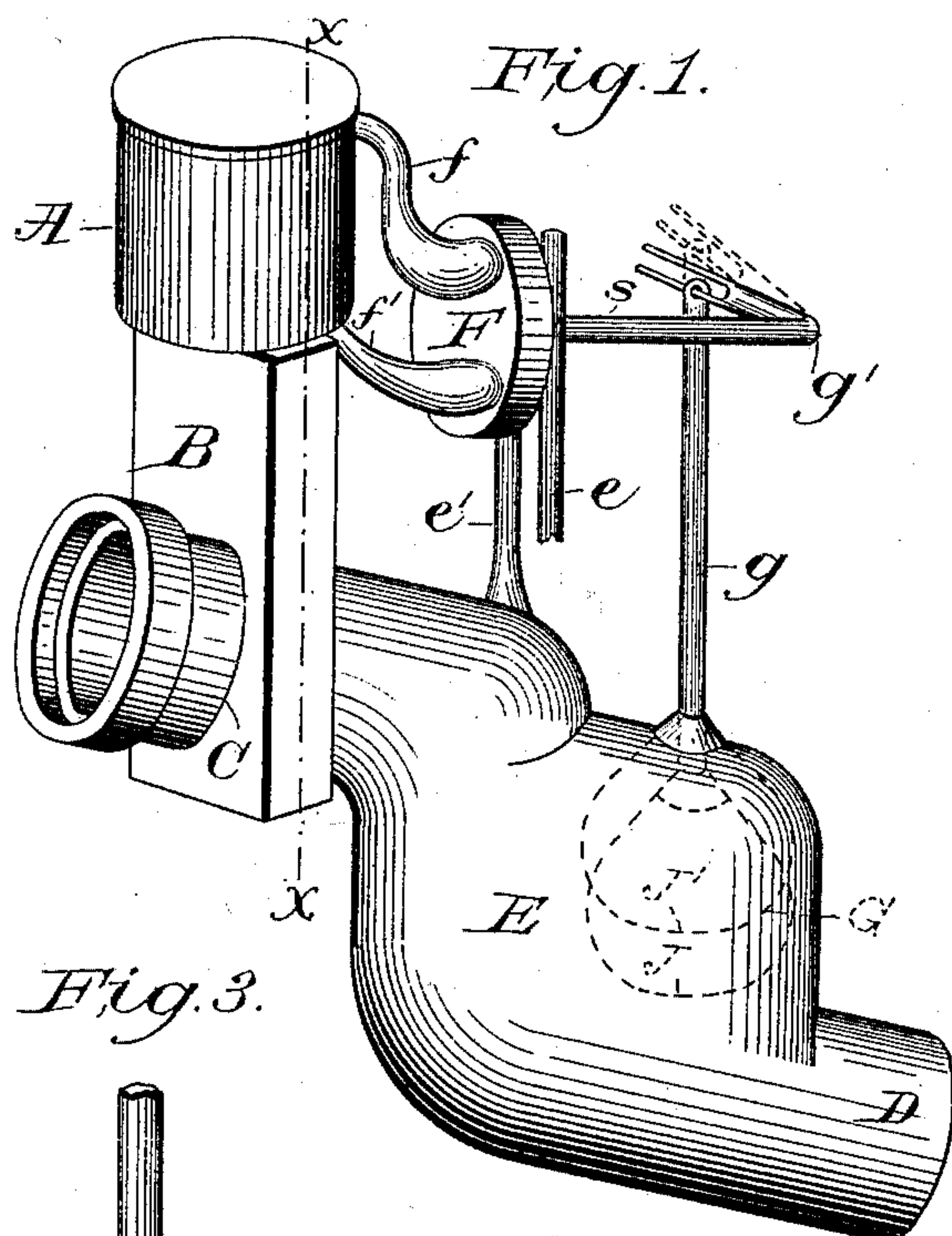


Fig. 3.

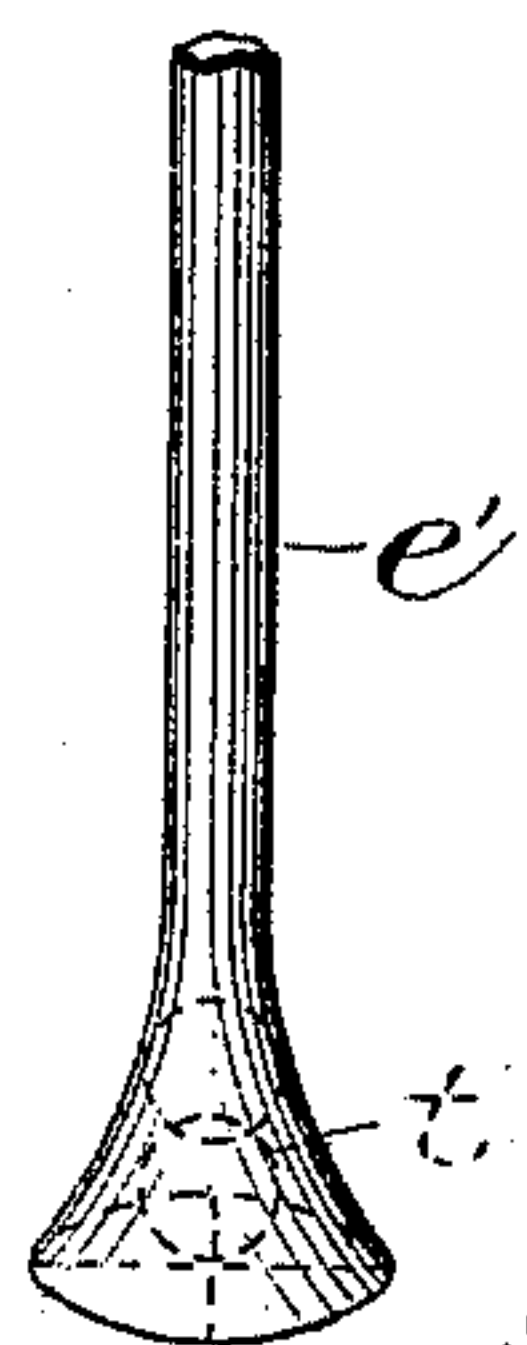


Fig. 4.

