

No. 751,735.

PATENTED FEB. 9, 1904.

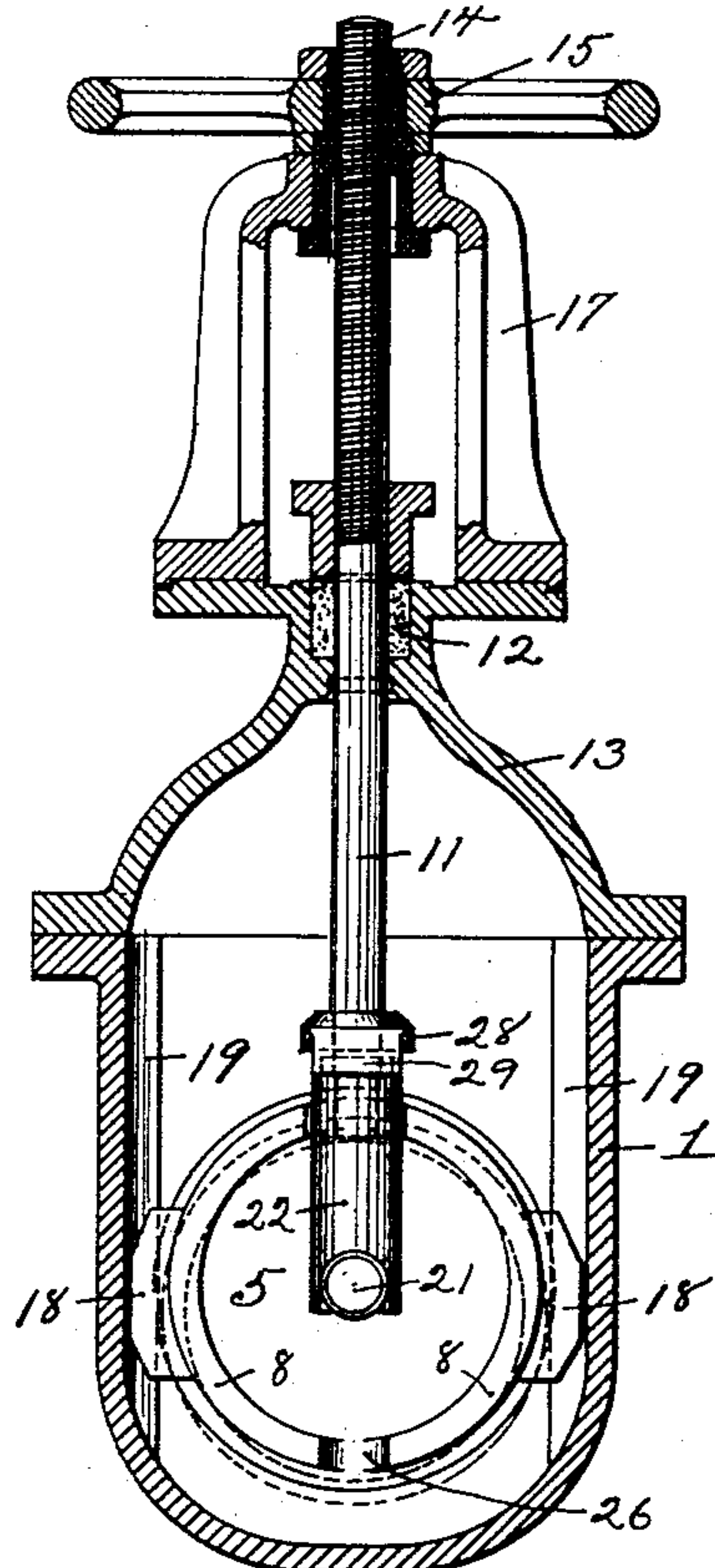
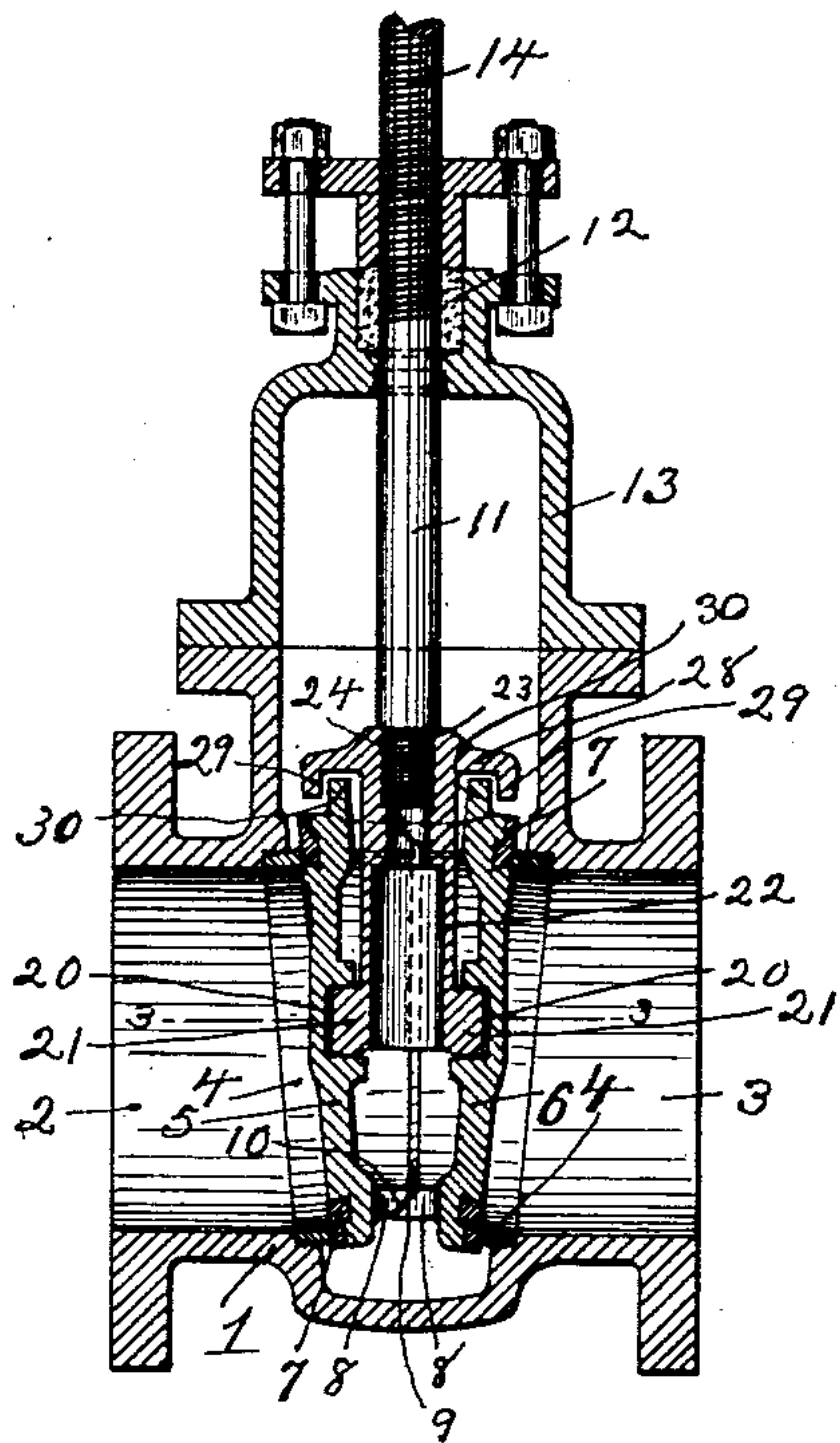
S. S. JACOBSEN.  
GATE VALVE.

