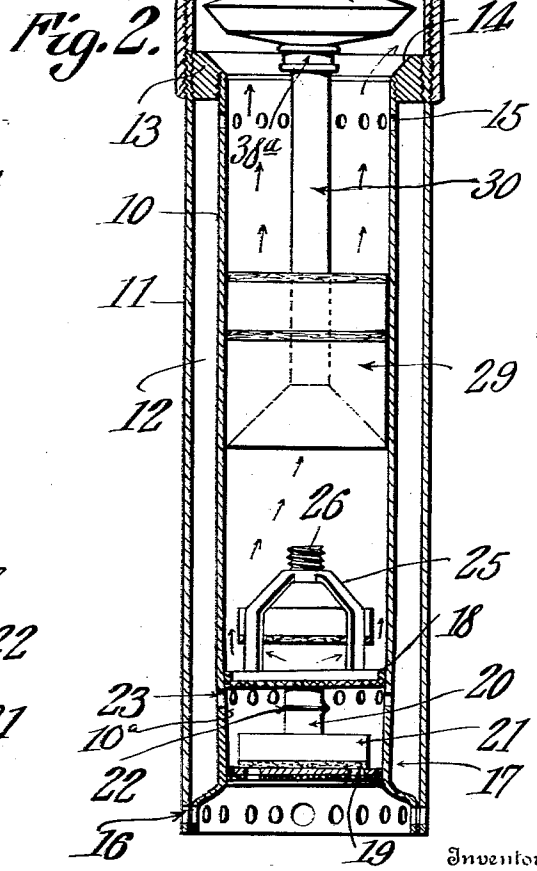
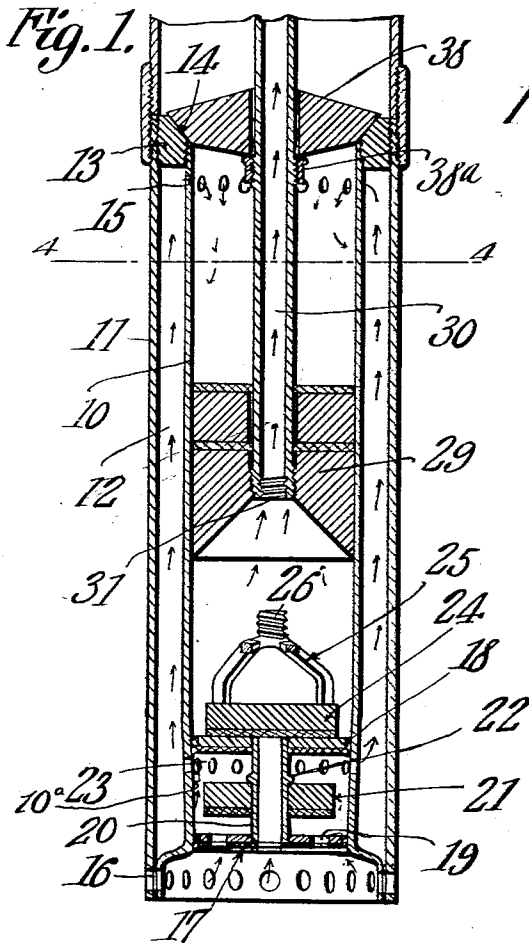
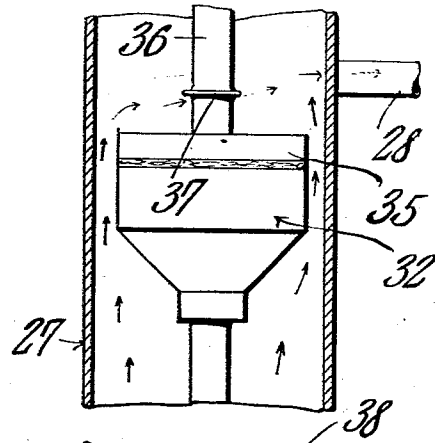
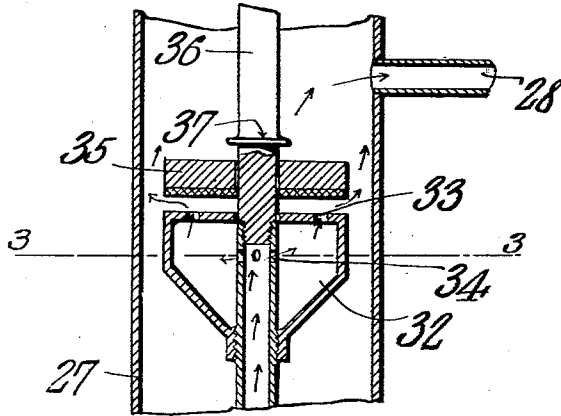


