May 24, 1932. H. J. ENGBRECHT 1,859,293

RECEPTACLE EVACUATING APPARATUS

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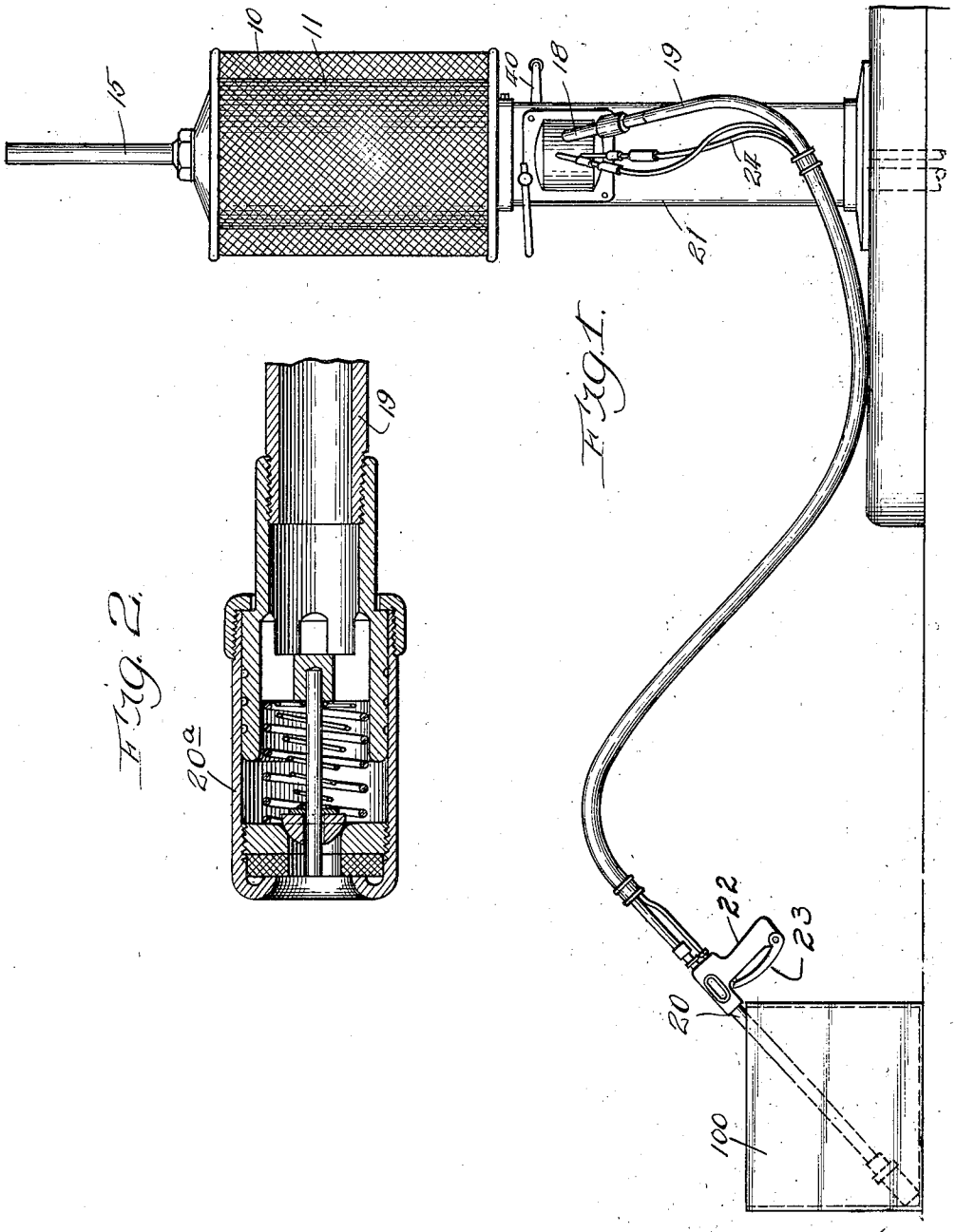


Fig. 1.