APPLICATION FILED JAN. 10, 1902.

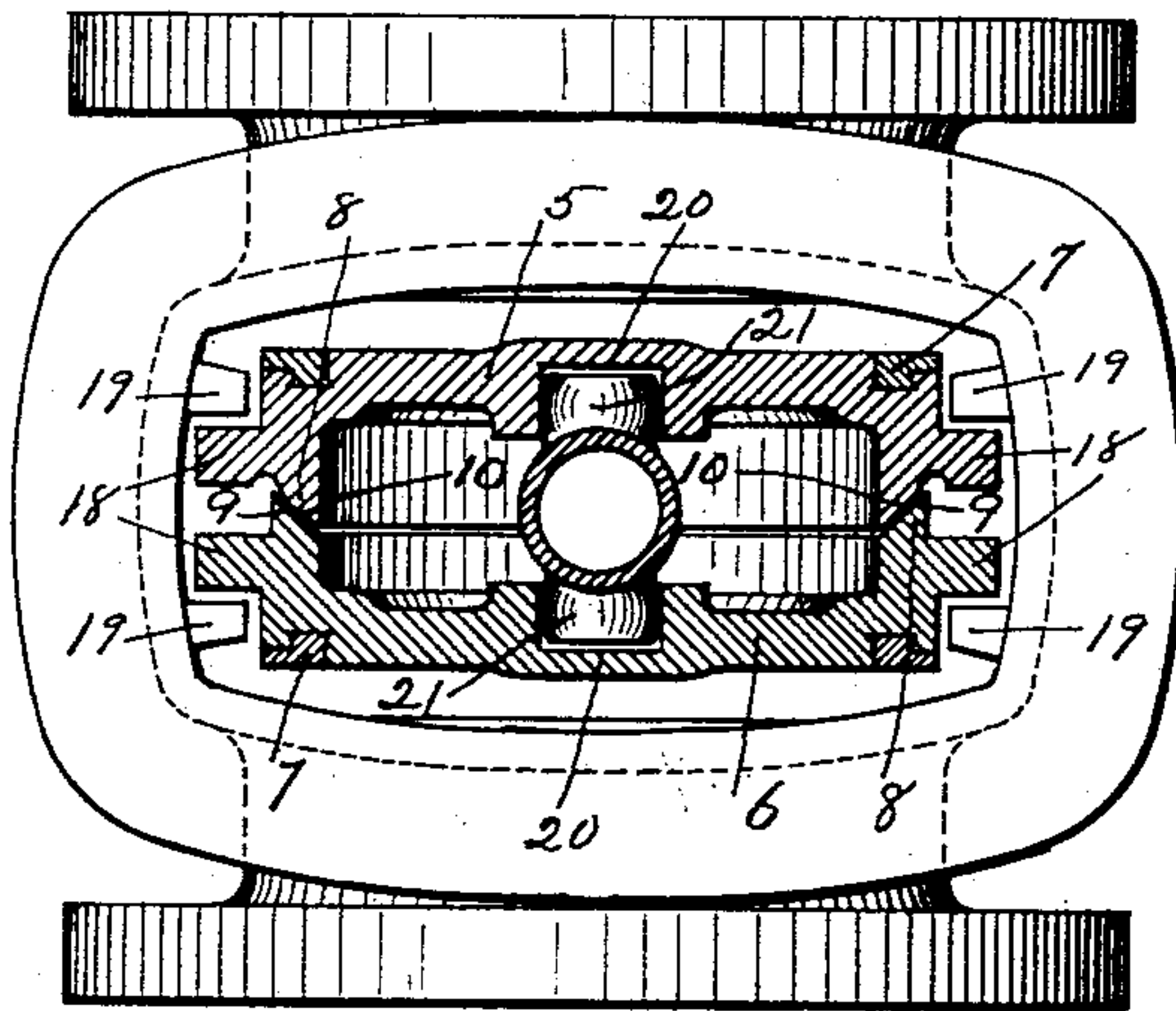
NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 2.*



