

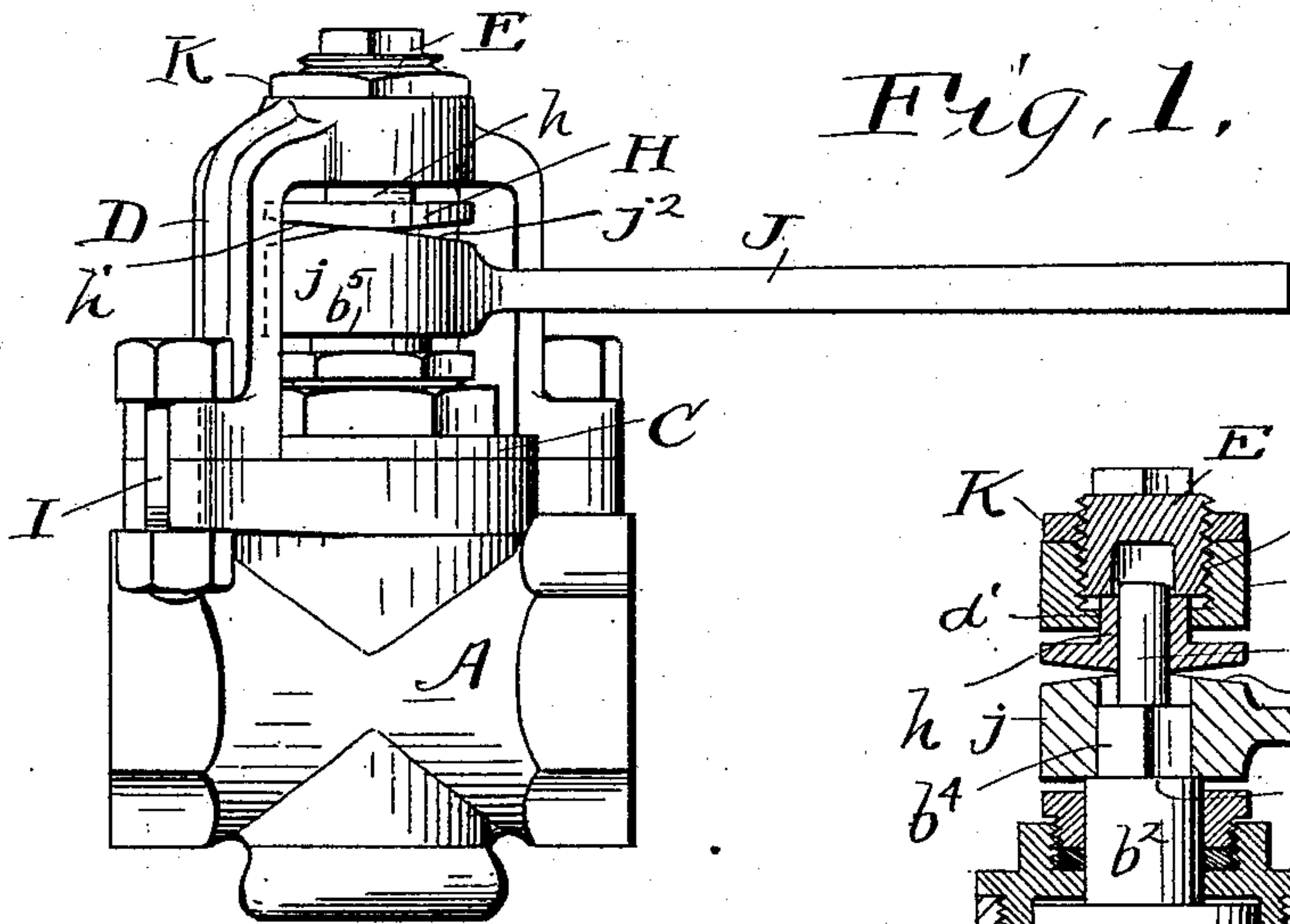
No. 715,578.

Patented Dec. 9, 1902.