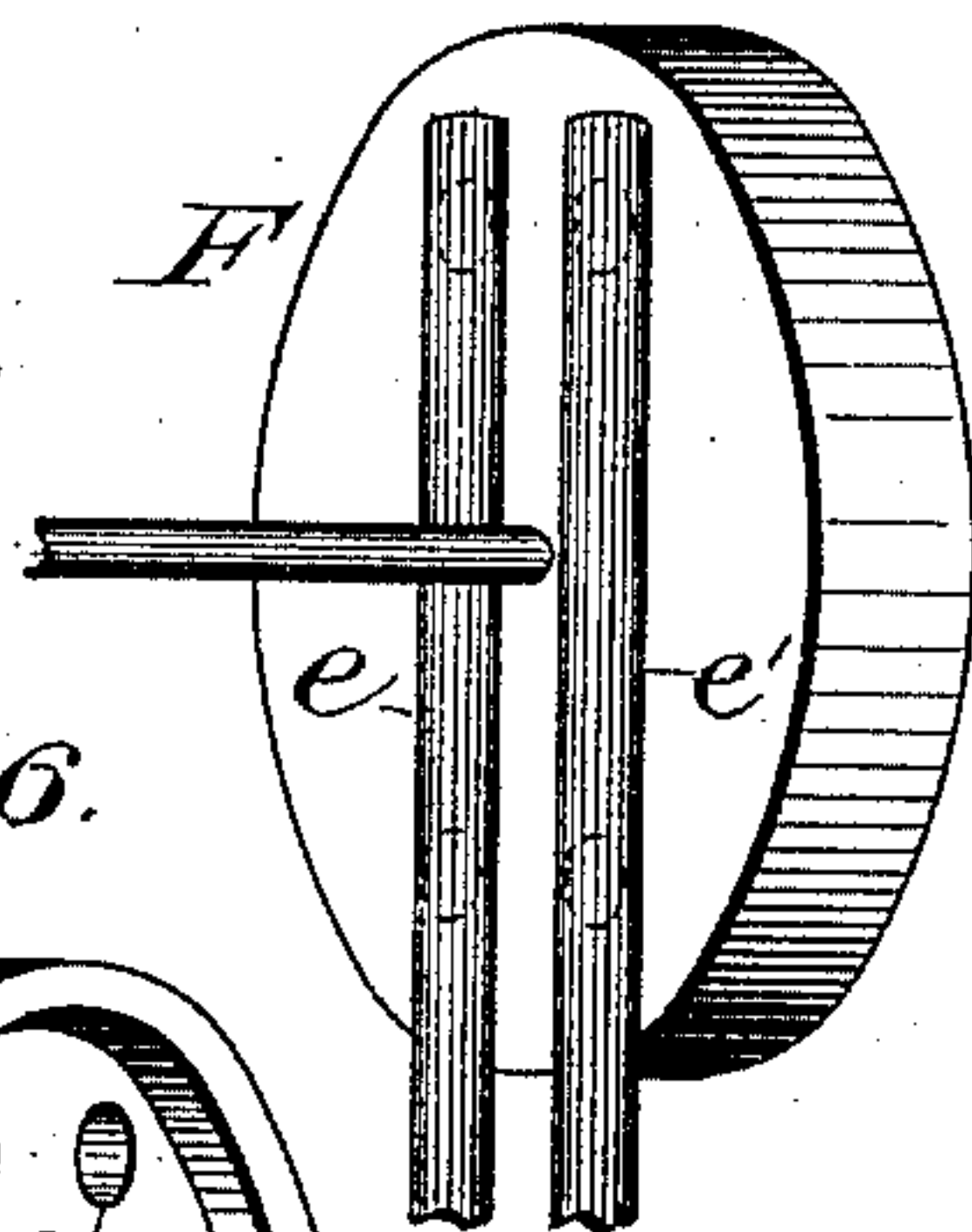


Fig. 6.

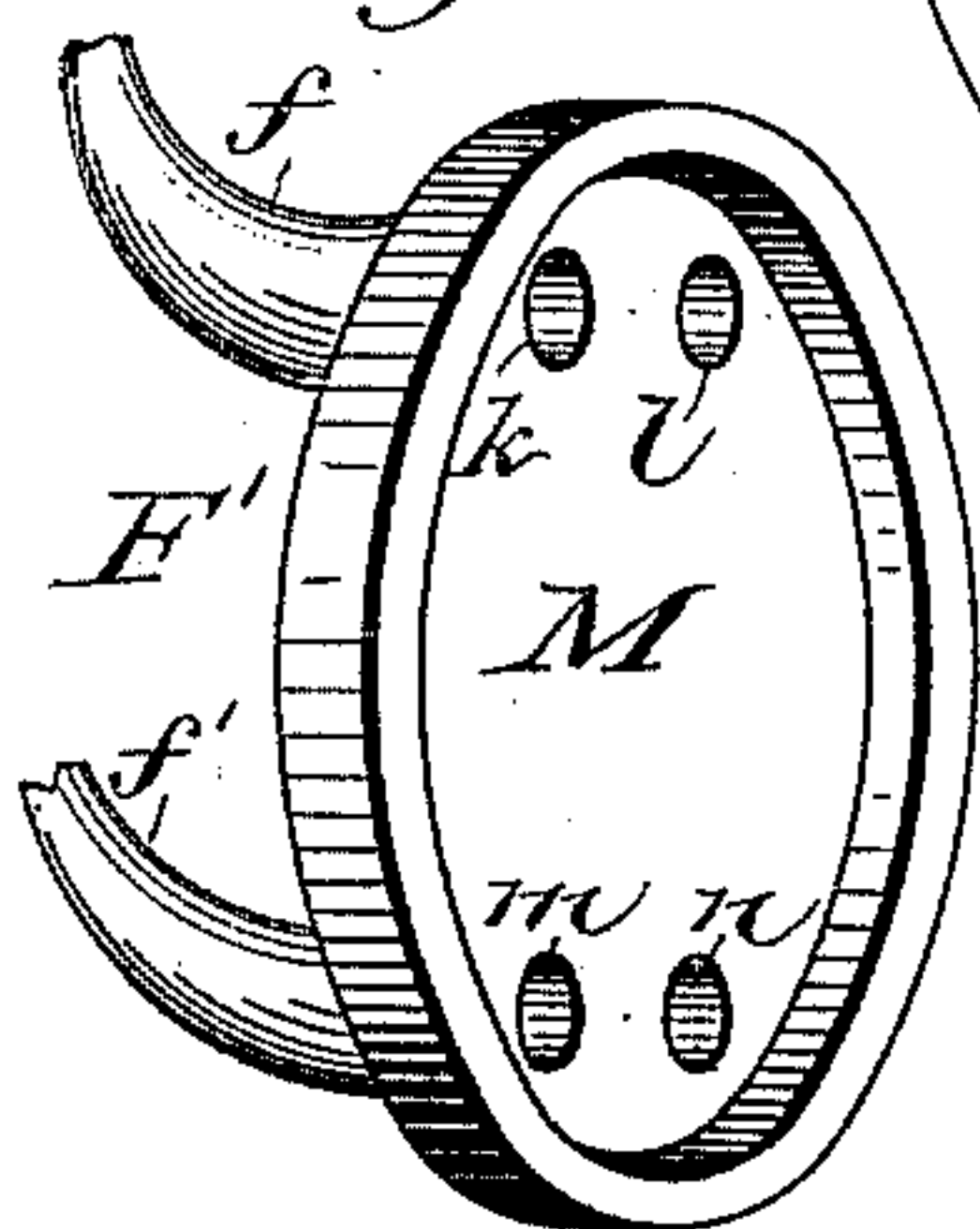


Fig. 7.

