

No. 877,865.

PATENTED JAN. 28, 1908.

A. C. RICKSECKER, JR.

VALVE.

APPLICATION FILED SEPT. 29, 1906.

Fig. 1.

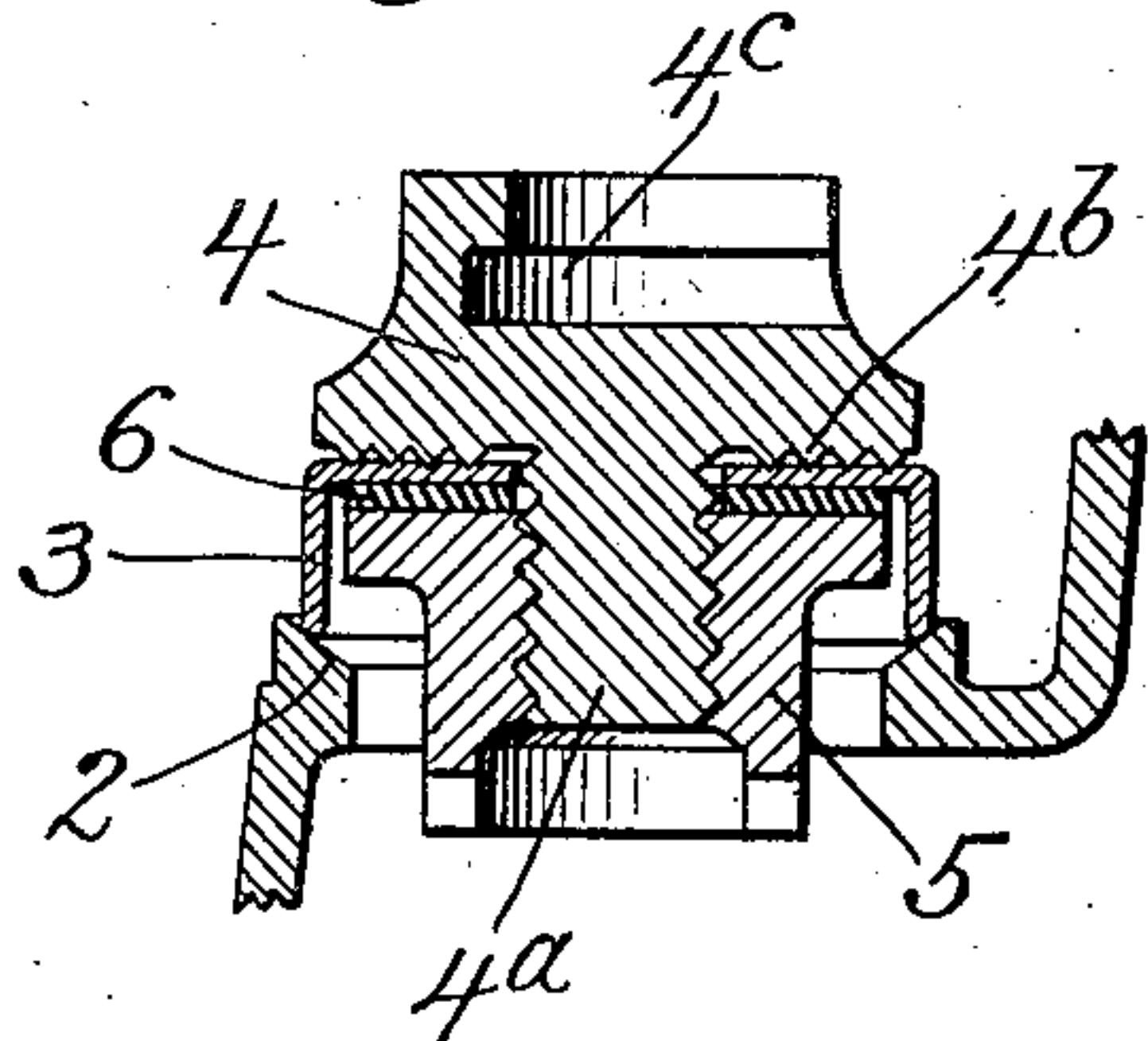


Fig. 2.

