(No Model.)

J. D. HOWARD.

PLUNGER FOR DEEP WELL PUMPS.

No. 357,149. Patented Feb. 1, 1887.

Fig. 1.

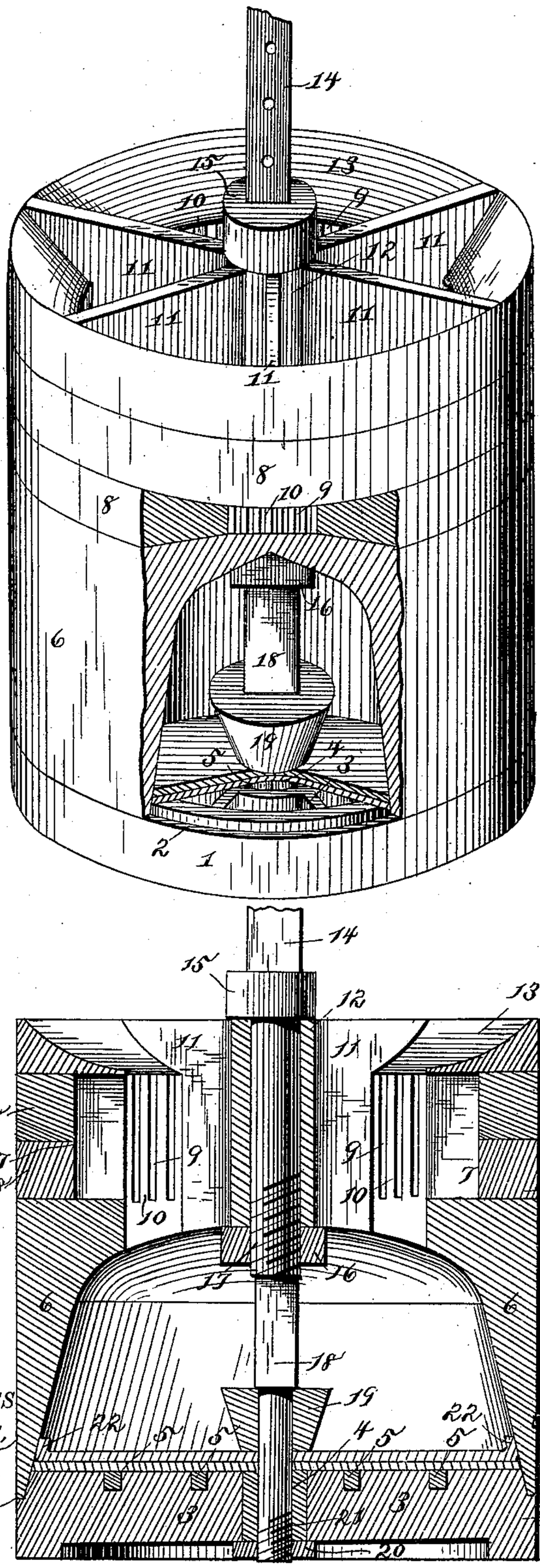

Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN D. HOWARD, OF ZINCITE, MISSOURI, ASSIGNOR OF ONE-HALF TO J. W. FREEMAN, OF SAME PLACE.

PLUNGER FOR DEEP-WELL PUMPS.

SPECIFICATION forming part of Letters Patent No. 357,149, dated February 1, 1887.

Application filed October 9, 1886. Serial No. 215,760. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. HOWARD, a citizen of the United States, and a resident of Zincite, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Plungers for Deep-Well Pumps; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of my improved plunger or piston for lifting-pumps, showing portions broken away, and Fig. 2 is a vertical sectional view of the same.

Similar numerals of reference indicate corresponding parts in both the figures.

My invention has relation to plungers or pistons for lifting-pumps, and more especially for pumps used in deep wells or mines; and it consists in the improved construction and combination of parts of such a plunger, as hereinafter more fully described and claimed.

In the accompanying drawings, the numeral 1 indicates the lower portion of the plunger, which is formed in the shape of a ring having a shoulder, 2, near its upper edge, and formed with a number of radiating arms, 3, extending from a sleeve or hub, 4, having re-enforcing rings 5, concentric with the outer ring connecting the arms.