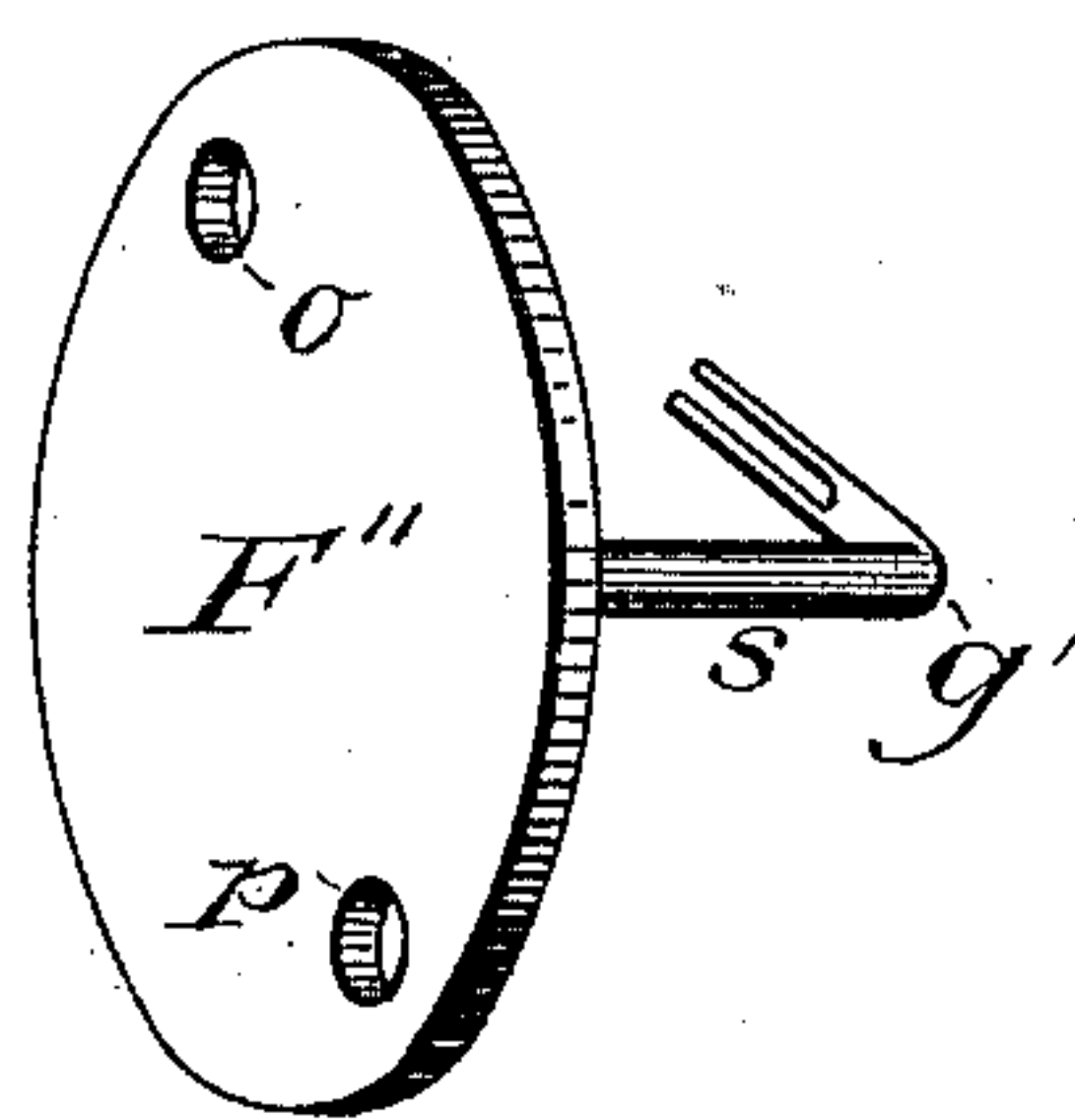


Fig. 5.

