

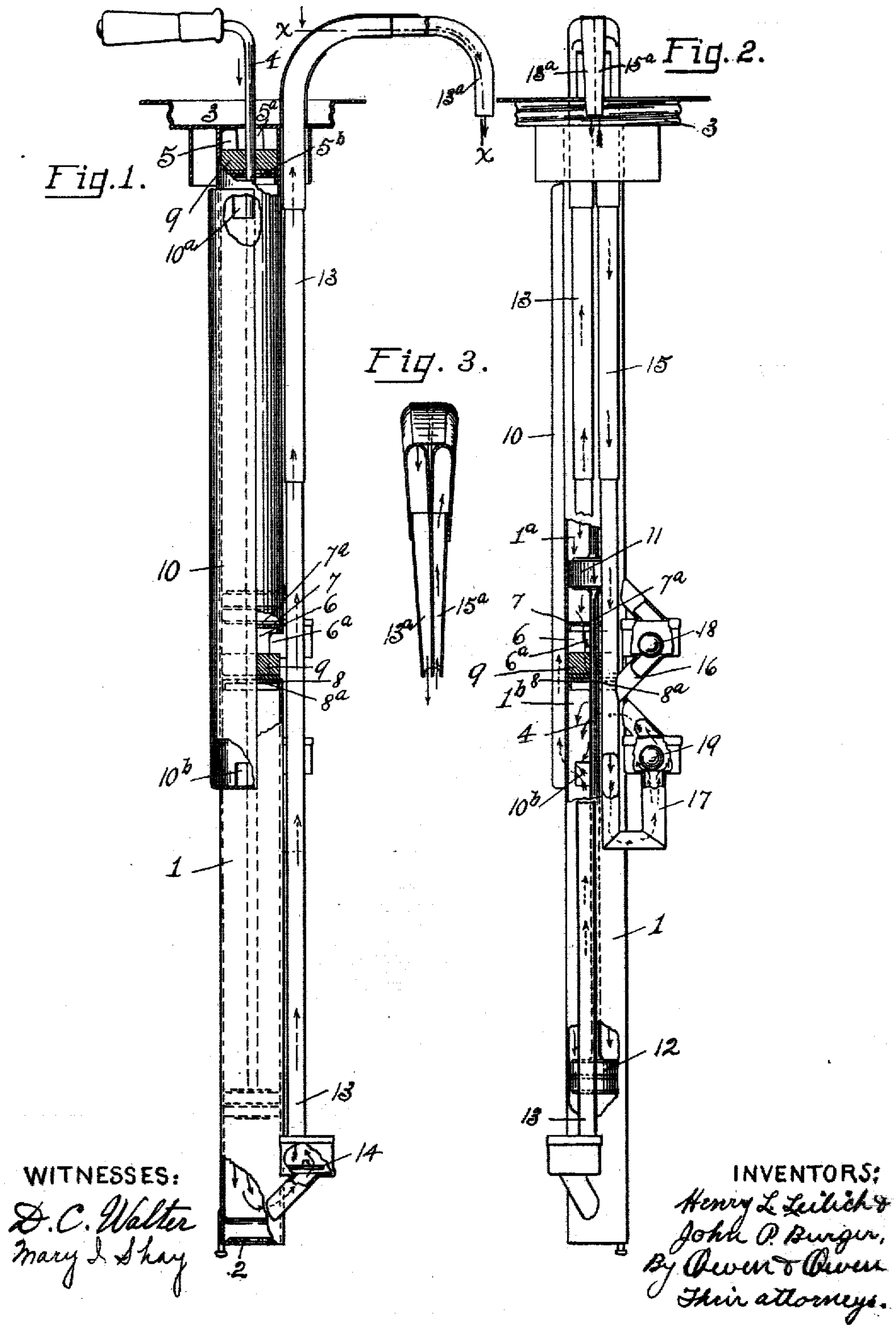
No. 825,548.

PATENTED JULY 10, 1906.

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OIL PUMP.