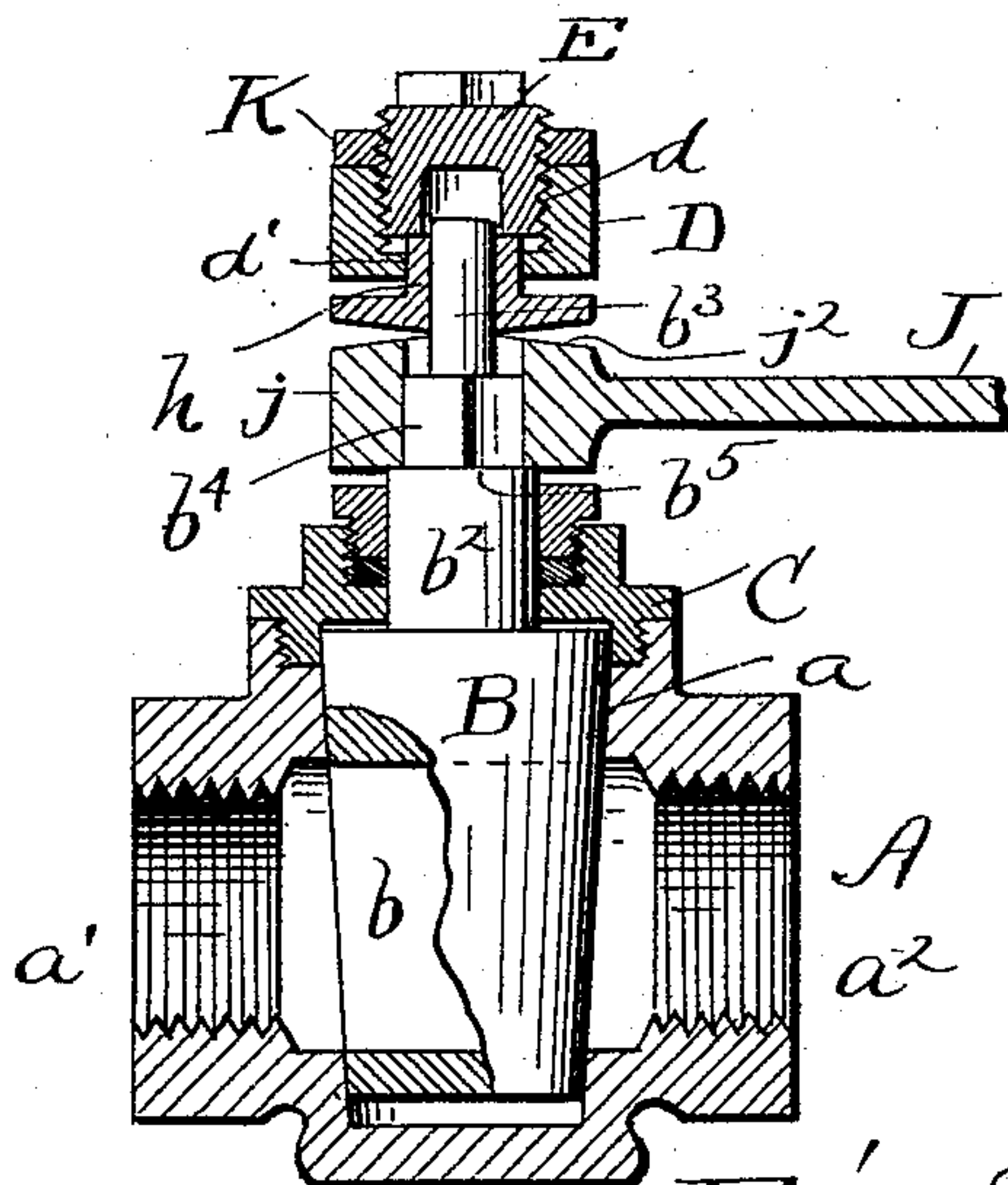
W. HESTON.  
VALVE.

(Application filed July 21, 1902.)

