J. B. GARBER.

GRAVITY VALVE CAGE AND VALVE FOR PUMPS.

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978,729. Patented Dec. 13, 1910.

Fig. 1.

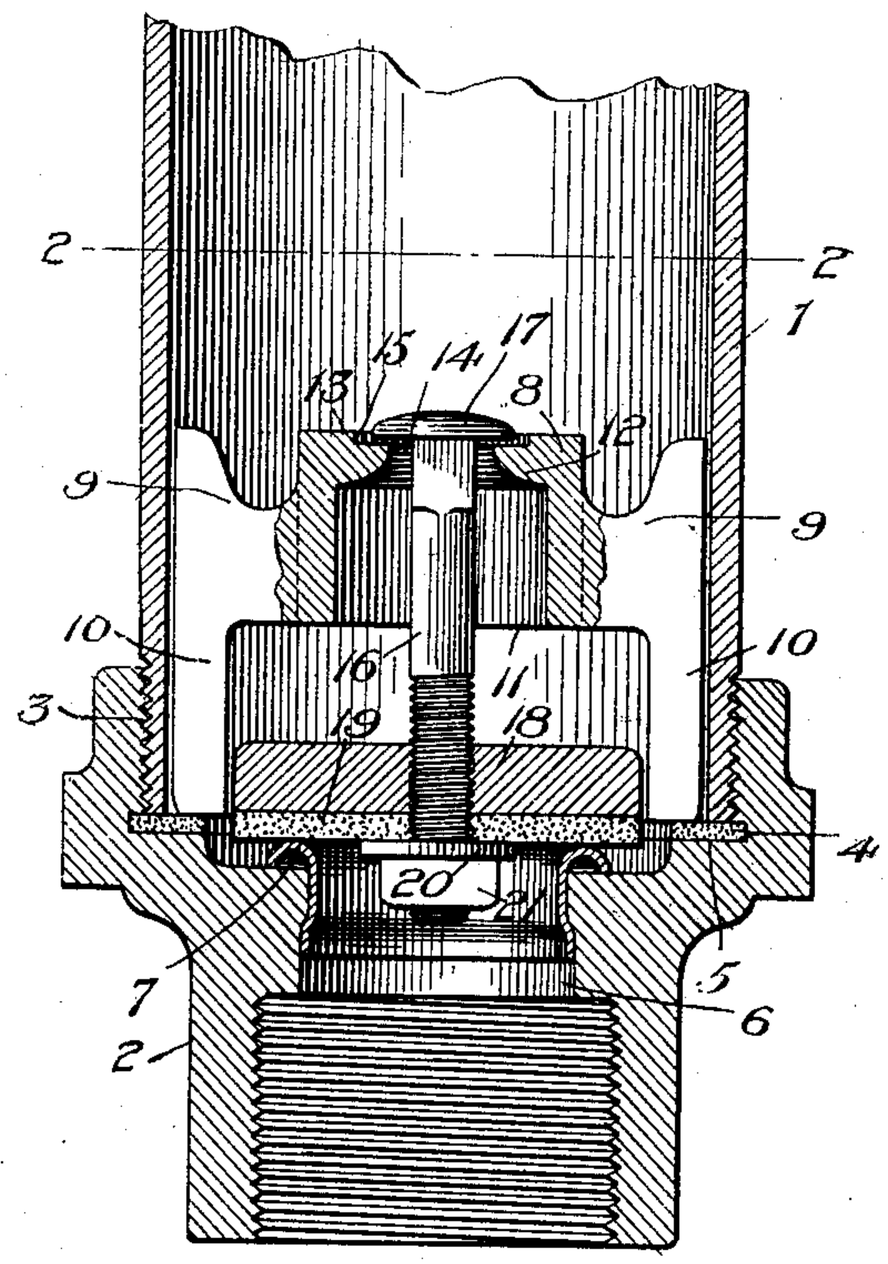


Fig. 2.