APPLICATION FILED NOV. 24, 1905.

2 SHEETS—SHEET 1



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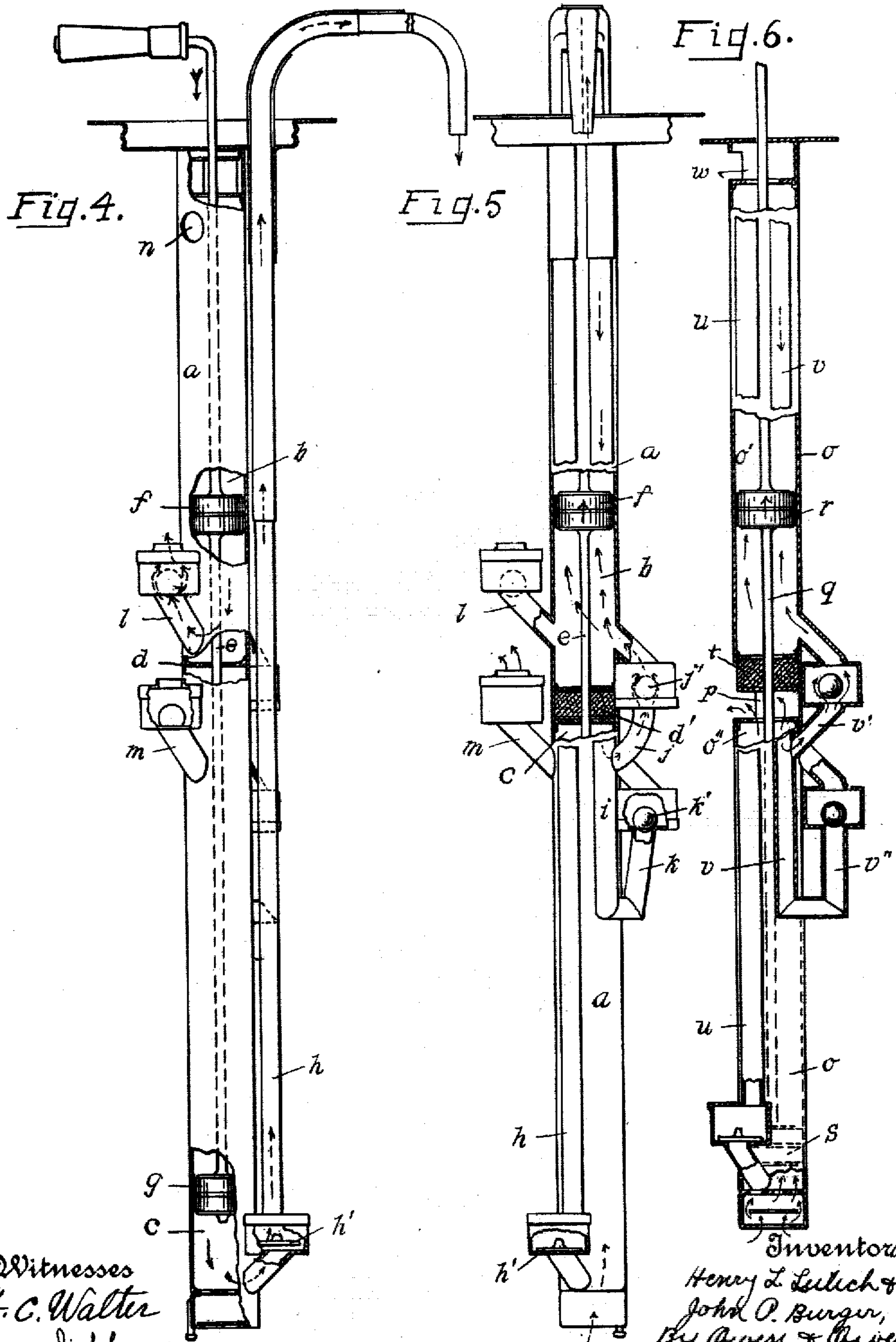
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HENRY L. LEILICH AND JOHN P. BURGER, OF DELPHOS, OHIO, ASSIGNORS
TO THE DELPHOS CAN COMPANY, OF DELPHOS, OHIO, A CORPORATION OF OHIO.