Fig. 2.

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Fig. 3.

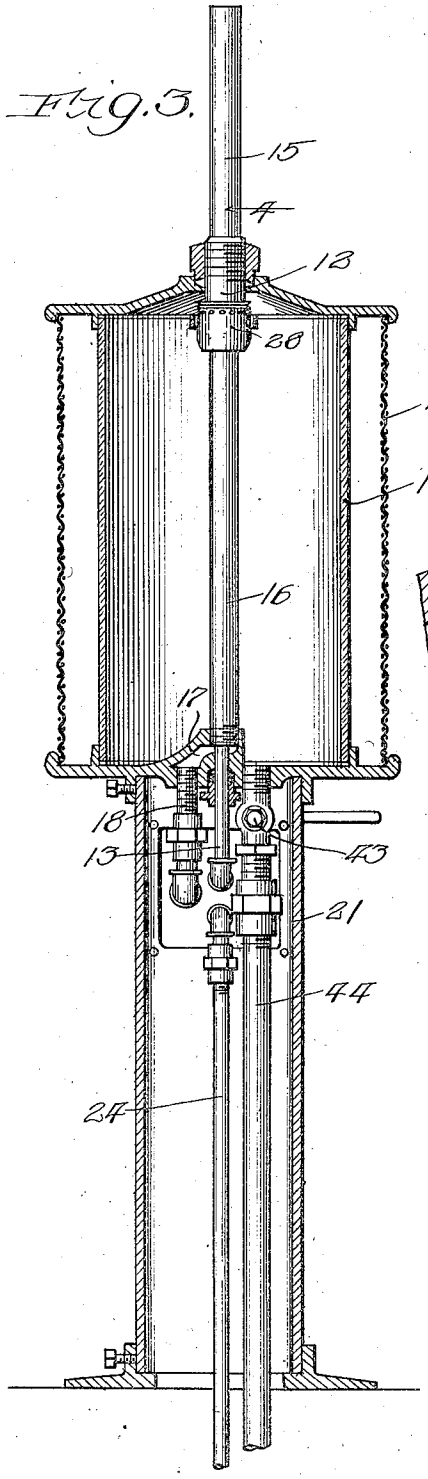
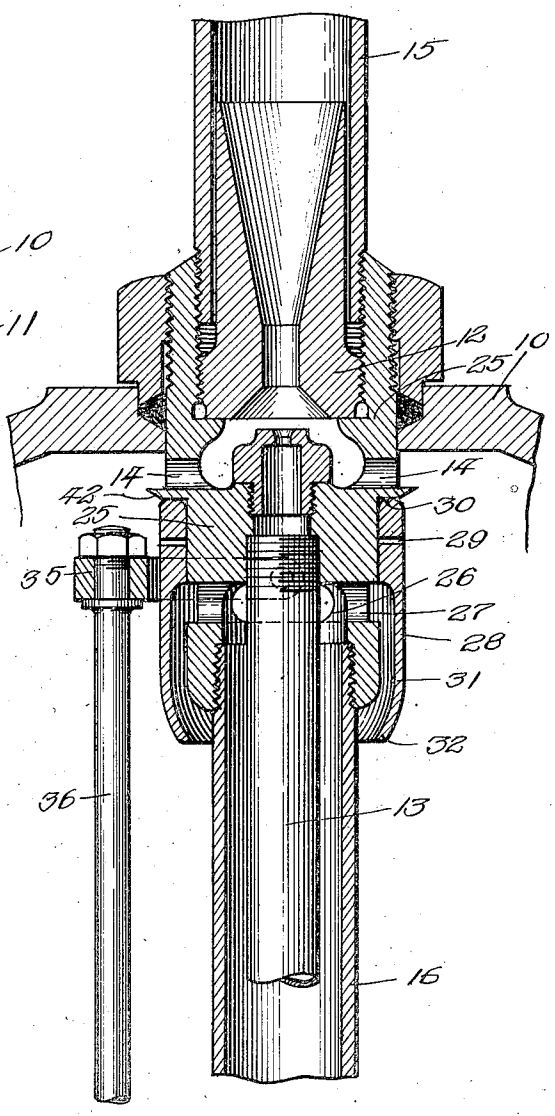


Fig. 4.



