

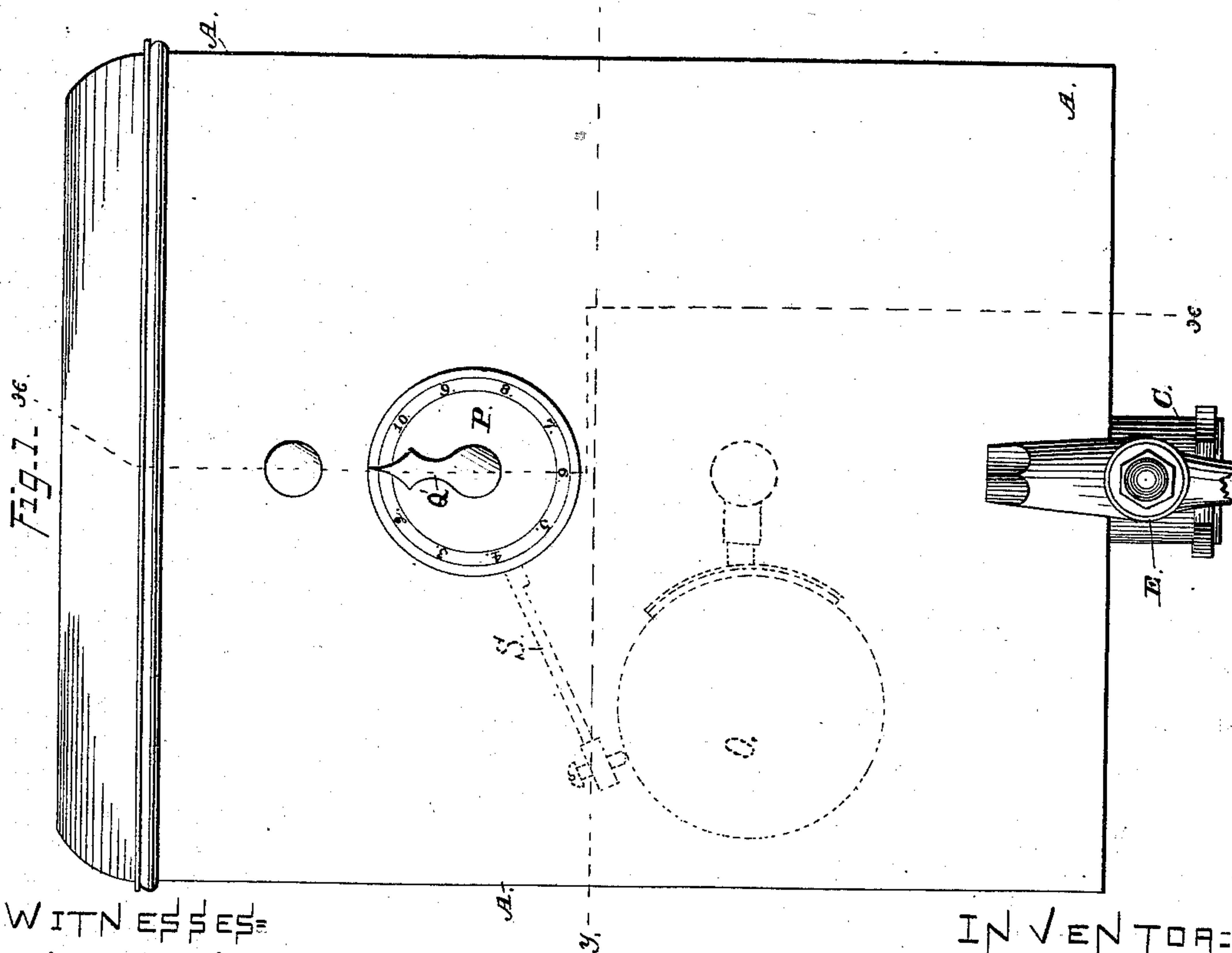