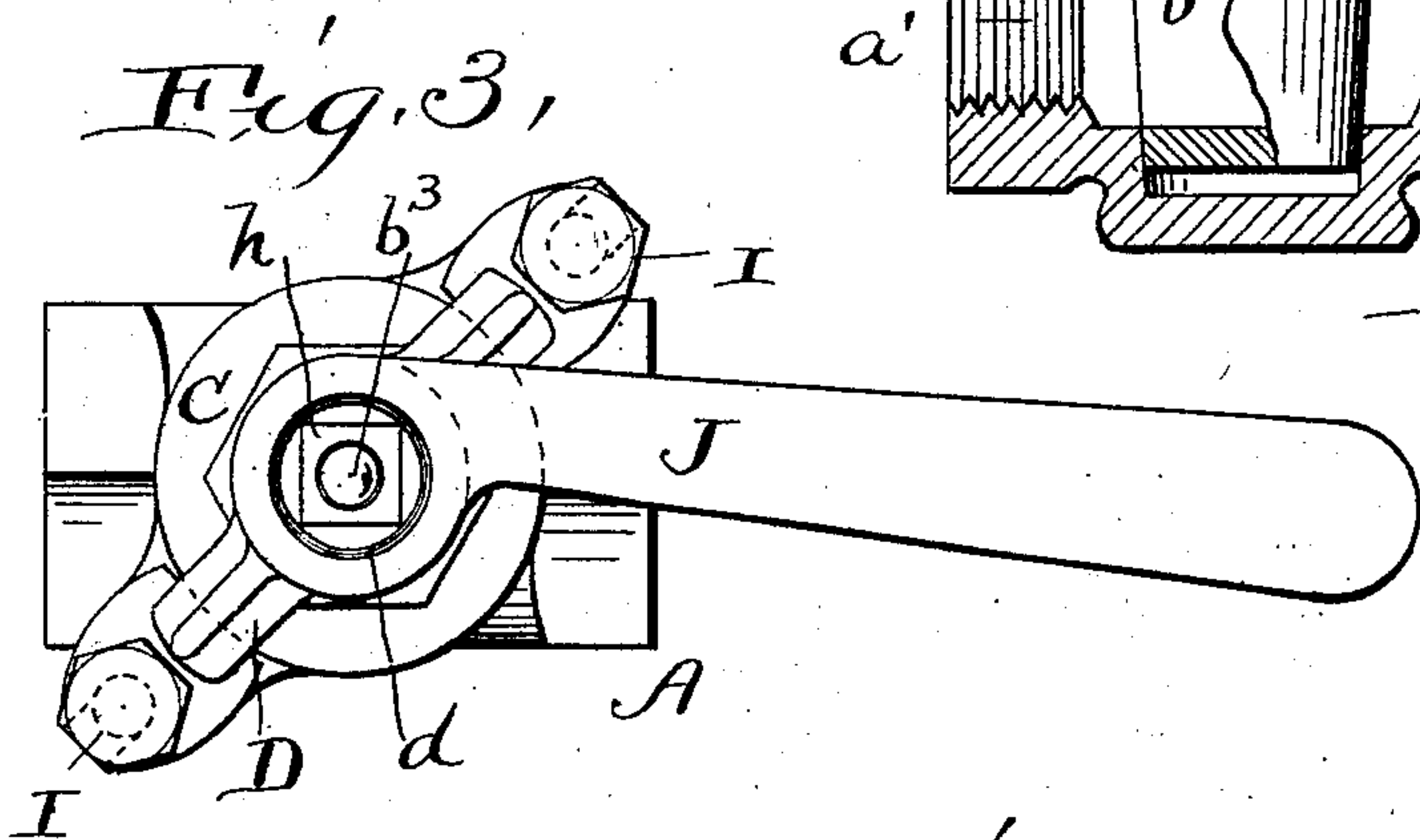
(No Model.)