*Fig. 3.*

Witnesses:

Walter Samaras  
Fred R. Sweet.

Inventor:

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Attorneys.

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2 SHEETS—SHEET 2.

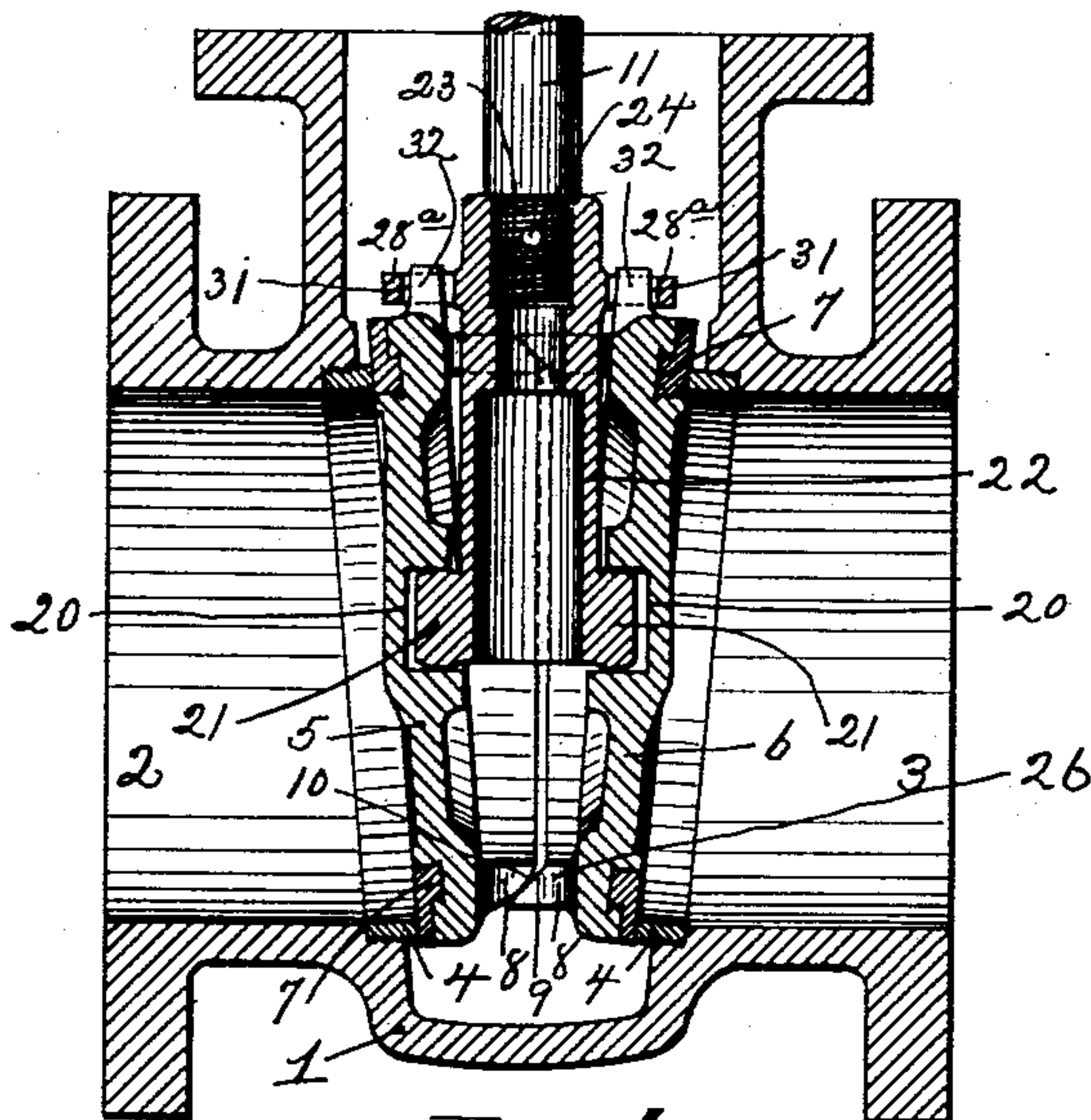


Fig. 4.