969,127.

Patented Aug. 30, 1910.

2 SHEETS—SHEET 1.



Witnesses

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DOUBLE ACTING PUMP.
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969,127.

Patented Aug. 30, 1910.

2 SHEETS—SHEET 2.

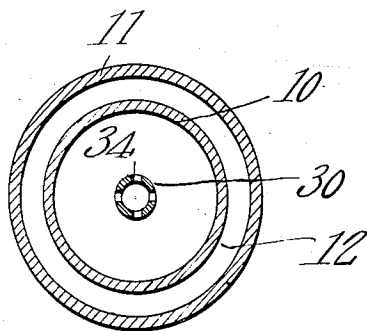


Fig. 3.

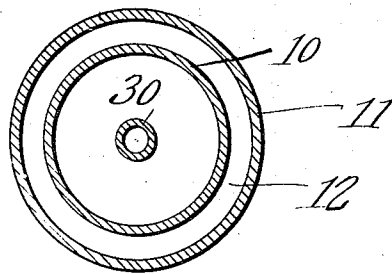


Fig. 4.

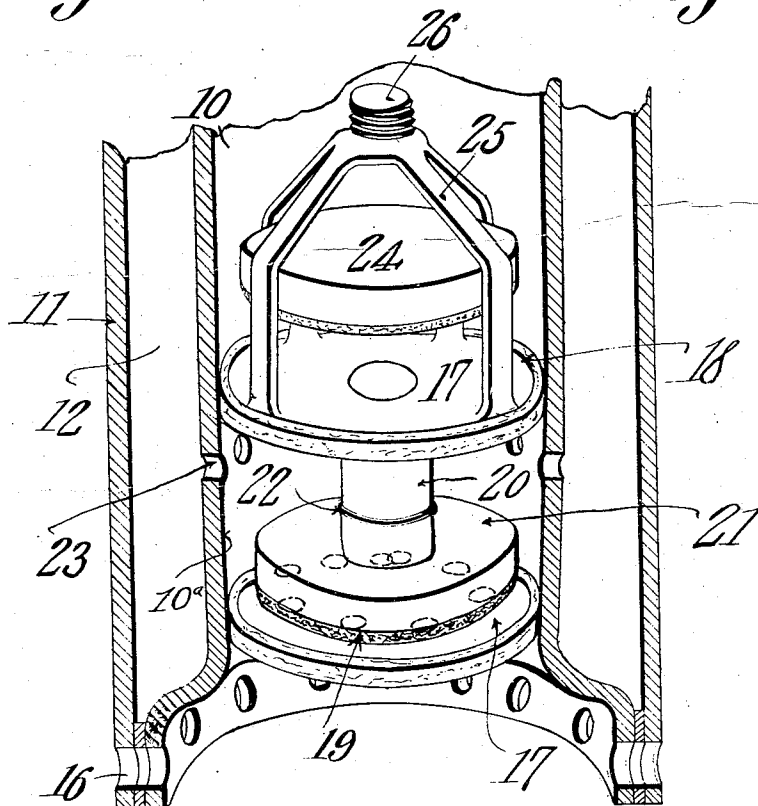


Fig. 5.

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UNITED STATES PATENT OFFICE.

HENRY BROWN ARNOLD, OF BIG SPRING, TEXAS.

