W. J. SHERRIFF.

DEEP-WELL CHECK-VALVES.

No. 193,350. Patented July 24, 1877.

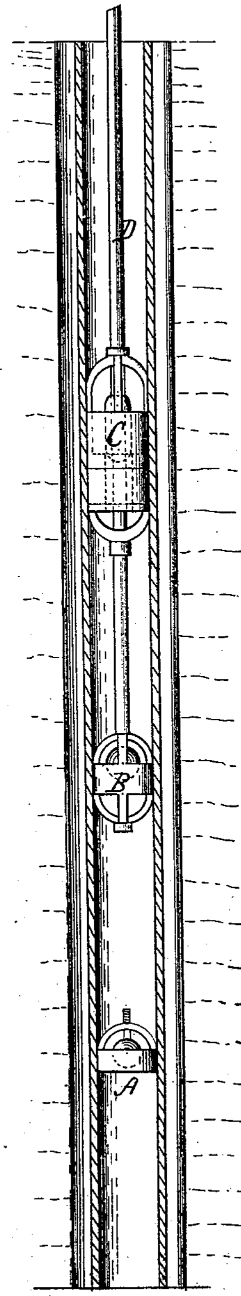

Fig. 1.

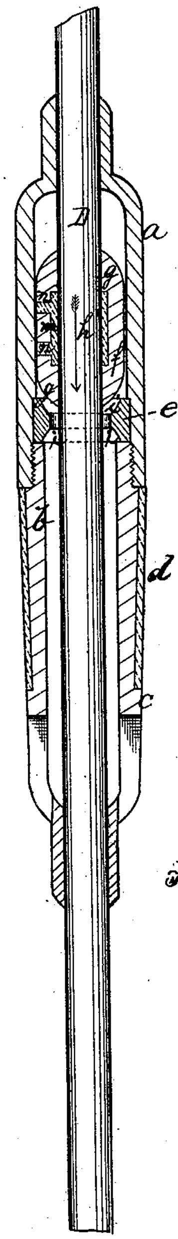

Fig. 2.

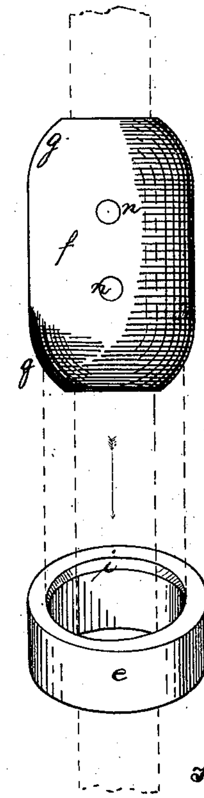

Fig. 3.

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WILLIAM J. SHERRIFF, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN DEEP-WELL CHECK-VALVES.

Specification forming part of Letters Patent No. 193,350, dated July 24, 1877; application filed May 26, 1877.

To all whom it may concern:

Be it known that I, WILLIAM J. SHERRIFF, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Check-Valves for Deep Wells; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a sectional view of a portion of a deep well and pumping devices, showing the relations of the working and check valves. Fig. 2 is a longitudinal central section of a check-valve embodying my invention, together with its cage and body. Fig. 3 is a detached view of the valve and its seat, in elevation.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of check-valves for deep wells, such as oil and salt wells; and consists, first, in turning off or beveling the check-valve and its seat so that it shall act on the principle of the ball-valve, whereby sand and similar substances are prevented from lodging upon the valve-seat and defacing and destroying both the valve and its seat; secondly, in forming the valve and its seat double-beveled or reversible, so that either may be reversed, upon injury to the working-surfaces, without delaying the pumping for a longer time than is necessarily occupied in withdrawing and replacing the rods, &c.; thirdly, in forming the valve with a seat or recess on its interior for a packing of Babbitt or similar metal, whereby the packing can be readily removed and renewed when worn; and, finally, in details of construction, hereinafter more specifically set forth.

In conjunction with the standing and working valves of deep wells, it is common to use a loose valve (through which the rod works) to support the column of liquid and relieve the working valve of the shock or thud due to the settling of the column on the descent of the working valve. Such loose valve, which is termed the "check-valve," rises with the ascent of the rod or column, and upon the descent of the rod is driven back upon its seat by the settling column. As at present constructed, and in common use, such valves have flat seats, upon the latter of which catch and accumulate sand, grit, and other substances contained in the liquid pumped, whereby, owing to the hammering of the valve, both valve and seat are rapidly defaced and destroyed.

Among others, the object of the present invention is to so construct the valve and its seat as to obviate the objections specified.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In the drawing, A represents the standing valve, B the working valve, C the check-valve, and D the rod of an oil or other deep well. *a* indicates the cage of the check-valve, which may be of the usual or any approved form, and *b* the body, which I form with a shoulder or flange, *c*, and inclose within a sheath or packing, *d*, of Babbitt or other suitable metal. Within the cage *a* is the ring *e*, which forms the valve-seat, and which I turn off or bevel out, as at *i*, to form an inclined or sloping seat for the valve. This ring is usually made detachable, and is preferably beveled above and below, as shown, so that, in case of injury to the upper face, the ring may be turned and a new seat obtained. *f* represents the valve, preferably made in form of a short hollow cylinder, and having one or both ends rounded off, as at *g*, to correspond with the sloping seat *i* of ring *e*. The bore *h* of the check-valve is slightly larger than the rod D, and, in order to pack the valve with the rod, I recess the interior of the valve slightly, as at *m*, and connect the recess with the exterior of the valve by a port or gate, *n*. The valve *f* is then slipped over and centered upon rod D and the packing metal melted and poured through gate or port *n*.

The valve *f* need not necessarily be cylindrical, with rounded ends, but may, if preferred, be spherical, though I deem the cylindrical form best, as the parallel sides act as guides in the vertical movement of the valve.

The operation of the valve is the same as the usual check-valve.

The advantages of my improved construction are, first, that the accumulation of grit or sand on the valve-seat is in a great degree prevented, and, should any lodge thereon, the valve and seat would, as a general thing, be

ground to fit closer; secondly, that, as both the seat and face of the valve are sloping, they will not obstruct or be cut away and destroyed by the wash of the column of liquid; thirdly, the valve can be reversed when found desirable to do so; and, finally, the old packing can be melted out and run back again in a few moments, to form a perfect packing, when from wear it is found the original packing has become imperfect.

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

1. In a check-valve for deep wells, the combination of the beveled or rounded valve having the rod-opening and its seat, substantially as and for the purpose specified.

2. In a check-valve for deep wells, the combination of the beveled or rounded valve having the rod-opening and its reversible seat, substantially as and for the purpose specified.

3. In a check-valve for deep wells, the cylindrical, doubled, beveled, or rounded reversible valve having the rod-opening and its seat. substantially as and for the purpose specified,

4. The check-valve provided with the interior soft-metal or alloy packing, substantially as and for the purpose specified.

In testimony whereof I, the said WILLIAM J. SHERRIFF, of the city of Pittsburg, county and State aforesaid, have hereunto set my hand.

WILLIAM J. SHERRIFF.

Witnesses:
F. W. RITTER, Jr.,
J. K. SMITH.