A. C. RICKSECKER.

VALVE.

APPLICATION FILED JUNE 27, 1906.

908,139. Patented Dec. 29, 1908.

Fig. 1.

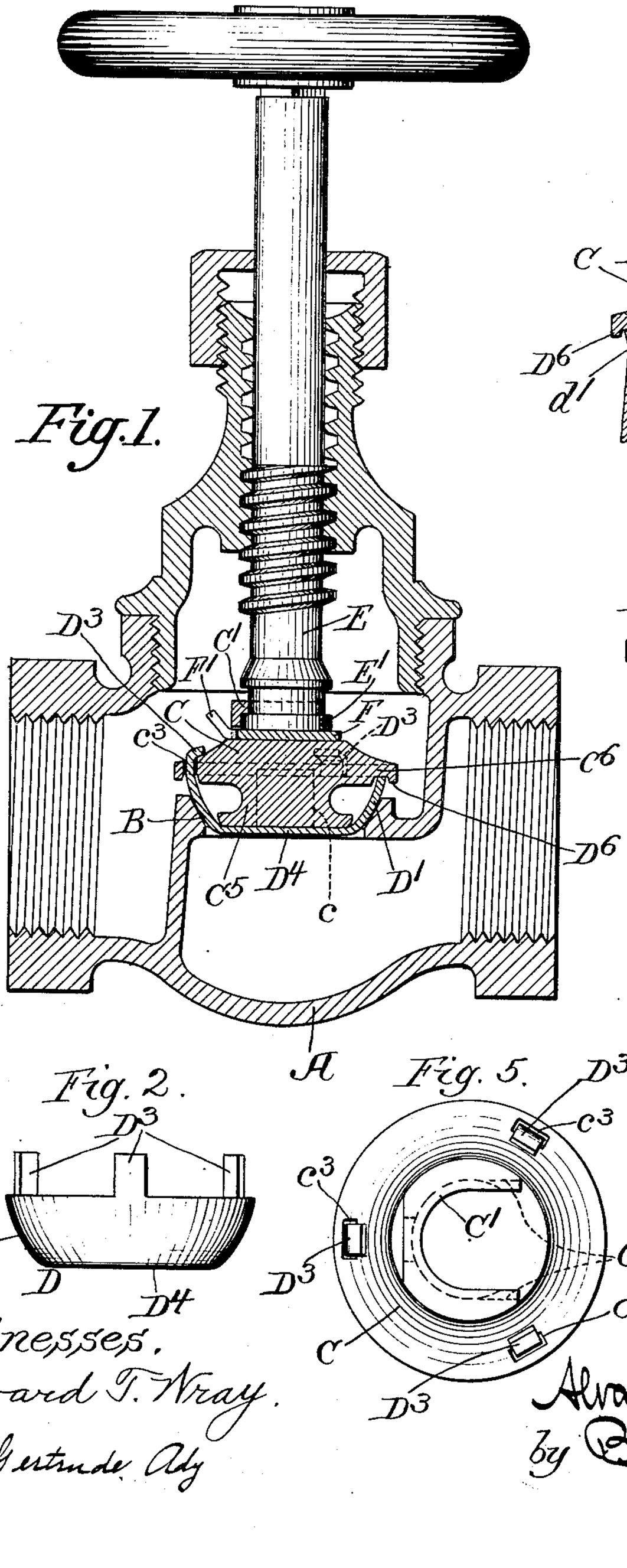


Fig. 3.

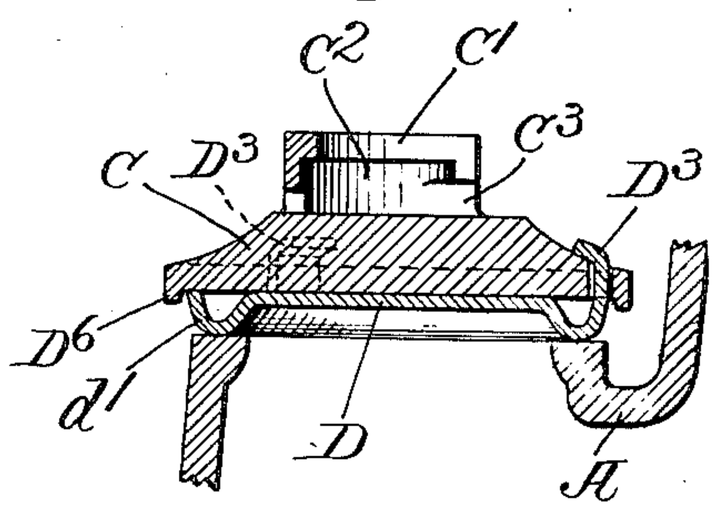


Fig. 4.