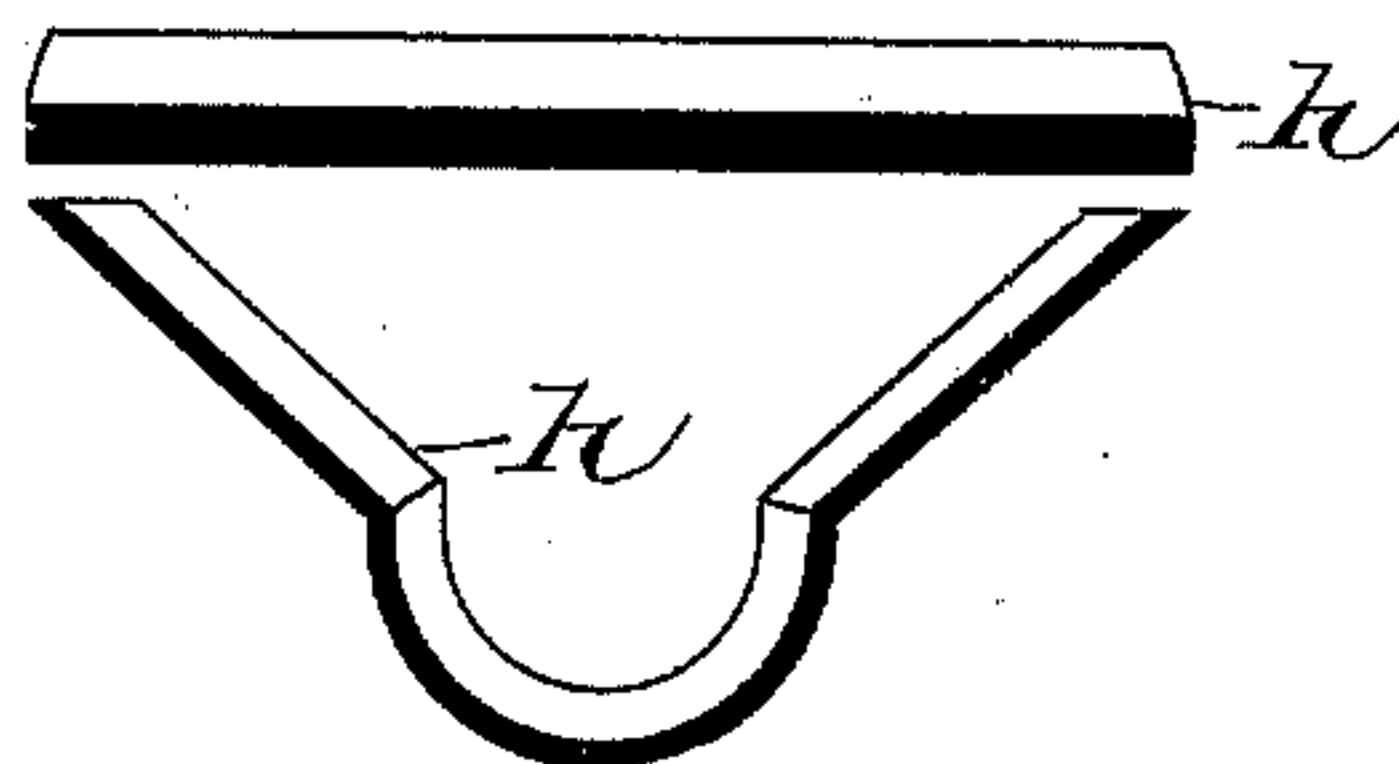
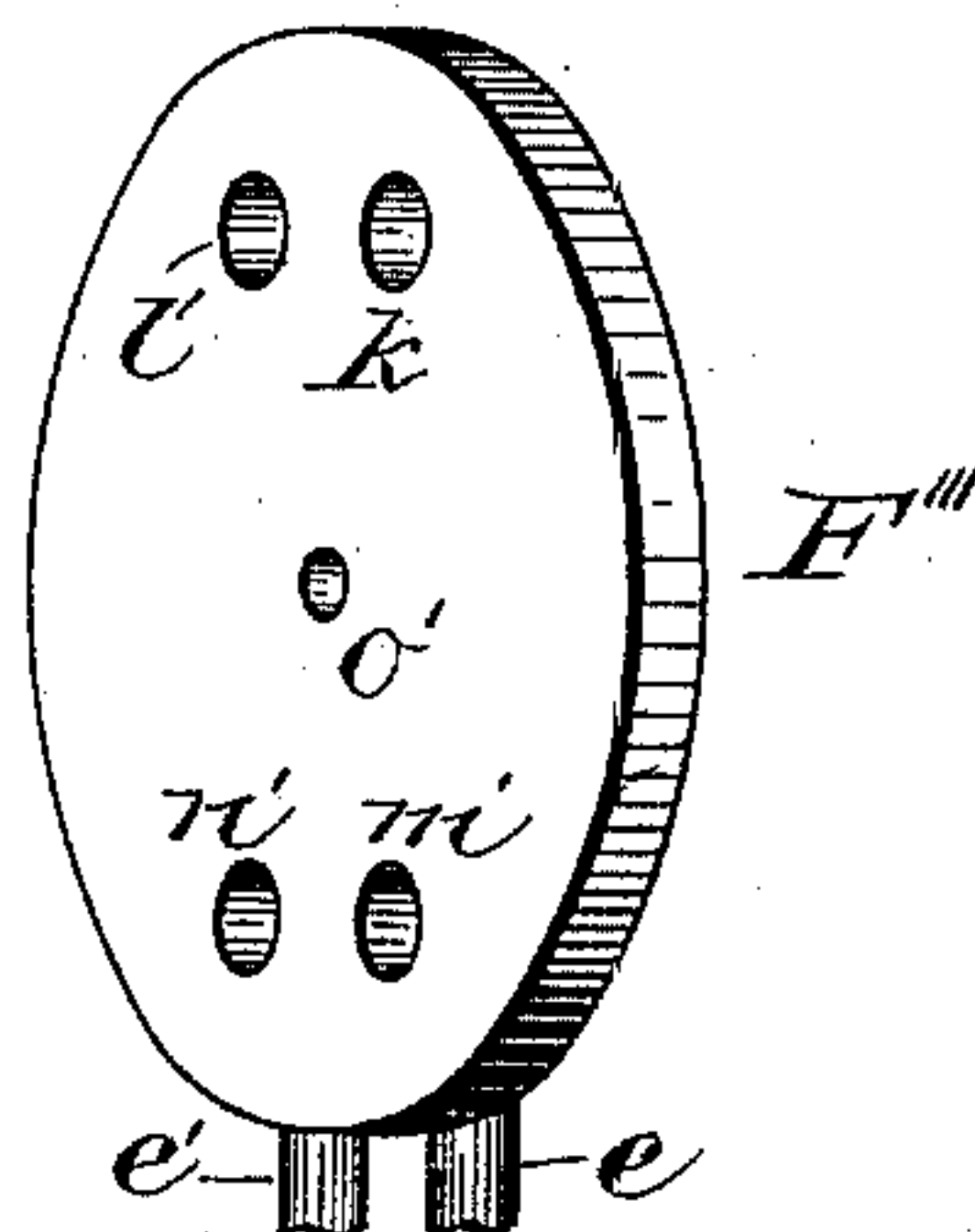


Fig. 8.



Witnesses:

M. A. [Signature]
Milton M. Holland

Inventor:

