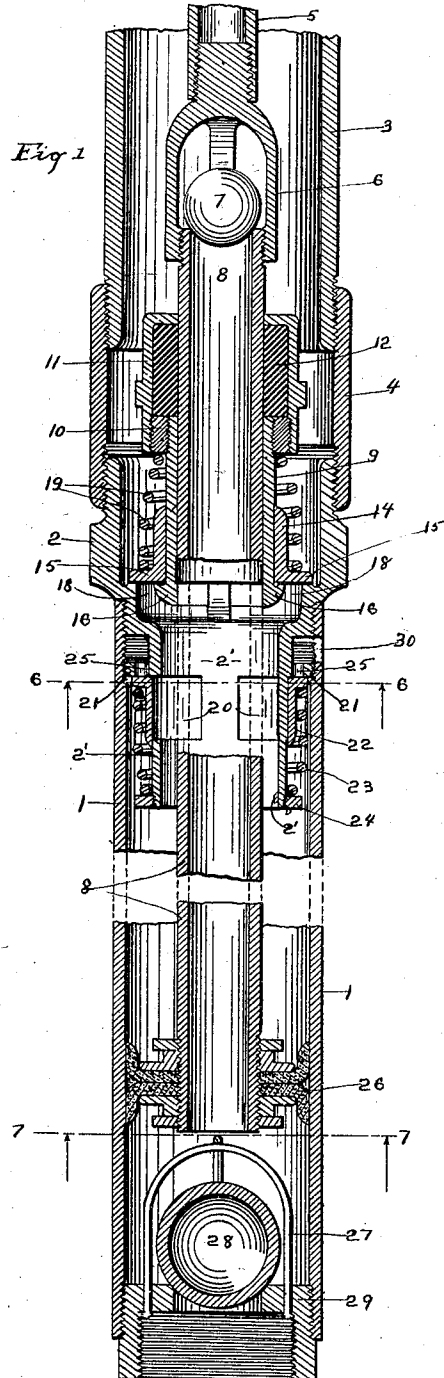
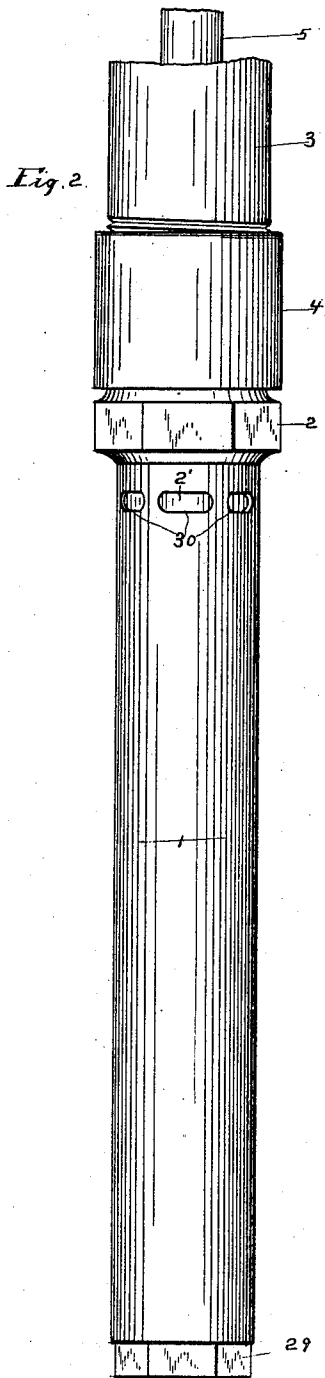


No. 778,898.

PATENTED JAN. 3, 1905.

W. W. ROBINSON.
DOUBLE ACTING PUMP.
APPLICATION FILED MAR. 4, 1904.

2 SHEETS—SHEET 1.



Witnesses:
W. C. Single.
J. W. Garrison

Inventor:
William Ward Robinson.
By Higdon & Higdon Attys

W. W. ROBINSON.
DOUBLE ACTING PUMP.
APPLICATION FILED MAR. 4, 1904.

Fig 3.

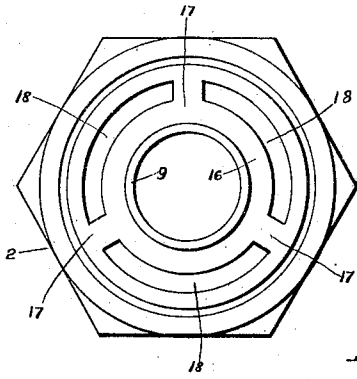


Fig. 6.