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Fig. 5.

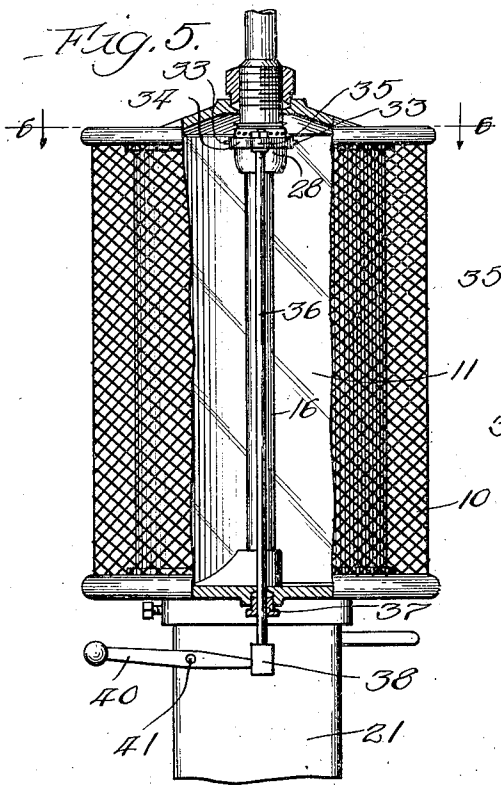


Fig. 7.

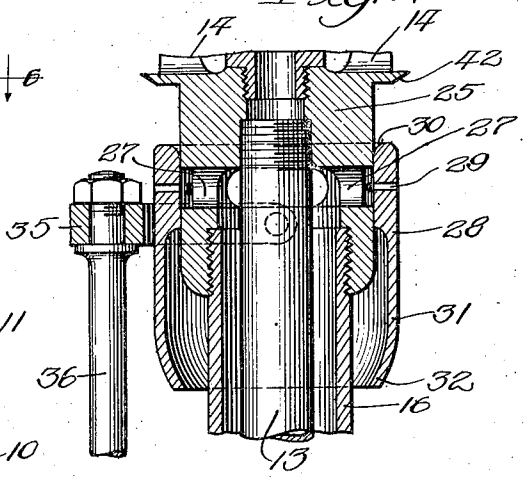


Fig. 8.

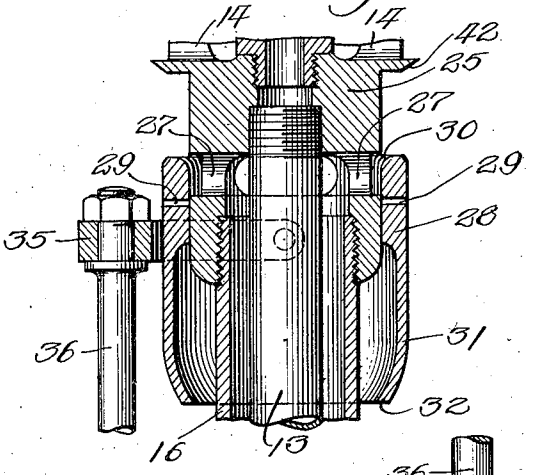


Fig. 6.

