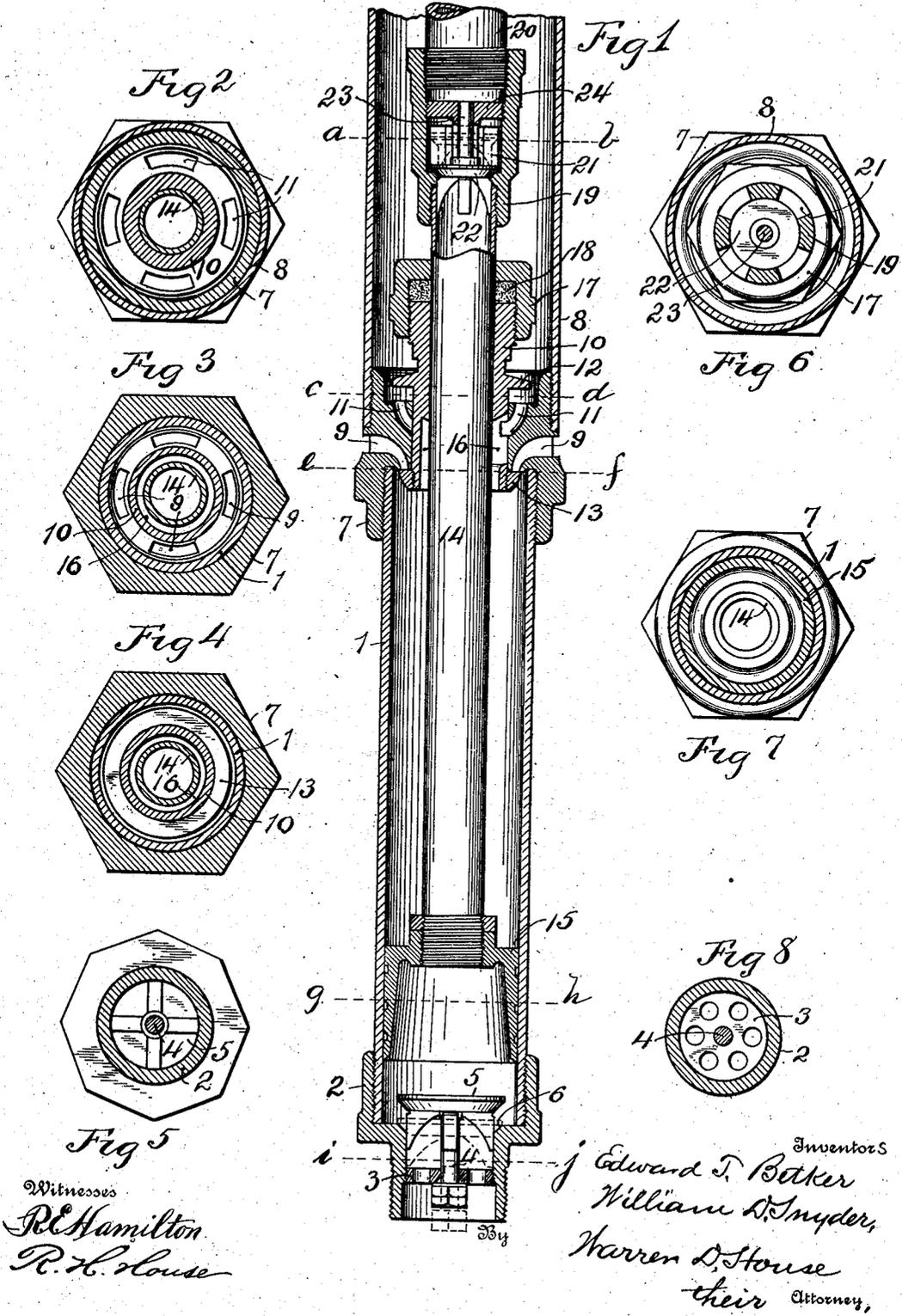


No. 827,205.

PATENTED JULY 31, 1906.

E. T. BETKER & W. D. SNYDER.  
PUMP.

APPLICATION FILED JAN. 23, 1906.



# UNITED STATES PATENT OFFICE.

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## PUMP.

No. 827,205.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed January 23, 1905. Serial No. 242,404.

To all whom it may concern:

Be it known that we, EDWARD T. BETKER and WILLIAM D. SNYDER, citizens of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

Our invention relates to improvements in pumps.