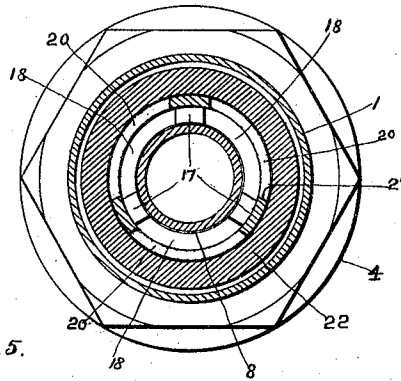


Fig. 5.

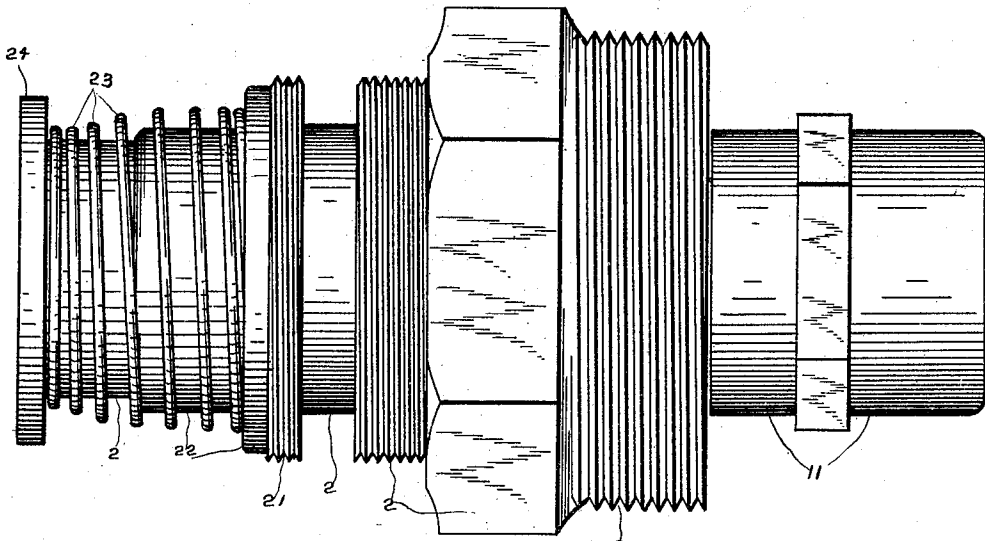


Fig. 7.

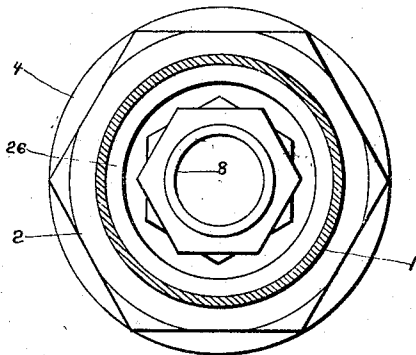
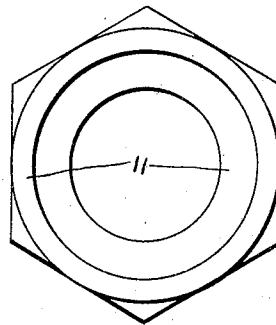


Fig. 4.



Witnesses:

W. C. Fingle.
J. W. Garrison.

Inventor:

William Ward Robinson.

By Higdon & Higdon Attys

UNITED STATES PATENT OFFICE.

WILLIAM WARD ROBINSON, OF SAN FRANCISCO, CALIFORNIA.

DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 778,898, dated January 3, 1905.

Application filed March 4, 1904. Serial No. 196,487.

To all whom it may concern:

Be it known that I, WILLIAM WARD ROBINSON, a citizen of the United States, residing at and in the city and county of San Francisco, State of California, have invented new and useful Improvements in Double-Acting Pumps; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

My invention relates to certain improvements in the pump covered by Letters Patent No. 516,411, dated March 13, 1894; and it refers particularly to the valves which admit and exhaust the water into and from the head or upper end of the pump-cylinder.

In the accompanying drawings, Figure 1 is a longitudinal section of a pump containing my improvements, a part of the cylinder and piston-rod being broken out. Fig. 2 is an elevation of the pump on a reduced scale. Figs. 3 and 4 are details. Fig. 5 is an enlarged elevation of the intake-valve, the discharge-valve chamber, and the packing-box. Fig. 6 is an enlarged section taken on line 6 6 of Fig. 1. Fig. 7 is an enlarged section taken on line 7 7 of Fig. 1.

