

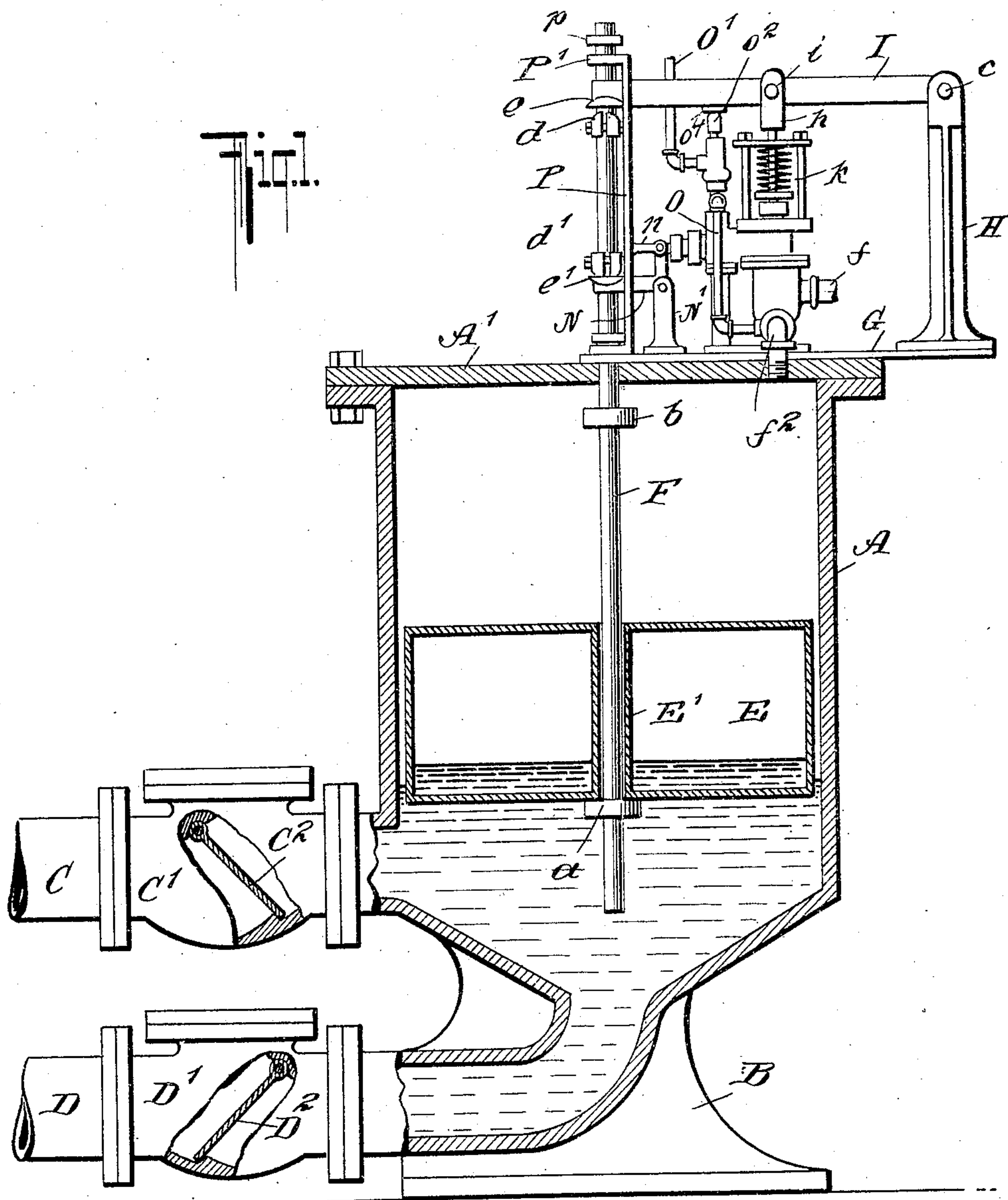
No. 877,794.

PATENTED JAN. 28, 1908.

W. McCLINTOCK.
SEWAGE EJECTOR.

APPLICATION FILED SEPT. 19, 1907.

