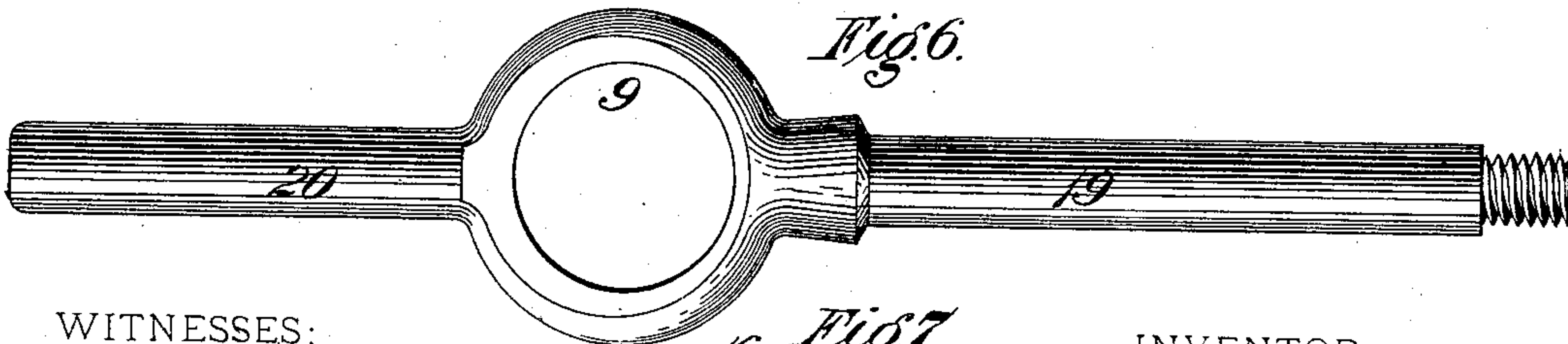
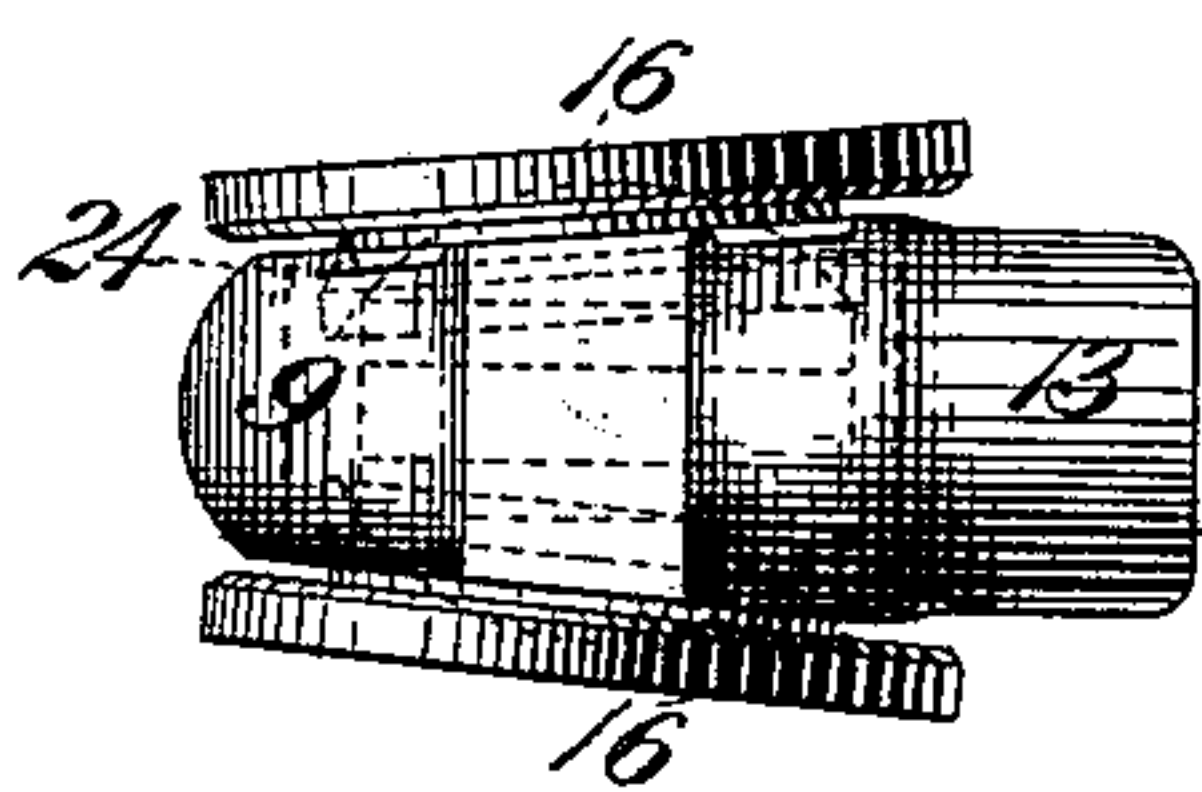
