

J. GLEASON.
DOUBLE ACTING DEEP WELL PUMP.
APPLICATION FILED OCT. 5, 1908.

913,123.

Patented Feb. 23, 1909.

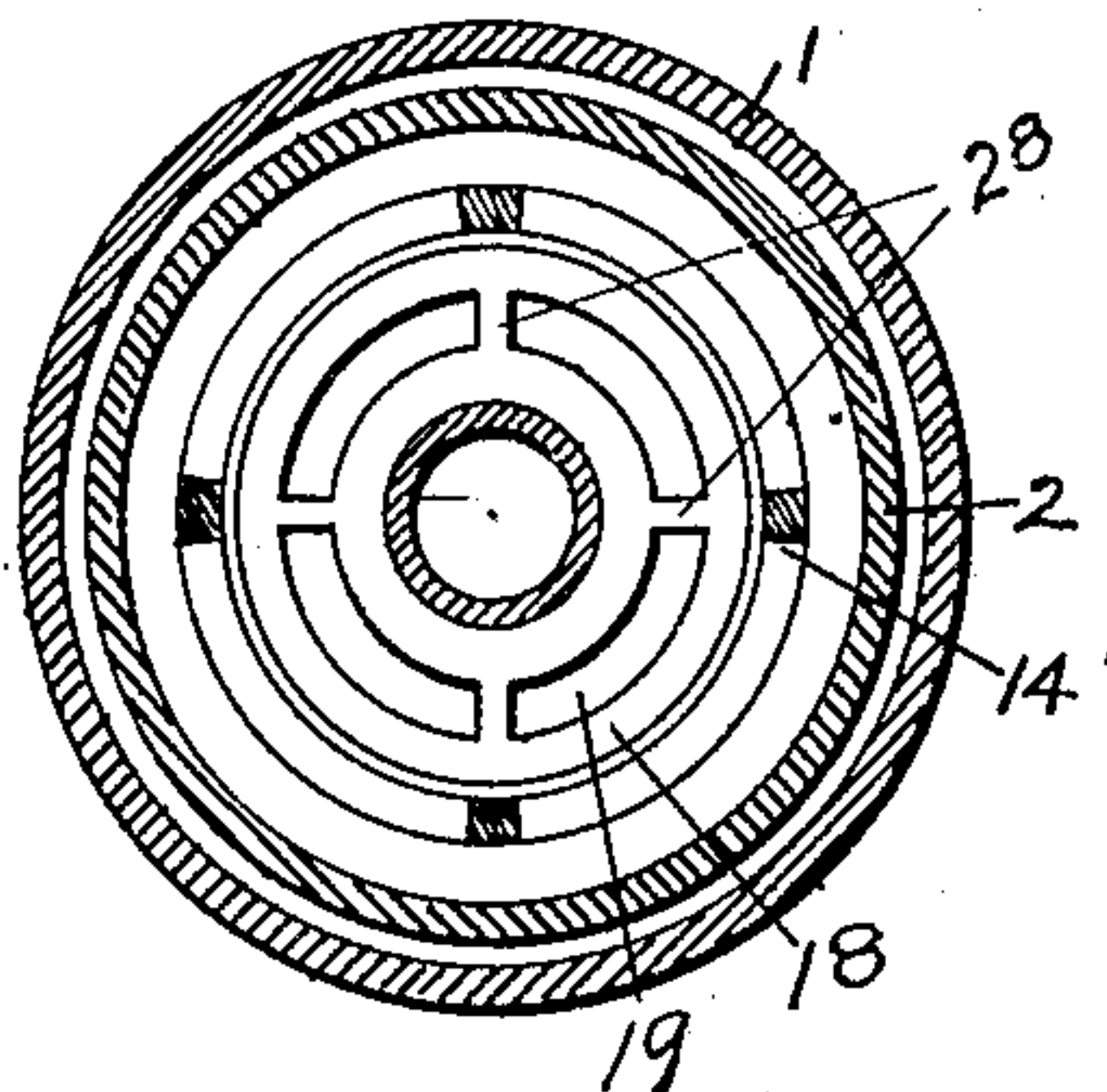
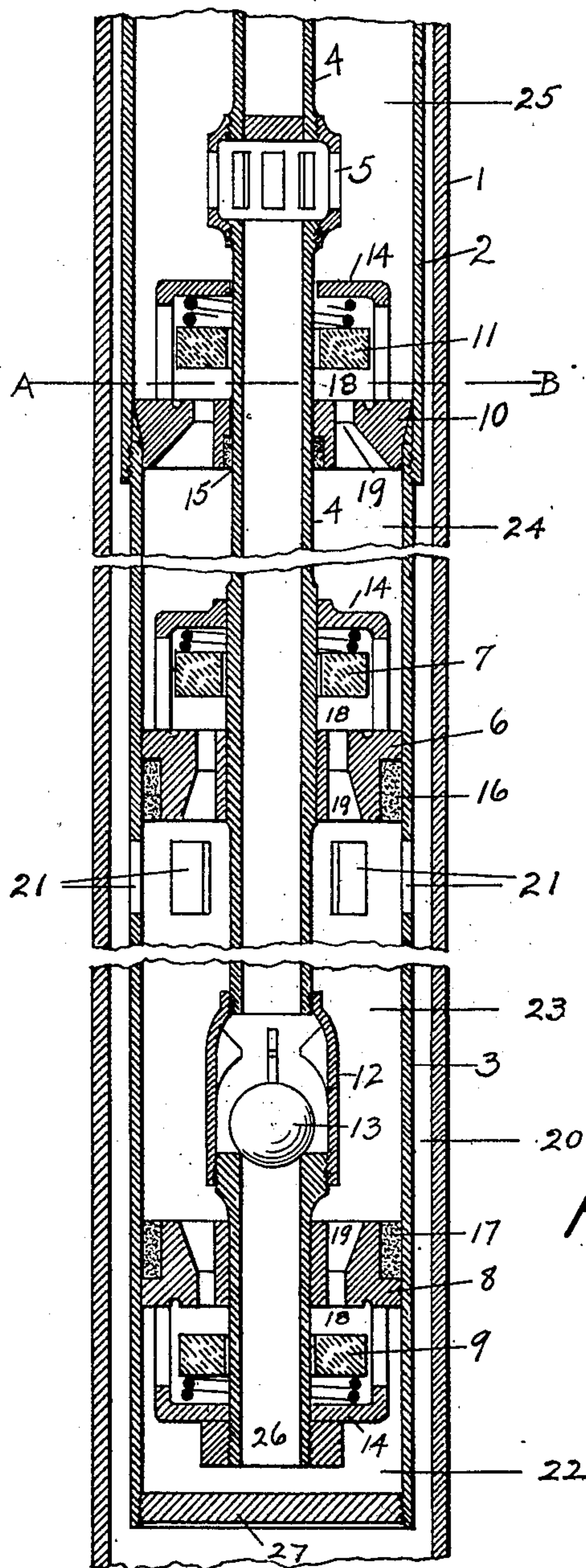


