

J. G. TALMAGE.  
VALVE.

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952,691.

Patented Mar. 22, 1910.

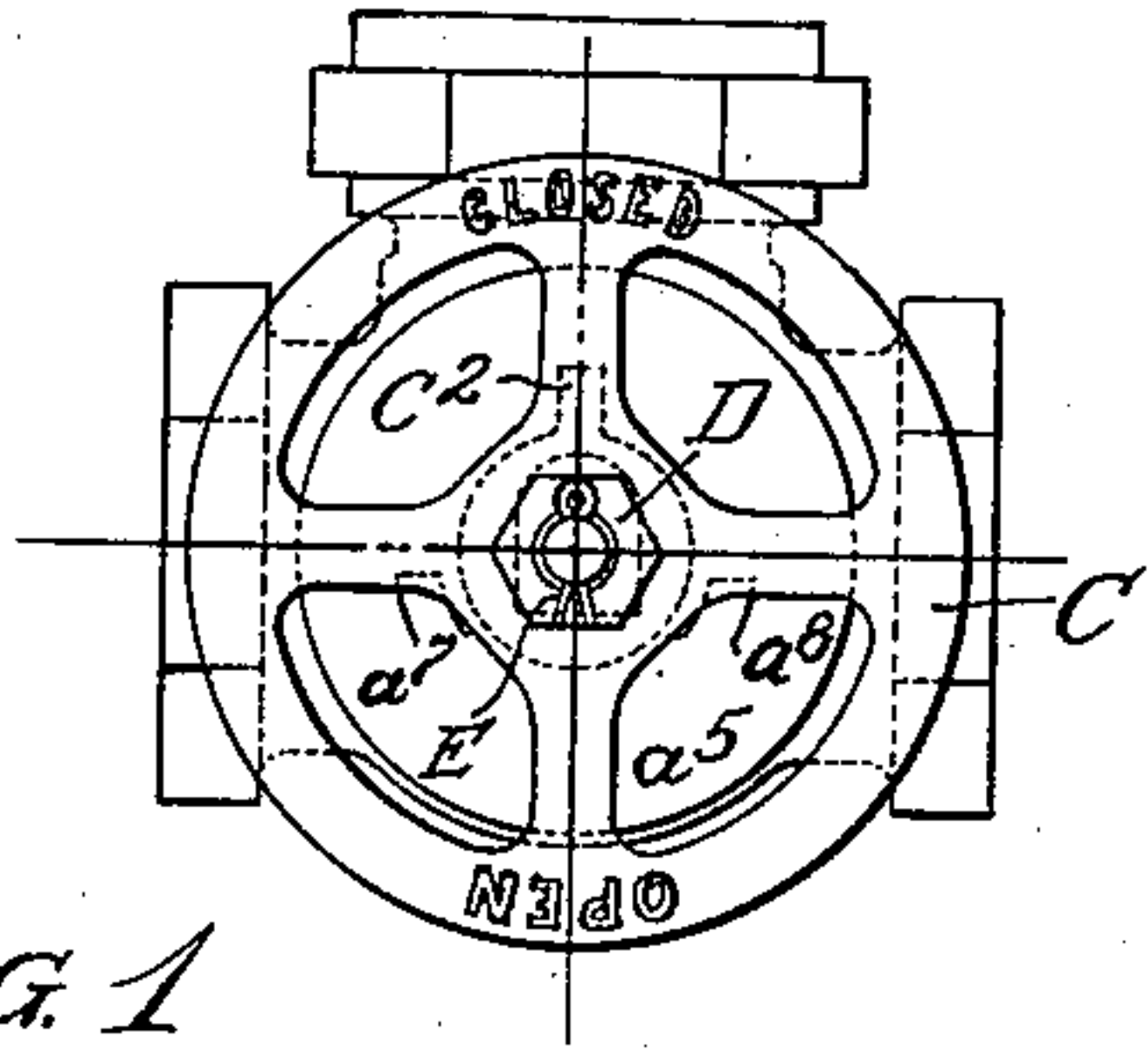


FIG. 1

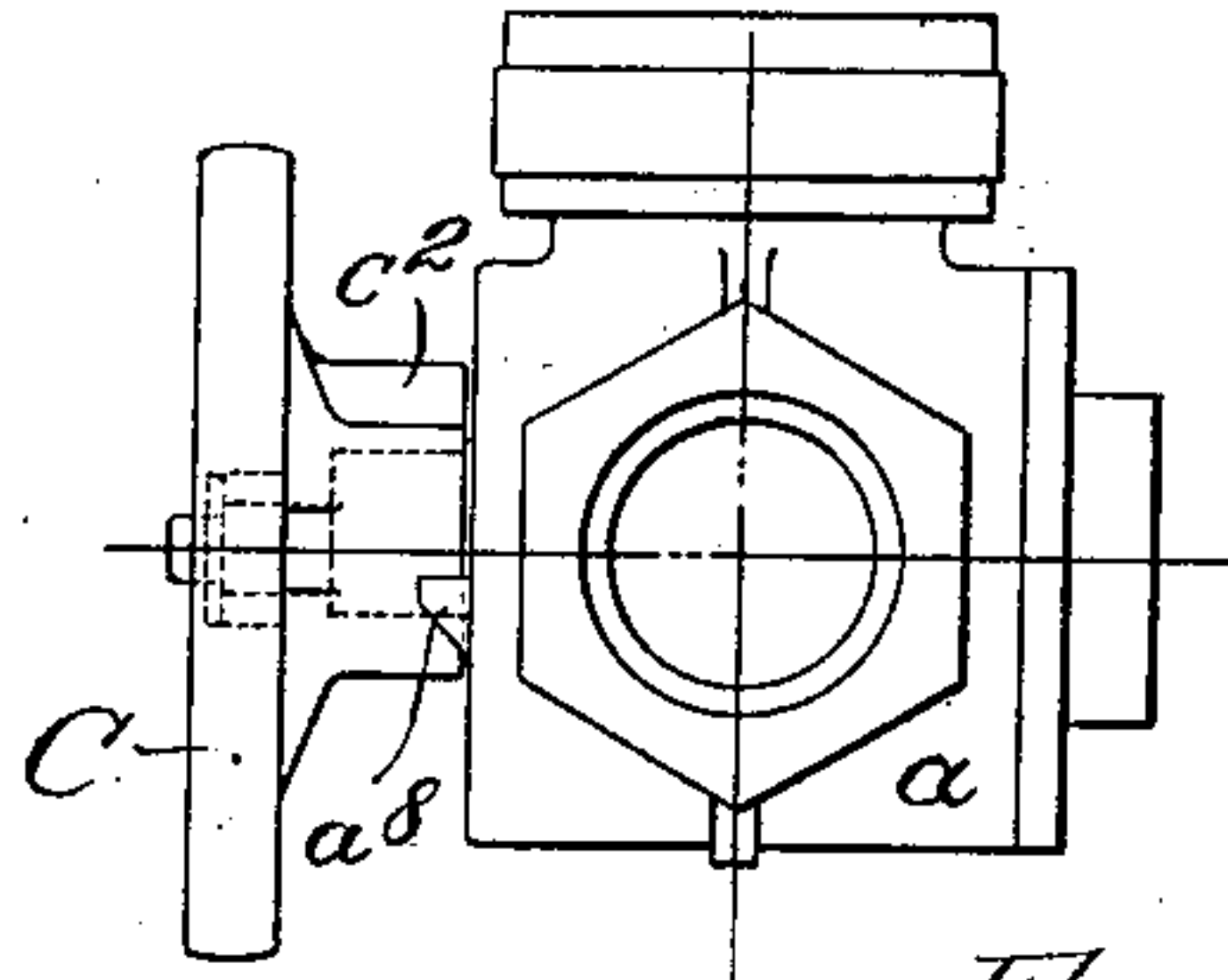


FIG. 2

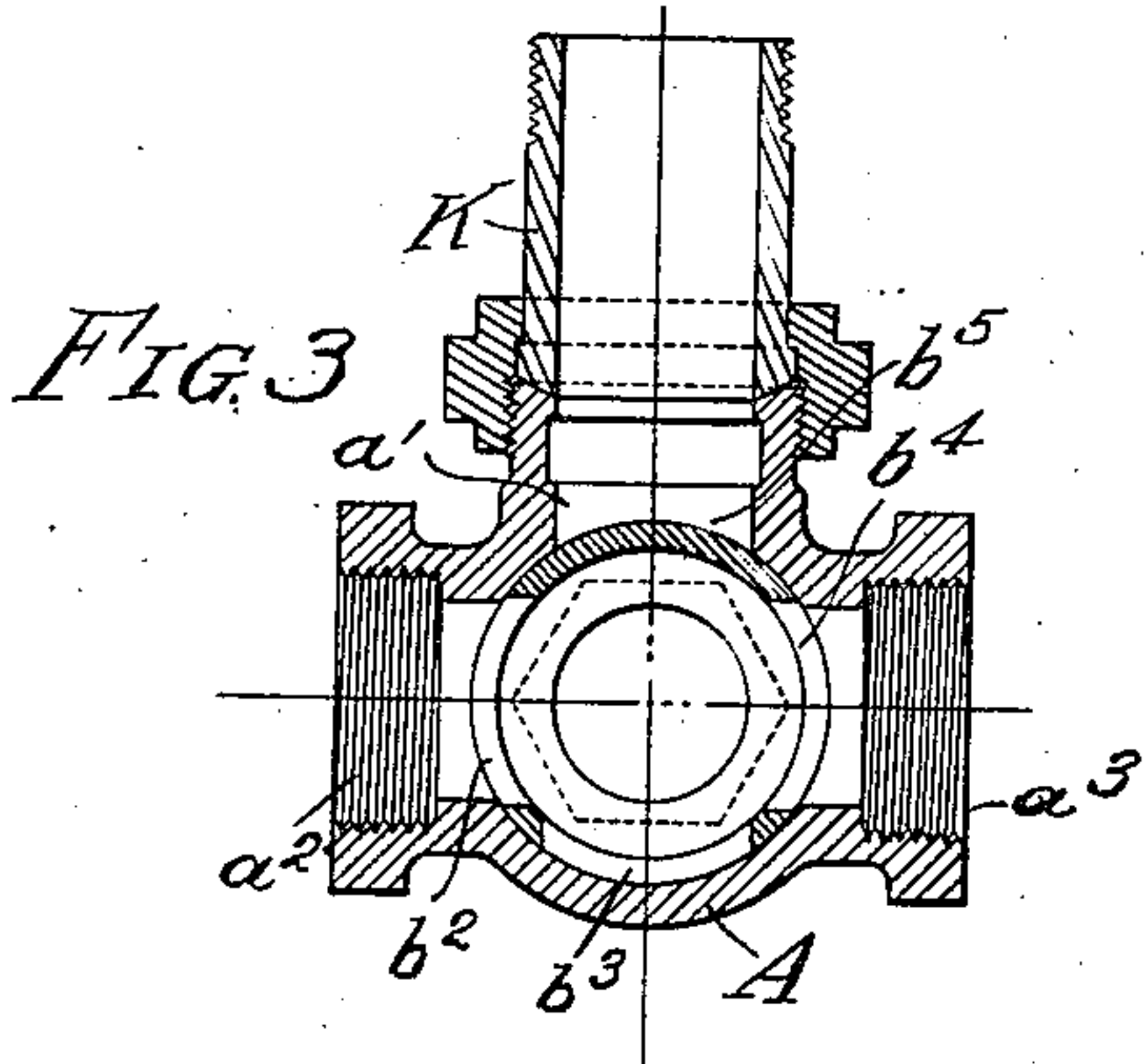