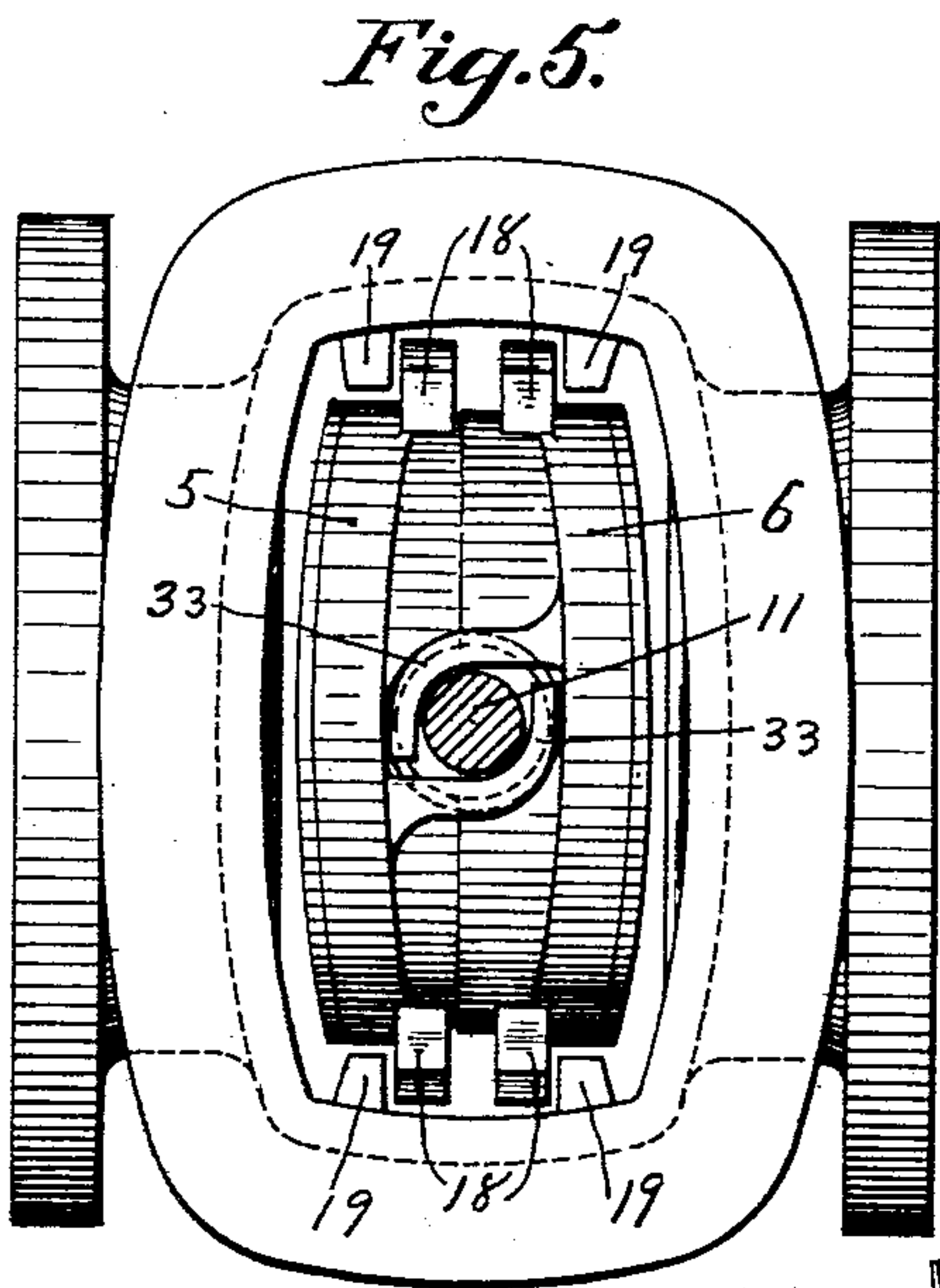


Fig. 5.