Hugh M. Browne

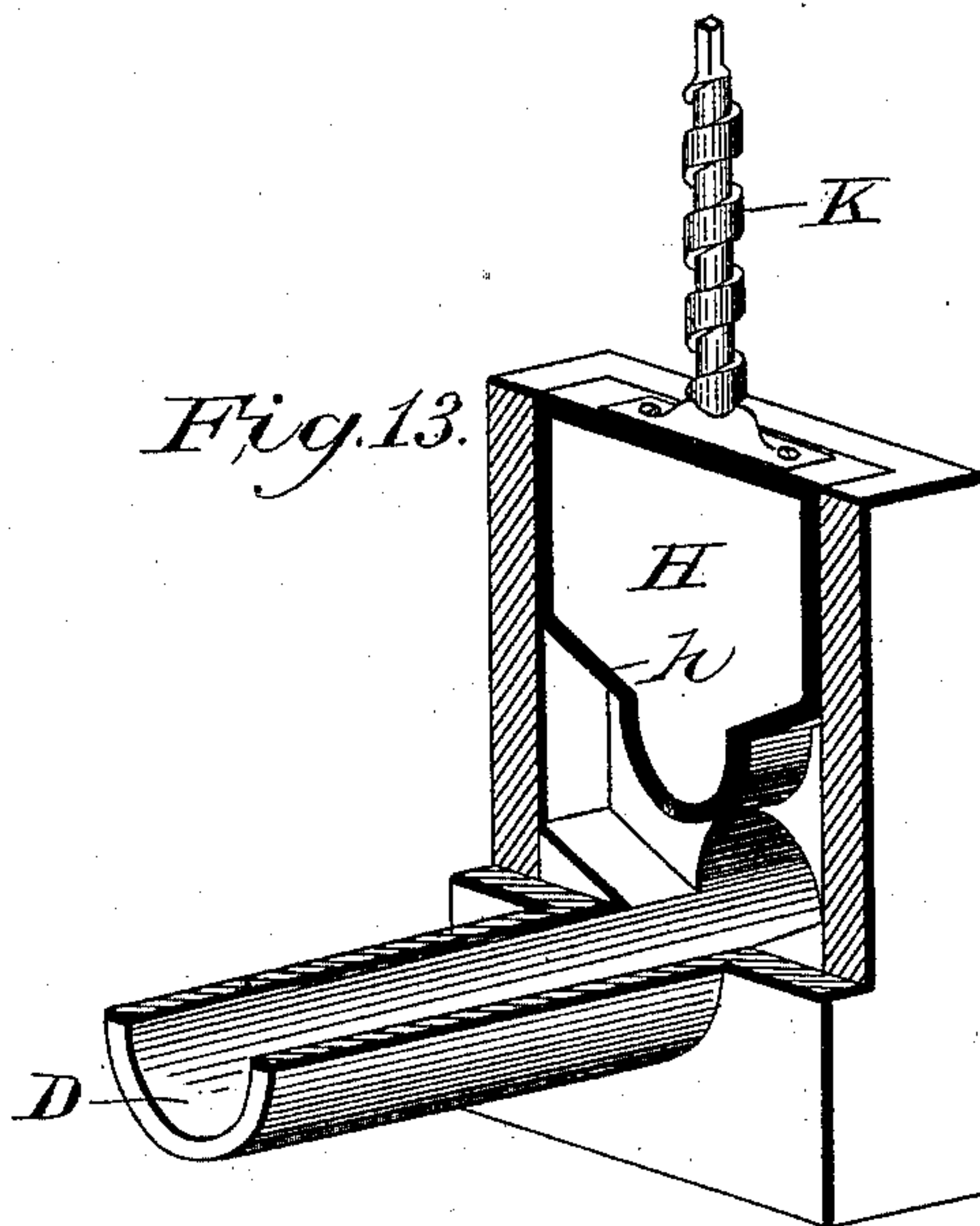
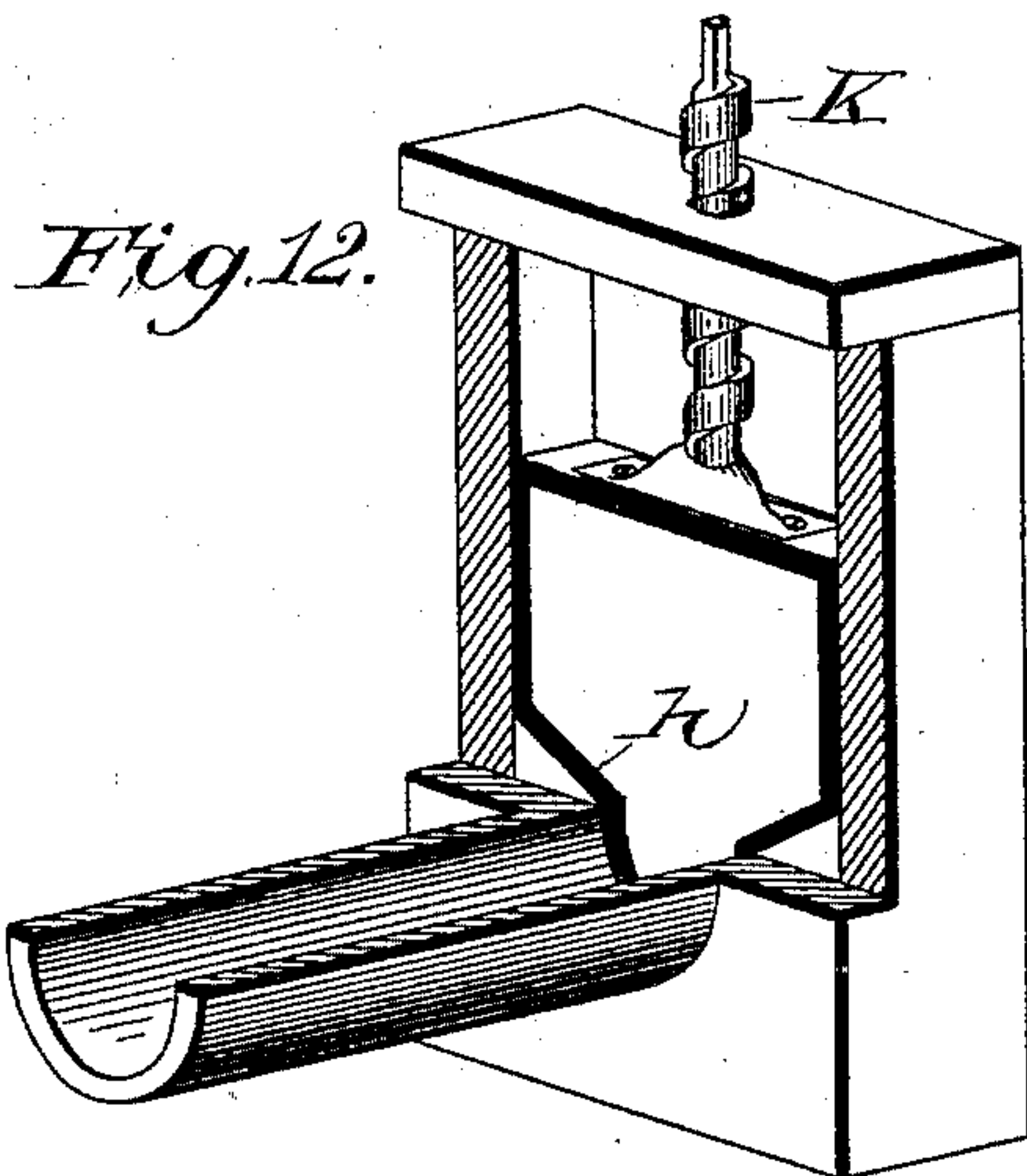