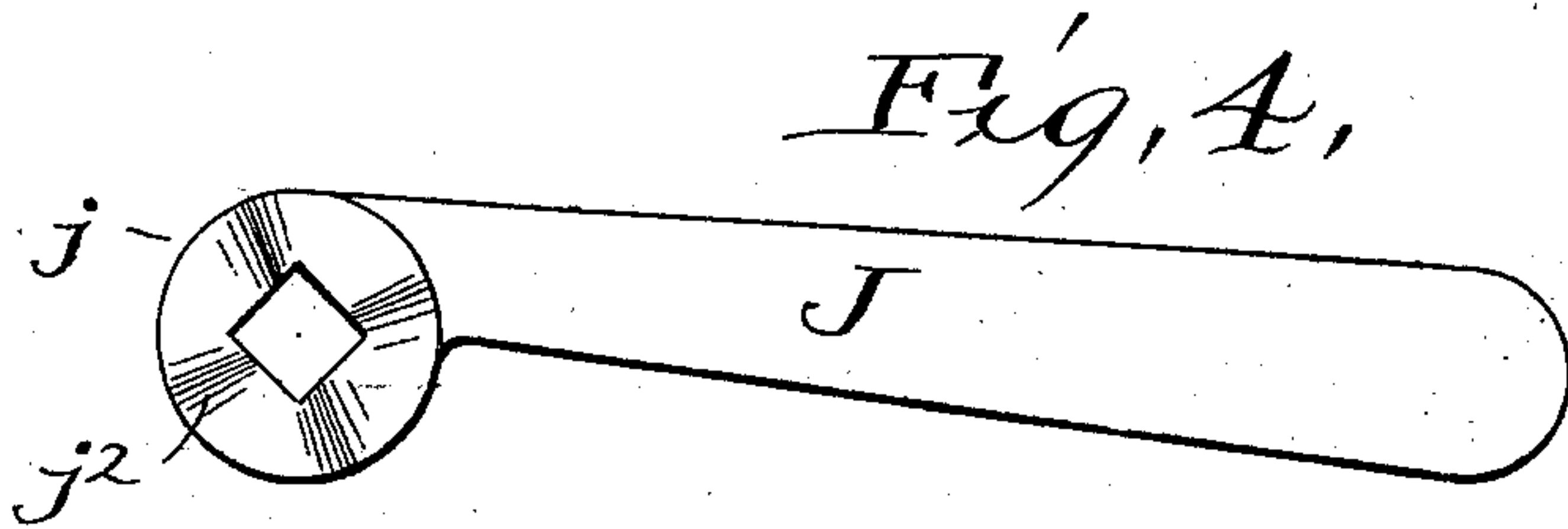
*Fig. 1.*



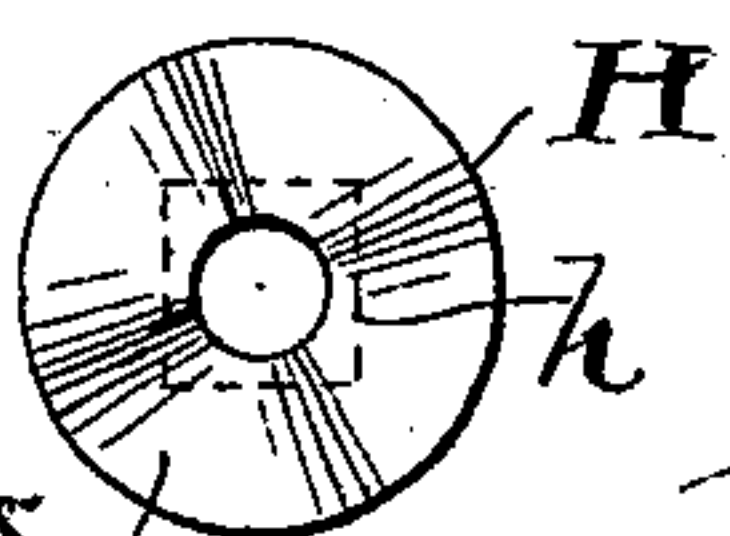
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Fig. 5.*

Witnesses  
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# UNITED STATES PATENT OFFICE.

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## VALVE.

SPECIFICATION forming part of Letters Patent No. 715,578, dated December 9, 1902.

Application filed July 21, 1902. Serial No. 116,344. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HESTON, a citizen of the United States, residing at Homestead, in the county of Allegheny and State of Pennsylvania, 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.

10 This invention relates to a valve or cock especially adapted for use where very high pressures are employed, the primary object of the invention being to provide a construction by means of which leakage under any  
15 circumstances may be prevented.