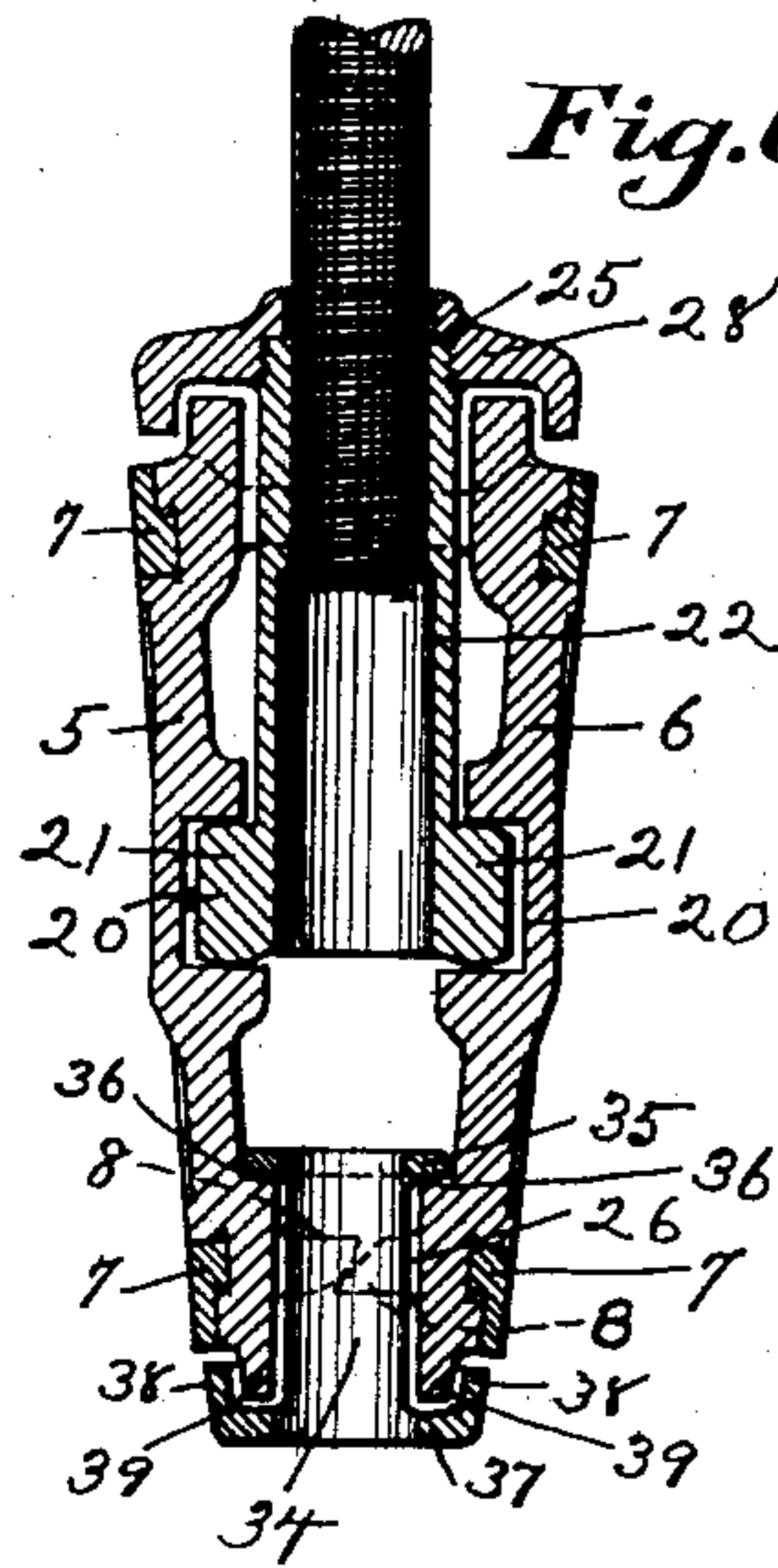


Fig. 6.

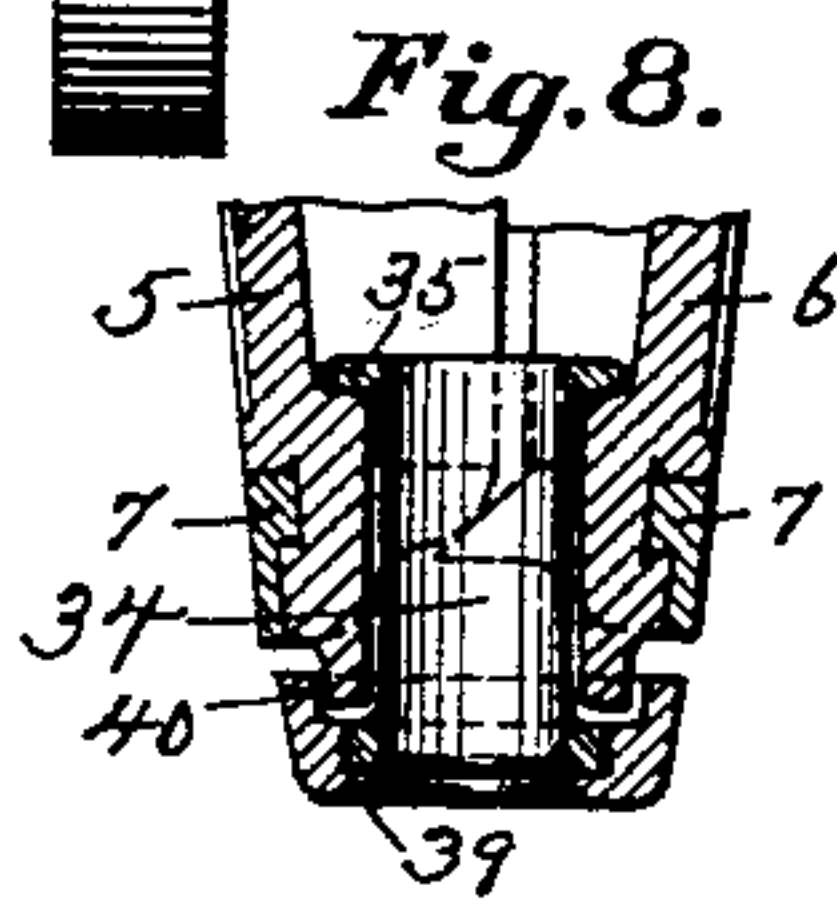


Fig. 8.