2 SHEETS—SHEET 1.



WITNESSES

WITNESSES
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G. Marshall

INVENTOR:

INVENTOR:
William McClinton

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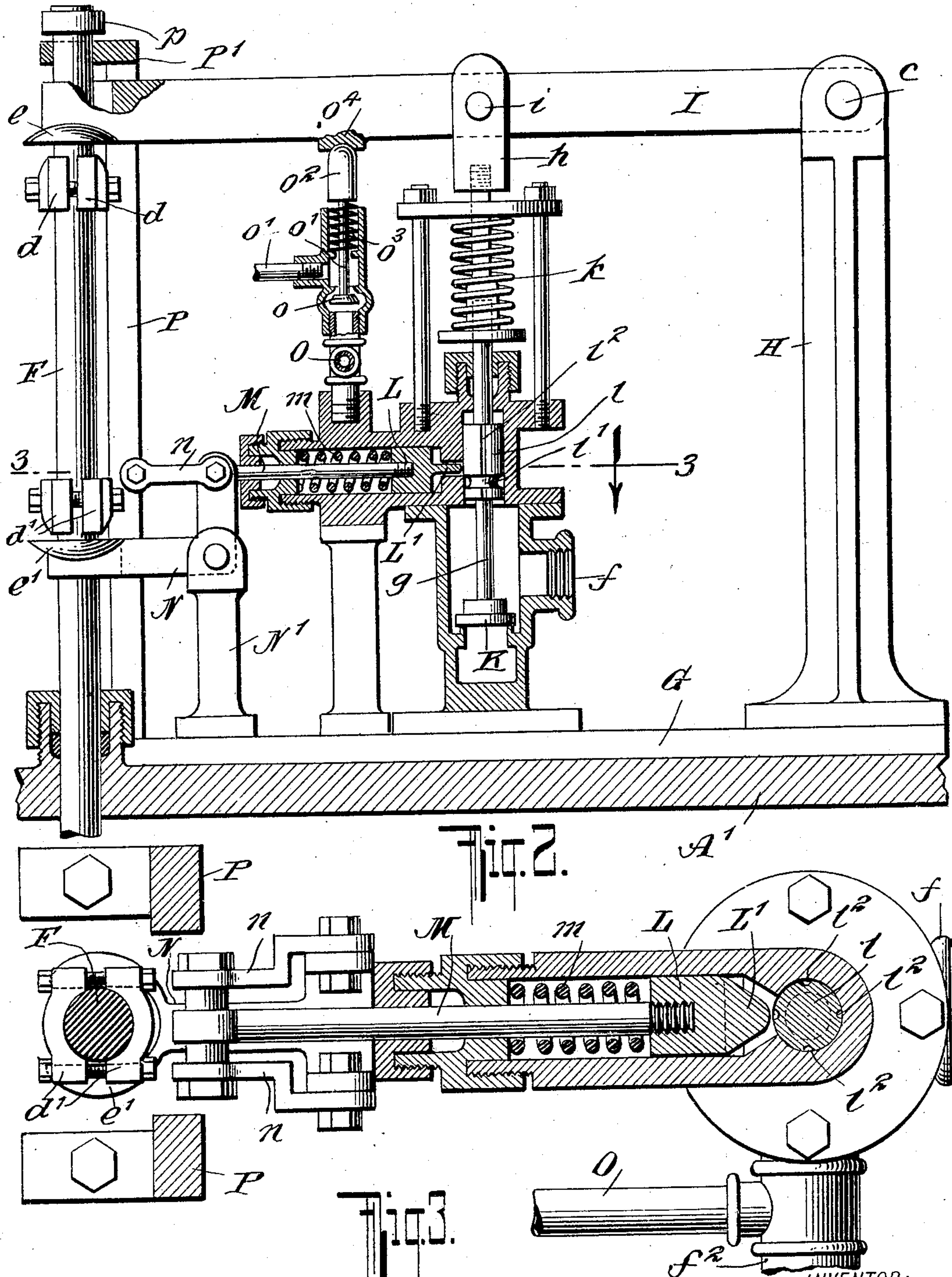
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WITNESSES

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WILLIAM McCLINTOCK, OF NEW YORK, N. Y.

SEWAGE-EJECTOR.

No. 877,794.

Specification of Letters Patent.