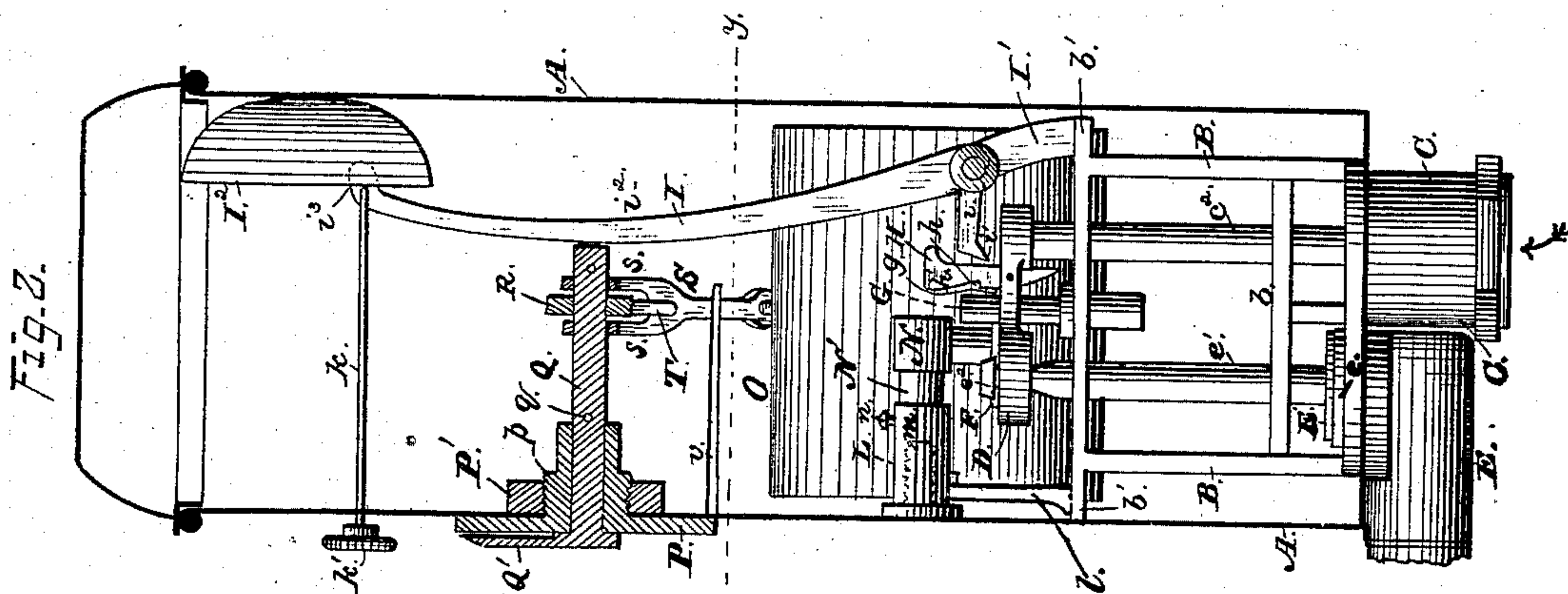
(Model.)

