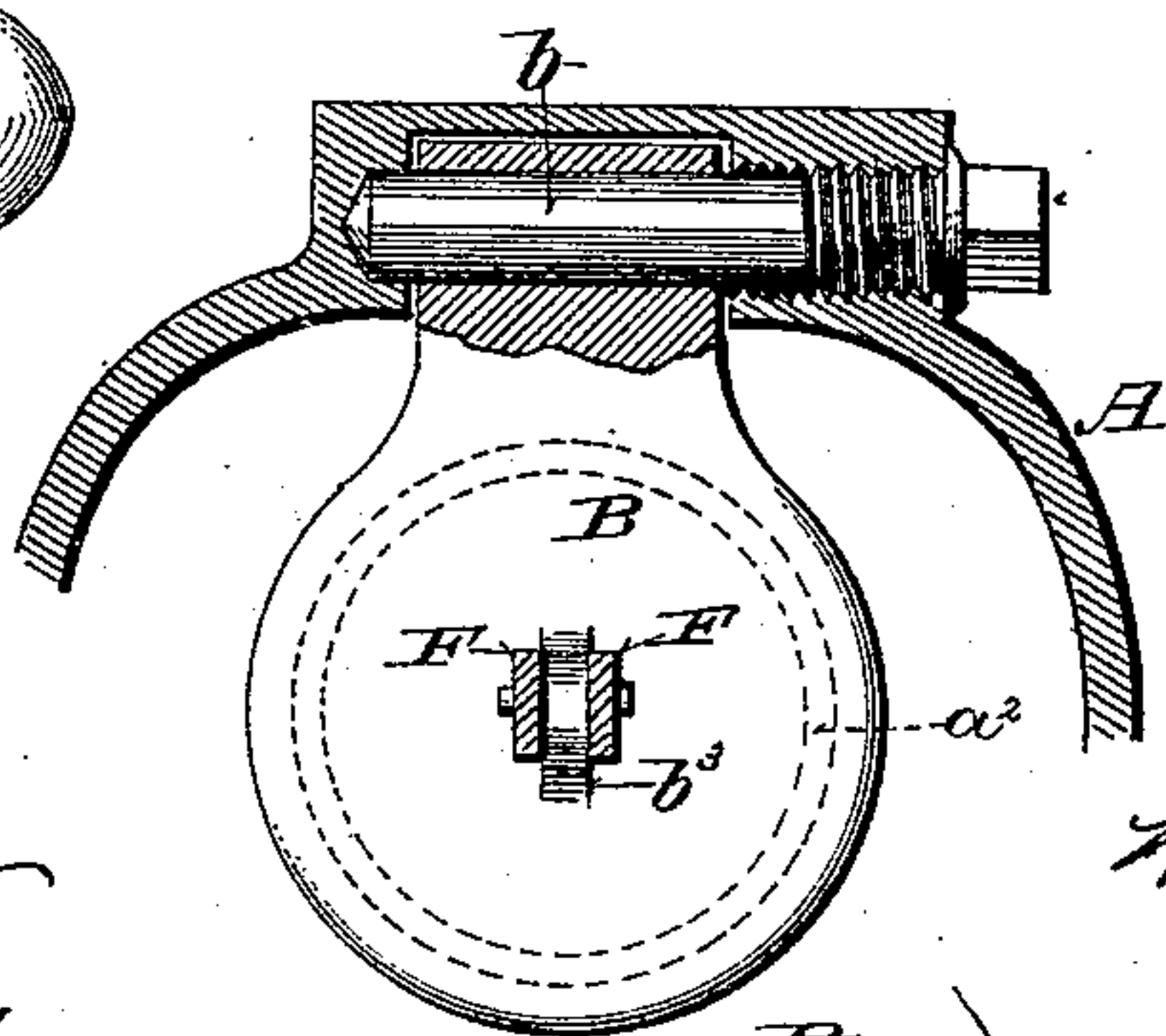
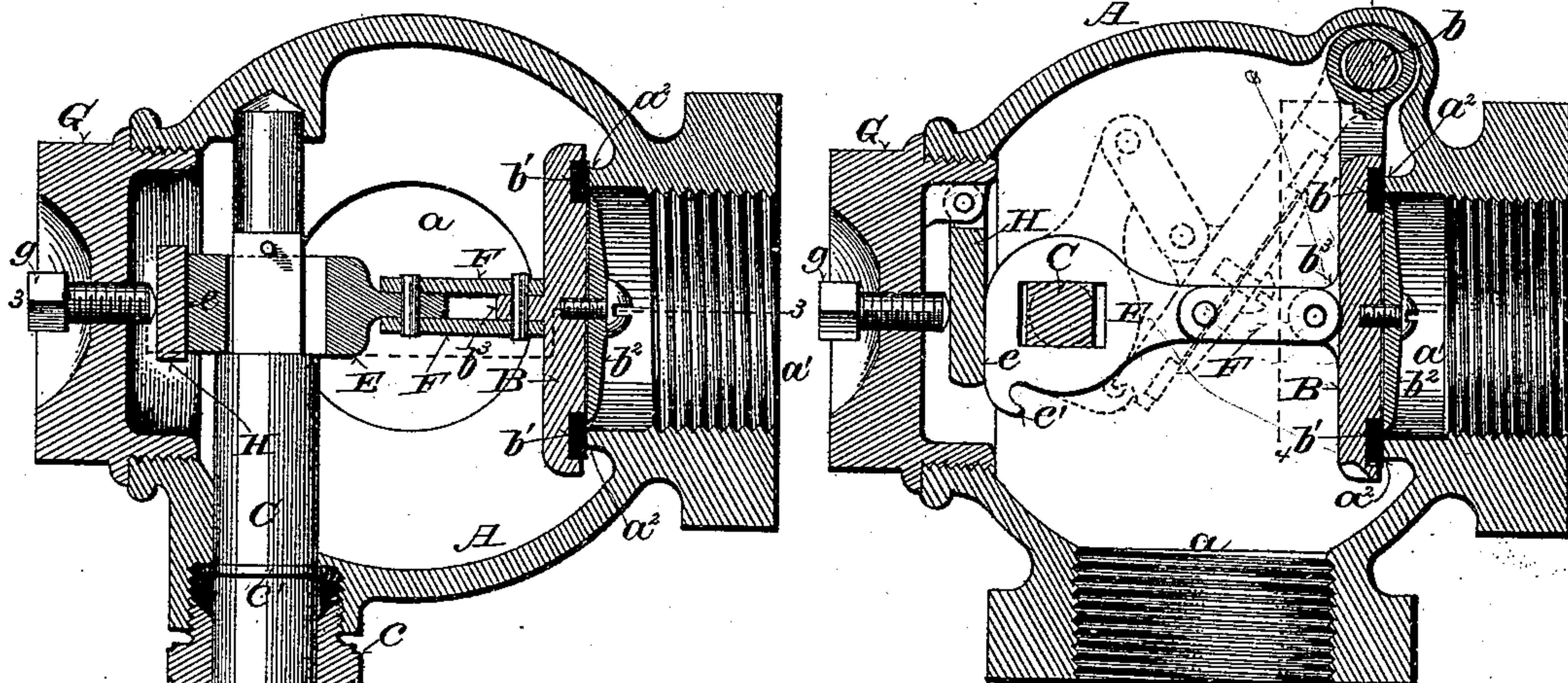