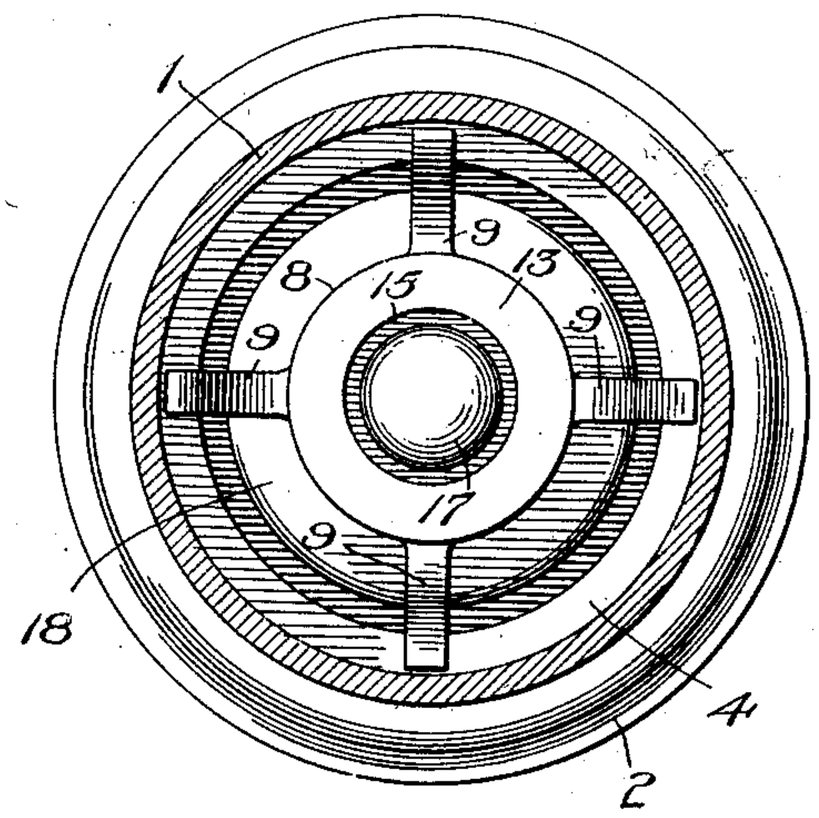
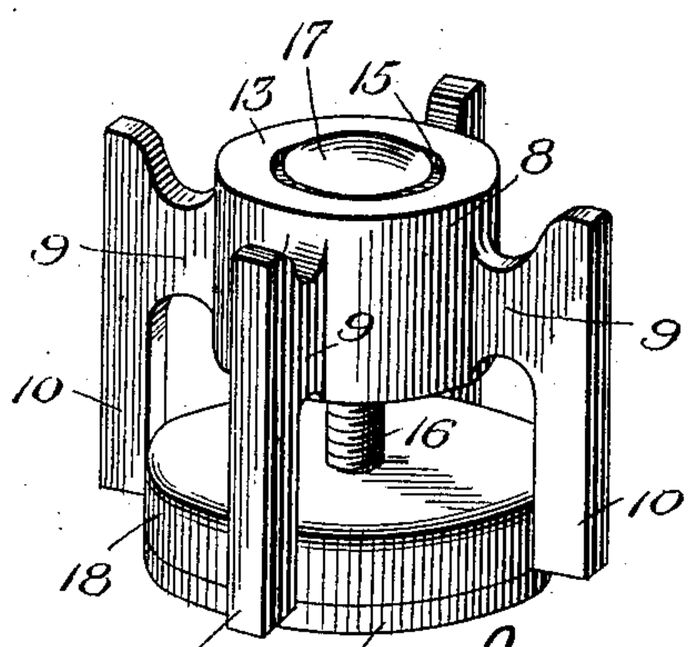


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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GRAVITY VALVE-CAGE AND VALVE FOR PUMPS.

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To all whom it may concern:

Be it known that I, JESSE B. GARBER, a citizen of the United States, residing at Salem, in the county of Columbiana and State of Ohio, have invented certain new and useful Improvements in Gravity Valve-Cages and Valves for Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to pumps and pumping apparatus, but has reference more particularly to a self-contained valve-cage and valve for use in pump cylinders, and to novel means for introducing, retaining or removing same therefrom.

It has for its object the production of a peculiarly inexpensive and equally simple and durable unitary structure adapted to be introduced bodily into a pump cylinder above its valve seat, and there to perform most efficient service without the necessity of other fastening means than that of gravity by which it is retained in satisfactory operative position at all times.

The invention will be hereinafter particularly described and pointed out in the claim following.

In the accompanying drawings which form part of this application for Letters Patent, and whereon like characters refer to corresponding parts in the several views: Figure 1 is a longitudinal vertical central section through the lower end of a pump cylinder, the combined valve-cage and valve, and an outside cylinder cap. Fig. 2 is a horizontal section on the line 2—2 of Fig. 1 looking down upon the parts shown by said figure, and Fig. 3 is a perspective view of the self-contained valve-cage and valve detached.

