

J. B. GARBER.
VALVE CAGE AND VALVE FOR PUMPS.
APPLICATION FILED AUG. 26, 1909.

948,169.

Patented Feb. 1, 1910.

Fig. 1.

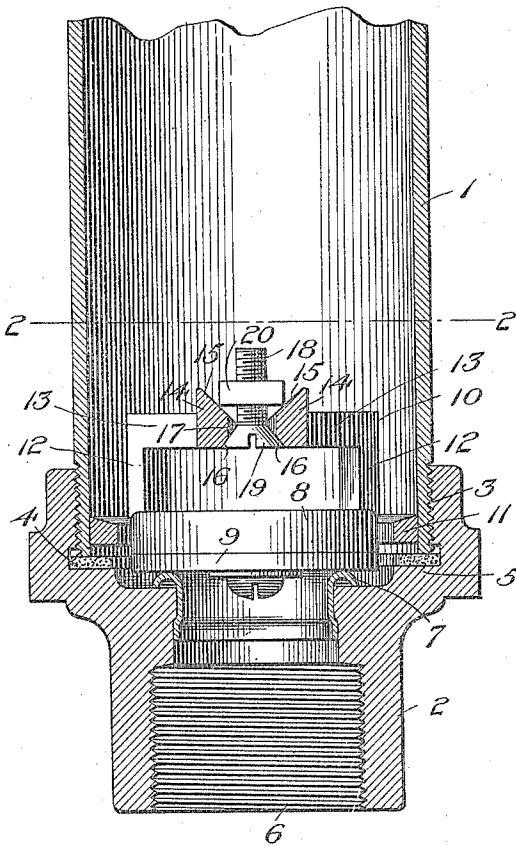


Fig. 3.

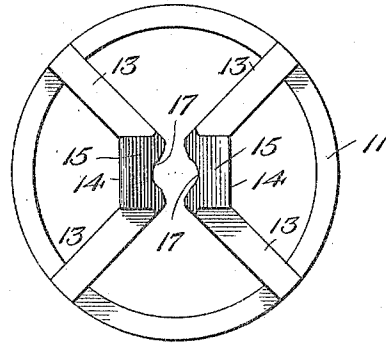


Fig. 4.

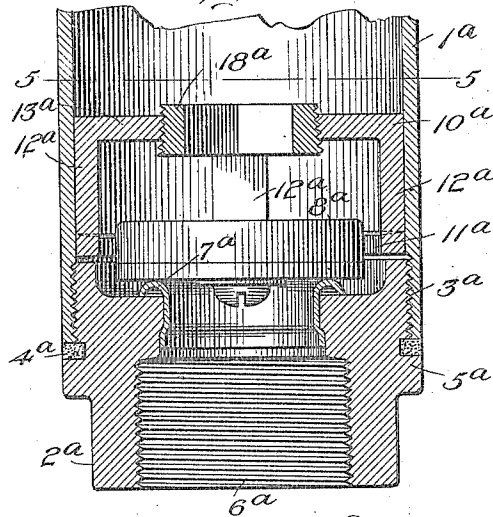
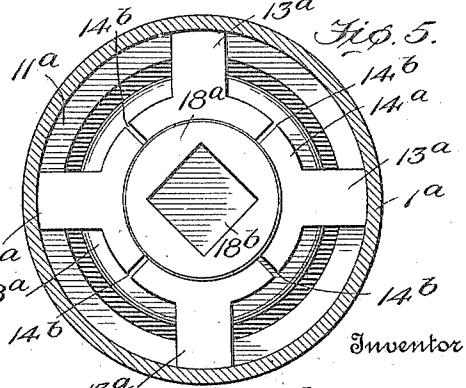
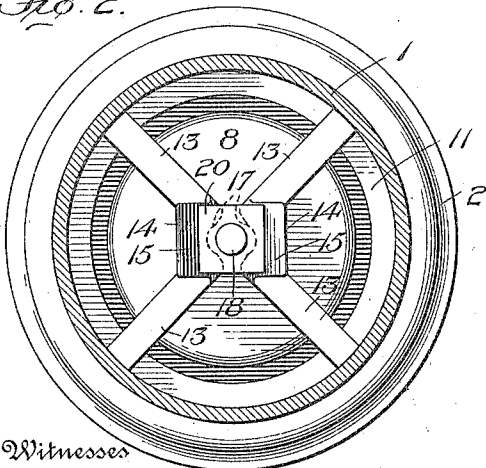


Fig. 2.



Witnesses

Edwin L. Bradford
M. D. Ballouf.

By

Jesse B. Garber,
Attorney

UNITED STATES PATENT OFFICE.

JESSE B. GARBER, OF SALEM, OHIO, ASSIGNOR TO THE DEMING COMPANY, OF SALEM, OHIO, A CORPORATION OF OHIO.

VALVE-CAGE AND VALVE FOR PUMPS.

948,169.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed August 26, 1909. Serial No. 514,746.

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 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 invention relates to pumps and pumping apparatus, but has reference more particularly to valve-cages and valves for use in pump cylinders, and to novel means for securing such cages within their respective cylinders.

It has for its object the production of an inexpensive, durable and peculiarly efficient valve-cage, adapted for use in connection with either outside or flush caps, at the foot, or at any other operative position, within a pump cylinder deep well or otherwise, and adapted also to be adjustably secured in predetermined position by means carried by the cage itself.

