No. 755,072. PATENTED MAR. 22, 1904.

H. C. STOUFFER.

PUMP.

APPLICATION FILED MAR. 12, 1902. RENEWED OCT. 3, 1903.

NO MODEL.

Fig. 1.

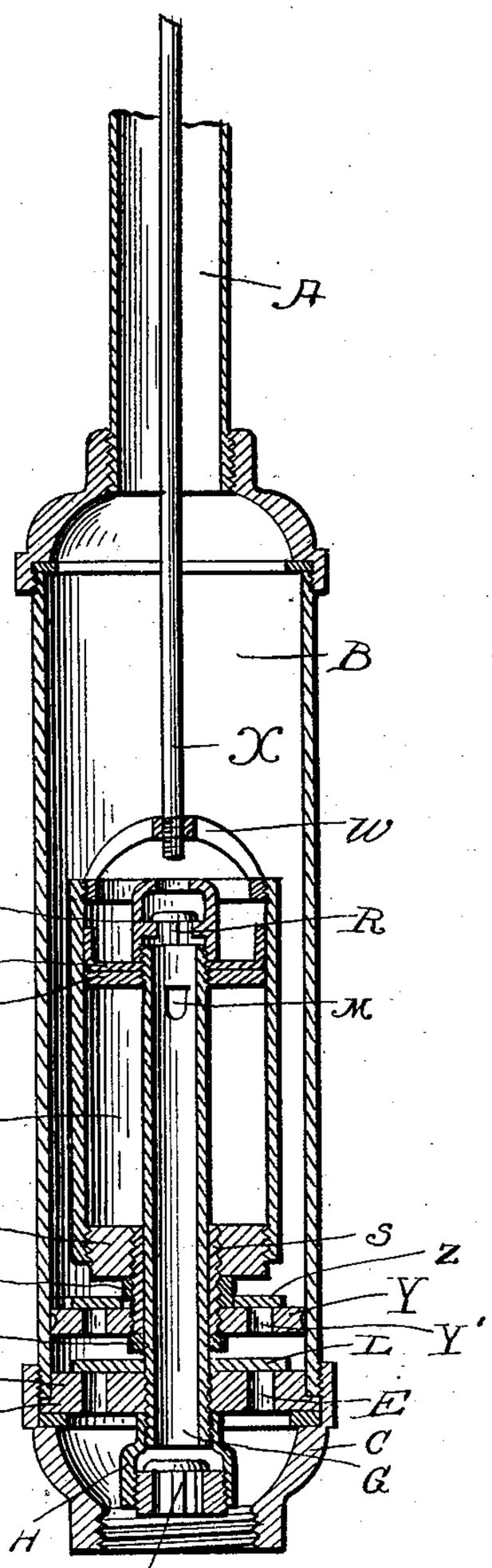
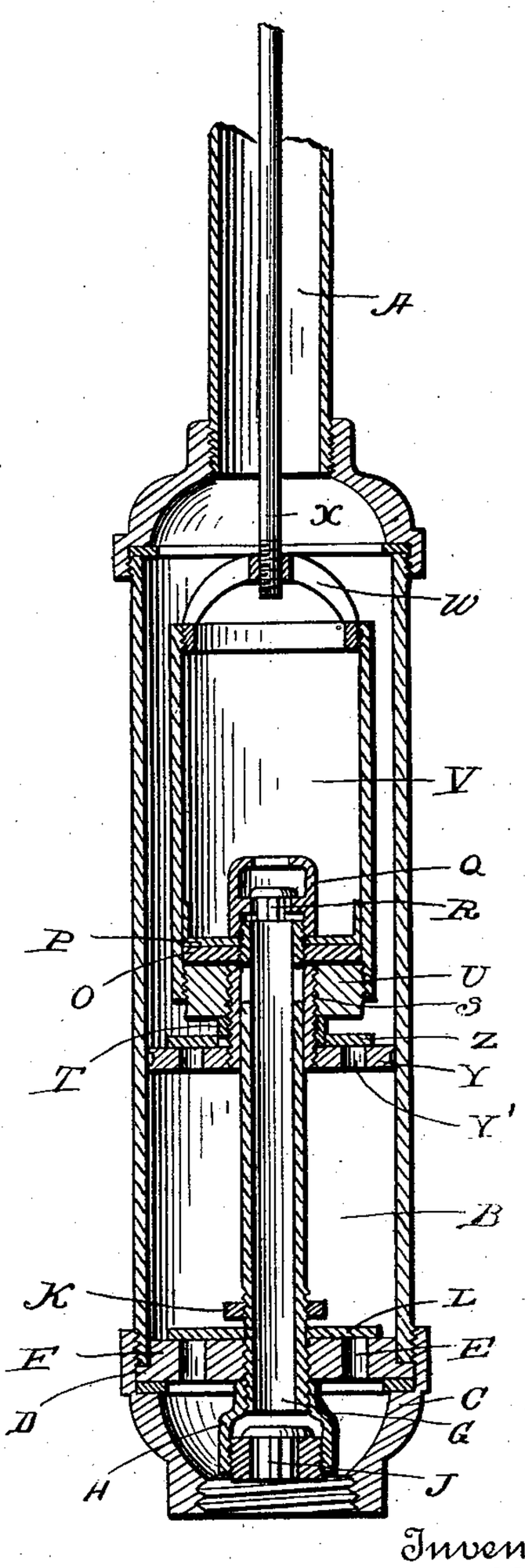


