

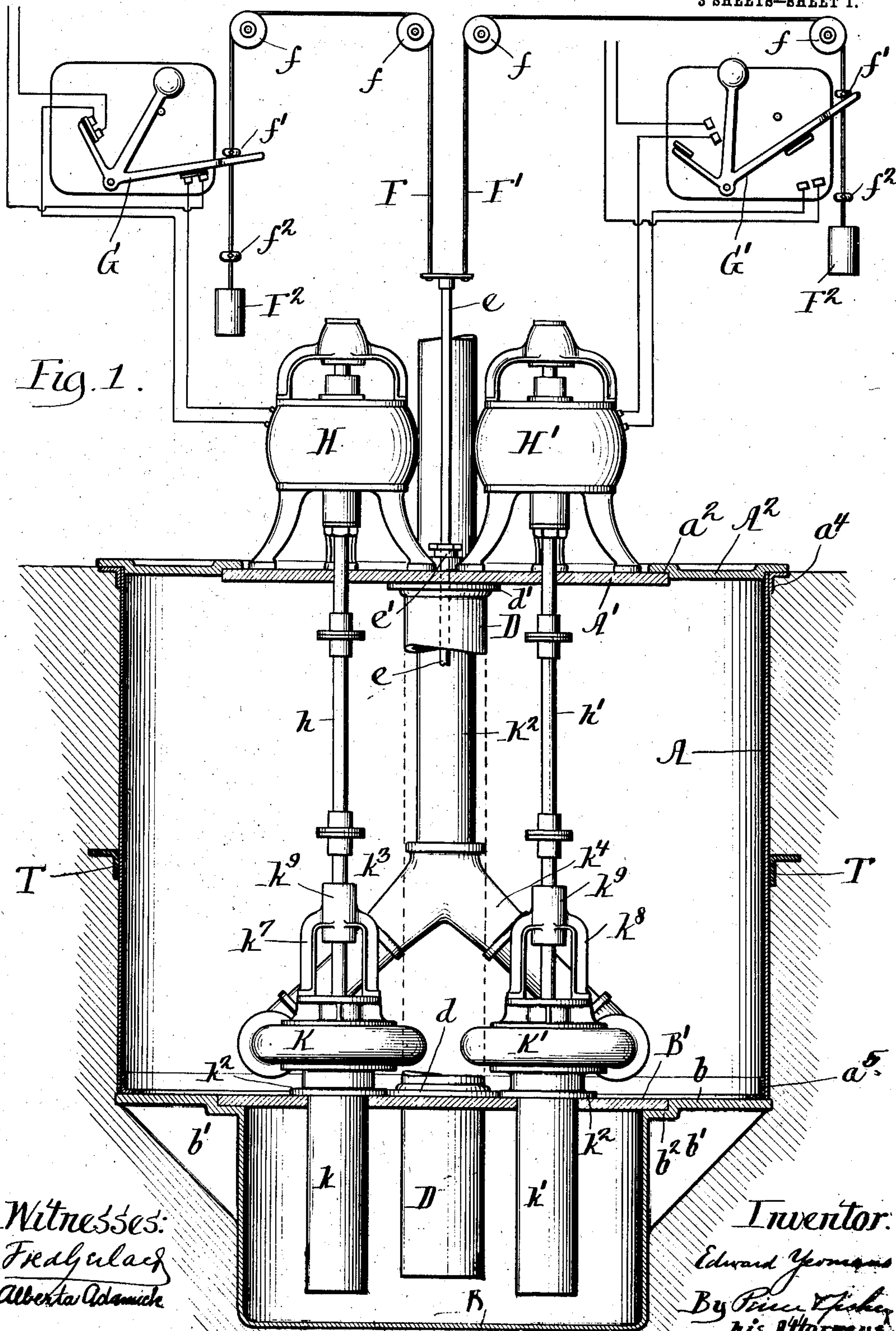
No. 757,169.

PATENTED APR. 12, 1904.