FIG. 2.

FIG. 1.

WITNESSES:

P. T. Benson
C. Benson

INVENTOR

James Gleason

UNITED STATES PATENT OFFICE.

JAMES GLEASON, OF GREEN BAY, WISCONSIN.

DOUBLE-ACTING DEEP-WELL PUMP.

No. 913,123.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed October 5, 1908. Serial No. 456,355.

To all whom it may concern:

Be it known that I, JAMES GLEASON, a citizen of the United States, and residing at Green Bay, in the county of Brown and State of Wisconsin, have invented a new and useful Improvement in Double-Acting Deep-Well Pumps, of which the following is a specification.

My invention relates to reciprocating power pumps for use in deep wells in which the pump is incased in a pipe which is lowered to a desired depth inside a previously sunk well casing, the pump or plungers being operated by a plunger rod or pipe inside of the pump casing or discharge pipe, and connected with a reciprocating piston or lever of the surface power.

My object is to produce a pump which shall discharge with both the upward and downward strokes, the quantity of water delivered to be approximately the same on either stroke. I attain this object by means of the mechanism illustrated in the accompanying drawing in which—

Figure 1 is a vertical section through the pump and casing showing sectional views of all the parts thereof, and Fig. 2, is a horizontal section of the pump on line A, B.

Similar figures refer to similar parts in the several views.

1, is the well casing, 2, is a suspension or discharge pipe lowered therein, 3, is the pump barrel, 4, a plunger rod or pipe. A little above the upper valve of the pump is a coupling, 5 which has ports or openings on each side to allow the free passage of water from the bore of plunger rod 4, above this coupling plunger 4 is plugged or may be solid at option of manufacturer. Plunger rod 4 carries a bucket or plunger 6 with valve 7, and plunger 8 with valve 9, these plungers being solidly attached to plunger rod, and spaced upon rod 4 according to length of stroke. Valve disk 10 with valve 11 is seated at the top of pump barrel 3 the plunger rod sliding through the center of this disk and valve.

