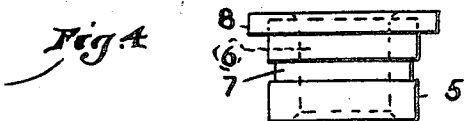
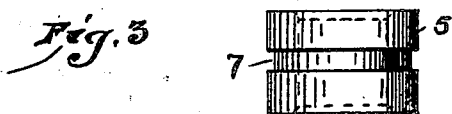
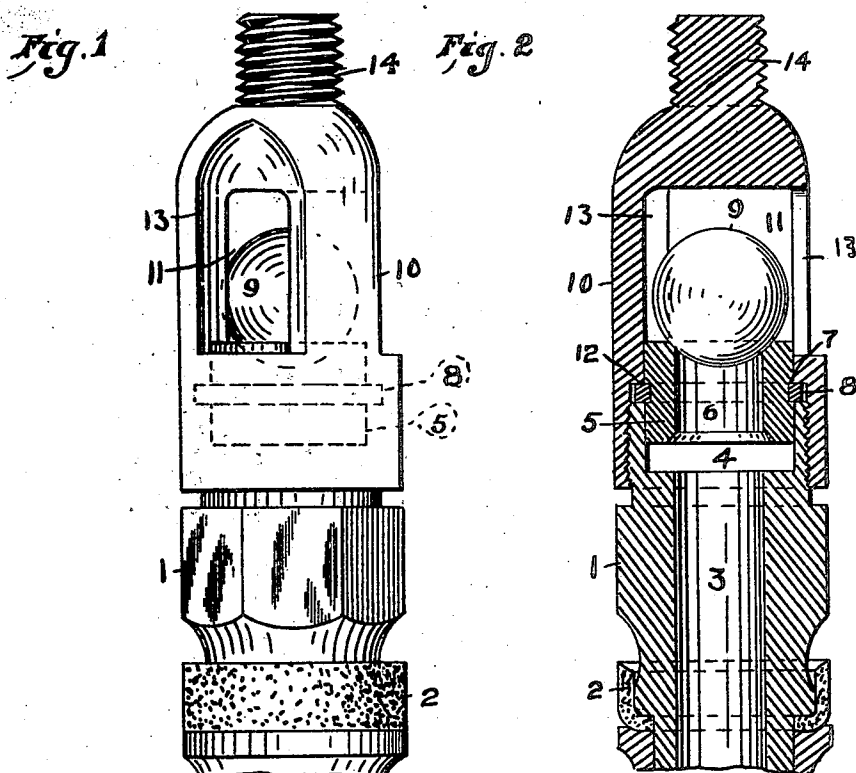


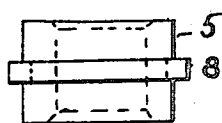
A. M. STEWART.
VALVE AND METHOD OF MAKING SAME.
APPLICATION FILED MAY 5, 1921.

1,435,029.

Patented Nov. 7, 1922.



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UNITED STATES PATENT OFFICE.

ANDREW M. STEWART, OF TOLEDO, OHIO.

VALVE AND METHOD OF MAKING SAME.

Application filed May 5, 1921. Serial No. 466,921.

To all whom it may concern:

Be it known that I, ANDREW M. STEWART, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented new and useful Improvements in Valves and Methods of Making Same, of which the following is a specification.

My invention relates to valves, and more particularly to working-barrel valves for oil wells, though it may be employed for other uses. Particularly in the valves used for pumping oil-wells, the valve-seats are subject to considerable wear and must be replaced from time to time. Valve-seats as usually made for oil-well pumps have an external or peripheral flange made integral therewith and designed to be clamped between the valve-barrel and the crown or cage. Such seats are usually made from high grade alloy steel and after machining are heat treated which causes such distortion thereof as necessitates the grinding of the external surface at each side of the flange. The grinding is rendered somewhat difficult and slow because it is necessary to chuck the seat twice in the grinder and to give it two gaugings, which increase the possibility of errors and limits the quantity production. It is the object of this invention to make the flange and the rest of the valve-seat in separate parts, so that the grinding and gauging may be done but once and after a single chucking operation. After the grinding has been completed the flange is united with the remainder of the seat.

My invention relates also to the method of making the valve seats.

Referring to the accompanying drawing, Fig. 1 is a side elevation of a pump-piston containing my improved valve-seat, the lower end of the pump piston being broken off; Fig. 2, a central longitudinal section of Fig. 1; Fig. 3, and side elevation of my valve-seat without the flange; Fig. 4, a side elevation of my valve-seat showing the flange being slipped to its annular seat; and Fig. 5, a side elevation of my valve seat assembled.

On the drawing, 1 designates a pump-piston provided with one of its cup packings, marked 2. The piston has the axial opening 3 which has the enlargement 4 at its upper end. 5 designates the body of the valve-seat which is cylindrical and has the cen-

tral opening 6 in alinement with the opening 3 and the peripheral groove 7 centrally between the ends of the body. 8 is a metal ring or flange seated in the groove 7 and extending beyond the periphery of the body 1. One end of the body 5 is inserted in the enlargement 4 of the opening in the piston with the flange 8 resting on the top of the piston around the said enlargement. 9 is a ball-valve adapted to fit the flared ends of the opening 6. 10 is a crown or cage having the longitudinal opening 11 enlarged below so as to form the shoulder 12 which engages the upper face of the flange 8 when the cage is screwed down tight over the upper end of the piston. The cage has a number of lateral openings 13 extending entirely through the side wall thereof and opening into the opening 11. The upper end of the cage is closed and has the pin 14 for the attachment of a pump rod.

After the body 1 has been ground and brought to the required diameter the ring 8, whose internal diameter is smaller than the external diameter of the body is, after having been suitably heated to cause it to increase its diameter, slipped over the body until it comes exactly around the groove 7 into which it contracts upon cooling. Pressure may be applied, if necessary or desired, to seat the ring. The ring may be forced cold over the body 1 as shown in Fig. 4, this method taking advantage of the property of the metal to recover its normal condition after expansion under pressure. When the ring reaches the groove 7 it will automatically spring into the same.

The ring 8 may be made of less expensive metal than the body 1 which is best made of high grade alloy steel. I find that, after heat treatment has been completed, I can, by grinding the bodies in an automatic grinding machine, thus requiring but a single grinding operation and fewer gaugings, increase the production on the grinding and gaging operations alone as much as fifty times over the old process herein described.

My invention is not limited to its use in pistons as it may be used in standing valves, and other devices.

I claim:

1. In a valve, a valve-seat comprising a cylindrical body having a peripheral groove, and a ring seated in the groove.

2. In a valve, a valve-seat comprising a

cylindrical body having a peripheral groove, and a ring slid over the body and seated in the groove.

3. The method of making a valve-seat
5 with cylindrical body and a central peripheral flange, which consists in forming a cylindrical body with a peripheral groove therein, grinding the periphery of the body to the desired gage, and forming a flange

on the body by sliding over the body and in 10 registry with the groove an expanded contractile ring whose normal external diameter is less than the external diameter of the body.

Signed at Toledo, Ohio, this 3rd day of 15 May, A. D. 1921.

ANDREW M. STEWART.