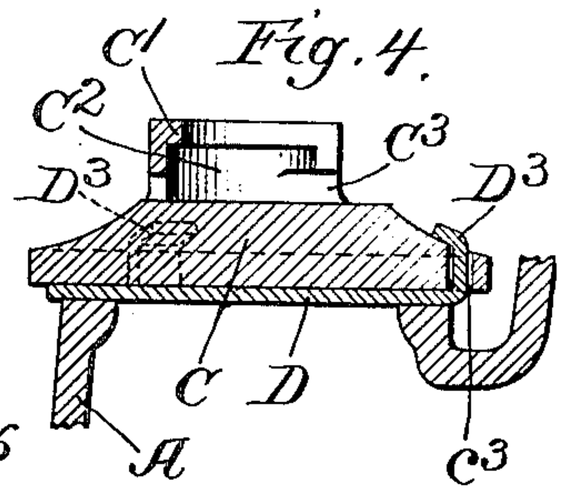


Fig. 2.




Fig. 5.




Witnesses.
Edward T. Wray.
M. Gertrude Ady

Inventor.
Alva C Ricksecker
by Burton & Burton
his Attys.

# UNITED STATES PATENT OFFICE.

ALVA C. RICKSECKER, OF CHICAGO, ILLINOIS, ASSIGNOR TO AJAX VALVE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

## VALVE.

No. 908,139. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed June 27, 1906. Serial No. 323,573.

*To all whom it may concern:*

Be it known that I, ALVA C. RICKSECKER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Valves, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved construction of valves of the type or class which comprises a rigid head or disk holder to which the stem is connected, and a seating element or face disk removably secured to such head or holder.

It consists in the features of construction shown and described in the specification and drawings and set out in the claims.

In the drawings:—Figure 1 is an axial section of a valve structure embodying my improvements. Fig. 2 is a side elevation of the disk of the form shown in Fig. 1. Figs. 3 and 4 are detail sections axial with respect to the valve head and seat showing modifications in the form of the valve head and disk. Fig. 5 is a top plan view of the valve head comprising the disk holder and disk detached from the stem and apart from the valve body, the form as seen in this view being the same for all three modifications shown in Figs. 1, 3 and 4.

In Fig. 1, I have represented my invention as applied to an ordinary screw-down valve in which the body, A, has a tapered valve seat at B, and the valve head comprises a holder, C, on which is mounted a removable disk, D, of which an annular portion, $D^1$, is concavo-convex, the convex side being exterior and forming the seating face for contact with the tapering seat, B. The valve head or disk-holder, C, is connected with the stem, E, in a familiar manner for permitting the rotation of the stem without rotating the valve head and allowing the valve within a limited range to accommodate itself in its seat. The construction for this purpose comprises an annular flange, $E^1$, on the end of the stem, E, which engages under an annular flange, $C^1$, which overhangs the cavity, $C^2$, in the upper side of the valve head, the flange, $E^1$, entering the cavity through the lateral opening, $C^3$, and then moving up into the top of the cavity to which the lateral opening does not extend, and being retained by the key, F, inserted through the lateral opening under the end of the stem and having the end upturned, as seen at $F^1$ to prevent its escape. This connection of the stem and head is not part of the present invention, being fully shown and described in patent granted to F. L. Smith, No. 749,637, dated Jan. 12, 1904.

A removable disk, D, in any of the forms shown in the drawings, is desirable for the purpose of quick and convenient repair of the valve, which may be made by substituting a new disk when the original disk is worn or damaged so as to seat it perfectly. In the forms shown in Figs. 1 and 3, the disk has further advantage of slight elasticity, permitting it to accommodate itself to the seat when the latter is imperfectly circular or otherwise slightly untrue. In the use of such removable disks heretofore, they have been generally secured at the valve head at the center where a threaded stem and nut or equivalent devices have been necessarily employed for securing them. Such construction involves the necessity of making a fluid-tight joint between the disk and head or disk-holder around the central stem or bolt, and involves a further objection that any nut for securing the disk in such position is liable to become loosened and escape and be carried back through the fluid passages into the mechanism with which the valve is connected, involving danger of serious damage to the latter. The present invention is designed to overcome these objections and difficulties by providing a disk which has no central aperture but is secured to the disk holder at the periphery. For this purpose, the disk, whether made as a flat facing for the disk-holder as in Fig. 4, or in the form shown in Fig. 3, wherein it comprises a concavo-convex annulus, $d^1$, for contact with a flat valve seat, or in the principal form shown in Fig. 1 wherein it has a concavo-convex annular portion, $D^1$, for seating on the tapered seat, is provided with a plurality of peripherally located lugs, $D^3$, $D^3$. Three such lugs constitute sufficient means for the purpose, but any greater number may be employed. The disk-holder, C, has corresponding apertures, $c^3$, in which the lugs, $D^3$, are engaged when the disk is applied to the holder, the ends of

the lugs being clenched down upon the upper side of the holder, as clearly shown in the drawings. When the disk is worn or damaged, it is readily detached by straightening the clenched lugs and withdrawing them.