1 designates the pump barrel or cylinder, to the upper end of which is connected a valve-chamber 2. This chamber is connected to the usual stand-pipe 3 by means of a sleeve or coupling 4.

5 is the working or operating rod, the reciprocation of which operates the pump. A valve-cage 6, containing a ball-valve 7, is secured in any preferred manner to the rod 5, and screwed into the bottom of said cage is a tubular valve-stem 8, on the upper end of which the valve 7 is seated.

Cast integral with the valve-chamber 2 is an interior concentric sleeve 9, on the upper end of which is screwed an also externally-threaded ring 10, which supports a packing-box 11, 12 indicating the packing, which closely embraces the piston-rod 8.

Mounted slidably on sleeve 9 is an annular discharge-valve 14, the flanged bottom 15 of which is seated upon an inward flange 16. The

connecting metal between said sleeve and the surrounding chamber is shown at 17 in Fig. 6. This web not being continuous, a plurality of openings 18 are thereby formed to permit the water to gain access to the valve 14 and the chamber surrounding the same.

For pressing the valve 14 upon its seat I employ a single spring 19, encircling the valve and confined between the aforesaid ring 10 and the valve-flange 15. This spring is simple and effective and cannot become disarranged.

20 designates ports formed in the lower part of the valve-chamber 2. The chamber is provided with an outwardly-extending flange 21, which forms a seat for an inlet-valve 22. Said valve is mounted slidingly on the depending reduced portion 2' of the chamber 2, in which the aforesaid ports or openings 20 are formed. The section in Fig. 1 is taken through one of said openings. The valve 22 is provided with a single coiled spring 23, which is supported and confined by a ring or collar 24, screwed on the lower end of the chamber 2. Thus the said valve is held normally seated.

Ports 25 are formed through the valve seat or flange 21. These ports communicate, when the valve is unseated, with said openings 20.

On the lower end of the piston-rod 8 is fixed a cup-valve, piston, or plunger 26. Below this is a valve-cage 27, containing a ball-valve 28, which is seated by gravity upon the seat 29, screwed into the lower end of the cylinder 1.

In the cylinder just above the valve-seat flange 21 intaking-openings 30 are cut, as shown in Figs. 1 and 2.

The seats of the inlet and the discharge valves are grooved to fit accurately the face of the valve, so that a perfect water-fit is provided.

The operation is as follows: Upon the upstroke of the operating-rod and plunger the bottom ball-valve 28 is raised, admitting water through the bottom of the cylinder 1 into its lower portion. Upon the downstroke the plunger 26 forces the water up through the stem 8, unseating the upper ball-valve 7, and the water thus enters the stand-pipe 3. Also

upon the downstroke water is drawn in through the upper inlets 30 in the cylinder, passes into the valve-seat ports 25, unseats the inlet-valve 22, and flows through the large ports 20 into the cylinder. Upon the next upstroke the plunger lifts the water into the valve-chamber 2. The water lifts the discharge-valve 14, and thus enters the stand-pipe 3. The inlet and discharge valves 14 and 22 are automatically seated by their respective springs.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a pump of the class described, the combination of a valve-chamber having an upper portion adapted to house a discharge-valve and a lower reduced portion adapted to form a guide for an inlet-valve, a ring fixed upon the lower portion of said guide portion, an annular inlet-valve slidably mounted on said guide portion, said valve opening downwardly, a coiled spring supported by said ring and operating to seat the valve, a tubular valve-guide formed preferably integral with the upper portion of said valve-chamber, an annular discharge-valve slidably mounted on said guide, said valve opening upwardly, a coiled spring surrounding and engaging the discharge-valve, and a ring fixed upon said guide, in combination with means for admit-

ting the water to said valves, substantially as described.

2. In a pump of the class described, a valve-chamber having an integral tubular valve-guide, an annular discharge-valve mounted thereon and having an outer flange, a coiled expansion-spring embracing the valve and bearing on its flange, in combination with a reduced portion of said valve-chamber, an annular inlet-valve mounted thereon and having an exterior flange, a coiled expansion-spring embracing the last-named valve and bearing upon its flange, and means for holding said springs in operative position, substantially as described.

3. In a pump of the class described, an annular upwardly-opening sliding discharge-valve provided with a coiled spring for pressing the valve to its seat, means for holding said spring in operative position, in combination with a downwardly-opening inlet-valve provided with a coiled spring for seating the valve, and means for holding said spring in operative position, substantially as described.

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

WILLIAM WARD ROBINSON.

Witnesses:

JOSEPHINE W. GARRISON,
K. M. IMBODEN.