E. YEOMANS.  
AUTOMATIC SEWAGE EJECTOR.  
APPLICATION FILED OCT. 12, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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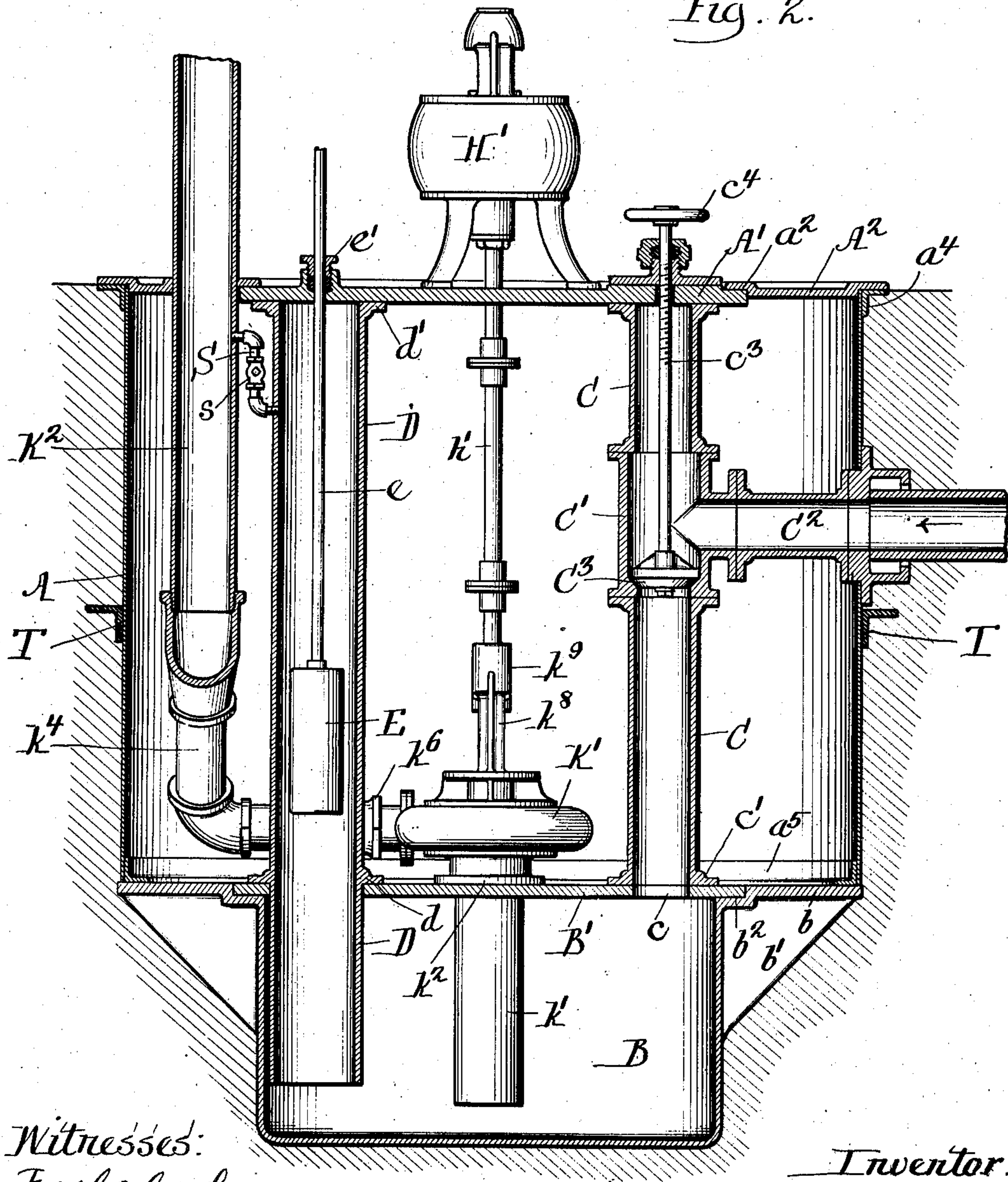
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3 SHEETS—SHEET 2.

Fig. 2.