Fig. 2.



Witnesses
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No. 755,072. Patented March 22, 1904.

UNITED STATES PATENT OFFICE.

HIRAM C. STOUFFER, OF MINERALRIDGE, OHIO, ASSIGNOR OF TWO-THIRDS TO J. N. COLE AND H. G. HUFFMAN, OF YOUNGSTOWN, OHIO.

PUMP.

SPECIFICATION forming part of Letters Patent No. 755,072, dated March 22, 1904.

Application filed March 12, 1902. Renewed October 3, 1903. Serial No. 175,699. (No model.)

To all whom it may concern:

Be it known that I, HIRAM C. STOUFFER, a citizen of the United States, residing at Mineralridge, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention relates to improvements in pumps; and the main object of my invention is the provision of a double-acting pump in which the valved plunger is stationarily mounted in an outer stationary cylinder, a reciprocating cylinder being mounted in the outer cylinder and slidable around the plunger.

Another object of my invention is the provision of a double-acting pump which is the embodiment of simplicity, durability, and cheapness, thus producing a thoroughly efficient and practical pump.

To attain the desired objects, the invention consists of a double-acting pump embodying novel features of construction and combination of parts, substantially as disclosed herein.

In the accompanying drawings, Figure 1 is a sectional view of the entire pump with the inner cylinder in its lowest position, and Fig. 2 is a similar view of the pump with the inner cylinder in its highest position at right angles to Fig. 1.

Referring to the drawings, A designates the uptake or supply pipe, to whose lower end is connected the enlarged outer cylinder B, in which is mounted the gist of my invention. Fitting upon the lower end of this cylinder and held in place by means of the hollow cap C is the circular disk or plate D, which is provided with a series of perforations E and the interior shouldered ring F, which is adapted to enter the end of the outer cylinder. This disk has also secured thereto the hollow tube G, upon whose lower end below the disk is secured the valve-casing H, carrying the winged check-valve J. Fitting upon the upper face of the ring F, between it and the nut K, is a metal valve L, which is adapted to control the flow of water through the perforations or channels of the disk. Near the upper end of the tube I provide the oppositely arranged or alined openings M, which allow water free egress or ingress from or to the interior of the tube. Secured above these openings to the tube is the disk O, which clamps the leather flap P in place. Above the flap P is the valve-seat Q, in which fits the check-valve R, which prevents the water from flowing downward into the tube. Slidably mounted upon the tube, between the ends thereof, is the exteriorly-threaded sleeve or tube S, upon which is secured the collar T and the threaded disk U, which is adapted to be screwed in the lower end of the inner cylinder or piston V, which is connected by means of the spider W to the piston-rod *x*. Secured upon the sleeve S below the collar T is a disk or plate Y, which is provided with a series of perforations or channels Y′, similar to the perforations of the disk D, and loosely mounted upon the sleeve between said disk and the collar is the metal valve Z. This valve and valve L are of a smaller diameter than the disks, so that the water can pass upward readily through the channels thereof and be checked against a backward flow thereof.