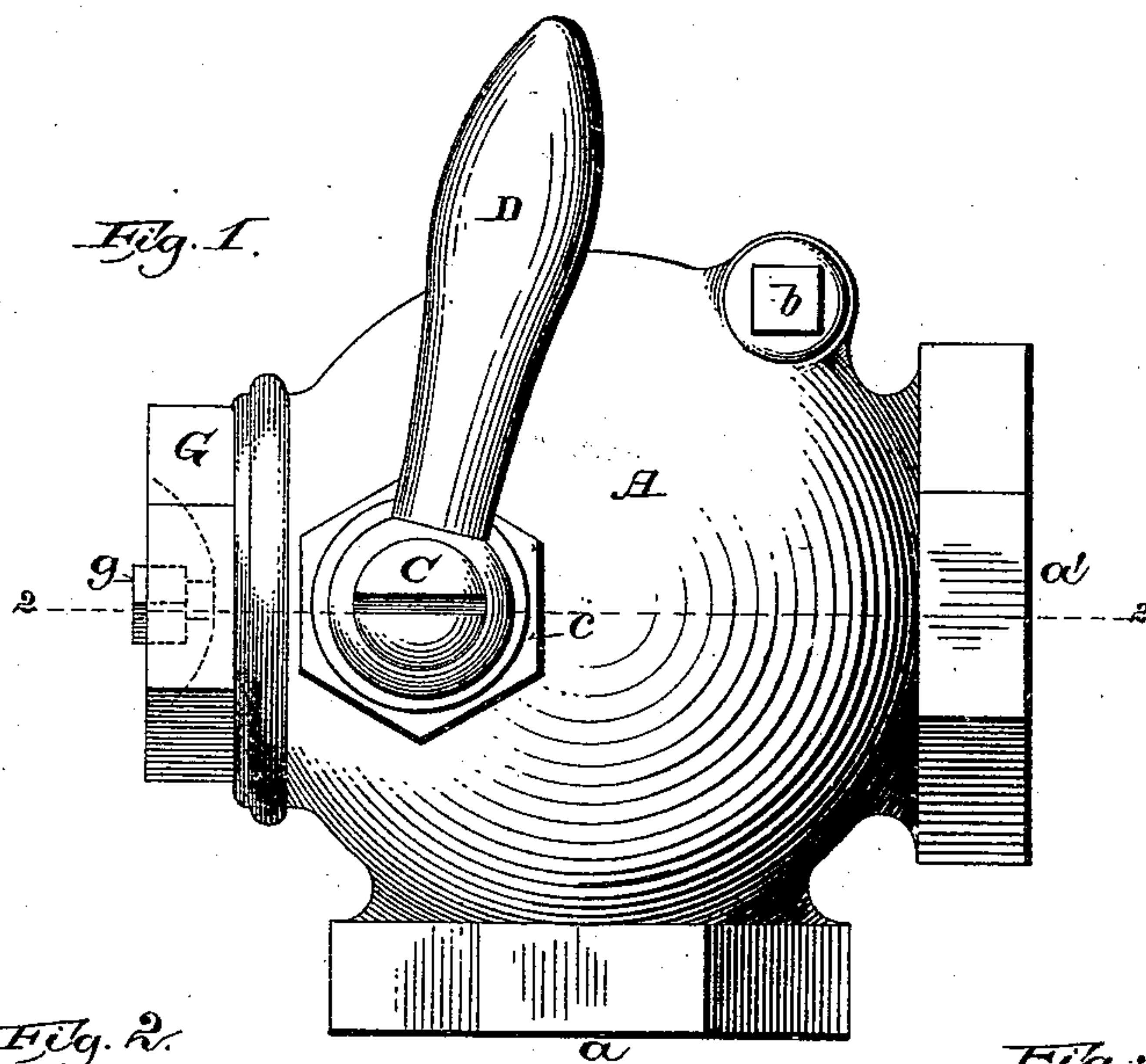