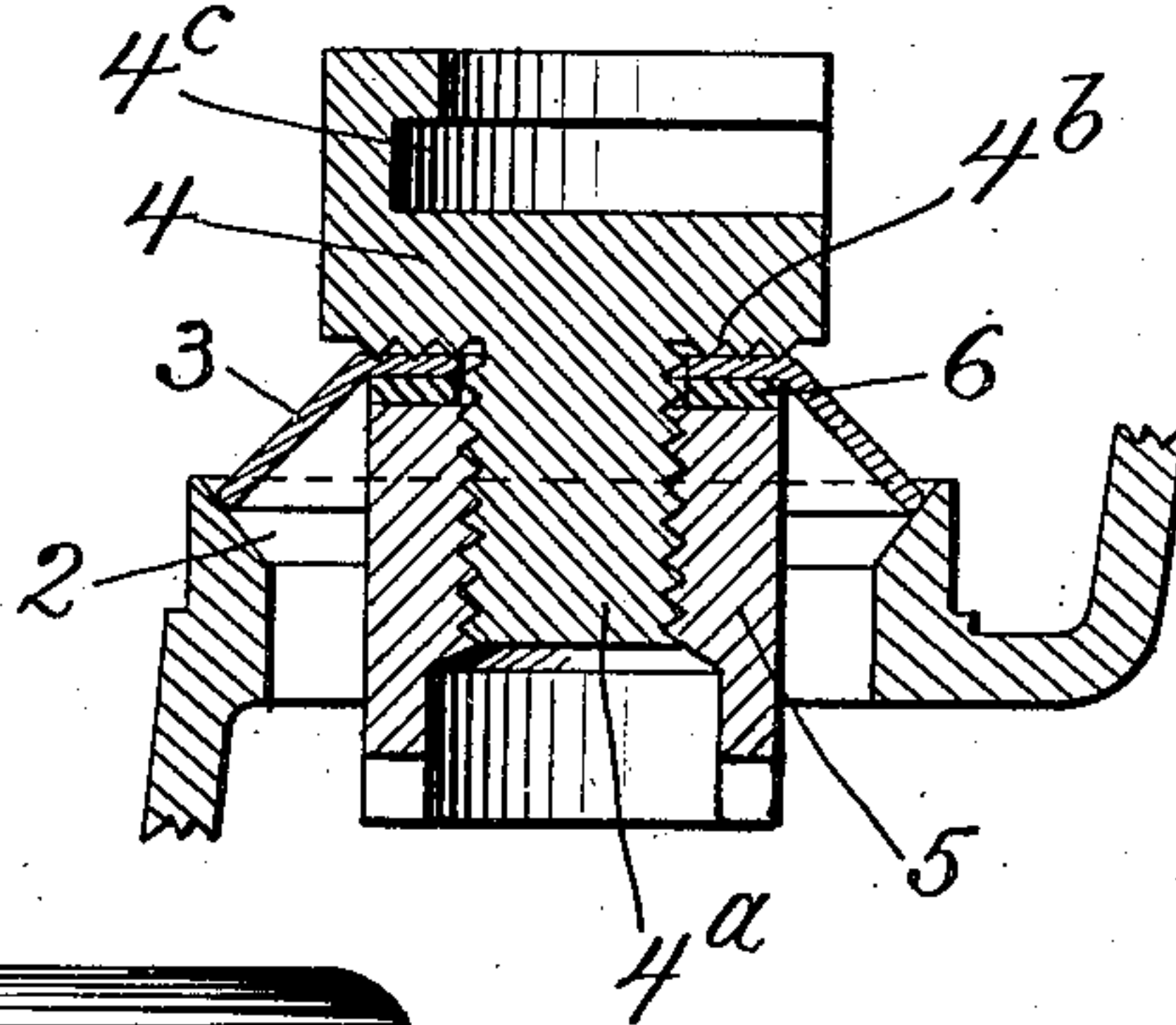
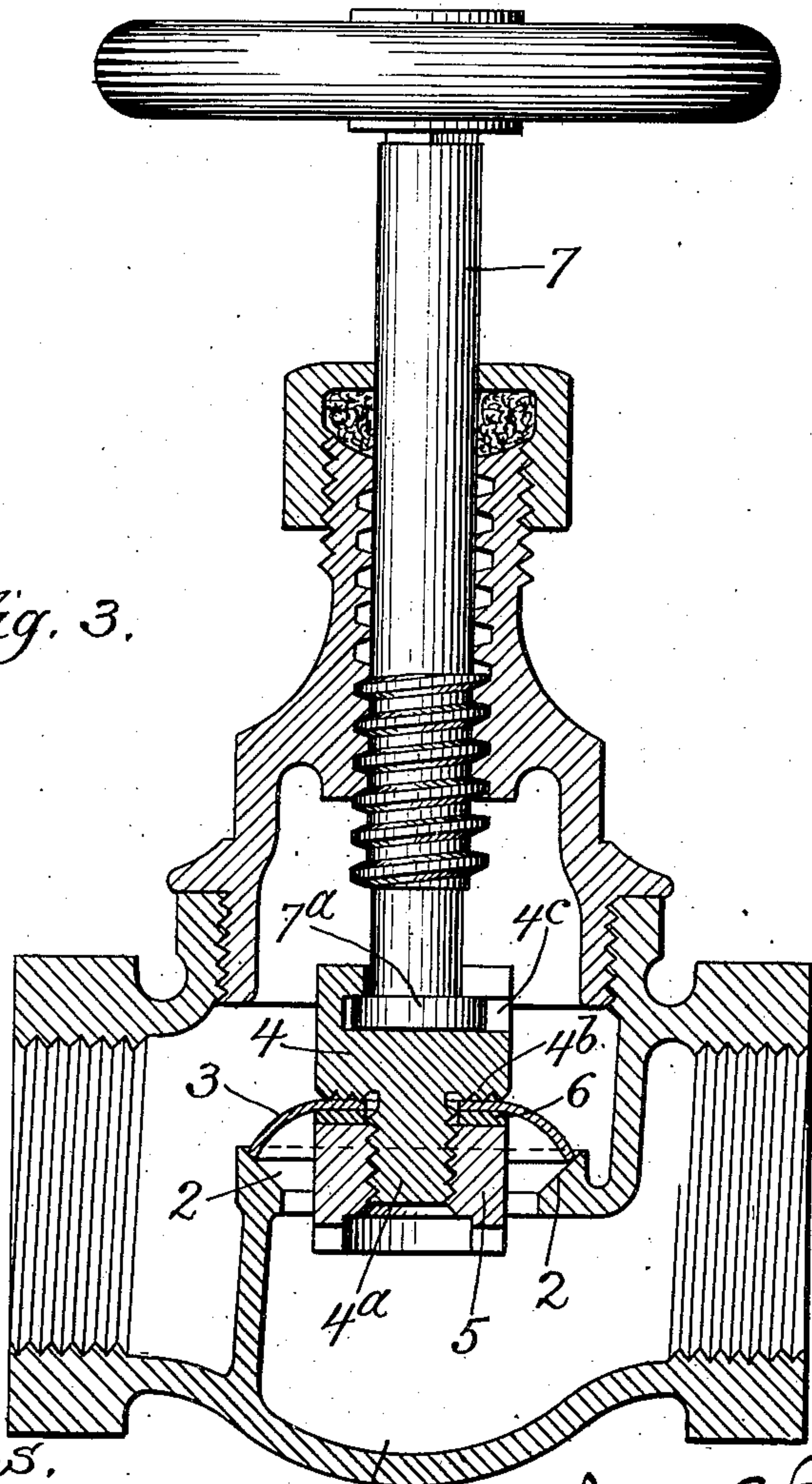