Patented Jan. 28, 1908.

Application filed September 19, 1907. Serial No. 393,633.

To all whom it may concern:

Be it known that I, WILLIAM McCLINTOCK, a citizen of the United States, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Sewage-Ejectors, of which the following, in connection with the accompanying drawings and reference characters marked thereon, is a full, clear, and exact specification, sufficient to enable others to make and use my improvements.

This invention has relation to that class of devices employed in buildings or on floating vessels or elsewhere for elevating or ejecting sewage and such like matter from levels below the ordinary sewage or other discharge level.

The object of my present invention is to provide or produce a sewage ejector of the general class above indicated which will be of few and simple parts, reliable in operation, automatic in action, easy to construct and mount in place for use and not liable to get out of order.

A further object of the invention is to simplify and improve the means for operating the valve which governs the inlet of the steam or compressed air employed to effect the ejection and to simplify and improve the other connections necessary for making the apparatus successfully operative.

A still further object of the invention is to arrange the operative mechanism so that it may be easily accessible in all its parts and afford easy access to the interior of the receiver whenever required for any purpose.

To accomplish the foregoing objects and to secure other and further advantages in the matters of construction, operation and use, my improvements involve certain new and useful relative arrangements or combinations of parts, peculiarities of construction and principles of operation, as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a vertical view, partly in section and partly in elevation, showing my improved apparatus complete and ready for use, the parts being in position which they assume when the receiver or tank commences to fill. Fig. 2 is a vertical view, partly in section and partly in elevation, corresponding with Fig. 1 but on a much larger scale, and showing only the parts exterior to the receiver. Fig. 3 is

a horizontal section and partial plan view of a fragment on a plane through line 3 3 of Fig. 2 and on a larger scale than that figure.

In all these figures like reference characters, wherever they are employed, indicate corresponding parts.

According to my present invention I employ in the receiving tank a float and cause this float by direct connection to operate the lever which opens the valve to admit steam or air under pressure from an outside source to the tank in order to effect the ejection; and through these same connections with the float I also operate the valve for opening the ventilating pipe leading from the tank and the locking device or catch for the stem of the valve which admits the steam or compressed air.

In the drawings, A represents the receiving tank which is made of any desired form and size but which is preferably and most economically made in general cylindrical form. This tank is sustained on any suitable base or other support, represented at B, and into the tank is led the sewage inlet pipe C and from it the sewage discharge pipe D. These latter pipes may lead in any desired direction and be connected with the tank at any desired points, but preferably they are located below the lowermost position of the float employed in the tank. Interposed between the tank and pipes C and D are the usual forms of valve chambers, C¹ and D¹, containing automatically seating valves as C² and D², the former opening to permit free ingress of sewage material but closing to prevent egress thereof, and the latter being reversely opening and closing to permit free egress from the tank but to prevent back flow through the pipe D.

E is a float located within the tank and arranged to rise and fall therein, this float being preferably in the form of a hollow vessel and being provided with a sleeve or tube, E¹, extending through it from top to bottom and permitting the float to move up and down on the main rod F of the operating apparatus. The float E is suitably weighted so that it will shift the rod F when its weight is applied thereto; and it is sufficiently buoyant so that when compelled to rise it will also shift the rod F in the manner required. To secure the necessary buoyancy notwithstanding the weight which may be added to the float, the float is made so as to leave only a narrow space between its verti-

cal wall and that of the tank or receiver A. When the material flows into the tank A the float does not rise until the liquid ascends in the space between it and the walls of the chamber A to a sufficient height to produce the necessary buoying effect to raise the float. A slight rise in this space will suffice to produce the necessary lifting effect; and one quarter of an inch clearance between the float and the tank will be found sufficient in most cases.

On the rod F are two stops for the float, one at the bottom, represented at *a*, and one at the top, represented at *b*. These stops are preferably in the form of collars and may be secured in any desired way. Manifestly when the weight of the float is applied on the stop *a* it will draw the rod F down and when the float strikes stop *b* it will push the rod up. The rod passes up through the top A¹ of the tank where it is suitably packed or within which it is suitably fitted to prevent leakage, the top being made tight at its joint with the tank and removable from the tank to permit the location of the float and to permit access to the interior of the tank whenever necessary.