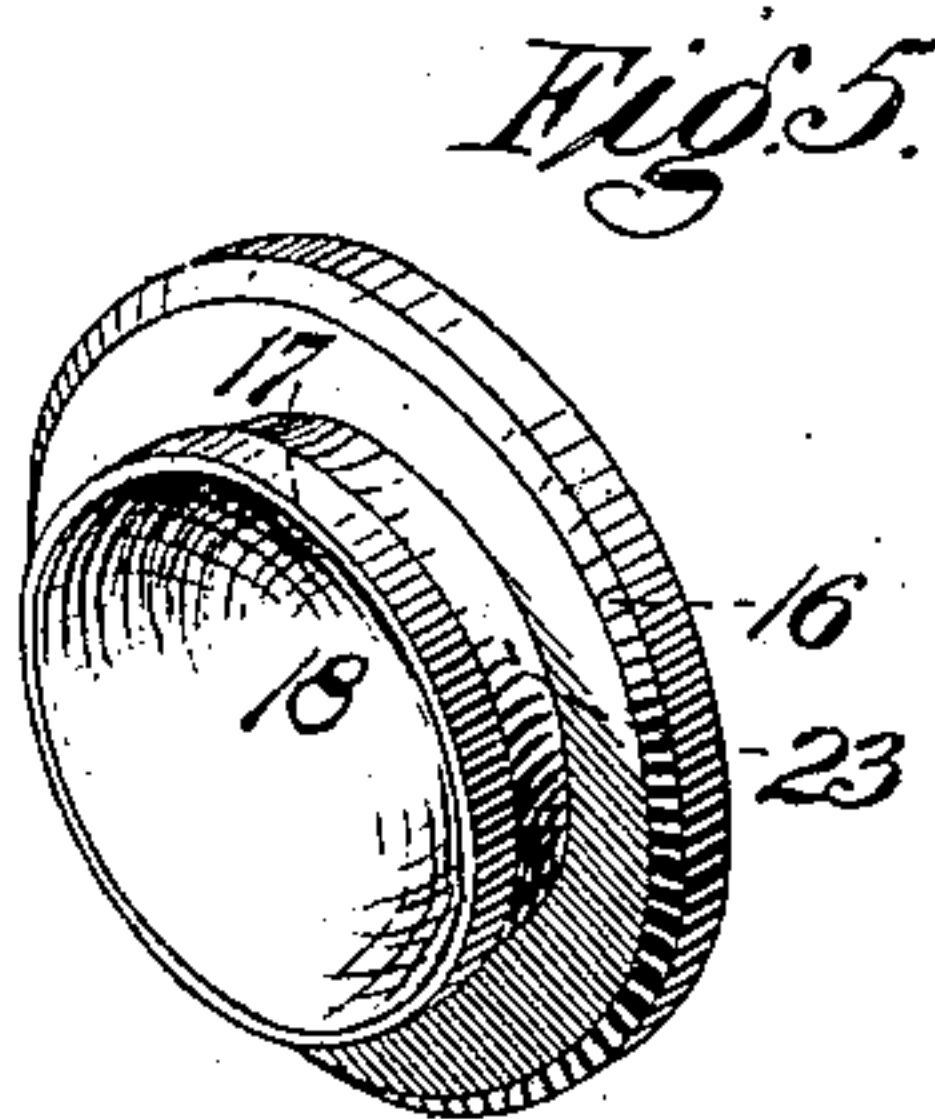