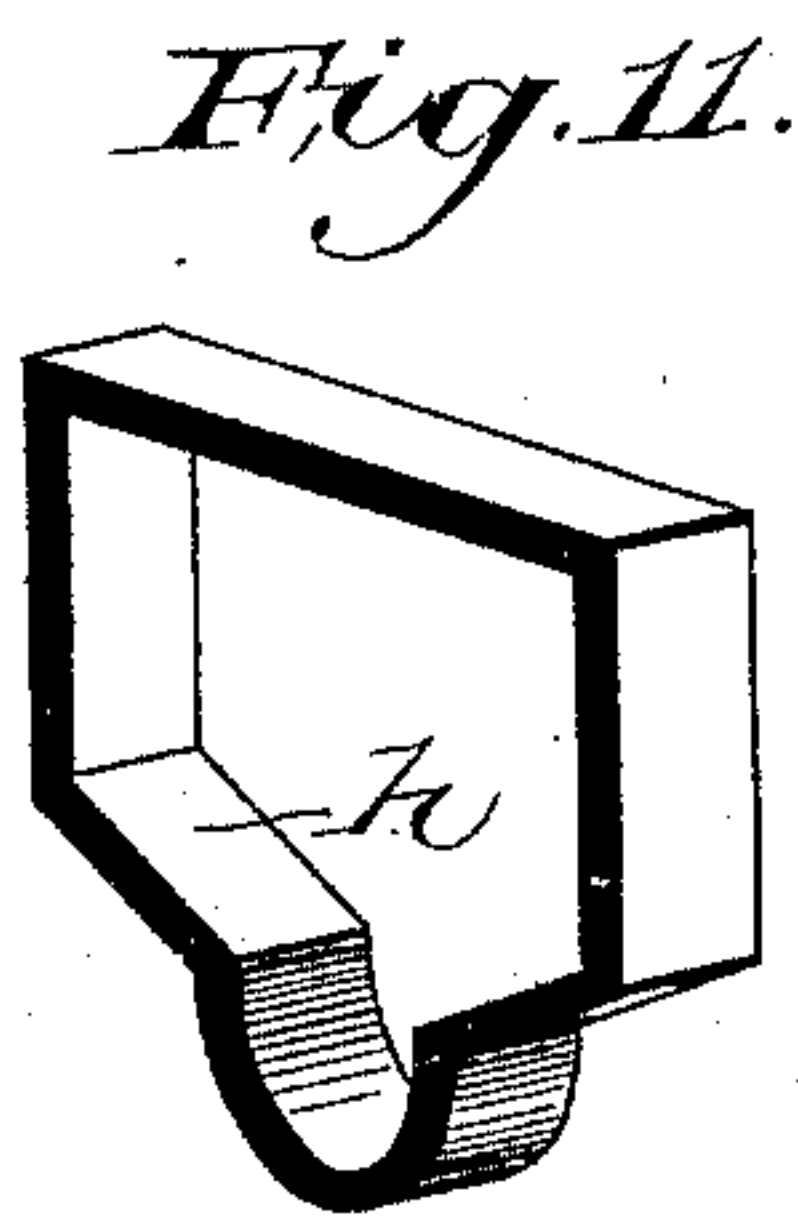
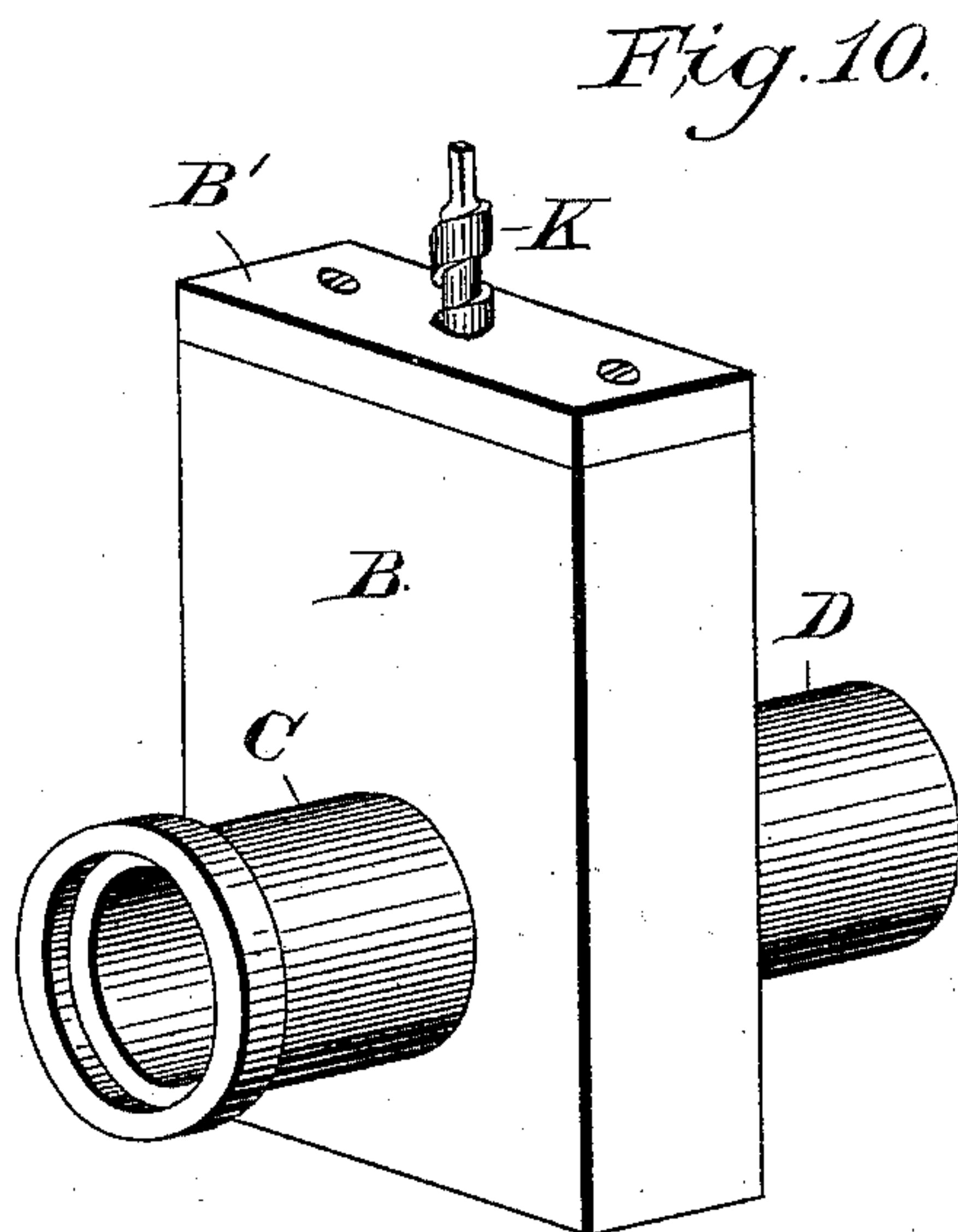
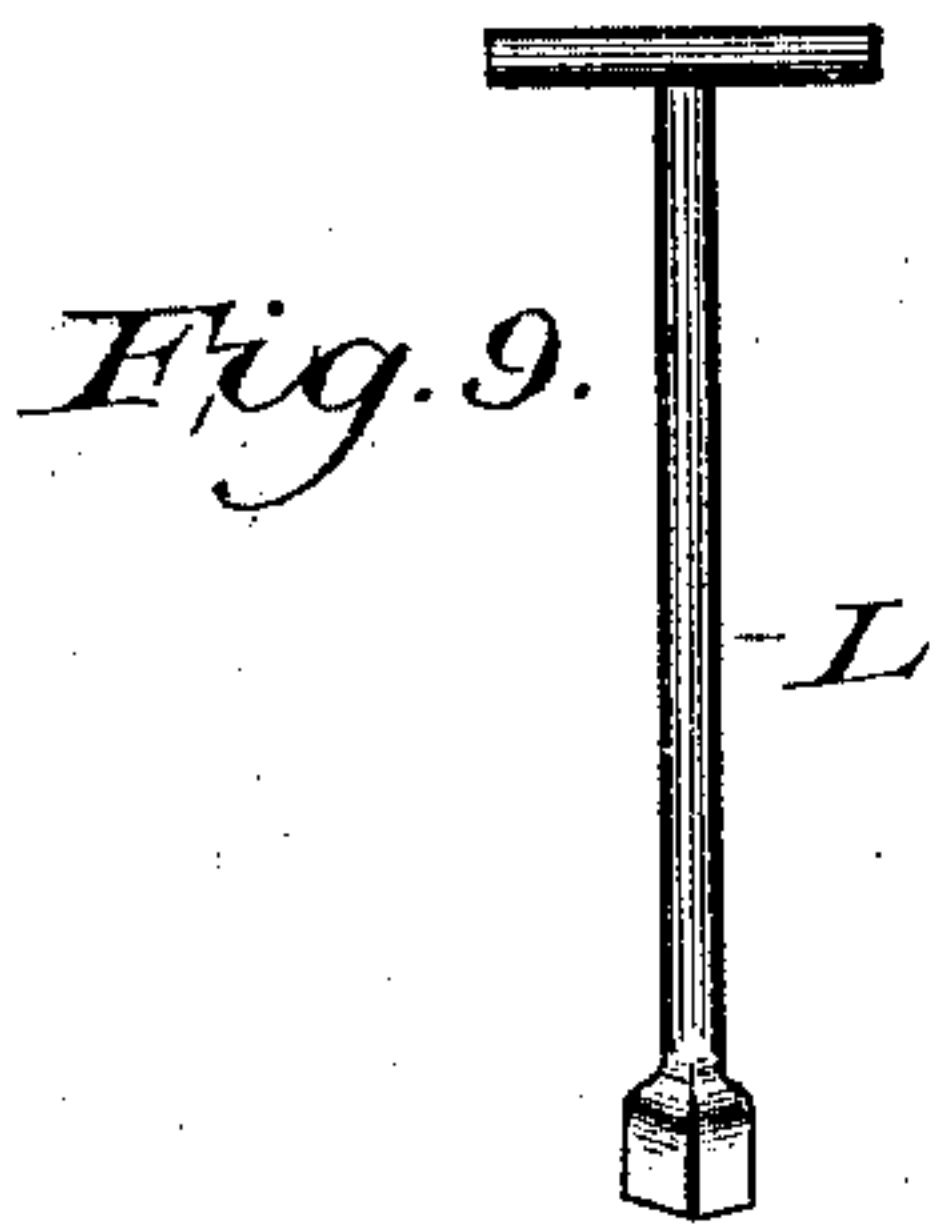
(No Model.)