Another object of the invention is to provide a structure of the character specified which is simple and cheap at first cost, in which wear of moving parts may be easily  
20 and quickly taken up, and in which wear upon the valve-plug and its seat will be minimized, because the plug will be locked to its seat as well when the valve is opened as when it is closed.

25 The invention is more particularly described hereinafter and may be here summarized as consisting of the combination of parts described in the following specification, as set out definitely in the claims.

30 In the drawings, Figure 1 is a side view of a valve embodying my invention. Fig. 2 is a central longitudinal section thereof. Fig. 3 is a plan view of the valve with the adjustable abutment in the yoke removed. Figs. 4  
35 and 5 are respectively face views of the cams in their preferred form, which serve to force the valve-plug to its seat.

Referring to the parts by letters, A represents a casing having a central conical well  
40  $a$ , which serves as the seat of the conical valve-plug B, which is fitted thereto. This casing has on opposite sides of this valve-seat two openings  $a'$   $a^2$  for the entrance and exit of the fluid. The valve-plug has a port  $b$  through  
45 it, which may by the turning of the valve-plug be brought into alinement with these two openings  $a'$   $a^2$ , in which case the valve is opened, or into a position at right angles to the alined position, in which case the valve  
50 is closed.

A cap C closes the opening in the top of the valve-casing, through which the valve-plug is inserted, and this cap has a properly-placed stuffing-box through which the cylindrical

portion  $b^2$  of the valve-stem passes. This cap 55 is preferably screwed into the opening in the valve-casing.

D represents a yoke which is secured to the valve-casing by the bolts I and which extends across the axial line of the valve-plug and at 60 such distance from the stuffing-box as may be necessary for the accommodation of the cooperating cams by which the valve is crowded against its seat. Through that part of the yoke which is in axial line with the valve-plug is a 65 hole  $d$ , which in its outer end is cylindrical and screw-threaded, and into this portion of the hole the threaded adjustable abutment-plug E is fitted. The lower or inner part  $d'$  of this hole is square or of some other non-cylindrical 70 shape, and in this portion of said hole is fitted the correspondingly-shaped stem  $h$  of the cam-plate H, which plate and its stem embrace the cylindrical portion  $b^3$  of the valve-plug stem.

Embracing a squared portion  $b^4$  of the valve- 75 plug stem, and therefore necessarily turning with it, is the hub  $j$  of the operating-handle J, and the lower face of this hub bears against the shoulder  $b^5$  on the valve-stem formed by squaring the same. The upper or outer face 80 of this hub is provided with inclines or cam-surfaces  $j^2$ , which engage with corresponding cam-surfaces  $h'$  on the lower or inner face of the cam-plate H. In the preferable construction these engaging cam-surfaces on the hub 85 and cam-plate, respectively, are oppositely inclined from two diametrically opposite points, substantially as shown.

The valve shown is an ordinary straight-way valve, which may be closed by turning 90 it ninety degrees from the position in which it is fully open.

The parts having been assembled, the operation is as follows: When the valve is being closed by the movement of the handle, 95 the movable cam-surfaces  $j^2$ —that is, those surfaces on the handle-hub—so move with respect to the non-rotating cam-surfaces  $h$  on the cam-plate H that the high points of each engage with the low points of the other, and 100 therefore the valve-plug B is allowed to move slightly from its seat. As the valve comes to its closed position the high points on said cam-surfaces engage, whereby the valve-plug is forced down firmly against its seat. This 105 makes it absolutely impossible that there shall be any leakage of the fluid past said valve and also that any sediment shall de-



posit itself between the valve and its seat. If one now turns the handle in the reverse direction, the first movement of the movable cam allows the valve-plug to move from its intimate contact with its seat and to be easily turned; but as the plug nears the open position the high parts of the cam-surfaces again engage, with the result that when the valve is completely opened it is again crowded against its seat. The result is increased durability, because it is practically impossible that any sediment or impurity in the fluid shall find any lodgment between the valve-plug and its seat, either when the valve is opened or closed.