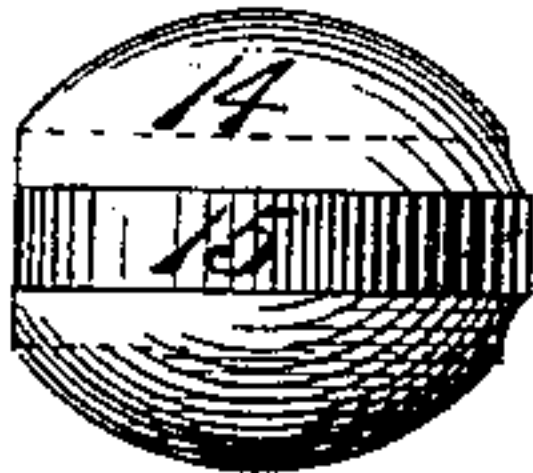
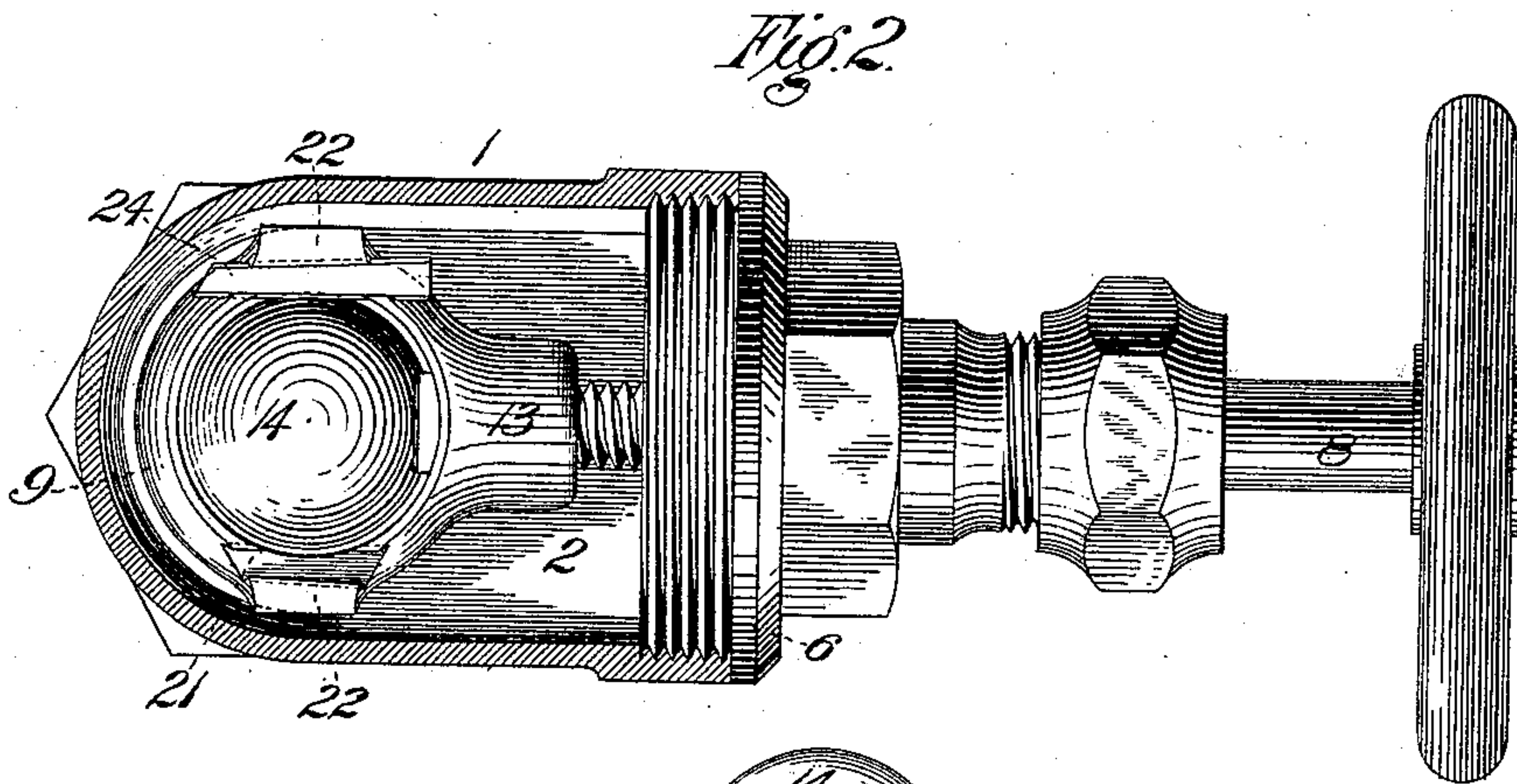