3 Sheets--Sheet 1.

H. E. MARCHAND.
Automatic Liquid Measure.

No. 232,527.

Patented Sept. 21, 1880.



WITNESSES

Jas. E. Hutchinson,
J. A. Rutherford

INVENTOR:

H. E. Marchand,
by James L. Norris.
att'y.

(Model.)

3 Sheets—Sheet 3.

H. E. MARCHAND.
Automatic Liquid Measure.

No. 232,527.

Patented Sept. 21, 1880.

Fig. 5.

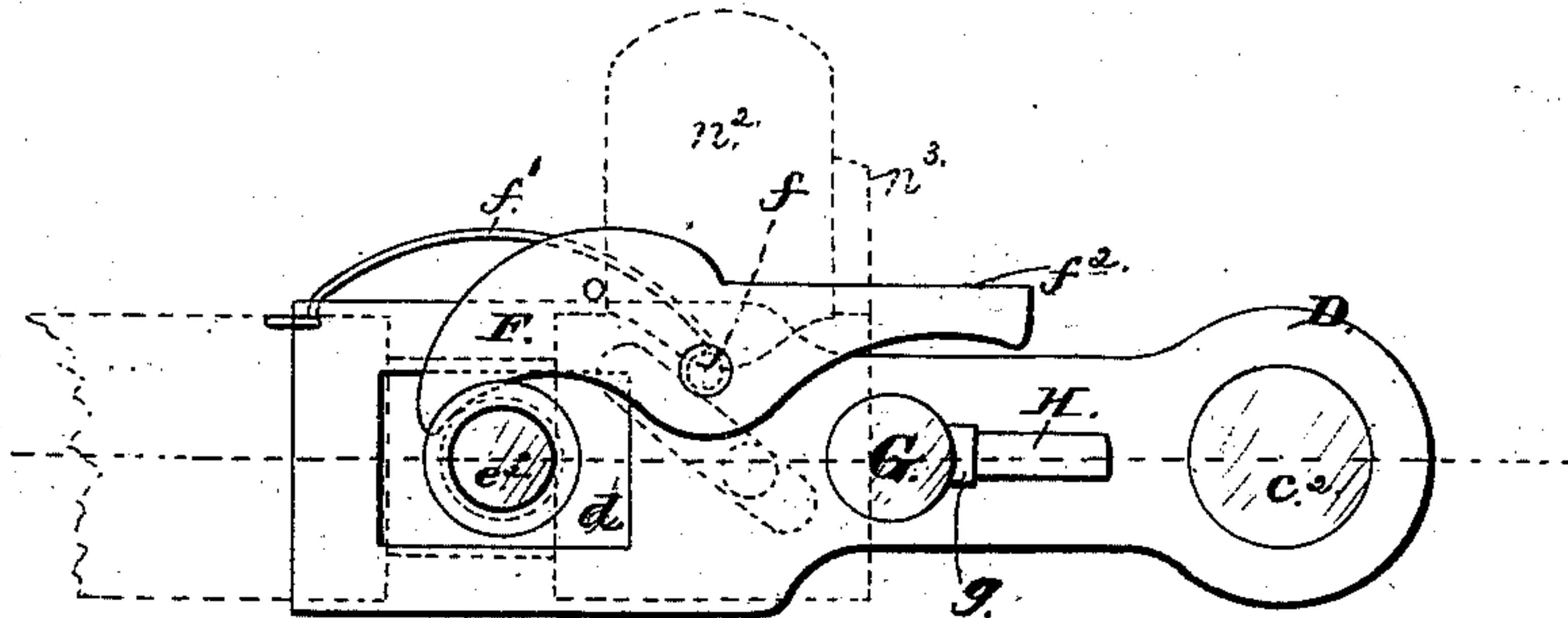


Fig. 6.