The upper portion of the plunger is formed cylindrical in shape, and with a downwardly-projecting flange, 6, at the lower portion tapering downward upon the inner side to fit upon the shoulder of the lower ring and forming a valve-chamber, while the upper end of the said portion is formed with an annular square groove, 7, into which suitable packing-rings, 8, may be inserted. The side of this groove is formed with a number of vertical slots, 9, separated by strips 10, which slots connect the groove with the hollow interior of the upper portion of the plunger, the said interior being divided by radiating partitions or wings 11, radiating from a central sleeve or hub, 12. The upper edge of the upper portion is beveled upon the inner side, as shown at 13, forming an edge which will cut all impurities loose from the inner side of the pump-cylinder.

The piston-rod 14 is formed with a shoulder, 15, and passes through the hubs of the rings, the shoulder fitting against the upper end of the hub, and a nut, 16, bears from below against the lower end of this hub, fitting upon a screw-threaded portion, 17, of the piston-rod. The lower end of the piston-rod is reduced and formed with a square shoulder, 18, against which a conical washer, 19, fits, the washer fitting upon the rod, and one or two circular check-valves, of leather or similar material, are secured with their perforated centers upon the rod, having the lower or smaller end of the conical washer bearing against their centers, and resting upon the radiating arms and rings of the lower ring, being clamped by the sleeve of the said ring by means of a nut, 20, fitting upon the lower screw-threaded end, 21, of the piston-rod, and bearing against the lower end of the hub of the lower ring.

The upper leather valve is preferably formed with an upwardly bent or crimped flange, 22, which may bear against the inner side of the tapering flange of the upper ring and assist in making a better joint between the upper and lower section of the plunger. By placing the conical washer in an inverted position the valves are kept from being forced up against the piston at either side and thus not be in position to be drawn down by the water when the plunger is lifted.

It will be seen that when the plunger is fitted into the cylinder and the packing-rings are fitted into the groove, the joints of the said rings being broken when soft packing-rings are used, and sectional rings with lapping joints being used when metallic packing-rings are used, the tapering flange of the upper ring will fit tightly upon the shoulder of the lower ring, forming a tight joint, and the plunger being forced down will cause the water to lift the check valve or valves, allowing it to flow into the plunger, whereupon the valve or valves will again be closed when the plunger is drawn up. The force of the water within the plunger will force the packing-rings out against the sides of the cylinder, bearing against them through the vertical slots in the sides of the plunger, thus caus-

ing the packing-rings to fit tightly against the sides of the cylinder, and the upper sharp edge will cut all impurities—such as grit or dirt—which may be carried into the cylinder, keeping the sides of the cylinder clean.

The leather valves may be tightened down upon the valve-seat formed by the lower ring by inserting thin washers above the conical washer or block, forcing the latter down upon the leather valves, and the flanged edge of the leather valve will be forced against the inner side of the tapering flange by the weight of the water, forming a tight joint, which will prevent water from escaping from the plunger.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

In a plunger for lift-pumps, the combination of a piston-rod having its lower end screw-threaded, a shoulder above said screw-thread, a second or upper screw-threaded portion above said shoulder, and a collar above said upper screw-threaded portion and having a nut upon each of said screw-threaded portions, a plunger composed of an upper and a lower portion secured thereto, said upper portion being cylindrical in shape and having its upper and lower edges beveled outwardly and having an annular groove near its upper end, and having vertical slots leading from said groove to the interior of said cylinder, vertical radiating wings connecting said cylindrical portion with the hub, said hub being secured upon the piston-rod between the collar and the nut upon the upper screw-threaded portion, packing-rings within said groove, the lower portion of said plunger being annular-shaped and having a shoulder upon its upper outer edge and provided with a number of radiating arms having re-enforcing wings, two circular valves, and an inverted conical washer, the said lower portion, valves, and washer being secured upon the piston-rod between said shoulder and the nut upon its lower end.

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

JOHN D. HOWARD.

Witnesses:
LEOPOLD FESSLER,
DAVID L. HOPKINS.