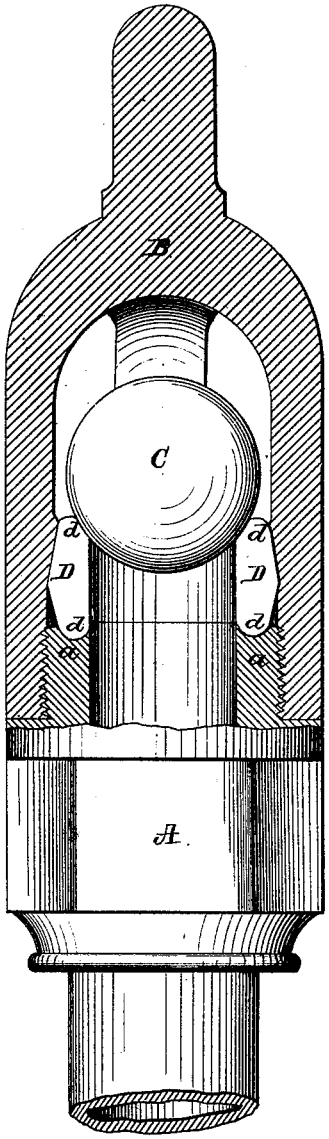
A. K. HILLS & W. E. BERENS.
Reversible Seat for Ball-Valves.

No. 197,133. Patented Nov. 13, 1877.



Attest.

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UNITED STATES PATENT OFFICE.

ADDISON K. HILLS AND WILLIAM E. BERENS, OF BUFFALO, NEW YORK.

IMPROVEMENT IN REVERSIBLE SEATS FOR BALL-VALVES.

Specification forming part of Letters Patent No. **197,133**, dated November 13, 1877; application filed September 24, 1877.

To all whom it may concern:

Be it known that we, ADDISON K. HILLS and WILLIAM E. BERENS, both of Buffalo, Erie county, State of New York, have jointly invented certain new and useful Improvements in a Valve for Oil and other Pumps, &c.; and we do hereby declare that the following description of our said invention, taken in connection with the accompanying sheet of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

Our present invention relates to a reversible seat for oil-pump and other valves; and it consists of an annular tapering ring inserted into the cage of a pump-valve or plunger, and retained therein by the body of the said plunger, said ring being made either of tempered steel, or of other hard composition metal, and serving as a seat for the usual ball-valve, as hereinafter more fully described.

The figure in the drawing is a partial longitudinal sectional elevation of a fragment of an oil-pump valve.

A is the body of the piston of an oil-well pump, usually termed "valve." This body terminates in a neck having an external screw-thread fitting an internal thread in the cage B. C is the ball, resting upon the annular double-tapered ring D, inserted into the cage B, and retained in position by the body A, forcing said ring D home into the tapering part of the cage B.

The faces of the ring D are countersunk at *d*, to form the bearing for the ball C, and the upper edge of the body A is recessed to fit the contour of the ring D.

The principal features of our invention consist in the arrangement with the cage of the double-tapering valve-seat D, which seat, when one of its faces is worn out, can be readily withdrawn from the cage and reversed, to present a new face to the ball C. This ring can readily be produced of cast-steel, and suitably tempered at a trifling expense.

To protect the face of the seat D not in use against the abrasive influences of the gritty liquid passing through the piston, the body A is recessed on its edge in contact with the said seat, to exactly conform to the contour thereof, so that the interior of the piston presents an even and smooth surface, whereby particles of sand and foreign matter raised together with the liquid are prevented from abrading the said seat.

In the present practice of constructing valve-seats, said seat is provided centrally with a projecting flange, and on both extremities externally screw-threaded. This construction is attended with considerable expense, the seat having to be turned from a bar of steel of sufficient size to afford said flange, and then twice screw-threaded. These seats are furthermore tempered to render them sufficiently hard, and it is a fact well known that in tempering steel pieces of the nature described—that is to say, having projecting flanges and deep and sharp incisions, such as in the threads—these parts are very liable to crack near the shoulders or in the threads, which defects cannot, as a rule, be detected until the parts separate after the piston or valve is in use, thus not unfrequently resulting in great damage to the pump-cylinders.

These objections are all overcome in our improved valve-seat, which consists of a plain cylinder having its exterior double-tapered, thereby discarding the objectionable flange and screw-threads, and thus removing the source of trouble. Our valve-seat can furthermore be manufactured at less than one-half of the cost of those heretofore mentioned.

Having thus fully described our invention, we claim—

1. As a new article of manufacture, a valve-seat consisting of an annular double-tapering ring, D, having the seats *d*, as specified.

2. The combination, with the cage B, having a screw-thread and a tapering bearing within its band, of the seat D, provided on its exterior with a double taper, and the body A, having its upper edge recessed at *a*, the whole being constructed and arranged substantially as and for the purpose specified.

In testimony that we claim the foregoing as our invention, we have hereto set our hands and affixed our seals in the presence of two subscribing witnesses.

ADDISON K. HILLS. [L. S.]
WILLIAM E. BERENS. [L. S.]

Attest:
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