OIL-PUMP.

No. 825,548.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed November 24, 1905. Serial No. 288,840.

To all whom it may concern:

Be it known that we, HENRY L. LEILICH and JOHN P. BURGER, citizens of the United States, and residents of Delphos, in the county of Allen and State of Ohio, have invented certain new and useful Improvements in Oil-Pumps; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures and letters of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in dispensing-pumps of the class commonly employed in conjunction with oil-cans or other tanks for discharging the liquid contents thereof into a receiving vessel, and has especial reference to improvements in the construction of pump described and shown in our joint application filed November 15, 1905, being Serial No. 287,430.

The object of our invention is the provision of a pump of the non-overflow type, which is so constructed that a suction is created through the return-tube at each down and up stroke of the piston-rod, while the expelling force through the discharge-tube is only created during one direction of movement of the piston-rod, thereby causing the returning or suction force of the pump to be more powerful than is its discharging or expelling force during a single operation or up and down stroke of the piston-rod, which relation of forces is found to be necessary in the handling of oils or other liquids of a heavy nature by a pump of this class to effectually prevent the overflow of such liquids from the receiving vessel.

To this end the invention consists of certain novel features of construction, combination, and arrangement of the parts, as will hereinafter be more fully described and finally claimed.

In the accompanying drawings, forming part of this specification, Figures 1 and 2 are different side elevations of one form of pump embodying our invention with portions thereof shown in section to disclose the operative parts. Fig. 3 is a section of the nozzle combining the spouts of the discharge and return tubes of the pump. Figs. 4 and 5 are different side elevations of a modified construction

of our pump with portions thereof shown in section, and Fig. 6 is a side elevation of another modification of the invention with portions thereof shown in section.

Referring to Figs. 1 and 2 of the drawings, 1 represents the pump cylinder or barrel, which has its lower end provided with the usual foot-valve 2 and its top closed by a suitable cap-piece 3, except for an axial opening therein, through which the piston-rod 4, operating in the cylinder, extends. A valve-chamber 5 is formed at the upper end of the cylinder immediately below the cap-piece 3 and has an exit-opening 5^a in one side thereof and an inlet opening or port 5^b in its bottom, through which the piston-rod 4 extends. Intermediate of the ends of the cylinder and dividing it into the two superimposed compartments 1^a 1^b is a valve-chamber 6, which has its side provided with an exit-opening 6^a and its upper and lower ends, which are formed by partitions 7 and 8, respectively, provided with inlet openings or ports 7^a and 8^a, respectively, through which the piston-rod extends.

Each chamber 5 6 is provided with a valve 9, which is fitted friction-tight to the piston-rod 4 and arranged to play therewith between the ends of its chamber. These valves are in the form of a stiff disk of rubber, leather, or other suitable packing material and are adapted on the downstroke of the piston-rod to close the ports 5^a and 8^a and open the port 7^a in the respective chambers 5 6 and on the upstroke of said rod to open the ports 5^a and 8^a and close the port 7^a. The compartments 1^a and 1^b of the cylinder have their upper ends in communication through the medium of a tube or channel 10, which is formed in any suitable manner exteriorly of the cylinder and is provided at its upper end with a port 10^a, opening into the upper end of the compartment 1^a, and at its lower end with a port 10^b, opening into the upper part of the compartment 1^b.

11 and 12 represent piston-heads which are carried by the piston-rod 4 within the compartments 1^a and 1^b, respectively.