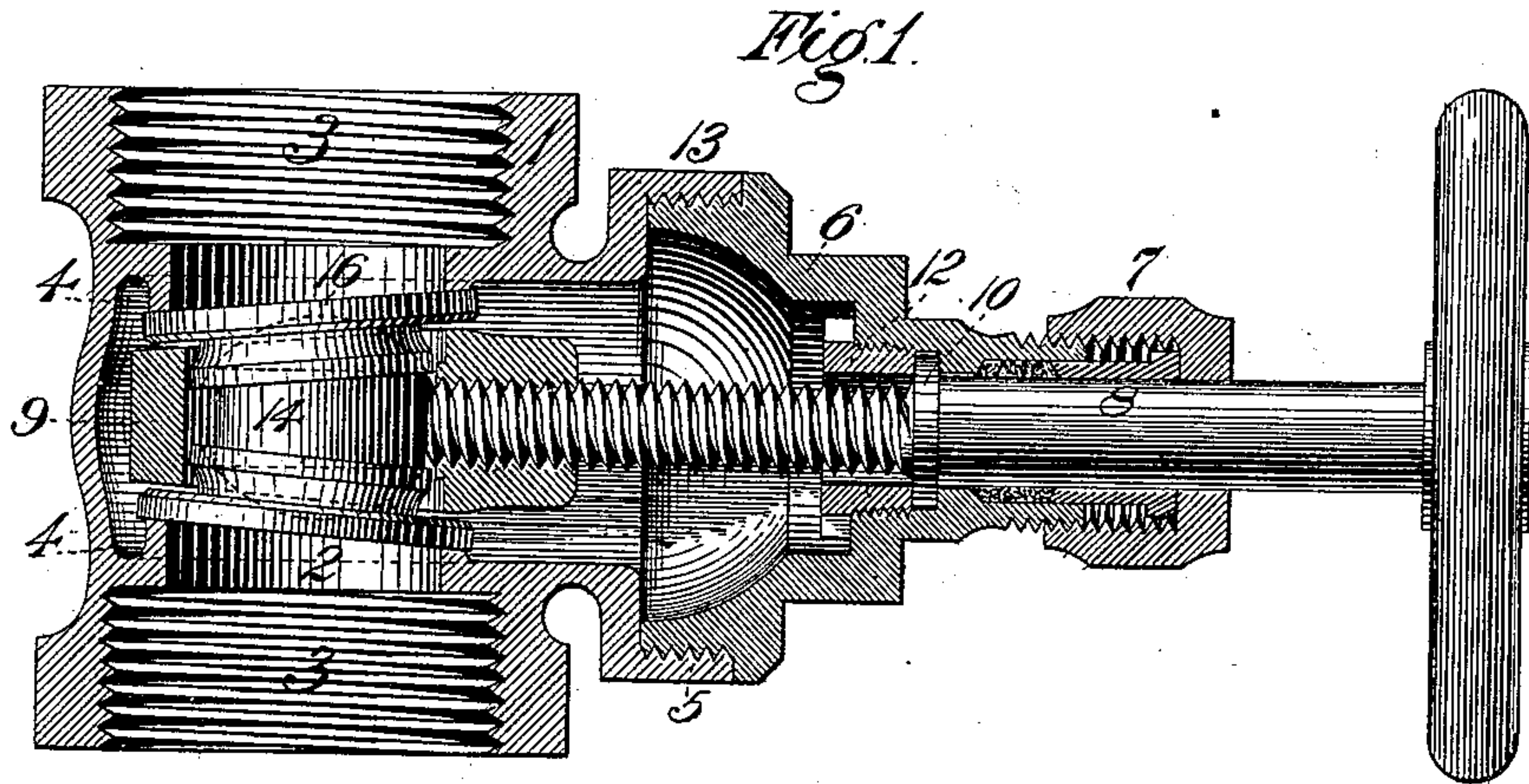