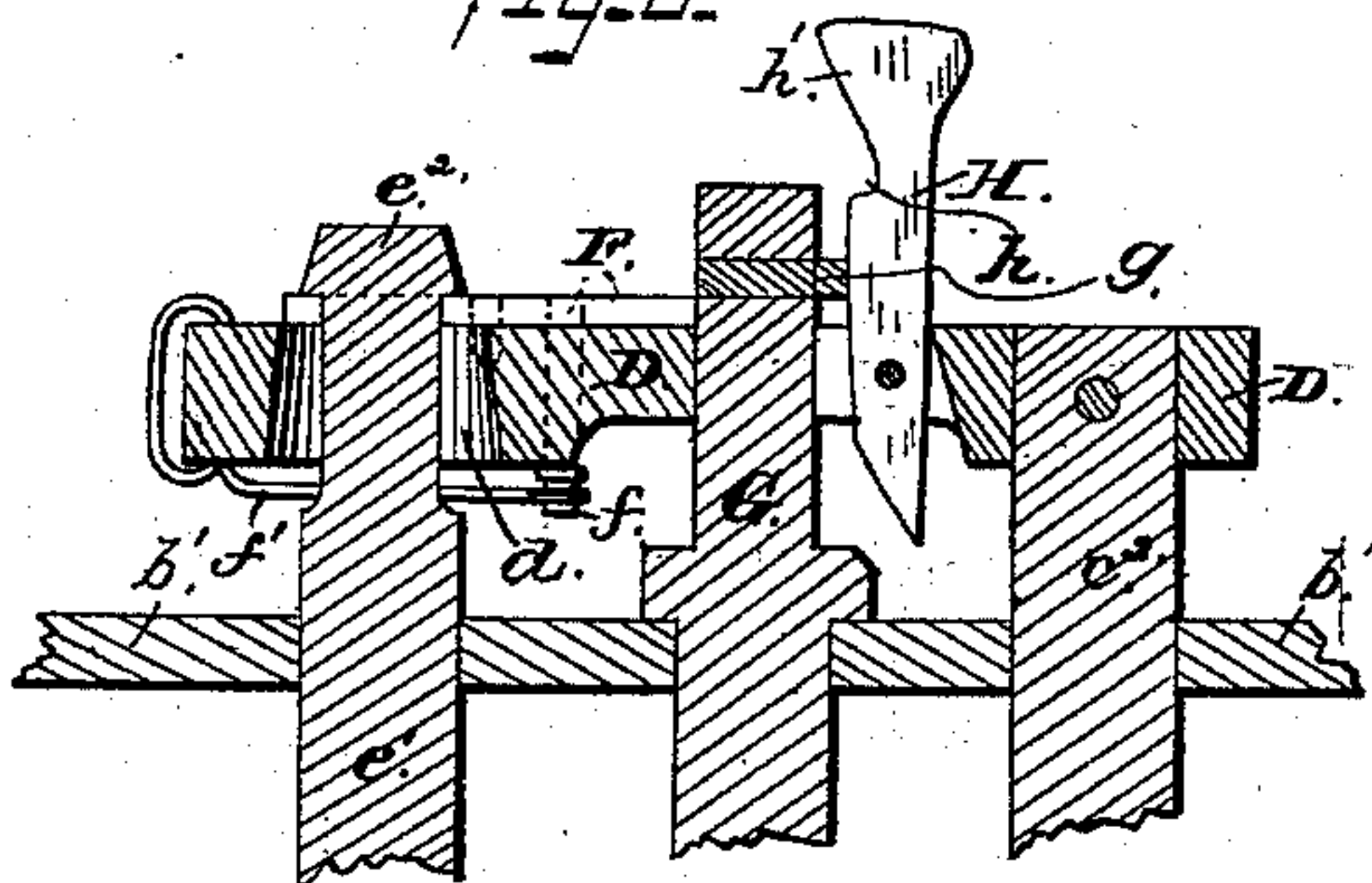