From the foregoing description, taken in connection with the drawings, the operation of my improved double-acting pump will be readily understood and its numerous advantages be fully appreciated; but the operation, briefly stated, is as follows: Assuming the parts to be in the position shown in Fig. 1, as the piston-rod *x* is raised it raises the inner cylinder V, the sleeve S, and the disk Y. The valve Z is seated and valve L is lifted and water flows through the openings E to fill the space between the disks D and Y, the parts assuming the position shown in Fig. 2. As the cylinder V is forced downward to again assume the position shown in Fig. 1 the valve L is seated and the water in the space around the tube G and between the disks D and Y passes through the openings Y′, covering the cylinder V and seating the valve R. At the same time the valve J is lifted and water flows through the tube G and the openings M into the cylinder V. On the next upstroke of the piston the water in the cylinder V is

discharged through the openings M and the valve R into the uptake-pipe A, and water is again drawn through the valve L to fill the space between the disks D and Y. It will thus be seen that after the pump is properly started water will be discharged on both strokes of the piston, the amount of water discharged on the downstroke of the piston being equal in volume to the space included between the inner cylinder V, the tube G, and the disks O and U.

It is evident that I provide a double-acting pump which is simple, durable, and cheap in construction and thoroughly efficient and practical in use.

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

1. In a pump, the combination of an outer cylinder, an uptake-pipe connected to the upper end thereof, a double-valved hollow tube projecting into said cylinder and having its lower end connected in the lower end of the cylinder, a disk surrounding and rigidly secured to the tube near its upper end, a valve slidingly mounted upon said hollow tube intermediate of its length, and an inner cylinder carrying said sliding valve and having the upper end of the hollow tube and the disk projecting therein.

2. In a pump, the combination of an outer cylinder, a double-valved hollow tube projecting into said cylinder from its lower end, a disk surrounding and secured near the upper end of said tube, a valve slidingly mounted upon said tube, and an inner cylinder surrounding the upper end of the tube having its lower end connected to said sliding valve so that the valve and cylinder will be slidably mounted upon the tube.

3. In a pump, the combination of an outer cylinder, an uptake-pipe connected to the upper end thereof, a hollow tube having a check-valve at each end secured in the lower end of said cylinder, a disk surrounding and secured to the upper end of said tube, a sliding valve mounted upon said tube intermediate of the ends thereof, an inner cylinder carrying said sliding valve slidably mounted upon the tube and also slidably surrounding said disk, and a piston-rod connected to said inner cylinder.

4. In a pump, the combination of an outer cylinder, an uptake-pipe connected to the upper end thereof, a hollow tube having a check-valve at each end and a disk valve above the lower check-valve, a stationarily-mounted disk surrounding and carried near the upper end of said tube, a casing surrounding said lower check-valve and disk valve to secure the tube in place within the cylinder, a sliding disk valve mounted upon the tube, an inner cylinder having its lower end carrying said sliding disk valve and slidably surrounding said stationary disk, and a piston-rod connected to said inner cylinder.

5. In a pump, the combination of an outer cylinder, an uptake-pipe connected therewith, a hollow tube mounted in the lower end thereof provided with openings through its body near its upper end, a disk surrounding said tube near its upper end, a check-valve mounted in each end of said tube, a valve slidingly mounted upon said tube, an inner cylinder having its lower end carrying said sliding valve and surrounding the upper end of the tube and its disk, and a rod to raise and lower the inner cylinder and the sliding valve.

6. In a pump, the combination of an outer casing, a perforated disk mounted in the lower end thereof, a hollow tube surrounded by and connected to said disk and extending upward therefrom provided with openings near its upper end, a casing carrying a check-valve connected to said tube below the said disk, a check-valve mounted in the upper end, a flap below the last-mentioned check-valve secured to the tube above the openings, a sliding disk valve mounted upon the tube intermediate of its length, and an inner cylinder having its lower end carrying the sliding flap and having the flap contacting its interior.

7. In a pump, the combination of an uptake-pipe, an enlarged cylinder connected thereto, a perforated disk mounted in the lower end of said cylinder, a hollow tube connected to said disk, a check-valve at each end of said tube, a stationarily-mounted disk surrounding the upper end of said tube, a circular valve slidingly mounted upon said tube intermediate of its ends, an inner cylinder of lesser diameter than the circular valves having its lower end carrying the sliding valve and slidably surrounding said disk, and a piston-rod connected to the upper end of the inner cylinder and extending through the uptake-pipe.

8. In a pump, the combination of an uptake-pipe, an enlarged cylinder connected thereto, a circular valve mounted in the lower end thereof, a hollow tube provided with openings in its sides near its upper end, check-valves mounted in the ends of said tube, a circular disk connected to the tube above the openings therein, a valve slidingly mounted on said tube, an inner cylinder carrying said sliding valve and surrounding said disk, and a solid piston-rod connected to said inner cylinder.

In testimony whereof I affix my signature in presence of two witnesses.

HIRAM C. STOUFFER.

Witnesses:
T. BLAIR SHOEMAKER,
DAVID P. MOORE.