The object of our invention is to provide a pump of large pumping capacity which will lift the water in a continuous stream and during reciprocation of the piston in both directions.

Our invention provides, further, a pump which is simple in construction, not liable to get out of order, cheaply manufactured, and the parts of which may be readily assembled together or detached from each other.

Other novel features are hereinafter fully described and claimed.

In the accompanying drawings, illustrative of the invention, Figure 1 is a central vertical sectional view, the piston-rod being shown partly in elevation and partly in section. Fig. 2 is a horizontal section taken on the dotted line *c d* of Fig. 1 looking downward. Fig. 3 is a horizontal section taken on the dotted line *e f* of Fig. 1 looking upward. Fig. 4 is a sectional view looking downward, taken on the dotted line *e f* of Fig. 1. Fig. 5 is a sectional view looking upward on the dotted line *i j* of Fig. 1. Fig. 6 is a sectional view looking downward on the dotted line *a b* of Fig. 1. Fig. 7 is a sectional view looking upward on the dotted line *g h* of Fig. 1. Fig. 8 is a sectional view looking downward on the dotted line *i j* of Fig. 1.

Similar characters of reference indicate similar parts.

The barrel 1 is a tubular cylinder, to one end of which is secured a fitting 2, provided with a central inlet-opening in which is secured a horizontal perforated disk 3, provided with a central vertical opening in which is slidably mounted the vertical stem 4 of a check-valve 5, which when seated in the valve-seat 6 of the fitting 2 prevents backflow at that end of the barrel. The barrel at this end is preferably externally screw-threaded to fit the internally-screw-threaded upper end of the fitting 2. The other end of the

barrel 1 is externally screw-threaded and fitted in the internally-screw-threaded lower end of a fitting 7, the upper end of which is externally screw-threaded and fitted in the screw-threaded lower end of a conducting-pipe 8, which carries the water to the surface of the ground. The fitting 7 is provided with one or more passages 9, leading from its exterior and discharging into the upper end of the barrel 1. The fitting 7 is provided with a central longitudinal opening or hole extending therethrough, in which is longitudinally slidably a tubular valve 10. The fitting 7 is provided also with one or more passages 11, leading from the central hole and discharging into the conducting-pipe 8. The valve 10 is provided with a horizontal peripheral flange 12, disposed above and adapted when the valve is properly positioned to close the passages or ports 11. The lower end of the valve 10 below the passages 9 is externally screw-threaded and has fitted to it a ring 13, forming part of the valve and when the valve is in the upper position adapted to close the passages 9. When the valve 10 is reciprocated vertically, the passages 9 and 11 are alternately closed by said valve. The valve 10 is slidably mounted upon a central longitudinal tubular piston-rod 14, which extends through and is reciprocatively mounted in the fitting 7 and has secured to its lower end a tubular piston 15, reciprocatively mounted in the barrel 1 above the check-valve 5.

In the lower end of the valve 10 is provided an annular space 16 around the piston-rod 14. This annular space 16 is adapted when the valve 10 is in the position shown in solid lines in Fig. 1 to register with the ports or passages 11, thus permitting water to pass upwardly from the barrel 1 through the annular space 16, ports 11, and into the conducting-pipe 8. When the valve 10 is in the lower position, the flange 12 covers the ports 11 and prevents backflow from the conducting-pipe 8 through said ports. The ring 13 is considerably smaller in diameter than the interior of the barrel 1, thus permitting the liquid to enter the barrel from the passages 9 around the periphery of said ring. When the valve 10 is in the lower position, the liquid may also pass from the passages 9, through the annular passage 16, into the barrel 1. When the piston 15 is moved downwardly,

the valve 10 will be moved by gravity or by the weight of water resting upon it to the downward position, thus closing the ports 11 and opening the passages 9, permitting the barrel to fill from its upper end. When the piston is moved upwardly, the check-valve 5 will be raised, permitting the water to fill the barrel from the lower end through the fitting 2, and the pressure of the water above the piston will force the valve 10 to the position shown in solid lines in Fig. 1, closing the passages 9 and permitting the water above the piston to pass through the space 16 and ports 11 through the conducting-pipe 8.

In order that the valve 10 may more certainly move with the piston-rod 14, the upper end of the valve 10 has secured to it a stuffing-box 17, which encircles the piston-rod 14 and compresses packing material 18 against the upper end of the valve 10 and around the periphery of the piston-rod, the friction of the packing 18 serving to move the valve with the rod, but permitting sliding of the rod through the valve after the valve has become seated.