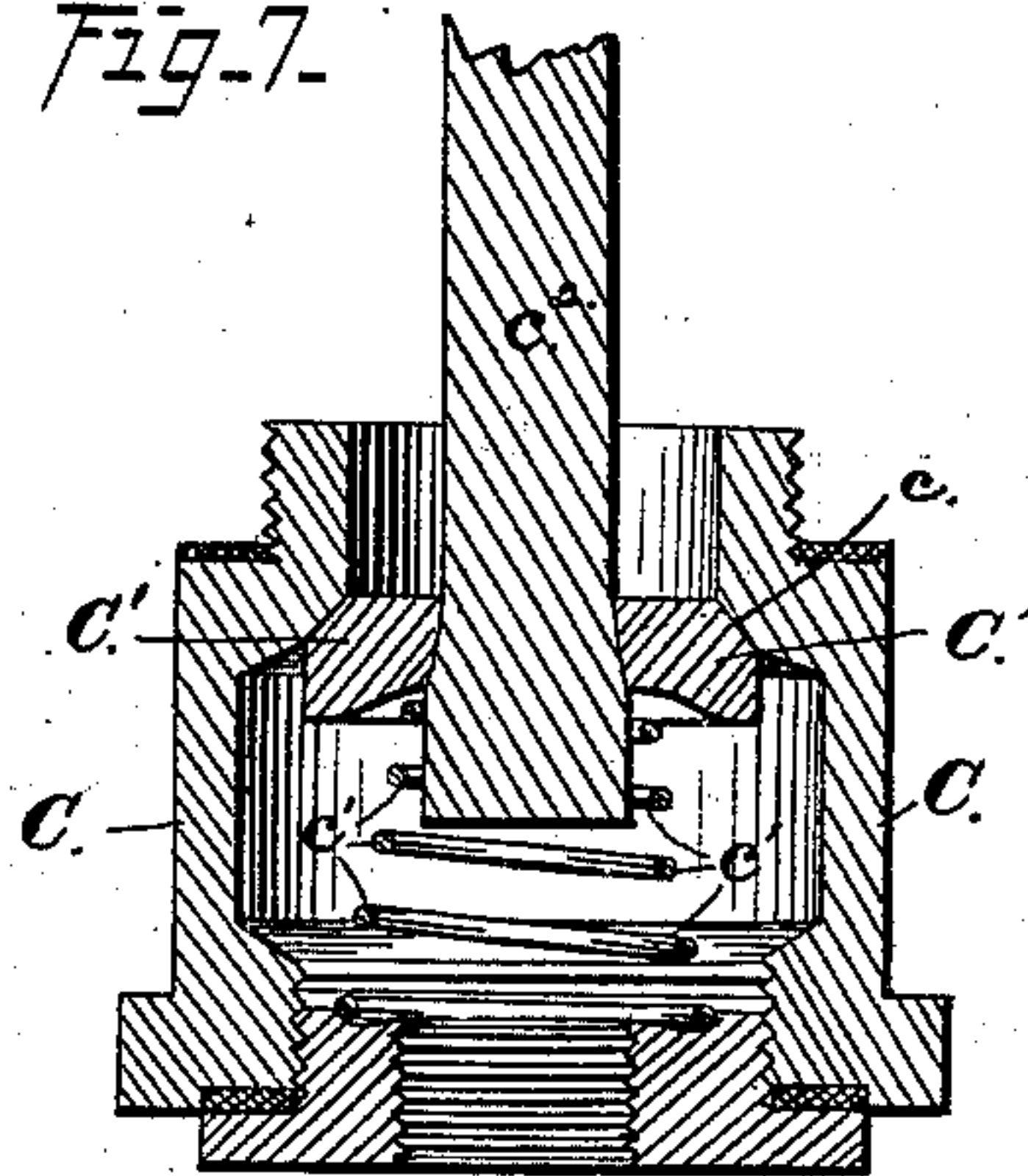