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By *Peirce, Fisher*  
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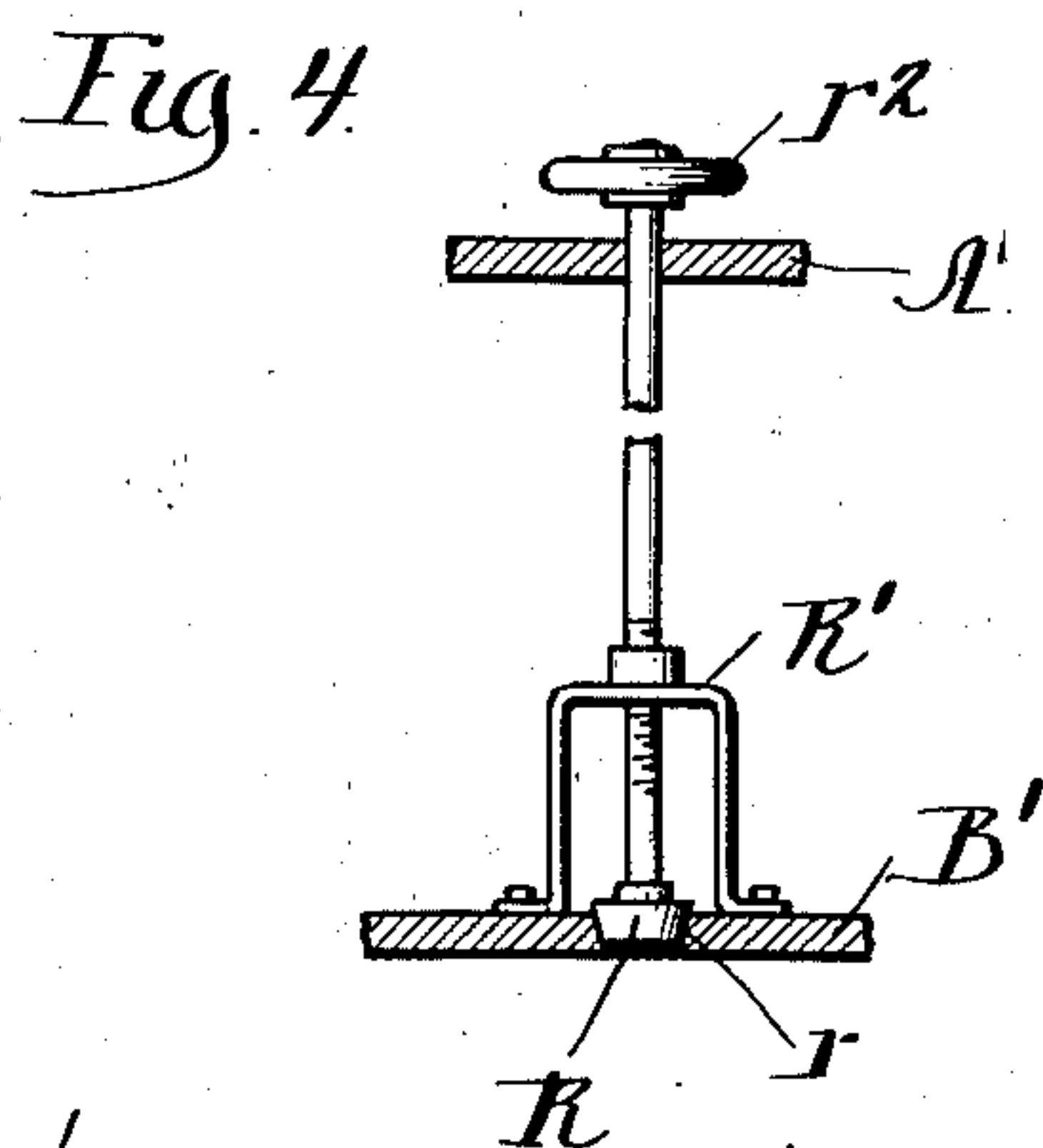
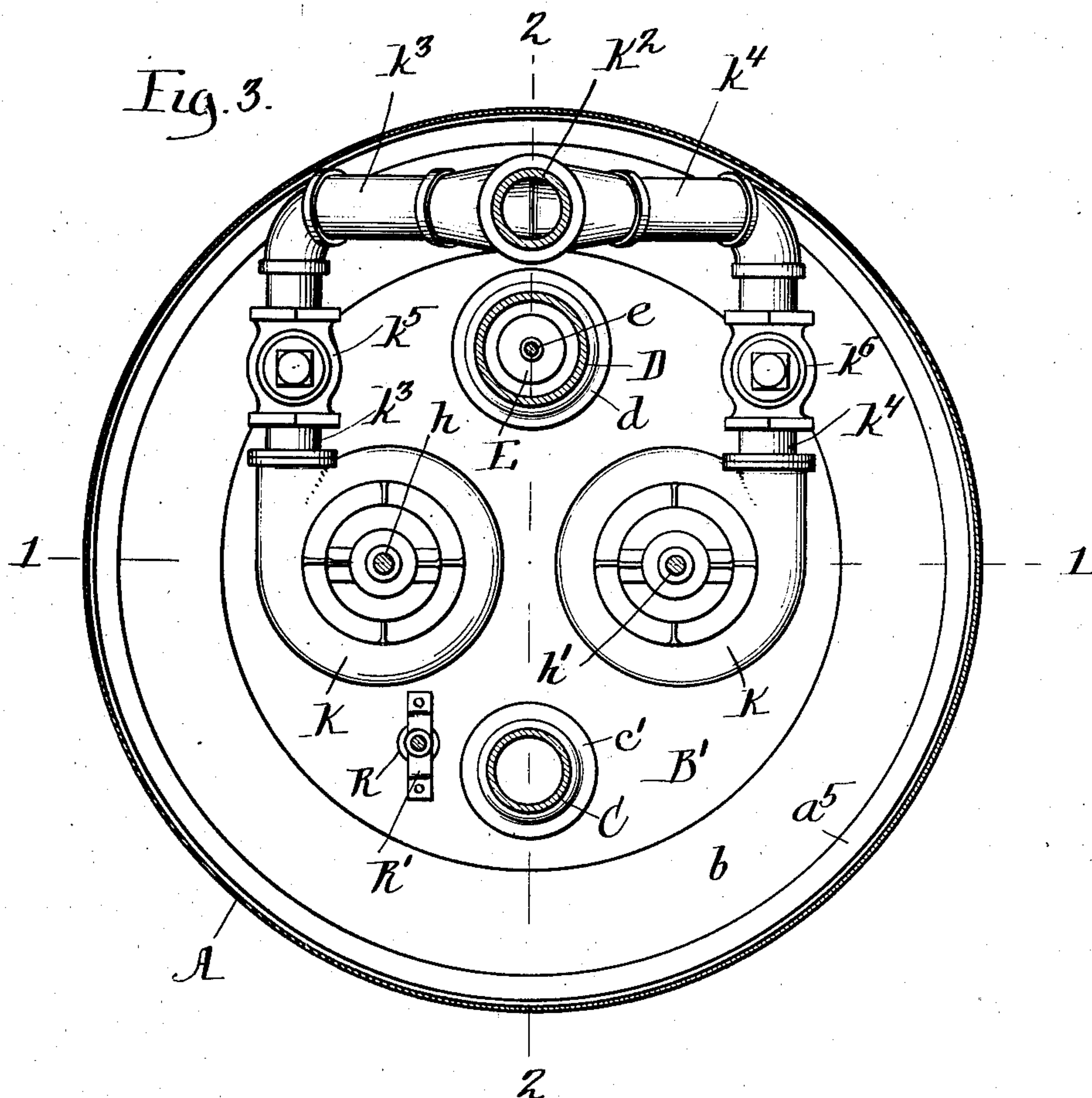
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NO MODEL.