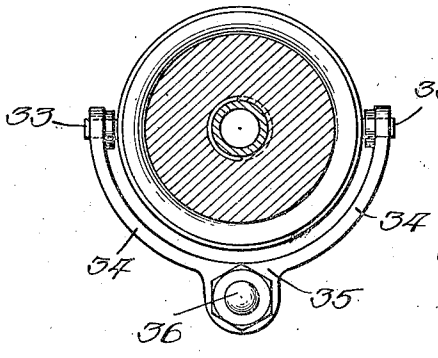
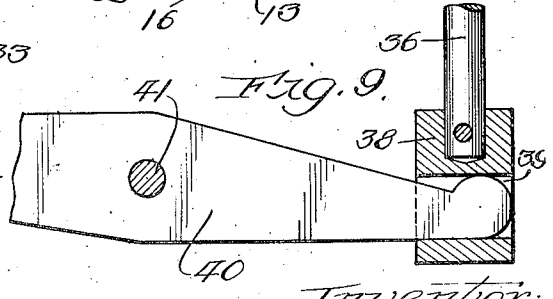


Fig. 9.



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UNITED STATES PATENT OFFICE

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RECEPTACLE-EVACUATING APPARATUS

Application filed August 6, 1925. Serial No. 48,602.

My invention relates generally to apparatus employing a receptacle in which suction is exerted to draw into it liquid, as for example oil, and more particularly to apparatus provided for the evacuating of oil casings of automobiles, and especially the crank cases thereof, and discharge of the same into the receptacle in which the suction is created, preliminary to the re-filling of the crank case with fresh oil.

Certain of my objects are to provide by simple and economical means, for the ready and effective cleansing of the receiver of such deposits as may accumulate on the inner surfaces thereof, and which it is desired be kept clean especially to permit of the observation of the contents of the receiver when the side wall is made of glass; and to provide, by a unitary structure, for the discharge of the cleansing fluid against different portions of the inner surfaces of the receiver, as desired, and for the desired downward projection of the oil evacuated from the container to be emptied.

Referring to the accompanying drawings, in which I have illustrated my invention as incorporated in an apparatus for receiving the used oil from crank cases of automobiles, and of the general type disclosed in my pending applications for U. S. Letters Patent Serial No. 13,819, filed March 7, 1925, and Serial No. 32,745, filed May 25, 1925, and involving a fluid-pressure-operated ejector-device for exerting suction in the receiver for drawing the oil into the latter from the crank case, the suction producing means being in the form of a fluid-pressure-operated ejector-device:—

Figure 1 is a view in elevation of an evacuating apparatus of the type referred to and in which my present improvements are incorporated, the liquid-conduit of the apparatus being shown as extending into a tank of cleansing fluid for supplying such fluid for the cleansing purpose. Figure 2 is an enlarged longitudinal sectional view of the valve-equipped inlet end of the conduit. Figure 3 is a view in vertical sectional elevation of the receptacle portion of the apparatus. Figure 4 is an enlarged broken sectional view of the ejector portion of the apparatus and a portion of a controlling mechanism for the cleansing fluid, the section being taken at the line 4 on Fig. 3 and viewed in the direction of the arrow. Figure 5 is a view in elevation of the receptacle portion of the apparatus with a portion thereof broken away, this view being of the side of the apparatus opposite that shown in Figs. 1 and 2. Figure 6 is a section taken at the line 6—6 on Fig. 5 and viewed in the direction of the arrows. Figure 7 is a fragmentary view of the apparatus shown in Fig. 4 showing a portion of the means controlling the flow of cleansing liquid, in one of its operative positions. Figure 8 is a similar view showing these means in another operative position; and Figure 9, a broken, enlarged, fragmentary view of the actuating device for the controlling means.

In explanation of the illustrated apparatus, as regards those features forming the subjects of my said applications, it may be stated that 10 represents a receiver for receiving the used oil from the crank cases of automobiles, the side wall 11 of this receiver being constructed of glass to permit of the observation of the oil drawn into it. The receiver 10 is provided in its top with a fluid-pressure-operated ejector-device 12 supplied with compressed air from any suitable source through a pipe 13, the suction-inlet of the ejector and shown as comprising a series of radial openings 14, opening into the upper portion of the receiver 10, it being understood that compressed air discharging upwardly through the pipe 13 and through the ejector device 12 and out through the exhause pipe 15, creates suction at the openings 14, in the receiver 10. The pipe 13 is surrounded by a pipe 16 spaced therefrom and communicating at its upper end with the upper part of the receiver 10 and at its lower end, by a passage 17 in the bottom of the receiver 10, with a pipe 18 which leads to a flexible hose line 19 equipped with a rigid extension-pipe device 20 having at its inlet end, a fitting 20^a, as for example as shown in the drawings and as set forth in said application Serial No. 32,745, to facilitate its connection with the lower drain