In a valve of the form shown in Fig. 1, adapted for taper seat and having the concavo-convex annual portion, $D^1$, for seating, the spring action of the disk for accommodating itself to its seat is designed to occur at the concavo-convex annular portion, acting somewhat as an arch supported at both ends and receiving the pressure at the middle, and in order that it may thus operate, at the circumference of the central flat portion, $D^4$, the disk is desirably provided with positive support. For this purpose, the disk holder, C, is formed, as shown in Fig. 1, with a central protruded portion or table, $C^5$, (from which, if desired, a central portion may be cored out to save metal, as indicated in dotted line at *c*) having the flat end on which the central portion, $D^4$, of the disk rests and is supported, and with an annular flange or marginal table, $C^6$, upon which the periphery of the disk lodges. It is through this flange or table that the apertures, $c^3$, are made for engaging the lugs, $D^3$. In the forms shown in Figs. 3 and 4, the disk holder has its entire end formed as a flat table on which the entire flat portion of the disk rests, whether that be the entire disk, as in Fig. 4, or the central portion within the concavo-convex annular portion, $d^1$, as in Fig. 3.

In either form shown in Fig. 1 or that in Fig. 3 in which there is a concavo-convex annular portion for seating, the outer circumference of the annular portion while supported upon the face or table of the holder is designed to be left free to move over that support to such slight extent as may be caused by the pressure from the concavo-convex seating annulus as upon an arch, tending to separate the arch at the base, such spreading being prevented at the inner circumference of the annulus by reason of the continuity of the disk, but permitted at the outer circumference, where, nevertheless, there may be provided, as shown in Figs. 3 and 4, a slight guard flange, $D^6$, at the margin of the table or flat face of the holder to check the expansion at a limit beyond which it might tend to result in rupture of the disk if extreme pressure should be applied.

I do not wish my invention to be understood as limited to the use of the lugs on the disk as the means of engaging the holder, and other means of detachable engagement outside the seating area may be substituted without departing from my invention in this respect.

I claim

1. In a valve of the class indicated, a valve head comprising a disk holder and a thin metal disk detachably secured to the holder and forming the seating element of the valve, said disk being lodged against the holder in contact therewith at an area encompassing the axis of the valve and within the seating area and also at a line or area encompassing said axis and outside of the seating area, the sole securement of the disk to the holder being at the latter line or area.

2. In a valve of the class indicated, a valve head comprising a disk holder and a thin metal disk detachably secured to the holder and forming the seating element of the valve, said disk being lodged against the holder in contact therewith at an area encompassing the axis of the valve and within the seating area, and also at a line or area encompassing said axis and outside the seating area, said disk being intermediate said two lines or areas out of contact with said holder, the sole securement of the disk to the holder being at the outer line or area.

3. In a valve of the class indicated, in combination with the disk holder, a metal disk forming the seating surface of the valve and extending continuously over the entire area encompassed by the seating area, said disk having lugs projecting from it outside the seating area, the holder having means for engaging the lugs for detachably securing the disk to the holder.

4. In a valve, in combination with a body having a tapering valve seat, a disk holder and a metal disk mounted thereon having an annular concavo-convex portion forming the seating surface of the valve, the disk holder having a centrally protruded portion and an nular portion encompassing the same, the disk being continuous and unapertured over the central area encompassed by its said annular portion and having said central area lodged upon the centrally protruded portion of the holder and its periphery lodged upon the annular encompassing portion of the holder, and means for securing the disk to the holder outside the concavo-convex annular portion which forms the seating face.

5. In a valve, in combination with the body having a tapering valve seat, a disk holder having a centrally protruded portion for extending within the valve seat and a metal disk which is continuous and unapertured over said central portion, and an annular portion encompassing the same and forming the seating surface of the valve, the disk being lodged and supported at said central portion upon said protruded portion of the holder, and at its periphery outside the seating surface lodged upon the holder outside said protruded central portion, and means for securing it to the holder outside of said seating portion.

6. In a valve, in combination with a metal disk which forms the seating surface of the valve and extends continuously over the entire area encompassed by the seating area, a

disk holder having apertures outside such seating area the disk having lugs coöperating with said apertures for securing the disk to the holder.

7. In a valve, in combination with a disk holder, a metal disk forming the seating surface of the valve and extending continuously over the entire area encompassed by the seating area, the holder having apertures outside the seating area, and the disk being provided with means outside the seating area for securing it to the holder at said apertures.

In testimony whereof, I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 22d day of June, 1906.

ALVA C. RICKSECKER.

In the presence of—
SOPHIE B. WERNER,
J. S. ABBOTT.