(No Model.)

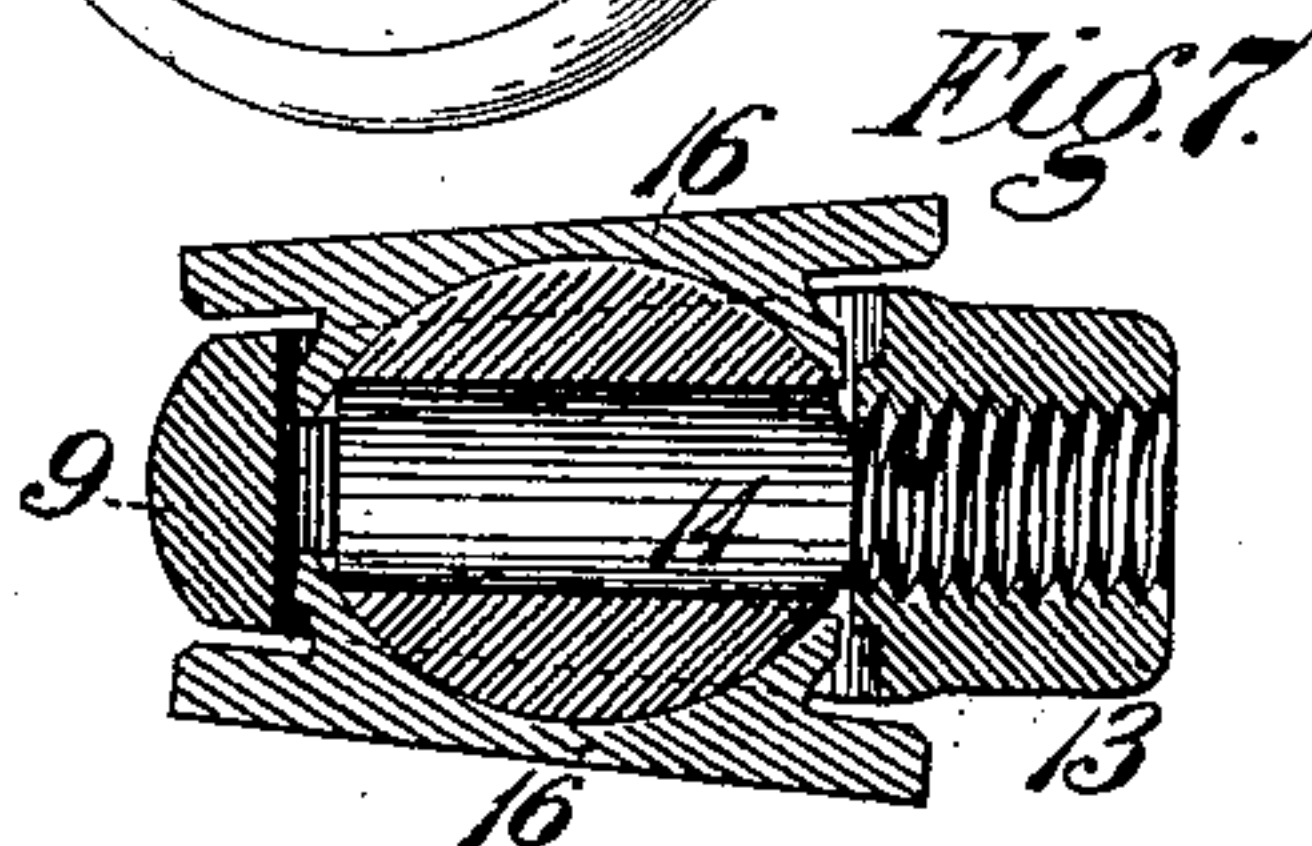
J. OLD.
SLIDING GATE VALVE.