The invention will be hereinafter particularly described and pointed out in the claims 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 central vertical section through the lower end of a pump cylinder, valve-cage, valve and 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. Fig. 3 is a plan view of valve-cage detached. Fig. 4 is a central vertical section corresponding with Fig. 1 but including a modified form of valve-cage, and Fig. 5 is a horizontal section on the line 5-5 of Fig. 4 showing the same modification.

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

centrically located with relation to the shoulder 5 by which it is surrounded.

Normally resting upon the seat 7 is a disk valve 8 circular in form, and cushioned upon its underside by a disk of leather or similar material 9. Surmounting the valve 8 and consequently within the lower end of cylinder 1 is a valve-cage 10 made of spring material, either cast or stamped, such as brass, bronze or other metal comprising an annular base 11 closely but slidably fitting the interior of said cylinder. Rising from base 11 are vertical cage members 12 arranged in diametrically opposite pairs as best shown by Fig. 3 of the drawings, each pair of risers 12 having horizontal extensions or radial arms 13 joined at the approximate center of the structure by an integral boss 14, as clearly shown by Figs. 1, 2 and 3.

Each of the oppositely disposed and centrally arranged bosses 14 have inclined upper faces 15, a beveled countersunk under-surface 16, and a central vertical depression 17 in their opposing edges, as best shown by Figs. 1, 3. Passing vertically between the oppositely disposed depressions 17 aforesaid is an adjusting screw 18 the head 19 whereof conforms in shape to the beveled countersunk under-surface 16 of bosses 14, while upon said screw is threaded a nut 20 the opposite sides whereof rest upon the opposing boss inclined 15, as shown by Figs. 1 and 2.

The foregoing being an embodiment of my invention in its preferred form, it will be noted that the self-contained cage-locking features may be variously modified without departing from the spirit of my invention; for example, Figs. 4 and 5 represent a modification of the present invention applied to pump cylinders such as 1^a having an inside or flush cap 2^a, screw-threaded as at 3^a, packed as at 4^a, shouldered at 5^a, having inlet port 6^a, valve-seat 7^a, and valve 8^a. The said modified Figs. 4 and 5 also disclose a valve-cage 10^a, 11^a, 12^a, 13^a having a central annular boss 14^a broken radially as at 14^b to allow for a limited degree of expansion and contraction under action of a taper screw plug 18^a, the latter being broken by a port 18^b by preference squared to facilitate turning.

This being a description of my invention in the best forms at present known to me it will be apparent that valve-cages embodying self contained locking features such as here-

inbefore described may be readily and accurately secured at any predetermined position within a pump cylinder by the simple and effective means of expanding the sides of said cages until they firmly engage at points diametrically opposite the inner walls of such cylinders as shown by the drawings. For example, an ordinary screw driver inserted in the slotted head 19 of adjusting screw 18 serves to seat said head in the countersunk under-surfaces 16, 16' of bosses 14, 14 and simultaneously draw nut 20 down the oppositely inclined upper faces 15, 15 to spread and forcibly wedge them apart, and, as a consequence, to force risers 12 with the outer ends of radial arms 13 into close frictional contact with the inner walls of the cylinder 1, thus retaining the cage in its proper position, until released by a reversal of the operation last described.

This being a description of the present invention and a statement of its operation, what I now claim and desire to secure by Letters Patent is:

25 1. In a pump the combination with a working cylinder, a valve-seat and valve, of an expansible valve-cage, and means for expanding said cage to lock it in operative position within the cylinder aforesaid.

30 2. In a pump the combination with a working cylinder, a valve-seat and valve, of an expansible valve-cage, and means for expanding said cage into frictional engagement with the interior of the cylinder aforesaid.

35 3. In a pump the combination with a working cylinder, a valve-seat and valve, of an expansible valve-cage, and means carried by said cage for expanding it into frictional engagement with the interior of the cylinder aforesaid.

40 4. In a pump the combination with a working cylinder, a valve-seat and valve, of a valve-cage made in separable sections, and means for wedging said sections apart to lock the cage in operative position by frictional engagement with the interior of the cylinder aforesaid.

45 5. In a pump the combination with a working cylinder, a valve-seat and valve, of

a valve-cage having a cover comprising radial arms, and means for spreading said arms radially to lock the valve-cage in operative position.

6. In a pump the combination with a 55 working cylinder, a valve-seat and valve, of a valve cage having a skeleton cover comprising radial arms, a lug upon the adjacent ends of said arms, and an adjusting screw for spreading said lugs.

7. In a pump the combination with a 60 working cylinder, a valve-seat and valve, of a valve-cage having a skeleton cover comprising radial arms, lugs upon said arms having opposing beveled faces, and a wedge 65 element co-acting with said beveled faces to spread the arms aforesaid.

8. In a pump the combination with a working cylinder, a valve-seat and valve, of 70 a valve-cage having a cover comprising radial arms arranged in diametrically opposite pairs, lugs connecting each pair of said arms, and an adjusting screw for forcing said lugs apart.

9. In a pump the combination with a 75 working cylinder, a valve-seat and valve, of a valve-cage having a cover comprising radial arms, lugs connecting the inner ends of said arms in pairs, oppositely arranged inclined upper faces on said lugs, and an ad- 80 justing screw for engaging and spreading said inclined faces.

10. In a pump the combination with a working cylinder, a cylinder cap, a valve seat in said cap, and a valve, of an expansible 85 valve-cage and means for expanding said cage to lock it in operative position.

11. As an article of manufacture a radially expansible valve-cage, in combination with means carried by said cage for expanding 90 ing it to increase its diameter.

12. As an article of manufacture a radially expansible valve-cage.

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

JESSE B. GARBER.

Witnesses:

NOAH C. GLASS,
J. C. BOONE.