3 SHEETS—SHEET 3.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

EDWARD YEOMANS, OF CHICAGO, ILLINOIS.

## AUTOMATIC SEWAGE-EJECTOR.

SPECIFICATION forming part of Letters Patent No. 757,169, dated April 12, 1904.

Application filed October 12, 1903. Serial No. 176,634. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD YEOMANS, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Sewage-Ejectors, of which the following is a full, clear, and exact description.

This invention, while susceptible of use in other situations, is designed more particularly for the pumping of sewage from buildings the basements of which are below the level of the city sewers. An example of this type of apparatus is illustrated in Patent No. 735,430, granted to me August 4, 1903.

The object of the present invention is to render the apparatus cheaper, more compact, and more efficient; and the invention consists in the features of improvement hereinafter described, illustrated in the accompanying drawings, and more particularly pointed out in the claims at the end of this specification.

Figure 1 is a view, partially in section and partially in side elevation, of an apparatus embodying my invention. Fig. 2 is a view in vertical section on line 2 2 of Fig. 3. Fig. 3 is a view in horizontal section on a line slightly below the cover of the inclosing casing. Fig. 4 is a detail view in vertical section, showing the valve and stem for closing the port in the top of the liquid tank or reservoir.

In the accompanying drawings the apparatus is shown as set within an excavation formed in the basement of a building.

A designates an inclosing casing, the top of which is shown as reaching to the floor-line of the basement, and this casing A may be formed of boiler-plate or other suitable material. The bottom of the casing A rests upon the annular top plate *b* of the submerged sewage tank or reservoir B, this tank or reservoir B and its top plate *b* being preferably formed of cast metal, the top plate *b* being braced at intervals by webs *b'*, extending between the top plate and the outer side wall of the tank B. The annular top plate *b* is preferably formed with countersunk portions *b''*, in which sets the edge of the cover *B'* of the tank. Through this cover *B'* is formed a port *c*, with

which connects the lower end of the induction-pipe C, this lower end of the pipe C being formed with an annular base *c'* to afford a firm bearing upon the top of the cover *B'*. With the T-section *C'* of the pipe C connects the sewage-admission pipe *C''*, and in the lower part of the section *C'* is formed a valve-seat adapted to receive a valve *C'''*, by which the admission of sewage to the tank B may be cut off when desired. The valve *C'''* is formed with a screw-threaded stem *c'''*, that leads upward through a threaded plate and is furnished with a hand-wheel *c''''*, whereby it may be conveniently manipulated. The uppermost section of the induction-pipe C terminates in a flanged end beneath the cover *A'* of the tank A, this cover *A'* being preferably formed of cast metal with its edge resting within a seat *a''* formed in the annular top plate *A''* of the casing A. The casing A is preferably connected to the annular top plate *A''* by an angle-ring *a'''*, and a similar ring *a''''* will be employed for connecting the bottom of the casing A to the annular top plate *b* of the tank B.

Through the top plate *B'* of the tank or reservoir B extends a float-pipe D, that is preferably provided with an annular flange *d*, adapted to set upon the top plate *B'*, and the upper end of this float-pipe D is expanded or provided with a similar annular flange *d''*, that bears against the under side of the cover *A''* of the casing A. It will thus be seen that the induction-pipe C and float-pipe D serve to support the cover *A'* of the casing A and parts mounted thereon. Within the float-pipe D is placed a float E, the stem-rod *e* of which passes upward through a stuffing-box *e'*, formed in the cover *A'* of the tank A. Preferably the lower end of the float-pipe D is extended downwardly to a point near the bottom of the tank or reservoir B, the purpose of this being to afford a guide for the float, so that the float shall not be disturbed by the agitation of the liquid within the tank or reservoir. As shown, the float-stem *e* has connected to the cross-head at its upper end two cables F and F', that pass around the pulleys *f* and are provided each with weights F<sup>2</sup> and with stops *f'* and *f''*, adjustably mounted upon the cables F and F' and adapted to con-



tact with and shift the arms of the electric switches G and G'. The switches G and G' control, respectively, the motors H and H'; but inasmuch as these switches, both as to  
 5 their construction and operation, are the same as set forth in my hereinbefore-mentioned Letters Patent No. 735,430 they need not be more particularly described herein, since they form no part of the present invention.