The exterior mechanism is mounted upon a suitable base or bed plate, represented at G, and this is most conveniently made independently of the top of the tank but applied thereto and secured in place by any suitable means. The base G may project beyond the top of the tank if necessary or desirable.

Secured upon the base G is a standard, H, in the top of which is a lever I, fulcrumed, as at *c*. The lever I extends over to the position of the rod F and its free end is raised when said rod is suitably raised by contact with said lever of contact pieces or tappets, *d, d*, adjustably secured upon said rod, as by suitable bolts and nuts. The upper parts of these tappets are preferably rounded off and the adjacent lower part of the lever I is provided with a curved portion, *e*, to properly receive the tappets.

At K is a valve by which the admission of steam or compressed air to the tank is controlled. The steam or air for effecting the ejection is supplied from any exterior source and enters the chamber of valve K at *f*.

At *g* is the stem of valve K, the same extending up through the valve casing and being connected with the lever I by a suitable connecting piece, as at *h*, the latter being journaled on the said lever as at *i*; but this form of connection may be suitably varied. When the free end of lever I is elevated it will open or raise valve K, thereby admitting steam or compressed air to the tank to effect the ejection. When the free end of lever I is allowed to descend, the valve is forced back to its seating by a sufficiently powerful spring, as at *k*. The valve stem *g* is suitably packed against leakage where it

passes out of the valve chamber. At some convenient point on the stem or rod *g* and firmly secured thereto or formed therewith is an enlarged portion, *l*, having a circumferential groove, *l*¹, and longitudinal grooves, as *l*². The circumferential groove is for the purpose of receiving the end of the locking bolt or catch by which the valve, when raised from its seat, is locked in its raised position against the downwardly acting force of the spring *k* and the pressure upon the upper surface of the valve. The longitudinal grooves are for the purpose of preventing steam or air from becoming trapped above the enlarged portion *l* and in the chamber within which the enlarged portion is compelled to move. With these longitudinal grooves the steam or air above and below the enlarged portion *l* becomes balanced, so that the movements of the valves are not impeded.

At L is the locking bolt or catch, the same being movable within a suitable chamber provided for it and being supplied with a flattened or reduced portion, L¹, intended to enter the circumferential groove *l*¹ as soon as that groove is brought to the proper location. At other times the reduced portion L¹ may bear against the enlarged portion *l* without interfering with the movement of the valve stem. Connected with the lock bolt L is a rod, M, the same being suitably packed against leakage from the chamber containing the locking bolt. The locking bolt is normally crowded to its locking position by means of a suitable spring, *m*.

While I have shown the locking bolt and the enlarged portion *l* below the packing for the valve stem *g*, these parts might be located on the other side of said packing and thus obviate the necessity of any packing for the locking bolt rod.

At N is a bell crank lever fulcrumed on a suitable standard, N¹. One end of this bell crank lever is connected with the locking bolt rod M and by a joint which will permit the lever to move said rod without interfering with the straight line movement of the latter; and this connection is preferably in the form of toggles, represented at *n, n*, the same being pivoted on the upwardly extending arms of the lever and upon the end of the rod M. The horizontal arm of the bell crank lever is swung down when the rod F descends. To effect this motion, the rod F is supplied with tappets, as at *d*¹, *d*¹, secured on said rod at the proper point and substantially as are the tappets *d, d*, being similarly shaped, but intended to act in the opposite direction. To receive these contact pieces or tappets, the horizontal arm of the bell crank lever N is provided with a curved portion, as *e*¹.

The apparatus being constructed as so far described, when the float is in position indi-

cated in Fig. 1, it will pull down upon the rod F, thereby withdrawing the locking bolt and permitting the valve K to be seated. When the float strikes the projection or collar *b* and raises the rod F, the free end of lever I is elevated and the valve K thereby opened, the circumferential groove *L*¹ being brought up to a position where it can be engaged by the reduced portion *L*¹ of the locking bolt, and then the locking bolt under the influence of its spring is forced into locking engagement, whereby the valve K is held in its open position until the locking bolt is withdrawn. Steam or compressed air is then free to enter the tank through a suitable tube, *f*², connected with the valve casing, and the sewage matter is then forced out through the pipe D. As the sewage matter in the tank descends the float also descends and when it strikes the projection or collar *a* and bears thereon it carries the rod F down. The downward movement of the rod F, through the tappets *d*¹ and the bell crank lever, causes the withdrawal of the locking bolt from its locking position and therefore leaves the valve K free to be closed by the action of the spring *k*. Then the steam or air is cut off from the tank and the latter is ready to be again filled.