It is obvious that the thrust of the movable cam-surface against the non-rotating cam-surfaces is borne by the adjustable abutment-plug E referred to, wherefore as the engaging cam-surfaces wear or as the valve-plug and its seat wear one may by the adjustment of this abutment-plug take up this wear, so that the valve will be opened or closed, respectively, when the handle is in the usual and desired positions.

K is a jam-nut screwing onto the projecting end of this abutment-plug, by means of which when the plug is properly adjusted it is immovably held.

Having described my invention, I claim—

1. The combination of a valve-casing having suitable inlet and outlet openings, and, between them, a conical valve-seat, with a conical valve fitted thereto and having a stem projecting out of the valve-casing, and a yoke secured to said valve-casing, oppositely-inclined cams secured to and rotating with said valve-stem, and a cooperating cam-plate non-rotatably secured to said yoke, and having oppositely-inclined cams which cooperatively engage the oppositely-inclined cams secured to the valve-stem, the parts cooperating to crowd the valve to its seat when the valve is open, and when it is shut, but to relieve said valve as it moves between said positions, substantially as and for the purpose specified.

2. The combination of a valve-casing having suitable inlet and outlet openings, and, between them, a conical valve-seat, with a conical valve fitted thereto and having a stem projecting out of the valve-casing, a yoke secured to said valve-casing and having an irregularly-shaped hole in axial alinement with the valve, a cam secured to said valve-stem, a cam-plate having an irregularly-shaped stem which is fitted into a correspondingly-shaped hole in the yoke and which loosely embraces the valve-stem, substantially as and for the purpose specified.

3. The combination of a valve-casing having suitable inlet and outlet openings, and, between them, a conical valve-seat, with a conical valve fitted thereto and having a stem projecting out of the valve-casing, and a yoke secured to said valve-casing, a cam secured to said valve-stem, a cam-plate having a stem

which is non-rotatively fitted into a hole in the yoke and which loosely embraces the valve-stem, an adjustable abutment-plug adjustably secured in said yoke and engaging the end of said cam-plate stem, substantially as and for the purpose specified.

4. In a valve, the combination of a casing having inlet and outlet openings, and, between them, the conical valve-seat, a conical valve-plug fitted to said seat and provided with a stem having first a cylindrical portion which passes through a stuffing-box forming part of the valve-casing, second a squared portion, and third a cylindrical end portion, a yoke secured to the valve-casing and having, in line with said valve-stem, an opening whose inner end is squared and whose outer end is cylindrical and screw-threaded, a handle whose hub has a square hole fitted to the squared part of the stem and whose upper face is provided with oppositely-inclined cams, a cam-plate which embraces the cylindrical portion of said valve-stem and has, on its lower face, cooperating cams, and has a squared stem projecting from its upper face into a square hole in the yoke, and an abutment-plug screwed into the cylindrical opening in said yoke, substantially as and for the purpose specified.

5. In a valve, the combination of a valve-casing having a conical valve-seat and one inlet and one outlet opening communicating with said valve-seat, with a conical valve fitted to said valve-seat and having a single port which when the valve is open establishes communication between said openings, a valve-stem rigid with the valve and extending out of the casing through a stuffing-box, a yoke attached to said casing, a non-rotating cam-plate secured to said yoke and having on its lower face oppositely-inclined cams, and oppositely-inclined cams rigid with said valve-stem and cooperating with the cams first named to crowd the valve to its seat when the valve is open and when it is shut, but to relieve said valve as it moves between said positions, substantially as and for the purpose specified.

6. The combination of a valve-casing having suitable inlet and outlet openings, and, between them, a conical valve-seat, with a conical valve fitted thereto and having a stem projected out of the valve-casing, a yoke secured to that side of the valve-casing through which said valve-stem projects, a hub secured to and rotating with said valve-stem and having on its upper side oppositely-inclined cam-surfaces, and a cam-plate adjustably secured to said yoke and having on its under side cooperating oppositely-inclined cam-surfaces, substantially as and for the purposes specified.

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

WILLIAM HESTON.

Witnesses:

E. L. THURSTON,  
ALBERT H. BATES.