10 The motors H and H' are supported upon the cover A' of the casing A, and the shafts  $h$  and  $h'$  of these motors extend downwardly through the cover A' and are coupled to the shafts of the centrifugal pumps K and K', re-  
 15 spectively. From these centrifugal pumps K and K' depend, respectively, the pipes  $k$  and  $k'$  to points adjacent the bottom of the tank or reservoir B, and each of these pipes  $k$  and  $k'$  is preferably formed with an annular flange  
 20  $k^2$ , that rests upon the cover B' of the tank or reservoir B. From the periphery of each of the pumps K and K' lead the branch discharge-pipes  $k^3$  and  $k^4$ , respectively, these pipes joining in a single discharge-pipe  $K^2$ ,  
 25 that extends through the cover A' of the casing A, whence it will lead by suitable connections to the sewer. The branch discharge-pipes  $k^3$  and  $k^4$  are furnished with suitable check-valves within check-valve casings  $k^5$  and  
 30  $k^6$ , these check-valves serving to prevent the backflow of sewage to either of the pumps when the other pump alone is in operation. Above the top of the pumps K and K' are mounted suitable brackets  $k^7$  and  $k^8$ , having  
 35 bearings  $k^9$  for the shafts  $h$  and  $h'$ , whereby the pumps are driven.

From the foregoing description the operation of my improved apparatus will be seen to be as follows: Sewage being delivered by  
 40 the induction-pipe C into the liquid-tight subjacent tank or reservoir B will rise up into the float-pipe D, thereby causing the float E to be lifted until the stop or ball  $f'$  of the cable F has shifted the switch G and  
 45 brought the motor H and its corresponding pump into operation. As the liquid thus rises in the float-pipe D, and as the centrifugal pump K is driven by the motor H liquid will be withdrawn from the tank or  
 50 reservoir B and will be discharged through the branch pipe  $k^3$  and main discharge-pipe  $K^2$  to the sewer. If the liquid accumulates within the tank or reservoir B more rapidly than it can be withdrawn by the pump K,  
 55 the float E will continue to rise within the pipe D until the stop  $f'$  on the cable F' shifts the electric switch G' and brings the motor H' and pump K' into operation, and when both pumps are thus in operation liquid will  
 60 be discharged through both the branch pipes  $k^3$  and  $k^4$  and the main discharge-pipe  $K^2$ . As the level of the liquid descends in the tank or reservoir B the float E will correspondingly fall until the stops  $f^2$  of the cables F  
 65 and F' shift the electric switches G and G'

and throw the motors H and H', and consequently the pumps K and K', out of action.

In the cover B' of the tank or reservoir B is formed a port  $r$ , that is normally closed by a valve R. The stem of this valve R has a  
 70 threaded portion that passes through a threaded hole in the bracket R', bolted to the cover B', and the upper end of this valve-stem passes up through a hole in the cover A' of the casing A and is fitted with a hand-  
 75 wheel  $r^2$ , whereby the valve may be shifted. In case there should be any accidental accumulation of liquid in the lower part of the casing A it will only be necessary to raise  
 80 the valve R, thereby permitting the liquid to flow down into the tank or reservoir B as it is withdrawn therefrom by the pump or pumps K K'.

In order to prevent the formation of an air-pocket in the upper part of the float-pipe D,  
 85 I prefer to connect the upper portion of this pipe with the main discharge-pipe  $K^2$ , by means of a small vent-pipe S, provided with a ball or other suitable check-valve  $s$ , that will allow the air to escape from the float-  
 90 pipe D, while preventing the backflow of liquid from the discharge-pipe  $K^2$  into the float-pipe D.

In order to prevent the casing A being lifted by any accumulation of water on the  
 95 outside thereof, I prefer to secure to the casing the angular band T, that will be embedded in the wall of the pit.

The great desideratum in apparatus of this character is that the parts shall be as simple,  
 100 compact, and durable as possible, and one marked advantage of my present invention is that it avoids the necessity of building any masonry pit and brings the various parts in  
 105 such relation that they occupy comparatively little space. By employing an inclosing casing for the pumps and by connecting this casing to the liquid-receiving tank not only is the structure simplified and cheapened, but  
 110 the space occupied by it is materially reduced, and the whole apparatus can be conveniently shipped ready for immediate instalment.

It is manifest that changes in the precise details of construction above set out may be  
 115 made without departure from the spirit of the invention.