FIG. 3

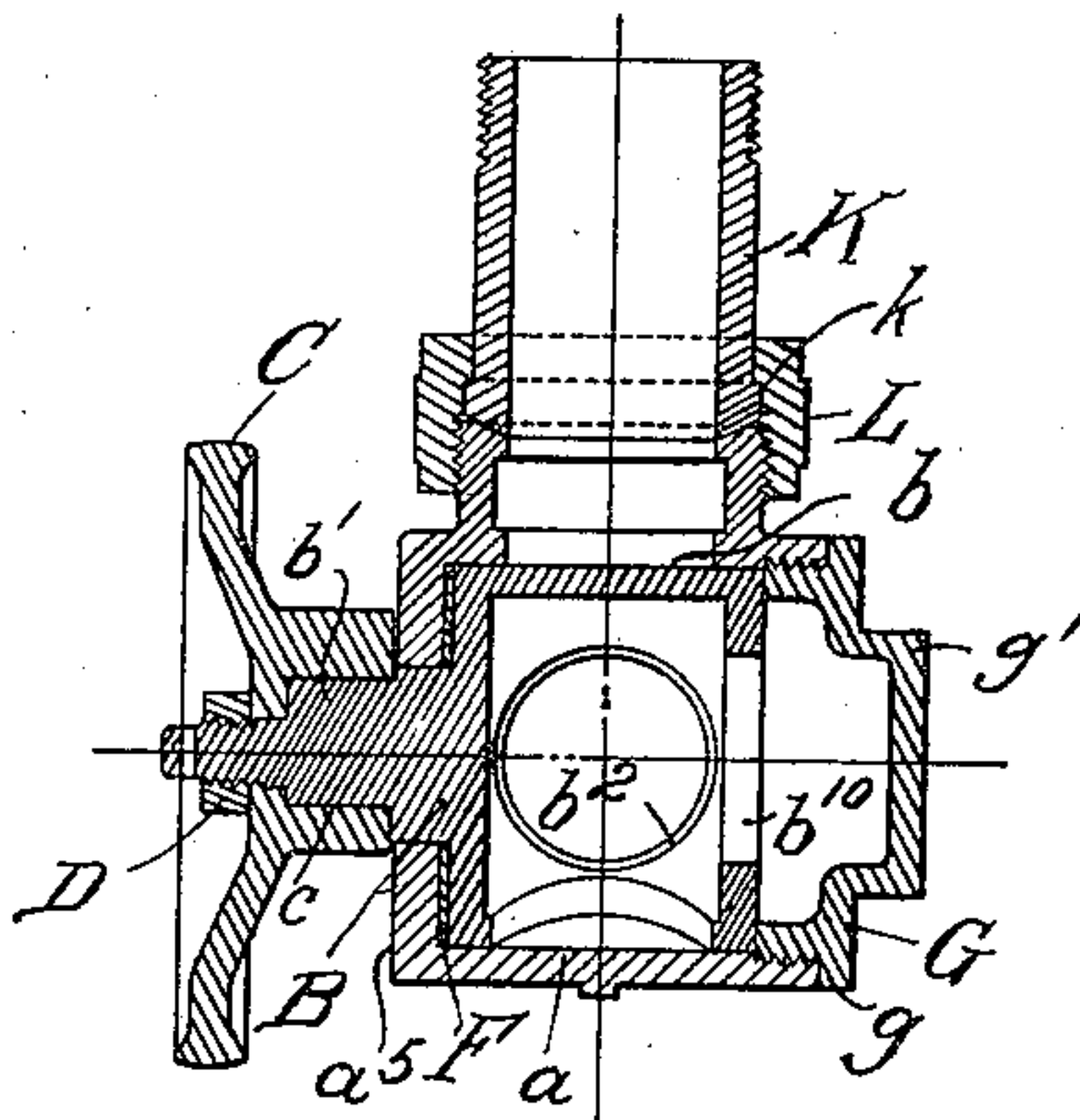


FIG. 4

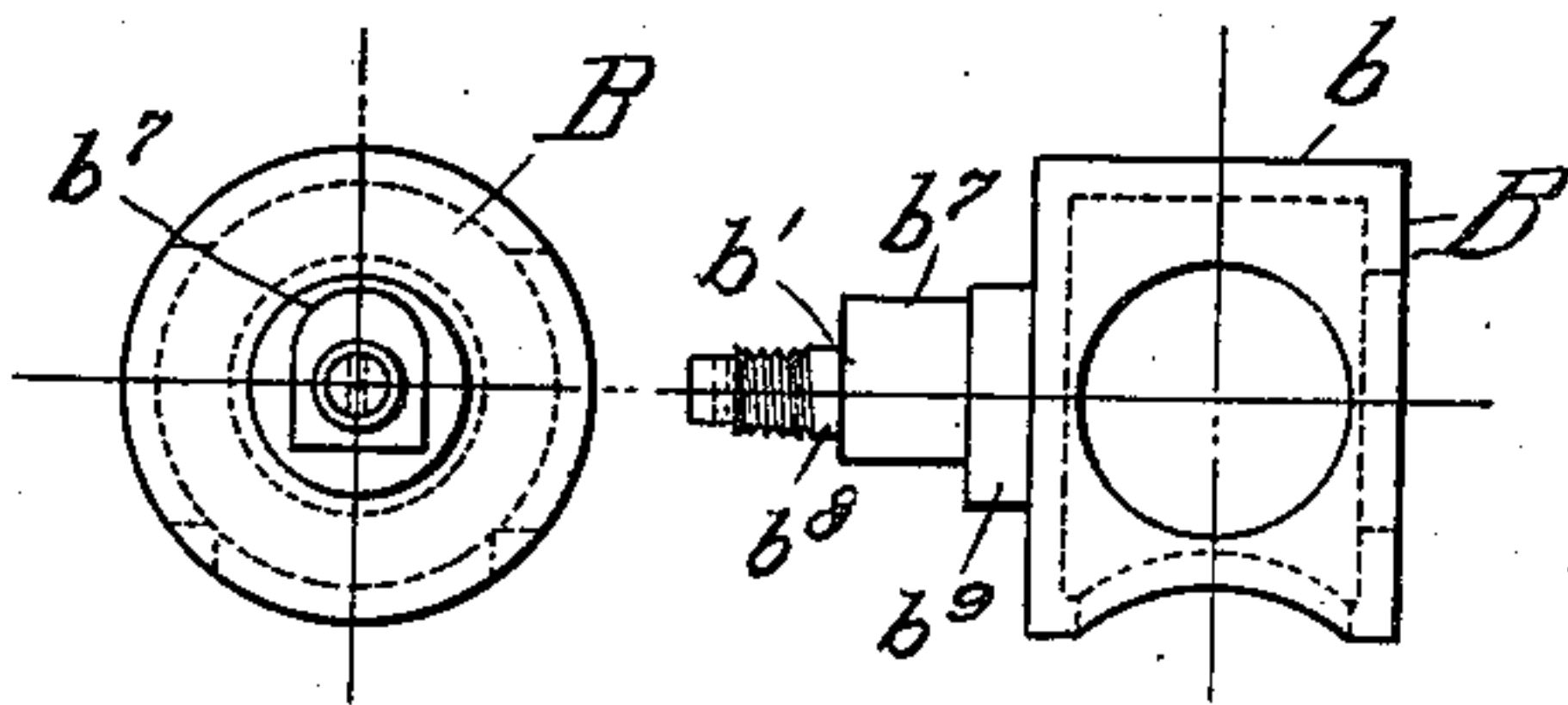


FIG. 5

FIG. 6

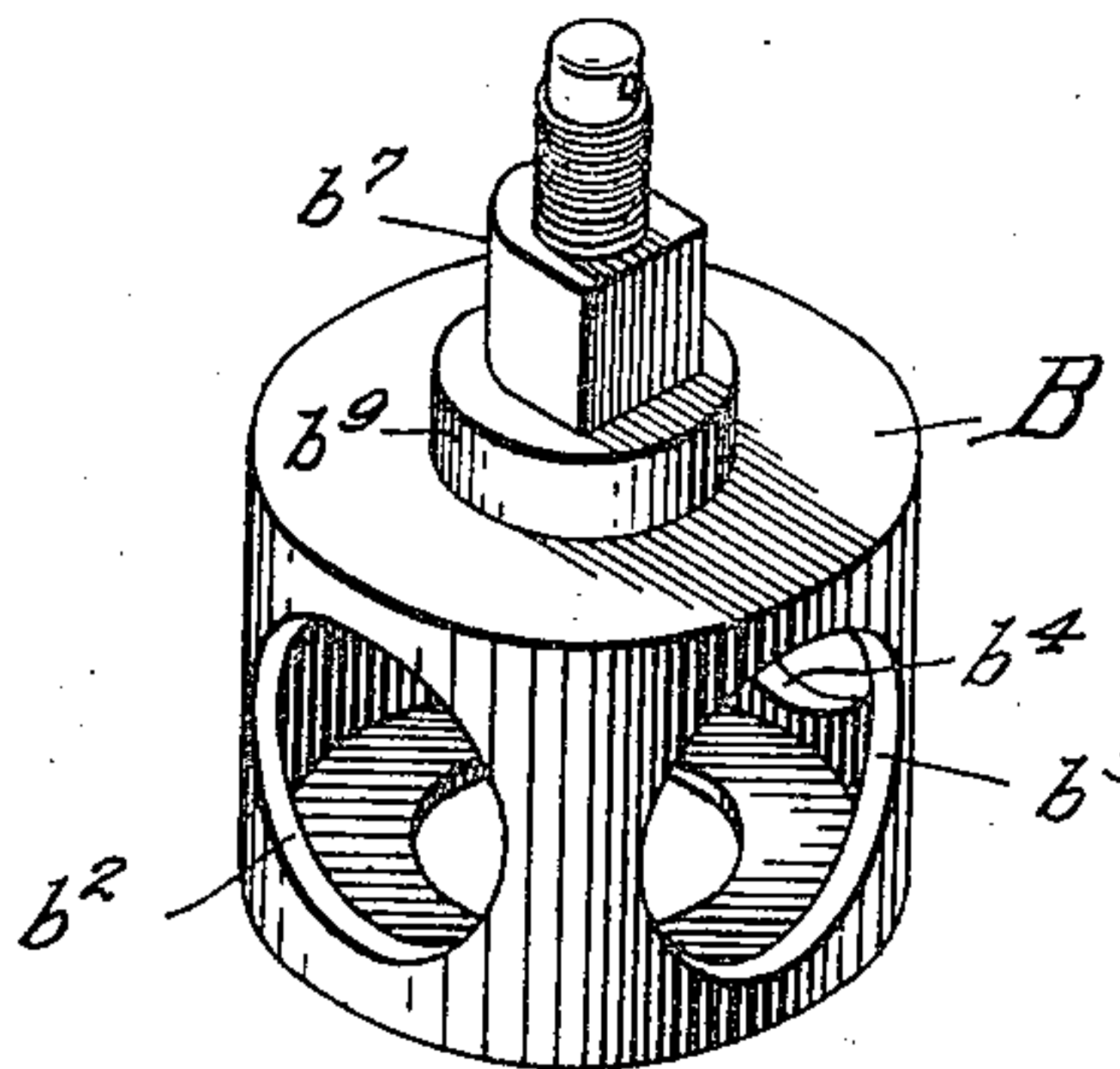


FIG. 7

WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## VALVE.

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952,691.

Application filed January 2, 1909. Serial No. 470,324.

*To all whom it may concern:*

Be it known that I, JOHN G. TALMAGE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide in a very simple form an efficient valve adapted to instantly establish unrestricted communication between two or more passageways.

My valve is particularly well adapted for a three-way valve. It is so devised that it is self-packing, without the necessity of a stuffing box. It is very easily operated and does not become locked from expansion due to passing fluid.

The valve is hereinafter more fully described and its essential characteristics set out in the claims.

The drawing shows my valve in an approved form.

Figure 1 is a front elevation thereof; Fig. 2 is a side elevation; Fig. 3 is a central section parallel with Fig. 1; Fig. 4 is a central section parallel with Fig. 2; Fig. 5 is a front elevation of the plug itself; Fig. 6 is a side elevation of such plug; and Fig. 7 is a perspective of the plug.