Fig. 7.



WITNESSES=

Jas. E. Hutchinson.

J. A. Rutherford.

INVENTOR=

H. E. Marchand,

by James L. Norris.
 att'y.

UNITED STATES PATENT OFFICE.

HENRY E. MARCHAND, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF OF HIS RIGHT TO WILLIAM J. BECKFELD, OF SAME PLACE.

AUTOMATIC LIQUID-MEASURE.

SPECIFICATION forming part of Letters Patent No. 232,527, dated September 21, 1880.

Application filed June 23, 1880. (Model.)

To all whom it may concern:

Be it known that I, HENRY E. MARCHAND, a citizen of the United States, residing at Allegheny city, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Automatic Liquid-Measuring Apparatus, of which the following is a specification.

This invention has for its object to provide a liquid-measuring apparatus which, when set for operation from the outside, will receive from a connected source of supply and automatically discharge a definite quantity of liquid, the inflowing liquid operating devices for sounding an alarm when a proper quantity has been received, and for registering the number of measurements.

It is especially adapted for use in measuring oils, molasses, and other liquids liable to soil the hands and clothing.

It consists, first, in the combination, with the receiving-casing of a liquid-measuring apparatus, of an inlet-valve and an outlet-valve, a float arranged to operate said valves automatically through intermediate devices for closing said inlet-valve and opening said outlet-valve, and a device for opening said inlet-valve from the outside of the casing at the commencement of said measurement, all constructed and arranged for the accomplishment of desired object, substantially as hereinafter described; second, in the combination, with the receiving-casing of a liquid-measuring apparatus, of an inlet-valve and outlet-valve, and a float arranged to operate said valves automatically through intermediate devices for closing the former and opening the latter simultaneously, and subsequently closing the latter when a definite predetermined quantity of liquid has been discharged from the casing; third, in the combination, with the casing, float, and automatically-operated measuring-valves, of a registering device arranged upon the outside of the casing and an operating lever or arm arranged inside the casing in the path of the float and connected with said registering device.

In the accompanying drawings, Figure 1 is a front view of the apparatus with some of the interior parts indicated in dotted lines.

Fig. 2 is a vertical section on line *x x* of Fig. 1. Fig. 3 is a rear view of the apparatus with its back wall removed. Fig. 4 is a horizontal section on line *y y* of Figs. 1 and 3. Figs. 5, 6, and 7 are detail views.

The letter A designates the walls of the casing, transversely on the bottom of which is arranged a frame, B, for supporting the valves, valve and alarm operating devices.

C designates an induction-nozzle passing through the bottom of the casing and base of the frame B, and having arranged within it a valve, C', Fig. 7, which is normally held against a seat, *c*, by means of a spring, *c'*.

From the valve C' rises a stem, *c*², passing upward through suitable guide-passages formed in the cross-bars *b* and *b'* of the frame B, and at its upper end, which extends above the cross-bar *b'*, the stem *c*² has secured to it a horizontal arm, D, extending above said cross-bar toward the front of the casing, its front end being widened, and having a vertical opening, *d*, (see Figs. 5 and 6,) formed through it, to permit the passage of the stem *e'* of a valve, E', which normally rests by gravity upon a seat, *e*, formed for it at the mouth of the discharge-spout E, which passes through the bottom of the casing and the base of the frame B in the same manner as does the nozzle C.

The stem *e'* is provided with a projecting head, *e*², under which is arranged to take a latch, F, mounted on a pin, *f*, passing loosely through the arm D, and acted upon by a spring, *f'*, to cause the latch to move under said head of the stem. This latch is provided with a tail, *f*², extending rearward, for a purpose to be hereinafter explained. For detail view of latch, see Fig. 5.

A standard, G, projects upward from the top cross-bar, *b'*, of the frame B, and through an opening in the arm D, and from this standard G projects rearward a short stud, *g*, under which is arranged to catch a shoulder, *h*, formed on a dog, H, pivoted in a slot formed in the arm D, and having a forwardly-extending head, *h'*, which overbalances it to cause it to fall forward by gravity. (See Figs. 2 and 6.)

When the arm D is depressed, thus forcing

down the stem c^2 and carrying valve C' away from its seat, the dog H falls forward, and the shoulder h catches under the stud g , thus locking the valve open. When the parts are thus situated the latch F is caused, by the spring f' , to take under the head of stem e' , as shown in Figs. 5 and 6.

For depressing the arm D a bell-crank lever, I , is pivoted at its angle to a standard, I' , mounted on the frame B , the short arm i of said lever extending forward over the arm D and provided with a toe, i' , while the long arm i^2 curves upward and terminates in a head or hammer, i^3 , arranged to strike a bell, I^2 . From the head or hammer i^3 a loosely-connected rod, k , leads through the front wall of the casing and terminates in a knob, k' . When the rod is drawn outward the bell-crank lever will obviously act upon the arm D to force it downward. From the top of the front portion of the frame B rises a standard, l , carrying at its top a horizontal sleeve, L . Into the rear portion of the sleeve L is fitted a cylindrical arm, N' , held rigidly in position by a binding-screw, n , and extending rearwardly over the arm D to the middle of the latter. Upon the rear end of the arm N' is fitted loosely a cap, N , in opposite portions of the wall of which are cut oblique slots n' , into which pins project from the arm N' , the slots being in such position that when the cap is turned to the right, as viewed from the front, the studs, acting on the walls of the slots, force the cap rearward, when its head or closed end will strike the head of the dog H and force its shoulder h out of engagement with the stud g , when the arm D will be permitted to rise, throwing the bell-crank lever backward, so that the hammer on its long arm strikes the bell to announce the completion of a measurement.