openings of crank cases to be evacuated of their oil content, and to which the suction created in the receiver 10 is supplied through the pipe 16, passage 17, pipe 18 and hose-line 19 to transfer the oil in the crank case to the receiver 10. The air-pipe 13 leads outwardly from the hollow standard 21 supporting the receiver 10 and connects with the outlet of a valve (not shown) controlling the supply of air to the pipe 13, and located in the pistol grip 22 of the pipe-extension 20 and manually controlled by a lever 23 as in said application Serial No. 32,745. The valve just referred to connects at its inlet with a pipe 24 which would lead, in practice, from a source of compressed air for supplying the pipe 13 with the ejector-operating pressure.

The ejector-device 12 is formed of a hollow head 25 located in an opening in the top of the receptacle 10 and into the lower end of which the pipes 13 and 16 are threaded, the portion of the head 25 above the upper open end of the pipe 16 containing a chamber 26 the side wall of which contains radial equidistantly spaced laterally-opening outlets 27, shown as six in number, and forming the outlet for the pipe 16 into the receptacle 11.

Assuming air under pressure to be supplied to pipe 24 and the valve in the extension pipe 20 to be open, air under pressure is supplied to the ejector-device which, in reducing the air pressure in the receptacle 10, exerts suction on the inlet of the extension pipe 20 for drawing liquid with which it is in communication, as for example liquid in a crank case from the drain opening to which the extension pipe is applied, into the receptacle 10 through the openings 27.

In accordance with the preferred illustrated embodiment of my invention, I provide for the supplying of cleansing liquid to the inner surfaces of the receptacle 11 through the extension pipe 20 and pipe 19, under the suction action produced by the ejector-device 12, the inlet end of the extension pipe 20 in such use of the apparatus being positioned in a tank, as for example that shown at 100, of the cleansing fluid which is drawn into and through the extension pipe and pipe 19 and thence into the receptacle 10.

The means shown for controlling the discharge of the cleansing fluid into the receptacle 10 and which, in the particular embodiment of my invention, are unitary with means for deflecting the used oil discharged into the receptacle 10, comprise a sleeve 28 surrounding the lower portion of the head 25 and slidable vertically thereon, the sleeve 28 containing a series of radial equidistantly spaced openings 29 shown as substantially horizontally disposed, and having its inner upper peripheral edge slightly rounded, as represented at 30. The lower end of the sleeve 28 is provided with a skirt portion 31 annularly spaced from the portion of the head 25 which it surrounds, with its lower edge slightly inwardly deflected as represented at 32. The sleeve 28 is provided with outwardly projecting pins 33 to which are pivotally connected the arms 34 of a yoke 35 secured to the upper end of a rod 36 which projects downwardly through a stuffing-box 37 in the bottom of the receptacle 10, the lower end of this rod carrying a head 38 containing a transverse slot 39 in which one end of a lever 40 pivoted on a pin 41 on the standard 21, extends, whereby upon actuating the lever 40 the sleeve 28 is raised or lowered depending upon the direction in which this lever is rocked.

In the use of the apparatus for displacing fluid, as for example oil from the crank case, the sleeve 28 occupies the position shown in Fig. 4 and the fluid in discharging from the head 25 into the receptacle 10 is deflected downwardly by the skirt portion 31.