DOUBLE-ACTING PUMP

969,127.

Specification of Letters Patent.

Patented Aug. 30, 1910.

Application filed January 17, 1910. Serial No. 538,504.

To all whom it may concern:

Be it known that I, HENRY BROWN ARNOLD, a citizen of the United States, residing at Big Spring, in the county of Howard and State of Texas, have invented a new and useful Double-Acting Pump, of which the following is a specification.

This invention has for its object to provide a pump which delivers the fluid in a continuous stream, a supply being obtained on both strokes of the piston.

A further object of the invention is to provide a pump of the kind stated which is simple in structure, easy to operate and especially adapted for deep wells, the standing valve being so mounted in the pump cylinder that it may be removed without pulling up the cylinder or the well tubing.

Another object of the invention is to provide a pump embodying certain novel structural details to be hereinafter described and claimed.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a central vertical sectional view of the pump. Fig. 2 is a similar view showing the parts in another position, some of the parts being shown in elevation. Fig. 3 is a transverse section on the line 3—3 of Fig. 1. Fig. 4 is a transverse section on the line 4—4 of Fig. 1. Fig. 5 is a perspective view of the standing valve, the pump cylinder being shown broken away.

The pump cylinder comprises concentric inner and outer barrels 10 and 11, respectively, spaced from each other so as to form an annular chamber 12 surrounding the inner barrel. The upper end of this chamber is closed by a ring 13 having its upper surface beveled to form a valve seat 14. The chamber 12 communicates with the interior of the barrel 10, at the top thereof, by openings 15 in the wall of said barrel. The lower end of the chamber 12 is closed by flaring the barrel 10 so as to engage the inner surface of the barrel 11, to which it may be soldered or otherwise made fast. In those portions of the two barrels which are connected together, are inlet openings 16 from the well.

In the lower end of the barrel 10 are located partitions 17 and 18, respectively, the former having openings 19 into the well. The partitions 17 and 18, are spaced from each other, and are connected at the center by a tube 20 opening at its ends through

said partitions. It will therefore be seen that the inlet from the well into that portion of the interior of the barrel which is between the partitions, is through the openings 19, whereas that portion of the barrel above the partition 18, which is the upper one, is in communication with the well by the way of the tube 20.

The openings 19 are controlled by a valve 21 which is a disk slidably mounted on the tube 20 between the partitions, and adapted to seat over said openings. The upward or opening movement of the valve disk is limited by a shoulder 22 formed on the tube. In the wall of the barrel 10, between the partitions 17 and 18, are openings 23 establishing communication with said portion of the barrel, and the chamber 12. The diameter of the valve disk 21 is less than the internal diameter of the barrel 10, so that the water or other fluid entering the latter may flow past the valve, when it is open, and into the chamber 12 by the way of the openings 23. The valve is faced with a packing disk of leather or suitable material.

On top of the partition 18 seats a valve 24 which controls the outlet end of the tube 20, this valve also being a disk having a packing of leather or other suitable material on its face. The valve 24 is slidable up and down in a cage 25 rising from the partition 18, the upper end of this cage being formed with a short externally threaded stem 26, which is provided for a purpose to be presently described.

The partitions 17 and 18 are provided with a cup leather, and they are held in place by slightly tapering the lowering end of the barrel 10 at 10^a.

To the upper end of the barrel 11 is coupled the well tubing 27 which conducts the water or other fluid to a discharge spout 28.