The upper end of the piston-rod 14 has secured to it, preferably by a screw-thread connection, the lower end of a tubular fitting 19, to the upper end of which is secured in any desirable manner the lower end of the connecting-rod 20 of the pump. The fitting 19 is provided with one or more lateral discharge-openings 21, through which the water discharged from the piston-rod escapes into the conducting-pipe 8. In the fitting 19 is mounted a vertically-movable check-valve 22, provided with a central vertical stem 23, vertically movable in a central hole provided in a horizontal disk 24, secured in the fitting 19 below the connecting-rod 20 and above the openings 21.

When the piston 15 is moved downwardly, the water in the barrel below the piston forces the check-valve 5 to its seat and prevents downflow of the water from the barrel. The water, therefore, which is below the piston passes upwardly through the piston-rod 14, raising the check-valve 22, and passes through the openings 21 into the conducting-pipe 8, in which it is forced to the surface of the ground by the succeeding instalments of water taken into the said conducting-pipe. It will thus be seen that when the piston is reciprocated the valve 10 will be reciprocated, and water taken in through the passages 9 upon the downward movement of the piston will upon the upward movement thereof be forced through the channels described into the conducting-pipe 8. The water drawn into the barrel past the valve 5 during the upward movement of the piston will upon the downward movement thereof be forced through the piston and piston-rod, past the valve 22 and through the fitting 19 and openings 21, into the conducting-pipe 8. The

water, therefore, is pumped upwardly in a substantially continuous stream.

Any suitable mechanism may be employed for reciprocating the connecting-rod 20, and the conducting-pipe 8, which may be of any desired length, may be supported in any convenient manner. The lower end of the fitting 2 is preferably externally screw-threaded for the affixing thereto of a strainer (not shown, but which may be of any ordinary pattern.)

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

1. In a pump, the combination with the barrel, of the conducting-pipe, a fitting connecting said pipe and barrel and having an inlet-passage leading from its exterior and discharging into the barrel and having also a discharge-passage leading from the barrel and discharging into the conducting-pipe, a piston reciprocatively mounted in the barrel and having a piston-rod extending through the fitting, and a valve slidable on the piston-rod and reciprocative by frictional means with the piston-rod to positions for alternately closing said passages.

2. In a pump, the combination with the barrel, of the conducting-pipe, a fitting connecting said pipe and barrel and having an inlet-passage leading from its exterior and discharging into the barrel and having a passage leading from the barrel and discharging into said pipe, a piston reciprocatively mounted in the barrel and having a piston-rod extending through the fitting into said pipe, a tubular valve slidably mounted on the piston-rod and adapted when reciprocated to alternately close said passages, and frictional means for imparting movement from the piston-rod to said valve.

3. In a pump, the combination with the barrel, of the conducting-pipe, a fitting connecting said pipe and barrel and having an inlet-passage leading from its exterior and discharging into the barrel, and having a passage leading from the barrel and discharging into the conducting-pipe, a piston reciprocatively mounted in the barrel and having a piston-rod extending through the fitting into said pipe, a valve reciprocative to positions for alternately closing said passages, and frictional means for imparting reciprocation from the piston-rod to said valve.

4. In a pump, the combination with the barrel, of the conducting-pipe, a fitting connecting said pipe and barrel and having a passage leading from its exterior and discharging into the barrel and having also a passage leading from the barrel and discharging into the conducting-pipe, a piston reciprocatively mounted in the barrel and having a piston-rod extending through the fitting into the conducting-pipe, a tubular valve slidably mounted on the piston-rod for alternately closing, when reciprocated, said passages,

and a stuffing-box mounted on said piston-rod and connected to the valve for imparting by friction, reciprocation from the piston-rod to the valve.

5 5. In a pump, the combination with the barrel, of the conducting-pipe, a fitting connecting said barrel and pipe and having a passage leading from its exterior and discharging into the barrel, and a passage leading from  
10 said barrel and discharging into said pipe, a tubular piston reciprocatively mounted in the barrel and having a tubular piston-rod extending through the fitting into said pipe, a valve for alternately closing said passages  
15 when the valve is reciprocated, and frictional means for imparting reciprocation from the piston-rod to the valve.