(No Model.)

W. H. CRAWFORD.
VALVE.

No. 446,059.

Patented Feb. 10, 1891.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM H. CRAWFORD, OF OSHKOSH, WISCONSIN.

VALVE.

SPECIFICATION forming part of Letters Patent No. 446,059, dated February 10, 1891.

Application filed June 20, 1890. Serial No. 356,124. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. CRAWFORD, of Oshkosh, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Valves; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The main objects of my invention are to quickly and easily open and close a hinge or flap valve and to provide for taking up wear.

It consists of certain peculiarities of construction and arrangement hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings, like letters designate the same parts in the different figures.

Figure 1 is a side elevation of a valve embodying my improvements. Fig. 2 is a horizontal section of the same on the line 2 2, Fig. 1. Fig. 3 is a vertical section on the line 3 3, Fig. 2; and Fig. 4 is a vertical section on the line 4 4, Fig. 3.

A represents the valve-case, of any suitable shape and construction, having the usual induction and eduction openings a a' , screw-threaded for attachment to pipes, &c. Around the eduction-opening a' is formed within the valve-case the annular valve-seat a^2 .

B is a disk-shaped valve hinged inside of the valve-case upon a pin b , so as to swing against the seat a^2 and close the eduction-aperture a' . It is preferably formed with an annular groove, in which is inserted a ring b' , of hard rubber or other suitable packing material, which bears, when the valve is closed, against the seat a^2 . This ring is held in place in said groove by a disk b^2 , attached to the valve and projecting at its edges over said groove. In the opposite side of the valve-case and parallel with the pin b , upon which the valve hinges, is journaled a spindle C, which passes outwardly through a stuffing-box c in the valve-case, and is provided at its protruding end with a handle D, which

may be made in the form of a lever, hand-wheel, or of other suitable shape. Within the valve-case the spindle C is squared, and upon the squared portion thereof is mounted a crank-arm E, which is connected by links F F with an ear b^3 on the inner face of the valve B. The crank-arm E and links F F constitute a toggle-joint connection between the valve B and the spindle C.

In line with the eduction-opening a' the valve-case A is formed with a threaded aperture, in which is screwed a plug or cap G, having a threaded perforation, in which is inserted an adjusting-screw g . This adjusting-screw bears at its tip against an adjustable bearing-piece H, which is hinged to the inside of the cap G, or otherwise suitably held inside of the valve-case against the hub of the arm E, which is rounded on one side to permit of being turned against said bearing-piece in one direction, and squared at e to abut against said bearing-piece and arrest the movement of said arm when it is brought into line with the links F F for closing the valve, as shown in Fig. 3.