From one side of the cap N projects a thimble, n^2 , into which is secured an arm, o , extending from a float, O , and from this thimble a cam, n^3 , projects downward. When this float is caused to rise by the admission of a liquid into the casing, the cap N is turned on its arm, so as to be forced rearward, as before described, and when said float has reached a predetermined point, on being permitted to descend by the drawing off of the liquid, the cam n^3 will strike the tail f^2 of the latch F and cause said latch to become disengaged from the head of the stem e' , so that the valve E' falls to its seat and closes the discharge-spout. Both the discharge and inlet valves will then be closed, and the knob k' must be pulled outward to place the parts in position to commence another measurement.

A registering-dial, P , having a marginal series of numbers, is arranged upon the wall of the casing, and from the center of this dial a screw-nipple, p , (see Fig. 2,) extends through the wall of the casing to receive a nut, P' , between which and the dial the wall is firmly clamped, as shown in the sectional view, Fig. 2. Through the nipple p is passed a spindle, Q , carrying at

its front end, in front of the dial, a pointer, Q' . A pin, q , secures the spindle in the nipple. Upon the rear portion of this spindle is rigidly secured a ratchet-wheel, R , and loosely pivoted upon said spindle is a bifurcated arm, S , having its arms s on opposite sides of the ratchet-wheel. Between these arms is pivoted, upon a pin, t , a pawl, T , the tongue of which rests upon the periphery of the ratchet-wheel at a point slightly above the pawl-pivot, in order to give the pawl a purchase upon the teeth of the said wheel.

Through the outer end of the lever S is arranged an adjusting-screw, U , the point of which stands in the path of the float O , so that when said float rises it will strike the screw and raise the lever S , causing the pawl T to turn the ratchet-wheel and spindle Q , thus moving the pointer in front of the dial to register the number of times the float rises, and consequently the number of measurements made.

The downward movement of the lever S is limited by a stop, v , fixed to the wall of the casing, and by adjusting the screw U the throw given to the lever by the float may be so regulated that the pointer will be moved the desired distance to properly count on the dial.

It will be understood that the movement of the float may be so arranged as to cause it to trip the valve-operating and alarm devices when the casing has received and discharged any desired definite quantity of liquid, which will form the unit of measurement of the apparatus.

The operation is as follows: The operator draws the rod k forward, and thereby causes the toe of the bell-crank lever to depress the horizontal arm D , which, in its downward movement, depresses the valve-stem and valve c^2 C' , thereby opening said valve and permitting the liquid to flow into the casing through the induction-pipe C . Upon releasing the rod of the bell-crank lever the said valve C is held open against the upward pressure of the spring e' by means of the dog H , which, during the descent of the horizontal arm D , swings forward so that its shoulder h will catch under the lug or arm g of the standard G . While the liquid is flowing into the casing the outlet-valve E is closed by gravity, and as the liquid rises in the casing the float is caused to rise.