In the barrel 10, above the valve 24, works a piston 29, carried at the lower end of a tubular rod 30, the latter opening through the piston. The lower end of this rod is internally screw threaded, as indicated at 31, so that it may be screwed on the stem 26 if it is desired to remove the valves 24 and 21, as well as the partitions 17 and 18. It is therefore possible to remove said parts from the pump cylinder without pulling up the latter and the well tubing. The rod 30 extends into the well tubing 27, and carries, above the valve seat 14, a hollow

head 32. In the top of this piston are outlet openings 33 into the tubing from the interior of the head, the latter being in communication with the bore of the rod 30 by openings 34 made in the latter. The openings 33 are controlled by a valve 35 seating on top of the head, and comprising a disk faced with a suitable leather or other packing, and slidably mounted on a stem 36 which screws into and closes the upper end of the rod 30. The pump operating means will be connected to this stem. The upward or opening movement of the valve 35 is limited by a collar 37 on the stem. The spout 28 is located above this valve. Between the piston 29 and the head 32, the rod 30 carries a valve 38 which is shaped to fit the seat 14, said valve being slidable on the rod, its downward travel being limited by a collar 38^a on the rod. The valve is so positioned on the rod that it seats on the beginning of the down stroke of the piston.

The operation of the pump is as follows: On the down stroke of the piston 29, the valve 24 closes, and the valve 21 opens, whereupon the water or other fluid in the barrel, above the valve 24, is forced up through the hollow rod 30, and out of the same through the openings 34 into the head 32, and from the latter into the tubing 27 by the way of the openings 33, and then to the spout 28, the valve 35 also opening on the down stroke and seating at the end thereof. The downward travel of the piston 29 creates a suction in the barrel 10 between the top of said piston and the valve 38, whereby water is drawn into that portion of the barrel through the openings 15, the valve 21 opening to let the water through the openings 19 into that portion of the barrel between the partitions 17 and 18, from which it passes through the openings 23 into the chamber 12, and out of the latter into that portion of the barrel 10 which is above the piston 29, by the way of the openings 15. The valve 38 seats at the beginning of the down stroke. On the up stroke of the piston, the valves 24 and 38 open, and the valves 21 and 35 close. The water from the well now flows by the way of the tube 20 into that portion of the barrel 10 above the partition 18, and the water which had entered the barrel 10 above the piston 29 on the down stroke, is lifted by the piston 29, and flows through the tubing 27 to the spout 28.

It will be evident from the foregoing, that the pump delivers the water or other fluid in a continuous stream, a supply being obtained on both strokes of the piston. The pump is easy to operate, and has no complicated parts to get out of order.

The preferred embodiment of the inven-

tion has been herein shown and described, but it will be evident that various minor changes in the structural details thereof may be resorted to without a departure from the invention.

What is claimed is:—

1. In a pump, a cylinder comprising inner and outer barrels, the outer barrel being closed at its ends, and in communication at its upper end with the inner barrel, spaced partitions in the lower end of the inner barrel, that portion of said barrel which is located between the partitions having an outlet into the outer barrel, and the lower partition having openings into the well, a tube extending between the partitions, and opening therethrough, a valve seating on the upper end of the tube, a valve slidably mounted on the tube, and controlling the openings of the lower partition, a delivery tube connected to the pump cylinder, a solid piston working in the inner barrel above the partitions, a hollow rod carrying the piston, a valve carried by the rod to close the upper end of the inner barrel at the down stroke of the piston, and a hollow head carried by the rod above the last mentioned valve, the interior of said head being in communication with the bore of the rod, and having a valve-controlled outlet into the delivery tube.

2. In a pump, a cylinder comprising inner and outer barrels, the outer barrel being closed at its lower end, a ring seated in the upper end of the outer barrel for closing said end, the ring having a valve seat, and said outer barrel being in communication at its upper end with the inner barrel, partitions in the lower end of the inner barrel, that portion of said barrel which is located between the partitions having an outlet into the outer barrel, and the partitions having valve-controlled openings into the well, a delivery tube connected to the pump cylinder, a solid piston working in the inner barrel above the partitions, a hollow rod carrying the piston, a hollow head carried by the rod, the interior of said head being in communication with the bore of the rod, and having a valve-controlled outlet into the delivery tube, and a valve carried by the rod below the aforesaid head, said last-mentioned valve engaging the aforesaid seat to close the upper end of the inner barrel at the down stroke of the piston.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HENRY BROWN ARNOLD.

Witnesses:

JAMES T. BROOKS,
PEARL HARRINGTON.