In the use of the device for cleansing the interior of the receptacle 10, the operator rocks the lever 40 to shift the sleeve 28 downwardly to the position desired, as for example to the position shown in Fig. 7 or that shown in Fig. 8. When the sleeve is lowered to the position shown in Fig. 8 the openings 27 are partially uncovered at their upper edges and thus the cleansing fluid, sucked for example from the tank 100 through the liquid-pipes described and as stated, discharges forcibly in an upwardly inclined direction against the underside of the top of the receptacle and as the sleeve is moved down from this position the streams of cleansing fluid become progressively less inclined impinging against the inner surface of the receptacle farther and farther from the center thereof, the discharge of the fluid as described reaching those inner upper portions of the receptacle which would not be impinged by horizontal streams. Following this operation the operator raises the sleeve 28 to the position shown in Fig. 7 in which the openings 29 register with the openings 27 and the cleansing fluid discharges forcibly in a substantially horizontal direction against the side wall of the receptacle 10 to complete the cleansing of the walls of the latter. Following this operation the operator further raises the sleeve 28 to a position in which the interior of the skirt 31 registers with the outlets 27 whereupon the cleansing fluid discharges downwardly along the pipe 16 cleansing the latter of accumulations.

The head 25 is preferably provided as shown, with an annular laterally-extending flange 42 above the sleeve 28, this flange serving to outwardly deflect the cleansing fluid and minimize drawing of the fluid into the suction openings 14 when the sleeve is adjusted to the position shown in Fig. 8.

The cleansing fluid may be removed from

the receptacle 10 by opening the valve 43 which controls a waste pipe 44 opening into the bottom of the receptacle 10.

It will be understood from the foregoing that by constructing an apparatus in accordance with my invention the cleansing operation may be performed with great facility and that the mechanism provided for producing the cleansing operation is of simple and economical construction.

While I have illustrated and described a particular embodiment of my invention, I do not wish to be understood as intending to limit it thereto as the same may be variously modified and altered without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is:

1. In apparatus for transferring liquid from one receptacle to another, means for producing flow of liquid to the transfer receptacle and for cleansing said last-named receptacle comprising a conduit having a suction inlet and common to the liquid to be transferred and to the liquid for cleansing said transfer receptacle, said conduit opening into said last-named receptacle.

2. In apparatus for transferring liquid from one receptacle to another, means for producing flow of liquid to the transfer receptacle and for cleansing said last-named receptacle comprising a conduit having a suction inlet and common to the liquid to be transferred and to the liquid for cleansing said transfer receptacle, said conduit opening into said last-named receptacle, and a device for controlling the direction of discharge of said liquid from said conduit into said transfer receptacle.

3. In apparatus for transferring liquid from one receptacle to another, means for producing flow of liquid to the transfer receptacle and for cleansing said last-named receptacle comprising a conduit having a suction inlet and common to the liquid to be transferred and to the liquid for cleansing said transfer receptacle, said conduit opening into said last-named receptacle, and an adjustable device controlling the direction of discharge of the cleansing liquid from said conduit into said transfer receptacle.

4. In apparatus of the character set forth, the combination of a receptacle, a conduit having an outlet opening into said receptacle, a sleeve laterally apertured and slidably mounted on said conduit and having a skirt portion spaced from said conduit, said sleeve being adapted to be moved to cause its skirt portion or said apertured portion to communicate with the outlet of said conduit, and means for producing flow of liquid through said conduit.

5. In apparatus of the character set forth, the combination of a receptacle, a conduit common to the liquid to be displaced and to cleansing liquid having an outlet opening into said receptacle, means for producing flow of liquid through said conduit and into said receptacle and an adjustable device controlling variably the angle of discharge of cleansing liquid into said receptacle through said conduit.

6. In apparatus of the character set forth, the combination of a receptacle, a conduit common to the liquid to be displaced and to cleansing liquid having an outlet opening into said receptacle, means for producing flow of liquid through said conduit and into said receptacle and an adjustable device controlling variably the angle of discharge of cleansing liquid into said receptacle through said conduit and movable into a position in which said outlet is entirely open.