2 Sheets—Sheet 2.

H. M. BROWNE.
SEWER OR OTHER TRAP.

No. 426,429.

Patented Apr. 29, 1890.



Witnesses:

Milton M. Hulland

Inventor:

Henry M. Browne

UNITED STATES PATENT OFFICE.

HUGH M. BROWNE, OF WASHINGTON, DISTRICT OF COLUMBIA.

SEWER OR OTHER TRAP.

SPECIFICATION forming part of Letters Patent No. 426,429, dated April 29, 1890.

Application filed July 20, 1889. Serial No. 318,183. (No model.)

To all whom it may concern:

Be it known that I, HUGH M. BROWNE, of the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in Sewer and other Traps, of which the following is a specification.

My invention has reference to sewer and other traps; and the object of the invention is to provide automatically, by means of hydrostatic power, against back or flood water without placing in the induction or discharge pipes any obstruction to the usual sewage flow.

In all of the constructions heretofore in use, so far as I know, some part of the mechanism is located in the path of the usual sewage flow and causes the lodgment of matter in the sewer-pipe, which consequently cripples the operation of said construction. This defect in the usual construction of sewer-traps requires but a short time to render them practically useless. I overcome this difficulty by such a construction as will locate all the operative parts of my apparatus away from the path of said flow, the valve alone being lowered to stop the flow of back or flood water.

Another objection to all the constructions heretofore in use, so far as I know, is that they use the back or flood water as the immediate power to close the induction-pipe. My construction overcomes this objection by using hydrostatic power from the water-main as the immediate power to close the induction-pipe, using the back or flood water only to operate the mechanism which stops and permits the flow of water from the water-main.

My invention consists in the use of a vertically-sliding valve so situated and arranged, in conjunction with a hydrostatic piston, a double stop and waste cock, a float, and an elbow of pipe, as to close the induction-pipe when the back or flood water rises and open the same when the back or flood water recedes.

In the accompanying drawings, forming a part of this specification, Figure 1 is a perspective view of my invention. Fig. 2 is a vertical section of the same on line *x x*, Fig. 1. Fig. 3 is a view of the outlet-pipe *e'*, Fig. 1. Fig. 4 is a perspective view of the double stop and waste cock, showing the opposite side from that shown at F, Fig. 1. Fig. 5 represents the india-rubber band used on H, Fig. 2. Figs. 6, 7, and 8 represent detached parts of the stop and waste cock F shown in Fig. 4. Figs. 9 to 13, inclusive, represent such modifications in the construction of my apparatus as will adapt it for use by hand. Fig. 9 represents the key; Fig. 10, a perspective of the complete apparatus; Fig. 11, the rubber band adapted for use in said apparatus; Figs. 12 and 13, perspective views of the apparatus with the valve lowered and raised, respectively.

Similar letters refer to similar parts throughout the several views.

A is the cylinder in which the hydrostatic piston moves.

B is the casing of the sliding valve H.

C is the induction-pipe.

D is the discharge-pipe, and E is the enlarged elbow.

F is the double stop and waste cock.

G is the float.

e is the pipe leading to the service-pipe of the water-main, and *e'* is the outlet-pipe connecting F with the elbow E.

f f' are pipes connecting, respectively, the upper and lower halves of cylinder A with the stop and waste cock F.

g is the shank joining the float G with the lever-handle of stop and waste cock F.

The hydrostatic piston I is joined to the sliding valve H by means of the piston-rod *i*, working water-tight through the hole *r* in such a manner as to cause the sliding valve H to move up and down in the interior of the valve-casing B simultaneously with the up-and-down movement of the piston I in cylinder A. The sliding valve H, when it bears on its seat, completely closes the induction-pipe C, as shown in Fig. 2, and when raised to the top of its casing it leaves the induction-pipe entirely open, as shown by dotted lines, Fig. 2, and by full lines in Fig. 13. The valve H is bound with an india-rubber facing *h h*. This facing on top of said valve is so fastened to the bottom of the piston-rod *i* by the flat bar *h'* as to be free to expand laterally in all directions, and this lateral expansion of the top part of the rubber band is effected by the downward pressure of the piston I. The purpose of this expansion of the rubber facing on the top of valve H is to close the small

space (which a free movement of the valve makes necessary) between the valve H and its casing B.