At O is a ventilating pipe, the same leading from the interior of the tank and by means of any suitable connection therewith, as through the tube *f*² and up to a branch or extension, O¹, which latter may be carried to any desired point. The pipe O enters a valve casing with which the branch O¹ is also connected, and this casing contains a valve, *o*, having a stem, *o*¹, projecting to the exterior and carrying a contact piece as *o*². Acting on the stem *o*¹ is a spring, *o*³, of sufficient power and intended to hold the valve *o* normally up against its seat so as to prevent the escape of steam or air while the tank is being emptied. The piece *o*² bears against the lever I or against a suitable bearing piece *o*⁴ applied on said lever. When the lever I is raised, the spring *o*³ will cause the valve *o* to be seated; but when the lever is depressed and therefore the valve K closed, the valve *o* is forced down and therefore open, to permit the air or steam or gas within the tank to escape by way of the ventilating pipe. By providing for this escape the inflow of material to the tank is in no way impeded by any fluid pressure within the tank.

At P P are standards applied on the bed plate, and connecting these at top is a suitable bar, P¹, through which rod F is made to pass and by which said rod is accurately guided in its movements. Above bar P¹ the rod F is supplied with a collar, *p*, arranged to bear on the bar and to sustain the weight of the float when the latter has descended to the desired lowermost position in the tank.

The stop *p* being set at the proper point

prevents the weight of the float from bearing on the lower arm of the bell crank lever after the material in the tank descends below the float, and it thus determines the extent to which the locking bolt can be drawn back in its casing.

The free end of the lever I, as also the lower arm of the bell crank lever, is forked instead of being perforated. This not only makes a simpler construction but it enables the rod F to be located and the other parts to be adjusted to working position without difficulty or delay.

The bed plate with the parts connected therewith are easily mounted on the tank top; and the tank top may be easily removed without dismantling the bed plate, if so preferred, to gain access to the interior of the tank.

The machine constructed substantially in accordance with the foregoing explanations will be found to accomplish all the objects of the invention above alluded to.

Having now fully described my invention, what I claim as new herein and desire to secure by Letters Patent, is:

1. In a sewage ejector, the combination with the valve operating lever and the lock operating lever, of the movable rod having tappets for engaging said levers, the ends of the levers being forked to receive the rod, substantially as shown and for the purposes set forth.

2. In a sewage ejector, the combination of a tank, a float, a movable rod, a valve for governing admission of steam or compressed air to the tank, a lever for operating said valve, a relief valve, said relief valve having a projecting stem arranged in the path of said lever and adapted to be moved by contact with said lever to open the relief valve, substantially as and for the purposes set forth.

3. In a sewage ejector, the combination with the tank, of a valve for governing admission of steam or compressed air to eject the material, and a lock for said valve, the valve being arranged to be opened against the pressure of the ejecting fluid, and means for releasing the locked valve, substantially as explained.

4. In a sewage ejector, the combination with a valve for governing admission of steam or compressed air, of a lock for said valve, said lock comprising a movable bolt, a spring for returning said bolt to its locking position, and means for automatically withdrawing it from its locked position, substantially as set forth.

5. In a sewage ejector the combination with the valve for governing admission of steam or compressed air to eject the material, of a projecting stem having a circumferential groove, and a locking bolt arranged to engage said groove and hold the valve open, means for automatically opening the valve and

withdrawing the locking bolt from engagement with the groove, substantially as set forth.

6. In a sewage ejector, the combination
5 with the tank, of the float located therein, the movable rod on which the float is mounted, contact pieces on said rod, levers moved by the rod, valves moved by the levers, and

a locking bolt for arresting one of the valves, all arranged for operation substantially in 10 the manner and for the purposes set forth.

WILLIAM McCLINTOCK.

Witnesses:

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WORTH OSGOOD.