The discharge-pipe 13 of the pump is connected to the lower part of the cylinder in communication with the compartment 1^b and is provided with an outwardly-opening check-valve 14. The upper end of this pipe terminates in a spout 13^a, to which is connected the return-spout 15^a of the return-pipe 15,

the latter being arranged close to and parallel with the discharge-tube for a portion of its length. This return-tube is provided near its lower end with a branch 16, leading to the lower portion of the compartment 1^a, and a branch 17, leading to the upper portion of the compartment 1^b, which branches are respectively provided with inwardly-opening check-valves 18 and 19, preferably of the ball type, the former of which opens under conditions which serve to close the valve 14 in the discharge-pipe, while the latter opens under conditions which serve to open said valve 14.

The operation of the pump is as follows:

On the reciprocation of the piston-rod the lower piston-head 12 thereon operates on its upstroke to draw a quantity of oil or other liquid into the lower compartment 1^b of the pump-cylinder and on its downstroke to force the liquid from the cylinder through the discharge-pipe 13 and into the receiving vessel, into which the end of its spout projects. The piston 12 on its downstroke also operates to create a suction in the return-pipe 15 and is augmented in this operation by the downstroke of the piston 11 in the compartment 1^a, due to the communication between the upper ends of the compartments 1^a and 1^b through the tube or channel 10, thus on the downstroke of the piston-rod causing a more powerful suction through the return-pipe than the eduction simultaneously taking place through the discharge-tube. A further suction is created through the return-pipe 15 on the upstroke of the piston 11, due to the valved branch 16, leading from the return-pipe and communicating with the compartment 1^a adjacent its lower end, thus causing a substantially continuous suction to be created through the return-pipe due to the alternate suction created through its branches 16 and 17 on the down and up strokes of the pistons. It will thus be apparent that as the liquid rises in the receiving vessel to a height sufficient to immerse the open end of the spout of the return-pipe the suction created through the return-pipe draws the surplus liquid in the vessel through the return-pipe and alternately through its branches 16 and 17 into the cylinder first below the piston in the compartment 1^a on the upstroke of the piston-rod and then above the piston in the compartment 1^b on the downstroke of the piston-rod, the liquid on the downstroke taking the course indicated by the arrows in Fig. 2. The liquid returned to the lower part of the compartment 1^a on the upstroke of the piston is on the downstroke of said piston expelled therefrom through the port 7^a and exit-opening 6^a in the chamber 6, the valve 9 therein having moved down with the piston-rod to uncover said port, while the liquid returned to the upper portion of the compartment 1^b and through the tube 10 to the upper portion of

the compartment 1^a on the downstroke of the pistons 11 and 12 is on the upstroke of said pistons expelled from the upper compartment through the port 5^b and exit-opening 5^a in the chamber 5 and from the lower compartment through the port 8^a and exit-opening 6^a in the chamber 6, the valves 9 in said chambers being moved by the piston-rod for that purpose.

While the pump described in our application, Serial No. 287,430, works very satisfactorily in conjunction with the handling of heavy oils or liquids, the construction above described is found in practice to be more perfect and efficient in its operation of returning the surplus liquid in the receiving vessel to the can or tank from which discharged and entirely overcomes the objections incident to the handling of heavy oils with pumps of this class in which a single piston for both discharging and returning the oil is employed.

In Figs. 4, 5, and 6 are shown similar constructions of pumps to that illustrated in Figs. 1 and 2, except that the tube 10 opening communication between the compartments 1^a and 1^b in Figs. 1 and 2 is eliminated, and Fig. 6 differs from Figs. 4 and 5 only in the construction and arrangement of its exit-ports for the returned liquid.

In Figs. 4 and 5, *a* represents the pump-cylinder; *b*, the upper and *c* the lower compartments therein, which compartments are shown in Fig. 4 as being separated by a single partition *d* and in Fig. 5 as being separated by a suitable stuffing-box *d'*; *e*, the piston-rod carrying the piston-head *f* in the upper compartment and the piston-head *g* in the lower compartment; *h*, the discharge-pipe having the check-valve *h'* therein; *i*, the return-pipe having the branch *j*, communicating with the lower end of the compartment *b* and provided with the inwardly-opening check-valve *j'*, and the branch *k*, communicating with the upper end of the compartment *c* and provided with the inwardly-opening check-valve *k'*; *l* and *m*, the valved exit-tubes leading from the lower end of the compartment *b* and the upper end of the compartment *c*, respectively, and *n* an opening in the upper end of the compartment *b* to permit the ingress and egress of air above the piston *f* as it is operated.