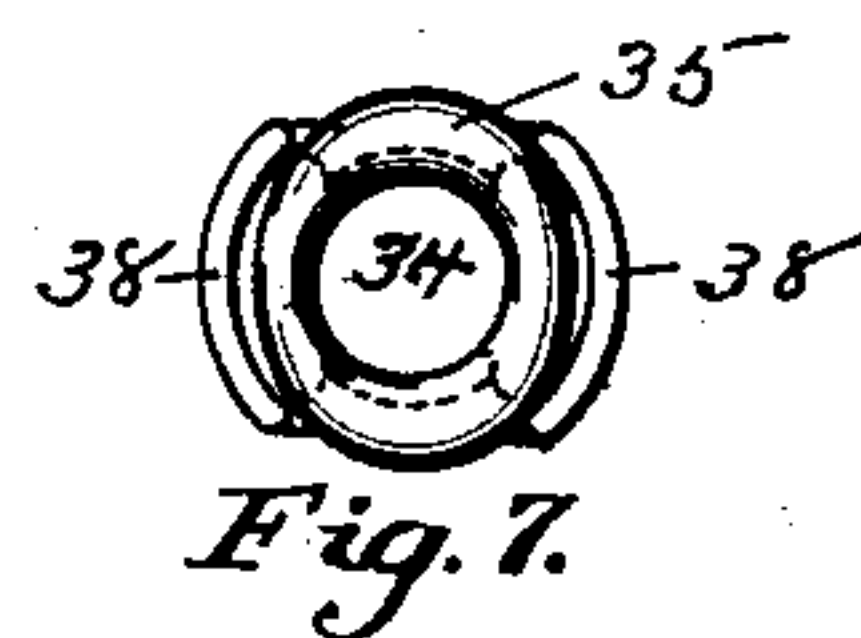


Fig. 7.

Witnesses:  
Hatter Samaris  
Fred R. Sweet

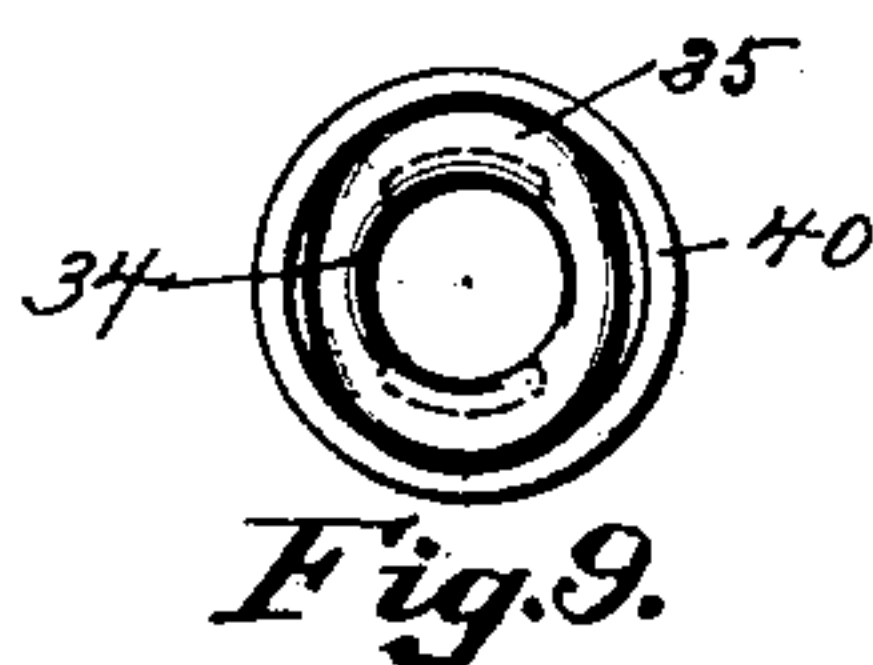


Fig. 9.

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# UNITED STATES PATENT OFFICE.

SOREN SANNE JACOBSEN, OF BELLEVUE, PENNSYLVANIA.

## GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 751,735, dated February 9, 1904.

Application filed January 10, 1902. Serial No. 89,152. (No model.)

*To all whom it may concern:*

Be it known that I, SOREN SANNE JACOBSEN, a resident of Bellevue, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gate-Valves; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to gate-valves of the type in which the disk is composed of two separate halves, and more particularly to such valves in which the disk halves have bearing-faces engaging each other, so that they can adjust themselves to make a tight connection with the valve-seats. This type of valve usually is provided with ways or guides in the valve-casing and lugs or flanges on the disk halves which engage therewith in order to guide the disk in its up and down movements. Should the ways or flanges become worn, there is danger of the disk halves falling apart or separating to such an extent as to become disengaged from the stem or to otherwise bind or clog in the casing.