So far as I am aware this invention presents the first instance of an apparatus of the character described in which there is a tank or reservoir for the sewage connected to an inclosing  
 120 casing wherein the pump mechanism is carried, the bottom of the tank or reservoir extending below the bottom of the inclosing casing. By thus connecting the sewage tank or reservoir with the inclosing casing not only  
 125 am I enabled to construct the parts more compactly and in better condition for immediate instalment, but the necessity for providing the pumps with supplemental pipes for withdrawing the liquid from the chamber wherein  
 130



the pumps are mounted is also avoided. The float-pipe D, extending as it does above the top of the tank or reservoir B, becomes, in effect, a part of the tank or reservoir and allows the liquid to rise sufficiently high to permit priming of the centrifugal pumps.

It is manifest that features of my invention may be advantageously employed whether a plurality of pumps be used or not, although for obvious reasons it is preferred to use two pumps.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus of the character described comprising an inclosing casing, a pump within said casing, a liquid-tight tank or reservoir connected to said inclosing casing and extending below the bottom thereof, a pipe for admitting liquid to said tank or reservoir, suitable pipes leading from said tank or reservoir to the pump and from the pump to the outside of the inclosing casing.

2. An apparatus of the character described, comprising an inclosing casing provided with an annular top plate and cover, a subjacent tank or reservoir of smaller diameter than said casing and provided with an expanded annular portion fixed to the bottom of said casing, a cover for said tank or reservoir resting upon said annular portion, pump mechanism within said casing and induction and discharge pipes connected with the cover of said tank or reservoir.

3. An apparatus of the character described comprising an inclosing casing, a pump within said casing, a liquid-tight tank or reservoir located below said casing and having an expanded annular portion connected to the bottom of said casing, a pipe for admitting liquid to the tank or reservoir and suitable pipes leading from said tank or reservoir to the pump and from the pump to the outside of the casing.

4. An apparatus of the character described, comprising an inclosing casing, pump mechanism within said casing, a liquid-tight tank or reservoir having an expanded annular portion connected to the bottom of said casing and provided with braces extending between said annular portion and the side wall of said tank or reservoir.

5. An apparatus of the character described, comprising an inclosing casing, pump mechanism within said casing, a liquid-tight tank or reservoir connected to said inclosing casing and extending below the bottom thereof, a float pipe or extension leading upwardly from said tank or reservoir to a point above the pump mechanism, a float, suitable means whereby said float controls the action of said

pump mechanism and suitable pipes for the admission and discharge of liquid to and from said tank or reservoir.

6. An apparatus of the character described, comprising an inclosing casing, pump mechanism within said casing, a liquid-tight tank or reservoir connected to said casing and extending below the bottom thereof, a float-pipe leading upwardly from the lower part of said tank or reservoir to a point above said pump mechanism, a float, suitable means whereby said float controls the action of said pump mechanism and suitable pipes for the admission and discharge of liquid to and from said tank or reservoir.

7. An apparatus of the character described, comprising an inclosing casing, pump mechanism within said casing, a liquid-tight tank or reservoir connected to said casing and extending below the bottom thereof, covers for said tank or reservoir and for said casing and induction and float pipes extending between said covers and supporting the cover of said inclosing casing, a float, suitable means whereby said float controls the action of said pump mechanism and a suitable discharge-pipe leading from the tank or reservoir.

8. An apparatus of the character described, comprising an inclosing casing, pump mechanism within said casing, a liquid-tight tank or reservoir connected to said casing and extending below the bottom thereof, said tank or reservoir being provided at its top with a port and with a valve for closing said port and suitable pipes for the admission and discharge of liquid to and from said tank or reservoir.

9. An apparatus of the character described comprising an inclosing casing, a pump within said casing, a liquid-tight tank or reservoir connected to said casing and extending below the bottom thereof, an induction-pipe leading through said casing to said tank and provided with a valve-seat and valve and suitable pipes leading from the tank or reservoir to the pump and from the pump to the outside of the casing.

10. An apparatus of the character described, comprising an inclosing casing, pump mechanism within said casing, a liquid-tight tank or reservoir connected to said casing and extending below the bottom thereof, an induction-pipe leading through said casing to said tank and provided with a valve-seat and with a vertically-movable valve, a valve-stem leading from said valve through the top of the inclosing casing and means for operating said valve-stem.

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