In Fig. 6, *a* represents the pump-cylinder; *o'* and *o''*, the superimposed compartments thereof; *p*, the exit-chamber interposed between the compartments *o'* and *o''* and having communication through its ends with said compartments; *q*, the piston-rod, carrying the piston-head *r* in the compartment *o'*, the piston-head *s* in the compartment *o''*, and the friction-tight valve *t* in the exit-chamber *p*; *u*, the discharge-pipe; *v*, the return-pipe having the valved branches *v'* and *v''*, leading to the compartments *o'* and *o''*, respectively, and *w* the opening in the upper

end of the compartment *o'* to permit the ingress and egress of air above the piston *r* as it is operated.

It will be apparent in the operation of the two modified constructions of the invention that each piston acts independently to create a suction in the return-pipe through the branch thereof leading to its chamber and that the suction created by the lower piston on its downstroke is not augmented by the action of the upper piston on its downstroke, due to the elimination of the tube therefrom.

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

1. A pump, comprising a cylinder having a plurality of superimposed compartments provided with exit-openings, a discharge-pipe leading from one compartment, a return-pipe having communication with each compartment, and reciprocatory means operative within the cylinder for creating an expelling force through the discharge-pipe in one direction of its movement and creating a suction through the return-pipe in both directions of its movement.

2. A pump, comprising a cylinder having a plurality of compartments and an exit from each compartment, a discharge-pipe leading from one compartment, a return-pipe having communication with each compartment, a piston-rod in the cylinder, and a piston carried by the rod within each compartment for creating a discharging force through the discharge-pipe during one direction of movement of the piston-rod and a suction through the return-pipe during both directions of movement of said rod.

3. A pump, comprising a cylinder having a foot-valve, a plurality of superimposed compartments, and a valved exit from each compartment, a discharge-tube leading from the lower compartment and having an outwardly-opening valve, a return-tube having branches leading to each compartment and provided with inwardly-opening valves, a piston-rod in the cylinder, and a piston carried by the rod within each compartment whereby to cause an intermittent discharge through the discharge-tube and a substantially continuous suction through the return-tube during the operation of the piston-rod.

4. A pump, comprising a cylinder, having a foot-valve, two superimposed compartments, and an exit-chamber interposed between the contiguous ends of the compartments and having ports communicating with each compartment, a discharge-tube leading from the lower compartment, a return-tube having communication with each compartment adjacent its exit-port, a piston-rod in the cylinder, a piston carried by the rod within each compartment whereby to cause an intermittent discharge through the discharge-tube and a substantially continuous suction through the return-tube during the operation of the piston-rod, and a valve mounted in the exit-chamber and operatively related to the piston-rod whereby the ports in the chamber will be alternately opened.

5. A pump, comprising a cylinder having a plurality of communicating compartments provided with valved exit-openings, a discharge-tube leading from one compartment, a return-tube having communication with each of the other compartments, a piston-rod in the cylinder, and a piston carried by the rod within each compartment to effect a movement of the piston-rod and a suction through the return-tube during both directions of movement of the rod, the suction created in one compartment being augmented by that created in the other compartments.

6. A pump, comprising a cylinder having two superimposed compartments communicating at their upper ends and each provided with exit means, a discharge-tube leading from near the bottom of the lower compartment, a return-tube communicating with each compartment adjacent its inner end, a piston-rod in the cylinder, a piston carried by the rod within each compartment to effect a discharge through the discharge-tube and a suction through the return-tube, substantially as described.

In testimony whereof we have hereunto signed our names to this specification in the presence of two subscribing witnesses.

HENRY L. LEILICH.
JOHN P. BURGER.

Witnesses:

M. WEGER,
H. H. EMSHOFF.