It is obvious that the relative positions of the induction and eduction connections of the valve may be reversed, so that the valve-disk B will open with and close against pressure, which may thus be utilized instead of a spring or other equivalent device for opening the valve. To prevent the pressure against the valve-disk, when it is desired to keep the same closed, from causing the toggle-lever to knuckle, and thereby release the valve-disk, the middle joint is preferably arranged to pass slightly beyond a straight line intersecting the points of connection of the toggle-lever with the valve-disk B and spindle C.

Instead of hinging the bearing-piece H to the cap G, it may be swiveled on the end of and supported by the adjusting-screw g . The squared aperture in the hub of the arm E is made oblong, so as to permit of its movement in the direction of said arm upon the squared portion of the stem C, for the purpose of taking up wear upon the valve and its seat, which is effected by advancing the screw g and the bearing-piece H. To permit of this adjustment and to preserve the proper position of the valve B with reference to its seat a^2 , the

hole in said valve through which the pin *b* passes is extended laterally, as shown in Fig. 3.

To prevent the accidental closing of the valve *B*, I may provide a notch or depression in its lower edge and a hook or detent *e'* on the hub of the arm *E* to engage with said notch or depression when the valve is open, as shown by dotted lines in Fig. 3. A partial turn of the spindle *C* suffices to open the valve and a like turn in the opposite direction closes it.

When the arm *E* and the links *F F* approach the same straight line inclosing the valve, they exert an increased leverage, which forces the valve snugly against its seat, and when they are brought into line they lock the valve closed.

I prefer to form the cap *G* with a depression to receive the head of the adjusting-screw *g* and prevent the same from projecting beyond the outside surface of the valve-case *A*. The spindle *C* may be formed with a rib or shoulder *c'* in the stuffing-box *c* to retain it in place in the valve-case. The force exerted through the toggle-joint against the valve *B* inclosing the same, being received by the bearing-piece *H*, and not by the spindle *C*, on which the arm *E*, constituting a portion of the toggle-joint, is mounted, it is not necessary that the spindle *C* should have a bearing at its inner end in the valve-case, as shown in Fig. 2.

The removable cap *G* affords access to the interior of the valve for the purpose of repairing or adjusting the inclosed parts. The pin *b*, upon which the valve *B* is hinged, may be conveniently screw-threaded and squared at one end, so as to plug the outer end of the hole in the valve-case, through which it is inserted, as shown in Fig. 4.

Various changes may be made in the details of my improved valve without affecting its mode of operation or departing from the spirit of my invention.

I claim—

1. In a valve, the combination of the valve-case, a valve-disk hinged to said case so as to swing to and from its seat, a spindle projecting through the valve-case, and a toggle-lever consisting of an arm on said spindle within the valve-chamber and a link connecting it directly with the valve-disk, said arm being adjustable in the direction of its length on said spindle to take up wear and cause the valve-disk to be properly seated, substantially as and for the purposes set forth.

2. In a valve, the combination of the valve-case, a valve-disk, a spindle projecting through the valve-case, a toggle-lever consisting of an arm capable of longitudinal movement on said spindle and of a link connecting it with the valve-disk, and a bearing-piece with which the hub of said arm engages in closing the valve, substantially as and for the purposes set forth.

3. In a valve, the combination of the valve-case provided with a suitable seat, a valve hinged therein at one side of said seat, so as to swing against the same and close the adjacent opening, a spindle projecting through the valve-case and provided on the outside with a suitable handle and on the inside with an arm capable of play in the direction of its length on said spindle and linked to said valve, and an adjustable bearing-piece held against said arm by an adjusting-screw which projects outside of the valve-case, substantially as and for the purposes set forth.

4. In a valve, the combination of the valve-case provided with a suitable seat, a valve having a loose hinged connection with the inside of said case at one side of said seat, a spindle passing through the valve-case and provided on the outside with a suitable handle and on the inside with an arm capable of movement thereon in the direction of its length and linked to the valve, an adjustable bearing-piece held in engagement with the hub of said arm, which is rounded to permit of its being turned against the same, and an adjusting-screw by which said bearing-piece is advanced to take up wear on the valve and its seat, substantially as and for the purposes set forth.

5. In a valve, the combination of the valve-case, a valve-disk, a spindle projecting through the valve-case, a toggle-lever consisting of an arm on said spindle, having a squared or flattened hub, and of a link connecting said arm with the valve-disk, and a relatively fixed bearing against which the squared or flattened portion of said hub abuts when the toggle-lever is straightened in closing the valve, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WILLIAM H. CRAWFORD.

Witnesses:

GEO. W. JOHNSON,
CHAS. F. MARQUART.