Referring to the parts by reference letters, A represents the casing which has a central cylindrical chamber  $a$  and tubular wings or branches extending therefrom, of which one is shown at  $a'$  and the others at  $a^2$  and  $a^3$ . Within the chamber  $a$  is the plug B which has a hollow cylindrical head  $b$  and a shank  $b'$  extending outwardly through an opening in the front wall  $a^5$  of the casing. The cylindrical head  $b$  of the plug has openings through its wall adapted to establish communication between the respective branches.

In the form shown, the valve is a three-way valve. Through the cylindrical wall of the plug are shown three openings  $b^2$ ,  $b^3$  and  $b^4$ . Each opening is of substantially the same diameter as the neck of the tubular wings. Two of the openings, as  $b^2$ ,  $b^4$ , are diametrically opposite each other, while the third opening,  $b^3$ , is intermediate of such two, the wall of the plug being solid diametrically opposite its third opening.

The plug is of such size that the openings

through its cylindrical wall may be of the same diameter as the passageways to and from the valve, while the solid wall  $b^5$  is large enough to bridge any of these passageways. The result is that the valve plug may be turned to shut off any of the passageways and couple the other two without restriction of the cross section of the passageway.

As shown in Fig. 3, the branch  $a'$  is shut off and the two branches  $a^2$  and  $a^3$  are in free and open communication through the plug. If the plug be turned ninety degrees in the right hand direction, the passageway  $a^3$  will be shut off and the branch  $a'$  be connected with the branch  $a^2$ . Similarly, if the plug be turned ninety degrees in the left hand direction from that shown in Fig. 3, the branch  $a^2$  is cut off and the branch  $a'$  is connected with the branch  $a^3$ . Any one of the branches shown may be an entrance and the other two exits. If, for example, the branch  $a'$  is the entrance branch, this will be closed when the plug is in the intermediate position as shown in Fig. 3, while turning the plug a quarter of a revolution in either direction will couple this entrance branch with either of the exit branches.

To enable the valve to be turned instantly, I provide on the shank  $b'$  a hand wheel C. This hand wheel is shown as having a hub  $c$  in which there is a non-circular recess which fits over a non-circular boss  $b^7$  on the shank  $b'$ . Through the center of the hand wheel is an opening through which extends a reduced portion  $b^8$  of the shank. This reduced portion is threaded beyond the hand wheel and carries a nut D locking the hand wheel, the nut being itself locked by a suitable cotter pin E.

On the hand wheel is a shoulder  $c^2$  which is adapted to abut either of a pair of lugs  $a^7$  and  $a^8$  on the front plate  $a^5$  of the casing. This shoulder and the lugs form limits to the movement of the hand wheel, allowing it to be instantly swung from one extreme position to the other and there stopped. By forming a suitable designation, as, for example, the word "Closed," on that portion of the hand wheel rim which is adjacent to the lug  $c^2$ , and some designation, as the word "Open," on the opposite side of the rim, the exact condition of communication within the valve is constantly shown. As appears in Fig. 1, the entrance branch  $a'$  is closed. When the hand wheel is turned to the left,



the exit branch  $a^2$  will be designated "Closed" and the branch  $a^3$ , "Open," and vice versa.

The shank of the plug has a cylindrical portion  $b^9$  between the non-cylindrical portion  $b^7$  and the head  $b$ . This cylindrical boss  $b^9$  is the portion that occupies the central opening in the front plate  $a^5$ . To make a tight joint and prevent leaking, I form an opening  $b^{10}$  through the rear end of the plug, which allows the fluid pressure within the plug to press it against the front plate  $a^5$ , making a tight joint. To relieve the friction, I insert a suitable anti-friction washer of fiber or other material F between the front end of the head  $b$  and the inner face of the front wheel  $a^5$ . The rear side of the chamber  $a$ , which is openable without restriction to allow the installation of the plug, is, in use, closed by a cap-plug G, which is shown as screwing into this portion of the chamber and having a flange  $g$ , abutting the end of the casing and limiting the inward movement,—the inner edge of the cap abutting the valve plug. This cap plug has a hexagon or other angular head  $g'$  by which it may be screwed in by a suitable wrench. The cap-plug not only closes the casing but holds the valve against the washer with desired snugness.