The piston I is worked by hydrostatic power, which is supplied alternately to each side of the piston I from the ordinary service water-pipe by means of the double stop and waste cock F. This stop and waste cock consists of the face-plate F', Fig. 6, the valve F'', Fig. 7, and the rear plate F''', Fig. 8. Said face-plate F' is provided with the seat or recess M and four apertures *k*, *l*, *m*, and *n*. Valve F'' has the key *s* rigidly secured thereto, and is provided with apertures *o* and *p*. The rear plate F''' is provided with the central aperture *o'*, through which the key *s* extends, and also with the apertures *k'*, *l'*, *m'*, and *n'*, which latter register with the apertures *k*, *l*, *m*, and *n* in the face-plate F' in the manner hereinafter explained.

In the upper half of face-plate F' apertures *k* *l*, Fig. 6, are connected with the upper half of the cylinder A, Fig. 1, by the pipe *f*, and the apertures *m* *n* of the lower half of said plate are connected with the lower half of cylinder A by the pipe *f'*, as shown in Figs. 1 and 6. On the outer face of rear plate F''' the apertures *l'* and *n'*, Fig. 8, are connected with the elbow E by the outlet-pipe *e'*, and the apertures *k'* *m'* on said plate are connected with the service water-pipe by pipe *e*. Thus it will be seen that both the upper and lower halves of cylinder A (or above and below piston I) are separately connected by means of the stop and waste cock F and the pipes *f* *f'* with the pipe *e*, leading from the ordinary service water-pipe, and with the pipe *e'*, leading to the elbow E.

The oscillating valve F'', with the two apertures *o* *p*, Fig. 7, oscillates in the seat or recess M in the face F', Fig. 6, of the stop and waste cock F. This valve rests normally (that is, when the elbow E is free from back or flood water) in the seat M, so as to let aperture *o* register with aperture *l* and aperture *p* register with aperture *m*, making an open passage from pipe *f* through apertures *l*, *o*, and *l'* to the outlet-pipe *e'*, and another open passage from the pipe *f'* through apertures *m*, *p*, and *m'* to the service water-pipe *e*, while it at the same time closes the aperture *k*, *n*, *k'*, and *n'*. Whenever back or flood water in elbow E causes the float G to rise from *j* to *j'*, the shank *g* will lift the lever-handle *g'* to the position indicated by the dotted lines above said handle, and the handle *g'*, by means of the key *s*, shifts the oscillating valve in the stop and waste cock F to its second position, which causes aperture *o* to register with apertures *k* *k'* and aperture *p* with apertures *n* *n'*, while it closes apertures *l* *m* *l'* *m'*, thus reversing the position of the registering apertures. When the back or flood water recedes from elbow E, then the float G sinks by its own weight from *j'* to *j*, shifting by means of shank *g*, lever-handle *g'*, and the key *s* the oscillating valve back to its normal position. It will

thus be seen that the water-power is applied above the piston I, and at the same time the water below the piston I is discharged whenever the back or flood water rises in elbow E, and vice versa when the back or flood water recedes from said elbow.

t is a floating ball-valve, which rests normally on the perforated bottom of the pipe *e'*, but is pressed against its seat whenever back or flood water rises in the pipe *e'* from elbow E.

It is evident that by a slight modification of the construction already described my apparatus can be adapted for manipulation by hand, and such modifications as I have devised are illustrated in Figs. 9 to 13, as before stated.

K, Figs. 10, 12, and 13, represents a screw adapted at its top end for the attachment of a wrench, with which said screw is to be turned for the purpose of raising and lowering the valve H, said screw working through the top plate B' on casing B. It will be observed that in this construction the screw K supplies the place of the hydrostatic piston, and in this way simplifies both the construction and operation of the apparatus. This substitution of the hand-operative screw for the hydrostatic piston does not, of course, involve any departure from the main principle of my invention; but for obvious reasons of utility and facility of operation I prefer that construction which employs the hydrostatic piston operated by the float and its connections.

While I have described my sliding valve, my hydrostatic piston, and my double stop and waste cock as adapted to a sewer-pipe connection, they may be applied in other ways, and I do not desire to limit myself to any particular use.

My stop and waste cock may be made as shown at F, Fig. 1, or in any other convenient shape or form, according to the connections to be made; and my valve may be made as shown at H, Fig. 2, or at H, Fig. 13, and may be used with or without the rubber facing.

My invention operates substantially as follows: Whenever back or flood water rises in elbow E, the float G is buoyed up. This causes its shank *g* to raise handle *g'*. This handle turns key *s*, and key *s* shifts the oscillating valve F'' in stop and waste cock F, causing its apertures to so register with those of said F as to admit water from the service-pipe to the upper half of cylinder A, and at the same time to discharge the water from the lower half of said cylinder, thus causing the piston I to move downward and force valve H into its seat, completely closing the induction-pipe C. Whenever back or flood water recedes from elbow E, then the float G sinks by force of gravity to its normal position *j*, reversing the registering apertures so as to admit water from the service-pipe to the lower half of cylinder A, and at the same time to discharge the water from the upper half of

said cylinder, thus causing the piston I to move upward and lift valve H to the top of casing B, leaving the induction-pipe C entirely open.

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

1. A sewer or other trap consisting of an induction and discharge pipe, forming an elbow, a casing over the induction end of said pipe and containing a valve, a hydrostatic piston connected to said valve, and a float located in the discharge end of the said elbow, and mechanism, substantially as described, 15 for connecting said float with a stop and waste cock, by means of which latter the hydrostatic piston is operated in the manner substantially as set forth.

2. A sewer-trap comprising an inlet and an outlet pipe, a valve for stopping the flow of back or flood water, a hydrostatic piston for operating said valve, and a float arranged in one end of said pipe, and adapted, by means of the mechanism substantially as described, 25 to operate the piston automatically to control the flow of the back or flood water in said pipe.

3. In a sewer-trap, the elbow-pipe having

the induction end C, the discharge end D, the latter enlarged to receive the float G, said float G, its shank *g*, key *s*, having the lever-handle *g'*, and the stop and waste cock F, comprising the parts F' F'' F''' , all combined with the hydrostatic piston and valve, as described, and operating in the manner substantially as 35 set forth.

4. The valve H, surrounded by the rubber band *h* and combined with the flat bar *h'*, to which it is so secured as to permit the lateral expansion of the rubber band placed between 40 said bar and valve, substantially as described and shown.

5. In a sewer-trap or similar device, the combination of the following elements, to wit: an elbow-pipe comprising induction and discharge ends, a hollow casing B, secured to or integral with said induction end, valve H, rubber *h*, hydrostatic piston I, rod *i*, cylinder A, pipes *f* and *f'*, stop and waste cock F, pipes *e* and *e'*, key *s* *g'*, shank *g*, and float G, all 50 operating substantially in the manner set forth.

HUGH M. BROWNE.

Witnesses:

MILTON M. HOLLAND,
JNO. H. SMITH.