The object of my invention is to overcome this difficulty and to provide means which will prevent the disk halves from falling away from each other or separating to such an extent as to become disengaged from the valve-stem or to otherwise bind or clog in the casing, even if the guideways and cooperating flanges or studs become worn excessively or be entirely absent.

To this end my invention comprises, generally stated, a gate-valve having its disk formed of two separate halves and means secured to or engaging with the valve-stem for holding said disk halves from falling apart or separating beyond a certain distance.

In the accompanying drawings, Figure 1 is a longitudinal section through my improved valve and its casing. Fig. 2 is a transverse section of the same. Fig. 3 is a plan of the casing and a horizontal section of the valve on the line 3-3, Fig. 1. Fig. 4 is a longitudinal section of a modified form of valve. Fig. 5 is a plan view of still another modification. Fig. 6 is a longitudinal section through the disk portion of still another modified form of valve. Fig. 7 is a plan view of a detail there-

of, and Figs. 8 and 9 are details of a slight modification.

The valve-casing 1 may be of any suitable shape and construction and is provided with the inlet and outlet ports 2 and 3. This casing opposite the inlet and outlet ports is provided with the valve-seats 4, said valve-seats being shown as separate brass rings secured to the casing by suitable screw-threaded joints, although they may, if preferred, be formed integral with the casing. These valve-seats are preferably inclined toward each other, as shown, so as to form a wedge-shaped chamber therebetween, in which chamber the valve-disk is received. The valve-disk is formed of two separate halves 5 and 6, having on their outer faces brass or other suitable rings 7, adapted to contact with the valve-seats 4. Each of these disk halves is preferably provided with an inwardly-projecting annular flange 8, said flanges being wider at the top of the disk than at the bottom, the diminution in size being a gradual one. The flange on one of the disk halves is shown provided with a beveled bearing-face 9 and that on the other disk half with a curved bearing-face 10, although both of these faces may be curved, if desired. When these two disk halves are placed with the flanges 8 in engagement with each other, they will form a wedge-shaped disk corresponding to the wedge-shaped chamber between the inclined valve-seats 4. The flanges 8 are preferably arranged to be practically opposite or in alignment with the valve-seats 4, so that said disk halves cannot become dished or bent by the pressure. The disk halves are moved by an ordinary valve-stem 11, which passes through the stuffing-box 12 in the cover 13, suitably secured to the valve-casing, and said stem may have its upper end screw-threaded, as at 14, Fig. 2, to receive the threaded hand-wheel or other nut 15, which works in the upper end of the yoke 17, or said stem may have the hand-wheel 15 splined to its upper end and have its lower end threaded and engaging a threaded socket in the disk, as shown in Fig. 6. By the rotation of this hand-wheel the disk halves connected to the stem are elevated and lowered, thereby opening and closing the passage



through the valve-casing. When the valve is lowered, the disk halves by reason of their curved or inclined bearing-faces can move upon each other and adjust themselves to the desired position so as to form tight connections with the valve-seats. Each of the disk halves is provided on its sides with the projecting studs or flanges 18, and the valve-casing is provided with the inwardly-projecting ribs or flanges 19, which form between them a groove in which the projections or flanges 18 may move in the upward and downward movement of the valve, thereby guiding the latter and preventing the disk halves from falling away from each other.

The valve as thus far described is old and is practically the same as that covered by Letters Patent No. 565,239, granted to W. H. H. Sheets August 4, 1896, and forms no part of my invention. My invention is an improvement on this and all other forms of gate-valves having a disk composed of two separate halves and is designed to prevent the undue separation of the disk halves in case the cooperating guides 18 and 19 become excessively worn or are entirely absent.

The valve-stem 11 may be secured to the disk halves in the manner shown in the above-named patent to Sheets, although I prefer to make this connection in a slightly-modified form. Each of the disk halves 5 and 6 is shown provided with a socket or recess 20, which sockets are adapted to be engaged by lugs or projections 21 on the stem-section 22, connected in any convenient manner to the stem 11. The lugs or projections 21 are preferably formed with rounded bearing-surfaces, as shown, so that they are, in fact, sections of a sphere, and the sockets or recesses 20 may likewise be formed with curved or rounded walls, thereby permitting said disk halves to move freely on the stem to adjust themselves to the seats 4. Any other well-known means for connecting the stem to a disk composed of two separate halves may be used.

In case the stem 11 is provided with screw-threads at its upper end, as shown in Fig. 2, it will be secured to the section 22 in any convenient way, as by the screw connection 23 and pin 24. When the stem 11 has the hand-wheel 15 splined thereto, it will have its lower end threaded, as at 25, Fig. 6, and engaging a screw-threaded socket in the stem-section 22. The flanges 8 are cut away at the lower side of the disk halves, as shown at 26, to permit the disk halves to pass over the lower end of the stem when the former are elevated.