Fig. 3.



Witnesses,
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UNITED STATES PATENT OFFICE.

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

VALVE.

No. 877,865.

Specification of Letters Patent.

Patented Jan. 28, 1908.

Original application filed May 6, 1905, Serial No. 259,149; Divided and this application filed September 29, 1906. Serial No. 336,706.

To all whom it may concern:

Be it known that I, ALVA C. RICKSECKER, Jr., 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.

This application is a division of my application No. 259,149, filed May 6, 1905.

The purpose of the invention broadly set out in said parent application is to provide an improved construction of valve in which the disk shall be adapted to accommodate itself to the seat by virtue of the elasticity and flexibility of the disk, and which shall nevertheless be adapted to sustain and resist high pressure when seated. Said parent application shows the spring disk in several forms, in some of which it is seated upon an outwardly sloping seat, and in others upon an inwardly sloping seat.

The specific invention selected to be covered by the claims of the parent application is that in which the disk seats upon an outwardly sloping seat, and the specific invention to which this divisional application relates is the form in which such disk seats upon an inwardly sloping seat. It consists of the features of construction of the valve and seat as set out in the claims.

In the drawings:—Figure 1 is an axial section of a valve and its seat embodying one form of the specific invention mentioned. Fig. 2 is a similar view showing a modification in the form of a valve disk. Fig. 3 is section of a complete valve body having a valve disk and seat embodying this invention in its preferred form.