Reference being had to the drawings and numerals thereon, 1 indicates the lower end of a pump cylinder of any suitable material and capacity, 2 an outside cylinder-cap into which said cylinder is threaded as indicated at 3, and 4 a suitable packing gasket interposed between the end of said cylinder and a shoulder 5 within cap 2. The said cap 2 is perforated centrally by a water inlet 6, and is provided with a raised valve-seat 7 concentrically located.

The parts thus far described are of ordinary construction and may be varied indefinitely without departing from the spirit of the present invention.

The novel features of this invention include a valve-cage comprising a central boss 8, a series of side wings 9 radiating from said boss, and a corresponding series of downwardly projecting guiding arms or space bars 10 concentrically positioned with relation to said boss. This boss 8 is bored vertically from below as at 11, is slightly crowned at the upper end of said boring from circumference to center as at 12, and is counter bored centrally through its upper surface 13 as at 14, thus producing a hollow perforated body, which by preference is cylindrical in form. The said upper surface or end 13 of boss 8, immediately surrounding the counter bored perforation 14, is slightly countersunk as at 15 all for purposes that will later appear. Projecting loosely through the central perforation 14 is a screw-threaded bolt 16 constituting a vertically movable valve-stem with its head 17 serving as a stop to prevent accidental disassociation of parts, normally resting in, or immediately above, the said countersunk depression 15; while adjustably threaded upon the lower end of said stem 16 is a heavy circular valve-plate 18, an underlying valve-disk 19 of corresponding circumferential dimensions, a washer 20, and a retaining nut 21, which latter also performs the functions of a lock-nut to retain said valve and valve stem in their adjusted relative positions.

This being a description of my invention in its preferred arrangement and combination of parts it will be noted that various structural changes will readily be suggested by this disclosure, to persons skilled in the art to which my invention relates, but such are understood to be clearly within the scope of the claim hereto appended.

When assembled substantially as indicated by Fig. 3 of the drawings, a self contained complete article of manufacture, it will be apparent to the most casual observer that the introduction of my combined valve-cage and valve into a pump cylinder, involves nothing more than removal of the upper cylinder cap (not shown), and the deposit bodily of my assembled invention into said cylinder. Guided by the radial arms 10 in engagement with the inner walls of cylinder 1 my combined cage and valve

thereupon gravitates to the position indicated by Fig. 1, with the lower extremities of the said arms or space bars 10 resting upon the upper surface of the packing gasket 4 at points diametrically opposite. In this relation it will be observed that the valve-disk 19 normally rests upon its seat 7, within the confines of the depending guide arms or space bars 10, with relation to which latter it may partake of a slight oscillatory movement for the purpose of automatically adjusting itself to seat 7. In this position, the valve 19, valve-plate 20, and valve-stem 16 are lifted vertically with each upstroke of the pump-piston (not shown), said valve being guided by the arms 10, and arrested at the limit of its upstroke by engagement with the under surface or rim of boss 8; the said operation being reversed with each downstroke. And it will be particularly noted that the crowned or concave construction of the upper inner surface of boss 8, and the resulting comparatively thin support for the vertically movable valve-stem 16 at this single point of engagement, permits a slight oscillatory movement of the valve in its descent so that it may automatically adjust or adapt itself to its seat 7. It will be observed also that the valve may readily be adjusted up or down upon its screw threaded stem 16 to provide for valve disks of varying thickness or valve-seats of different height. It may also be here noted that my improved valve-cage and valve can as easily be removed from a pump cylinder as introduced, there being no fastening required or employed to retain it in operative position beyond gravity of the parts, which also makes it possible to easily fish same from a pump cylinder by agency of a grab tool should there be occasion for so doing.

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

In a foot valve for pumps the combination with a cage composed of a hollow boss having guide arms of equal length connected to it the latter paralleling in arrangement the axis of said boss and having their ends in planes at right angles thereto said boss being located between said planes and said guide arms being further formed with outer guiding surfaces extending their entire length and adapted to engage the interior of a pump cylinder, a valve stem of less cross sectional area than the interior of said boss passing through and reciprocable in said boss the said stem having a shoulder engaging the outer surface of the boss, and a valve carried by the valve stem reciprocable within the series of guide arms and adjustable on the stem to a position with its seating surface beyond them.

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

JESSE B. GARBER.

Witnesses:
LEE VINCENT,
W. G. BUTLER.