The means for preventing the disk halves from falling away from each other or separating to an undue extent may take various forms, it being merely necessary that the means engage with or be secured to the stem and engage with both of the disk halves in such a manner that they can move away from

each other only to a limited extent. This means is shown in Fig. 1 as a yoke 28, having two arms which project in opposite directions and having the ends thereof turned downward, as at 29, and adapted to lie outside of and engage with the upper edges of the disk halves 5 and 6 or with suitable projections 30 thereon. This yoke 28 is shown in Fig. 1 as formed integral with the stem-section 22; but this is not necessary, as it may be formed in a separate piece and secured to the stem 11 or stem-section in any suitable way. In Fig. 4 the yoke is composed of two lugs or projections 28<sup>a</sup>, also shown as formed integral with the stem-section 22, although they be in a separate part. These lugs or projections 28<sup>a</sup> are provided with suitable holes 31, which are adapted to receive studs 32 on the upper sides of the disk halves.

In Fig. 5 each of the disk halves 5 and 6 is shown as provided with a hook-shaped arm or lug 33, which arms or lugs are adapted to extend beyond and to the opposite side of the stem 11 and by engaging the latter prevent the disk halves from falling apart or separating to such an extent that they will become disengaged from the stem or otherwise bind or clog in the valve-casing.

In Fig. 6 the yoke 28 is substantially the same as in Fig. 1, the only difference being that said yoke is separate from the stem-section 22 instead of integral therewith, it being shown as secured to said stem-section by means of a screw-threaded connection. In this modification the lower sides of the disk halves are also united by means which prevent their undue separation, said means being an attachment 34, which is a sleeve or open skeleton frame to permit the stem 11 to pass there-through; but when used with a stem threaded at its upper end, as in Fig. 2, it need not necessarily be in the shape of a sleeve. This attachment is held in the cut-away portions 26 of the flanges 8 and is provided at its upper end with an enlargement 35, which seats on the shoulders 36 on the disk halves, and thus prevents the attachment from falling out. It is provided at its lower end with the yoke 37, having the upturned ends 38, which take over and engage with the lower sides of the disk halves or with suitable projections 39 thereon. In this form of valve it is necessary that the yoke 28 at the upper ends of the disk be separate from the stem-section 22 or that the attachment 34 be in two parts, as shown in Figs. 8 and 9; otherwise the parts could not be assembled; but with said yoke 28 screwing onto the stem-section, as shown, the disk halves are first assembled with the stem-section 22 and holding device 34, after which the yoke 28 is screwed down upon the stem-section to the position shown, and then the stem proper, 11, is screwed into the stem-section 22. The attachment 34 (shown in Figs. 8 and 9) has a



lower portion 39, provided with an annular flange 40, which portion after the disks are assembled can be suitably secured to the sleeve portion, as by screwing the same thereon.

5 In all the forms of my invention as illustrated and described the disk halves are perfectly free to move on each other and on the valve-stem, so as to seat themselves firmly on the valve-seats. Should the guides 18 and 19  
10 be absent or become unduly worn, the disk halves could nevertheless not separate or fall away from each other to such an extent that the lugs 21 on the valve-stem would escape from the sockets or recesses 20 in said disk  
15 halves. In the form shown in Figs. 1 and 6 the said disk halves can swing outwardly at their upper ends until the projections 30 come in contact with the bent-down ends 29 of the yokes 28 and then can move no farther, no mat-  
20 ter what the condition of the guides 18 and 19 may be. Inasmuch as there is no or very little wear between the yoke 28 and projections 30, this means will always insure the proper engagement between the stem and disk halves.  
25 In the modification shown in Fig. 4 the disk halves can swing outward at their upper ends to the extent permitted by the openings 31, but no farther, and in the modification shown in Fig. 5 said disk halves can swing outward  
30 until the hooked arms 33 come into engagement with the valve-stem 11. With all of these modified forms of holding means I may employ suitable means at the lower end, such as shown in Figs. 6 to 9, for preventing said  
35 lower ends from falling apart or separating to

such an extent that the disk will bind or clog in the casing. When the external screw on the stem 11, as shown in Fig. 2, is used, it is not necessary that the stem-section 22 be separate from the stem 11, as it may be formed  
40 integral therewith. Neither is it essential that the lugs 21 be on the stem and the sockets 20 in the disk halves, as these parts may be reversed or be substantially such as shown in the patent to Sheets above referred to, or they  
45 may be replaced by any well-known means for connecting the stem to a disk composed of two halves. Neither is my invention limited to disk halves having bearing-faces engaging each other, as shown, but it is equally appli-  
50 cable to all gate-valves which have a disk composed of two separate halves.

What I claim as my invention, and desire to secure by Letters Patent, is—

A gate-valve having a disk composed of two  
55 separate halves having shoulders and flanges providing bearing-faces engaging one another, a valve-stem, cooperating lugs and sockets on said stem and disk halves, an attachment hav-  
60 ing an enlargement at its upper end resting on the shoulders on the disk halves, extending through the flanges and provided at its lower end with means for engaging both of said disk halves to prevent their undue separation.

In testimony whereof I, the said SOREN  
65 SANNE JACOBSEN, have hereunto set my hand.

SOREN SANNE JACOBSEN.

Witnesses:

F. W. WINTER,  
ROBERT C. TOTTEN.