The pipes communicating with the valve may be coupled with it in any suitable manner. As shown, the branches  $a^2$  and  $a^3$  are internally threaded to secure pipes screwing thereinto. The branch  $a'$  is shown in Figs. 2 and 3, as having a suitable face to receive a nipple K which is provided with a flange  $k$  by which it may be held to the valve by a usual collar L overhanging the flange and screwing onto the outer side of the neck  $a'$ .

From the above description, it will be seen that my valve is extremely simple in construction; is cheaply made, and its various parts easily assembled, or disassembled, when desired. The fluid pressure keeps a tight joint where the shank passes out of the casing so that no stuffing box is required. By having the plug large, as shown, the openings through it may be of the same size as the passageways to and from the plug so that there is no restriction by the plug. The plug being cylindrical, it does not bind to the casing when it expands by heat. The hand wheel furnishes means for instantly changing the presentation of the plug and shows at all times the condition of communication.

Having thus described my invention, what I claim is:

1. In a valve, the combination of a casing having a cylindrical chamber with round entrance and exit passageways and an unrestricted rear, a cylindrical plug within the chamber having round entrance and exit openings through the cylindrical wall there-

of and adapted to be passed into such chamber from the rear, such openings having cross sections substantially as great as the cross sections of the passageways, said plug having parallel flat ends one of which bears against the front wall of the casing, and a removable closure for the casing bearing against the rear end of the plug.

2. In a valve, the combination of a casing having a cylindrical chamber unrestricted at the rear and reduced at the front by a solid wall of the casing having an interior plane face, a cap-plug screwing into the rear end of said chamber and having a flange abutting the rear edge of the casing, a valve plug within the casing engaged by the inner edge of the cap-plug, said valve plug having a shank extending through the front wall of the casing, and a flat packing washer surrounding the shank between the end of the plug and the inner face of the casing front.

3. The combination of a casing having an entrance and two exit passageways all communicating with a central cylindrical chamber, said chamber having an unreduced opening at the rear of the casing and having a central reduced opening through the front wall of the casing, a valve plug having a head adapted to occupy such chamber and having a shank adapted to pass through the opening in the front wall, means adapted to engage the shank in the front of the casing for turning the plug, and a closure for the rear end of the chamber, there being openings through the wall of the plug and through the rear end thereof.

4. The combination of a casing having a chamber and entrance and exit passageways communicating therewith, a plug occupying such chamber and having a shank passing through an opening in the wall of the chamber, a packing washer surrounding such shank and lying between the head of the plug and the inner face of such casing wall, entrance and exit openings into the plug, and an opening through the end of the plug to enable internal pressure to press it toward the washer.

5. The combination of a casing having a chamber and entrance and exit passageways communicating therewith, a plug occupying such chamber and having a shank passing through an opening in the wall of the chamber, a packing washer surrounding such shank and lying between the head of the plug and the inner face of such casing wall, entrance and exit openings into the plug, and an opening through the end of the plug to enable internal pressure to press it toward the washer, and a screw threaded closure for closing the rear end of the casing.

6. In a valve, the combination of a casing having a cylindrical chamber, a pair of in-



ternally threaded tubular wings communi-  
cating therewith and on diametrically op-  
posite sides of the chamber; an intermediate  
tubular wing communicating with the cham-  
ber; a cylindrical plug occupying such  
chamber and having two diametrically op-  
posite round openings through its wall and  
an intermediate round opening, which open-  
ings are adapted to unrestrictedly communi-  
cate with said tubular wings, said plug hav-  
ing a central shank extending forwardly  
through a central opening in the front wall  
of the casing, means on said shank in front  
of the casing for turning the plug, said

chamber opening unrestrictedly at the rear  
of the casing, and a closure for said rear  
opening adapted to abut the rear end of the  
plug and hold it pressed toward the front  
wall, and an anti-friction washer between  
the front end of the plug and the rear face  
of said front wall. 15 20

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

JOHN G. TALMAGE.

Witnesses:

ALBERT H. BATES,  
BRENNAN B. WEST.