The two plungers and valves and the stationary disk and valve are all similar in shape and design, the valves seating at 18 over ports 19, the valves are held against the seat by coiled springs and incased in bonnets 14 which are shown here as four legged but may be of other convenient shape. The upper valve disk is packed at 15, the intermediate valve-disk at 16 and the lower valve-disk at 17. Plunger rod 4 also carries just above

the lower plunger a ball check valve, the casing marked 12 and the ball 13. The lower end of pump barrel is closed with a plug at 27. The lower end of plunger pipe or rod 4 is open at 26. At a point just below the lower end of travel of intermediate plunger 6 the pump barrel 3 has ports 21 opening into the annular space 20 between the pump barrel and the well casing, the barrel of pump being enough less in diameter than the well casing to provide for the free passage of water around the pump barrel.

A horizontal section through the well casing and discharge pipe is shown in Fig. 2. This shows the port 19 which is an annular opening, divided into a plurality of parts by webs 28 which unite the outer and inner portions of the valve seat. A section through each of the valves just above the seat or between the seat and valve will be identical except as to the varying diameters of pipe 2 and barrel 3. The space in pump barrel between the upper and intermediate valves is designated 24, the space between the intermediate and lower valves 23 and the space below the lower valve 22.

In action the water is admitted to the space 23 through the annular space 20 and the ports 21. When the plunger rod is raised, the valve 9 is opened and the water flows through into the space 22. At the turn of the stroke the valve 9 closes and the water in space 22 is forced through the open end 26 of the plunger rod 4, past the ball check 13 and out through ports in coupler 5 into the space 25 of discharge pipe 2. When the plunger descends the valve 7 is opened and the water entering through ports 21 passes into the space 24. At the turn of the stroke the valve 7 closes and the plunger rising forces the water through valve 11 into the space 25 of discharge pipe 2. This pipe then being filled from both upward and downward strokes of the plunger. The flow of water is upward into the annular space between the well casing and pump barrel, through ports into the pump barrel, thence downward to bottom of pump barrel and up through a hollow plunger rod into the discharge pipe, or from the annular space through ports into the pump barrel, thence upwards into the upper part of pump barrel, thence upwards into the discharge pipe.

The valve 11 and ball valve 13 are held shut by the weight of the water column above, except when forced open by action of

plunger. The suspension or discharge pipe 2 is larger in diameter than pump barrel 3 and the working parts of pump may be removed by drawing out the plunger rod for the purpose of repair or cleaning, the reduced size of working parts as compared with diameter of discharge pipe permitting such removal.

The form of packing boxes, manner of attaching plungers, etc. may be varied from the forms shown, they being no part of the claim for patent right.

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

1. In an apparatus of the character described the combination of a discharge pipe, a pump barrel closed at the lower end, a valve seated at the upper end thereof, a hollow plunger rod open at lower end, a plunger with valve operating in the upper half of pump barrel, a plunger with valve operating in the lower half of pump barrel, a ball check valve operating in the lower end of hollow plunger rod, water ports in the upper part of lower half of pump barrel, and a coupling with ports above the upper valve of pump admitting water from the hollow plunger rod to the discharge pipe of the pump, a plunger rod, valve and plungers so connected and proportioned in diameters that the working parts may be lifted out without disturbing the discharge pipe, as set forth.

2. A discharge pipe, a pump barrel smaller in inside diameter than the discharge pipe, a valve situated at upper end of pump barrel, a plunger rod connected at lower end with a working plunger rod having a hollow sec-

tion, an enlarged coupler with ports opening from hollow of plunger rod to discharge pipe, a ball check valve near the lower end of said hollow plunger rod, a bucket attached to hollow plunger rod at its lower extremity, ports in said bucket with valve opening downwards, a bucket attached to said hollow plunger rod midway of its length, ports in said bucket with valve opening upwards, pump barrel closed at its lower end, ports in the sides of pump barrel just below the lowest point of travel of the upper bucket, as described.

3. In apparatus of the character described, the combination of a discharge pipe, a pump barrel, smaller in diameter than the discharge pipe, closed at the bottom end, ports in the sides of the pump barrel about midway of its length, a hollow plunger rod open at its lower extremity, two plungers spaced upon and attached to said hollow plunger rod, the lower one having a valve opening downwards, the upper having a valve opening upwards, a stationary disk with valve seated at the upper end of pump barrel with hollow plunger rod passing through it, plunger and disk valves to be approximately the same in shape and manner of operation, an enlarged coupling with ports at upper end of hollow plunger rod, a ball check valve near lower end of hollow plunger rod, as described.

JAMES GLEASON.

Witnesses:

P. T. BENTON,
C. H. BENTON.