In the drawings the valve body, 1, fully shown in Fig. 3, has the valve seat, 2, sloped inwardly and adapted to be encountered by the valve disk on such inward slope. The valve disk, 3, is preferably made of elastic sheet metal struck up or pressed in a die or spun into the desired form. In all three of the figures showing modifications of the disk it has its seating portion constituting a peripheral annulus, the entire disk being in the form of a cup or cap,—that is, being dished or cupped,—and having a central aperture in the bottom of the dish or cup form by means of which aperture it is adapted to pass onto the holder or terminal element, 4, of the

stem, said holder having a threaded terminal portion, 4^a, which passes through the central aperture of the disk, and having also an annular platform or shoulder, 4^b, surrounding said central threaded portion, and preferably annularly corrugated as shown, the corrugations being somewhat acute, so that the disk when clamped onto the shoulder against such corrugations is slightly impressed or indented, and there is thereby produced a fluid-tight joint between the disk and the holder. A gasket, 6, or other means of preventing the passage of fluid, may be interposed between the binding nut, 5, and the annular portion of the disk against which said nut operates to clamp it to the corrugated seat or shoulder, 4^b. The disk holder, 4, is preferably connected to the threaded stem, 7, so as to be readily detachable and to permit the stem to rotate without rotating the holder and disk. The mode of attachment illustrated is familiar, the stem, 7, having an enlargement or flange, 7^a, at the end which engages under the slot, 4^c, at the end of the holder, the slot being extended so as to open at one side for entering the head onto the stem.

In Fig. 1, the disk, 3, is shown with its peripheral annulus cylindrical, so that when the edge of said cylindrical portion encounters the inwardly sloping seat said cylindrical annulus will readily spring by yielding in one direction and expanding in another, if necessary, to accommodate itself to the seat when the latter is not perfectly circular, or when the angle at which it encounters it requires such springing in order to make perfect contact at a line which will in such case be slightly oval.

In the form shown in Fig. 2 the disk, 3, has its peripheral annulus dished or flaring conically,—that is, with direct or straight-line slope from the central portion where it is bent between the shoulder, 4^b, and the nut, to the edge which encounters the inwardly sloping seat. In this construction the inclination of the conically sloping annulus of the disk and the slope of the seat are preferably so related that the angle between the two at the inner side,—that is, toward the axis of the valve,—is a little greater than a right angle, so that pressure forcing the valve to its seat will tend to spring the valve out of circular form at the periphery, if necessary to cause it to reach the seat throughout its entire circumference, the action in this respect being

similar to that above described with respect to the form shown in Fig. 1. But this form is readily made to operate with less tendency to spring or to require more pressure to spring out of circular form than that shown in Fig. 1, by merely making the slope of the seat and disk relatively such as to cause the disk to encounter the seat nearly at right angles, so that the pressure which would seat it tends to produce a thrust nearly at right angles to the seat.

The form shown in Fig. 3 is preferred for most purposes to the other forms, though said other forms have their special advantages and are specially fitted for certain uses. In the form shown in Fig. 3 the peripheral annulus of the disk, 3, is radially concave toward the port or fluid way which it controls,—that is to say, convex toward the direction from which pressure is applied to seat it. The advantage of this concavo-convex form of the disk is that upon being forced to its seat with considerable pressure it operates as an arch with the elasticity afforded by the curved form, and is rendered only slightly more convex outwardly by such pressure; whereas in the form, for example, shown in Fig. 2 such pressure tending to spring the valve radially may spring it outwardly at one part and inwardly at another part of its circumferential extent, with the result that the seating edge is liable to be rendered somewhat serpentine, and so to be sprung in off the seat at some points. The form shown in Fig. 3, on the contrary, must spring or bulge outward throughout its entire circumference, and cannot bulge or be buc-

kled inward at any point by the pressure by which it is seated. The angle at which the disk meets the seat in the form shown in Fig. 3 is preferably substantially the same as in Fig. 2, and for the same reasons.

I claim:—

1. In a valve, a thin metal disk having an annular flexible outer portion for seating, in combination with a holder to which such disk is detachably secured and an inwardly sloping seat positioned relatively to the valve for the encounter of its inward slope by the edge only of the disk.

2. In a valve, a thin metal valve disk of dished or flaring form, in combination with a holder and means for securing the disk to the holder about the central portion, and an inwardly sloping seat positioned for the encounter of its inward slope by the outer circumference or edge only of the flaring portion of the disk.

3. In a valve, a thin metal disk of dished or flaring form concavo-convex in radial section; a holder for such disk on which the same is mounted with the concave side toward the seat, in combination with an inwardly sloping seat whose inward slope is adapted to be encountered by the periphery of the concavo-convex disk.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 15th day of February, 1906.

ALVA C. RICKSECKER, JR.

Witnesses:

EDWARD T. WRAY.

J. S. ABBOTT.