During the depression of the horizontal arm, as just described, the latch F will be forced by spring-pressure between the said horizontal arm and the head e^2 of the valve-stem e' of the outlet-valve, as shown in Figs. 5 and 6. As the float rises the cap N will be turned on its arm, the walls of the oblique slots in the cap acting on the pins in said arm, so that the cap will be forced inward or toward the rear wall of the casing, and when the said float has reached a certain height in the casing the cap N will strike against the dog H , thus freeing the dog from engagement with the lug or arm

g. The spring c' , upon such disengagement of the dog, which has heretofore locked the valve C' in an open position, immediately forces the said valve up against its seat, so as to cut off the inflow of the liquid, such action necessarily causing the valve-stem c^2 and the horizontal arm D to have a like upward movement. As the arm D rises it acts upon the toe of the bell-crank lever I, so as to cause said lever to strike the gong, and it also raises the valve-stem e' , so as to open the outlet-valve E' . As the liquid now flows out through the discharge-spout the float descends, and when the said float has reached a predetermined point the cam n^3 of the thimble n^2 , connected to the slotted cap N, will strike the tail f^2 of the latch F and cause said latch to become disengaged from the head of the stem of the outlet-valve, thereby permitting said stem and valve to descend in order to close the discharge-spout. Both the discharge and inlet valves will then be closed, and the knob k' must be pulled outward to place the parts in position to commence another measurement.

The number of measurements made are indicated by the pointer Q' in front of the dial P, as hereinbefore described.

The apparatus herein described is intended as an improvement upon that which forms the subject of Letters Patent No. 221,333, granted to me November 4, 1879.

What I claim is—

1. The combination, with the receiving-casing of a liquid-measuring apparatus, of an inlet-valve and an outlet-valve, a float arranged to operate said valves automatically through intermediate devices for closing said inlet-valve and opening said outlet-valve, and a device for opening said inlet-valve by hand from the outside of the casing at the commencement of each measurement, substantially as described.

2. The combination, with the receiving-casing of a liquid-measuring apparatus, of an inlet-valve and an outlet-valve, and a float arranged to operate said valves automatically through intermediate devices for closing the former and opening the latter simultaneously, and subsequently closing the latter when a definite predetermined quantity of liquid has been discharged from the casing, essentially as set forth.

3. The combination, with the casing A, provided with the induction-nozzle and discharge-spout, of the spring inlet-valve C' , having a suitably-guided stem, c^2 , provided with an arm, D, the outlet-valve E' , its stem e' , connected with said arm D, the dog H, provided with a

shoulder, h , arranged to catch under a suitable stop, a suitable device arranged for operation by the float O, for disengaging said dog from said stop, and a lever arranged to act upon the arm D for depressing the same, and provided with an operating-rod leading outside the casing, substantially as described.

4. The combination, with the casing A, provided with the induction-nozzle and discharge-spout, of the spring inlet-valve C' , having a suitably-guided stem, c^2 , provided with an arm, D, the outlet-valve E' , having the headed stem e' , the latch F, mounted on the arm D and arranged to take under the head of said stem, the dog H, provided with a shoulder, h , arranged to catch under a suitable stop, a suitable device arranged for operation by the rising of the float O, to disengage said dog from said stop, and a device arranged for operation by the falling of the float to disengage the latch F from the head of stem e' , to permit the same to fall, substantially as described.

5. The combination, with the spring inlet-valve C, having stem c^2 , secured to an arm, D, of the float, and automatic tripping devices, a lever, I, arranged to operate upon the arm D, a rod arranged to operate said lever and leading outside of the casing, and a bell arranged within the casing A and standing in the rearward path of said lever, substantially as and for the purpose set forth.

6. The combination, with the casing, float, and automatically-measuring valves C' E' , of a registering device arranged upon the outside of the casing, and an operating lever or arm, S, arranged inside the casing independently of the float, and having one of its ends in the path of the float and its other end connected with said registering device, substantially as and for the purpose set forth.

7. The combination, with the casing and float, of the dial P, spindle Q, carrying pointer Q', ratchet-wheel R, fixed upon the spindle-arm S, pivoted on said spindle, and the pawl T, pivoted to said arm and arranged to engage the teeth of the ratchet-wheel, and a set-screw, U, passed through the free end of the arm S, said arm being arranged independently of the float and having its free end in position to be acted upon by the float, all substantially as described, and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

H. E. MARCHAND.

Witnesses:

WM. H. STERRITT,
WM. K. GRAY.