No. 332,939.

Patented Dec. 22, 1885.



WITNESSES:
Samuel S. Wolcott
C. M. Clarke



INVENTOR.
James Old.
BY George H. Christy
ATTORNEY.

UNITED STATES PATENT OFFICE.

JAMES OLD, OF ALLEGHENY, PENNSYLVANIA.

SLIDING GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 332,939, dated December 22, 1885.

Application filed March 13, 1885. Serial No. 158,675. (No model.)

To all whom it may concern:

Be it known that I, JAMES OLD, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Gate-Valves, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a central sectional view of my improved form of gate-valve. Fig. 2 is an end elevation, partly in section, of the valve. Fig. 3 is an edge view of the ball-bearing. Fig. 4 is an edge view of the supporting-yoke with the ball-bearing and valve-plates in place. Fig. 5 is a perspective view of one of the valve-plates. Fig. 6 is a side view of a modified form of supporting-yoke. Fig. 7 is a sectional elevation of the yoke and valve-disks.

My invention relates to that class of valves termed "gate" or "straightening" valves, in which the valve-disks are wedged against their seats by a movement of the supporting-yoke at right angles to the flow of the fluid through the valve case; and the object of my invention is to so construct the disks, their bearings, and the supporting-yoke as to permit entire freedom of movement of the disks in their seating movement, thereby allowing said disks to accommodate themselves to any irregularities of the seats.

Within the case 1, which is of the usual form, is provided a valve-chamber, 2, opening on two sides into the sockets 3, into which are inserted the ends of pipes. The inner surfaces of the walls of these openings from the valve-chamber form annular seats 4 for the valve-disks, said seats being formed at an angle to each other and converging at the lower end of the valve-chamber, as shown in Fig. 1.

The top of the case is provided with a threaded socket, 5, for the reception of the cap 6, and in the upper portion of said cap is formed the stuffing-box 7. Through the stuffing-box and cap passes the valve-stem 8, provided at its lower end with suitable threads for engagement with the yoke 9. On the valve-stem above the screw-threads is formed a collar, 10, constructed to fit in a socket in the cap 6, said collar being held loosely within

the socket by the annular nut 12, and thereby locking the valve stem as against longitudinal movement, but permitting of perfect freedom as to rotary movement.

The yoke 9, which consists of an annular piece of metal, is provided with an interiorly-threaded knob or projection, 13, into which screws the threaded portion of the valve-stem 8, and by the rotation of the stem which is held as against longitudinal movement, as above stated, the yoke is drawn up into the upper part of the valve-chamber. Within the yoke 9 is placed the ball-like bearing, consisting of two segments, 14, of a globe or ball arranged on opposite sides of a disk, 15, said disk and segments being formed in one piece, as shown, by which construction as perfect freedom of movement of the valve-disks on the bearings 14 is attained as if a complete sphere or globe was used, and a considerable saving of space is attained.