7. In apparatus of the character set forth, the combination of a receptacle, a conduit common to the liquid to be displaced and to cleansing liquid having an outlet opening into said receptacle, means for producing flow of liquid through said conduit and into said receptacle and an adjustable sleeve surrounding said conduit controlling variably the angle of discharge of cleansing liquid into said receptacle through said conduit.

8. In apparatus of the character set forth, the combination of a receptacle, a conduit common to the liquid to be displaced and to cleansing liquid having an outlet opening into said receptacle, and means for producing flow of liquid through said conduit and into said receptacle and movable into a position in which said outlet is entirely open and into different positions to control the direction of discharge.

9. In apparatus of the character set forth, the combination of a receptacle, a conduit for cleansing liquid having an outlet opening into said receptacle, means for producing flow of cleansing fluid through said conduit and into said receptacle and an adjustable device movable on said conduit and containing an opening restricted relative to said outlet, a portion of said device above said opening and movable in the adjusting of said device below the upper edge of said outlet operating, in such position, to permit the liquid to discharge from said outlet in an upward direction.

10. In apparatus of the character set forth, the combination of a receptacle, a conduit for cleansing liquid having an outlet opening into said receptacle, means for producing flow of cleansing fluid through said conduit and into said receptacle and an adjustable device containing a laterally extending opening restricted relative to said outlet, a portion of said device above said opening and movable in the adjusting of said device below the upper edge of said outlet, operating in such position to permit the liquid to discharge from said outlet in an upward direction.

11. In apparatus of the character set forth, the combination of a receptacle, a conduit common to the liquid to be displaced and to cleansing liquid having an outlet opening into said receptacle, means for producing flow of fluid through said conduit and into said receptacle, and an adjustable deflector-equipped device controlling the direction of discharge of liquid from said conduit into said receptacle and movable into and out of a position in which the deflector portion of said device registers with said outlet.

12. In apparatus of the character set forth, the combination of a receptacle, a conduit having an outlet laterally opening into said receptacle, means for producing flow of cleansing fluid through said conduit and into said receptacle, and an adjustable sleeve containing a laterally extending opening and a skirt portion spaced from said conduit, said sleeve being movable to a position in which its opening registers with said conduit-outlet or its skirt portion opposes the latter.

13. In apparatus for the purpose set forth, the combination of a receptacle for befouling liquid and having a drain, a conduit opening into said receptacle for transfer thereto of the befouling liquid and cleansing liquid, and means for producing flow of liquid through said conduit into said receptacle operative to cause befouling liquid or cleansing fluid selectively to flow into said receptacle.

14. In apparatus of the character set forth, the combination of a receptacle, means for producing suction in said receptacle, a conduit for liquid opening into said receptacle, and means controlling the force at which the liquid discharges into said receptacle while maintaining constant the suction in said receptacle.

15. In apparatus of the character set forth, the combination of a receptacle, means for producing suction in said receptacle, a conduit for liquid opening into said receptacle, and means controlling the force at which the liquid discharges into said receptacle while maintaining constant the suction in said receptacle and controlling the direction of discharge of said liquid.

16. The method of transferring a befouling liquid from one recetacle to another and cleansing the transfer receptacle which consists in creating suction in the transfer receptacle to draw the befouling liquid thereto, draining the befouling liquid from the transfer receptacle and drawing into said transfer receptacle, by the suction produced therein, and through the same course as that through which the befouling liquid flows to said receptacle, a cleansing fluid to cleanse the latter.

17. In apparatus of the character set forth, the combination of a receptacle, a conduit having an outlet opening into said receptacle, means for producing suction in said conduit, a sleeve adjustable along said conduit and spaced therefrom and in one position providing an outlet at its lower end for directing downwardly liquid flowing from said conduit and in another position closed at its lower end to the outlet of said conduit and affording an outlet for the discharge of liquid from said conduit into the receptacle in a direction at an angle to the flow of liquid in the first-referred-to position of said sleeve.

HERMAN J. ENGBRECHT.