6. In a pump, the combination with the barrel, of the conducting-pipe, a fitting connecting said pipe and barrel and having a passage leading from its exterior and discharging into said barrel, and a passage leading from  
20 said barrel and discharging into said pipe, a tubular piston reciprocatively mounted in said barrel and having a tubular piston-rod extending through said fitting into said pipe, a tubular valve slidably mounted on the piston-rod and reciprocative therewith to positions for alternately closing said passages, and  
25 frictional means for imparting reciprocation from the piston-rod to the valve.

7. In a pump, the combination with the barrel, of the conducting-pipe, a fitting connecting said pipe and barrel and having a passage leading from its exterior and discharging into the barrel, and a passage leading from  
30 the barrel and discharging into said pipe, a tubular piston reciprocatively mounted in the barrel and having a tubular piston-rod extending through said fitting into said pipe, a tubular valve slidably mounted on the piston-rod and reciprocative to positions for alternately closing said passages, and a stuffing-box mounted on said piston-rod and connected to said valve for imparting by friction  
35 reciprocation from the rod to the valve.

8. In a pump, the combination with the barrel, of the conducting-pipe, a check-valve at one end of the barrel for preventing back-  
40 flow therefrom, a fitting connecting the other end of the barrel with the conducting-pipe and having a passage leading from its exterior and discharging into the barrel, and having a passage leading from the barrel and discharging into the conducting-pipe, a tubular piston reciprocatively mounted in the barrel and having a tubular piston-rod extending through the fitting into said pipe, a valve reciprocative to positions for alternately closing  
45 said passages, frictional means for imparting reciprocation from the piston-rod to the reciprocative valve, and a check-valve for preventing backflow from the conducting-pipe through said piston-rods.

9. In a pump, the combination with the

barrel, of the conducting-pipe, a check-valve for preventing backflow from one end of the barrel, a fitting connecting the other end of the barrel with said pipe and having a passage leading from its exterior and discharging  
50 into the barrel, and having a passage leading from the barrel and discharging into said pipe, a tubular piston reciprocatively mounted in the barrel and having a tubular piston-rod extending through the fitting into said pipe, a reciprocative valve movable to positions for alternately closing said passages and slidable upon and with the piston-rod, frictional means for imparting reciprocation from the rod to the reciprocative valve, and  
55 means for preventing backflow from the conducting-pipe through said piston-rod.

10. In a pump, the combination with the barrel, of the conducting-pipe, means for preventing backflow from one end of the barrel, a fitting connecting the other end of the barrel with the conducting-pipe and having a passage leading from its exterior into the barrel, and having a passage leading from the barrel and discharging into the conducting-  
60 pipe, a tubular piston reciprocatively mounted in the barrel, and having a tubular piston-rod extending through the fitting and discharging into the conducting-pipe, means for preventing backflow from said pipe through the piston-rod, a valve reciprocative to positions for alternately closing said passages, and frictional means for imparting reciprocation from the rod to said valve.

11. In a pump, the combination with the barrel, of the conducting-pipe, means for preventing backflow from one end of the barrel, a fitting connecting the other end of the barrel with the conducting-pipe and having a passage leading from its exterior into the barrel, and having a passage leading from the barrel and discharging into the conducting-pipe, a tubular piston reciprocatively mounted in the barrel, and having a tubular piston-rod extending through the fitting and discharging  
65 into the conducting-pipe, means for preventing backflow from said pipe through the piston-rod, a tubular valve slidably mounted on the piston-rod and movable to positions therewith for alternately closing said passages, and frictional means for imparting reciprocation from the piston-rod to said valve.

12. In a pump, the combination with the barrel, of the conducting-pipe, means for preventing backflow from one end of the barrel, a fitting connecting the other end of the barrel with the conducting-pipe and having a passage leading from its exterior into the barrel, and having a passage leading from the barrel and discharging into the conducting-  
70 pipe, a tubular piston reciprocatively mounted in the barrel and having a tubular piston-rod extending through the fitting and discharging into the conducting-pipe, means for preventing backflow from said pipe through

the piston-rod, a tubular valve slidably mounted on the piston-rod and movable to positions therewith for alternately closing said passages, and a stuffing-box mounted on the  
5 piston-rod and connected to said valve for imparting by friction reciprocation from the rod to the valve.

In testimony whereof we affix our signatures in presence of two witnesses.

EDWARD T. BETKER.  
WILLIAM D. SNYDER.

Witnesses:

WARREN D. HOUSE.  
HENRY F. ROSE.