The valve-disks or plates 16 are made of a size somewhat larger than the openings between the valve-chamber and the sockets 3, and are provided on their rear sides with projections 17, in which are formed the curved recesses 18, for the reception of a portion of the ball-bearing 14, the curvature of the sides of said recess being the same as that of the ball. One of these disks is placed on each side of the yoke, as shown, the curved portion of the ball projecting into and bearing upon the sides of the recess 18 in the projection 17 of each disk, the length of projections 18 and the diameter of the ball in line with such projections being so proportioned with relation to the thickness of the annular portion of the yoke that the disks will have considerable vibratory movement or play on the ball-bearing. The projections 18 serve as bearings or journals for the support of the disks in the yoke, as clearly shown in Fig. 1.

The yoke, ball, and disks having been placed together, as shown in Fig. 4, they are placed within the valve-chamber, the disks bearing against the seats 4 in said chamber. These seats at their tops are such a distance apart that the disks will stand nearly parallel when raised, so as to permit the fluid to pass through the valve-chamber; but when the yoke is forced down the disks are caused to rotate on the ball-bearing by the inclined

seats 4, and assume a wedge shape, as in Figs. 1 and 4, and by the time the yoke has reached the lower part of the valve-chamber and the disks cover the openings between said chamber and the end sockets of the valve-case said disks will have been forced tightly against the seats 4. In making the valve-case sufficient space should be allowed in that portion of the valve-chamber below the seats 4 to allow of the yoke being forced farther down as the seats or valves wear, and thus insuring a tight seating of the valve.

When a screw-stem is employed for raising and lowering the yoke, as shown in Figs. 1 and 2, an opening (shown in dotted lines, Fig. 3) somewhat larger than the diameter of such stem should be formed through ball-bearing for the reception of said stem when the yoke is raised; but when a sliding stem, 19, (either with or without the lower guide, 20, as shown in Fig. 6,) is employed the hole or opening through the ball may be omitted. In case the lower guide-stem, 20, is employed an opening provided with a suitable stuffing-box is made through the lower end of the valve-chamber.

In some instances it is desirable that the disks should be so secured to the yoke as to prevent their being lost when taken out of the case or becoming displaced while within the case. I therefore form undercut grooves 21 in lugs 22, formed on the side of the annular portion of the yoke, and a circular groove, 23, around the projection 17 on the valve disks or plates, said grooves in the yoke and disks being in line when the latter are in position, and then into said grooves is slid the key 24, thereby locking the disks and yoke together. The groove 23 should be so constructed as to permit free movement, either rotary or vibratory, of the disks.

I am aware that valve-disks with concave inner seats have been combined with an operating-stem having semi-spherical projections which played in the disk-seats, so that in connection with the valve-seats proper the valves responded to movements of the stem; but in such cases there was no connection be-

tween the disks and the stem, except one of surface-contact. In my present improvement I add a jointed connection from one to the other. Thereby they are held together when detached or separate from the case, either before being put into the case or after being taken out, which element in the fitting up, putting together, and taking apart for repairs or other purposes is one of importance and evident utility.

I claim herein as my invention—

1. In a gate-valve, a case having inclined valve-seats, in combination with a reciprocating yoke having wedge-shaped sides, a bearing having convex ball-shaped sides loosely mounted in said yoke, the two disks arranged outside of the yoke on opposite sides thereof, and provided with concave seats for the reception of the ball-bearing, substantially as set forth.

2. In a gate-valve, the combination of a yoke, a disk on each side of the yoke, a ball-and-socket bearing back of each disk, and a jointed connection uniting or tying each disk to the yoke independently of the valve-seat bearing, substantially as set forth.

3. In a gate-valve, a reciprocating yoke, in combination with valve-disks 16, provided with journal projections 17, adapted to fit within the yoke, a ball-bearing arranged between the disks and within the yoke and the key 24, engaging the disks and yoke and serving to hold them in loose connection, substantially as set forth.

4. In a gate-valve, a reciprocating yoke having guide-stems 19 and 20, arranged on opposite sides thereof, in combination with a bearing having convex sides, and two valve-disks arranged one on each side of the yoke and provided with convex seats for the reception of the ball-bearing, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JAMES OLD.

Witnesses:

DARWIN S. WOLCOTT,
R. H. WHITTLESEY.