

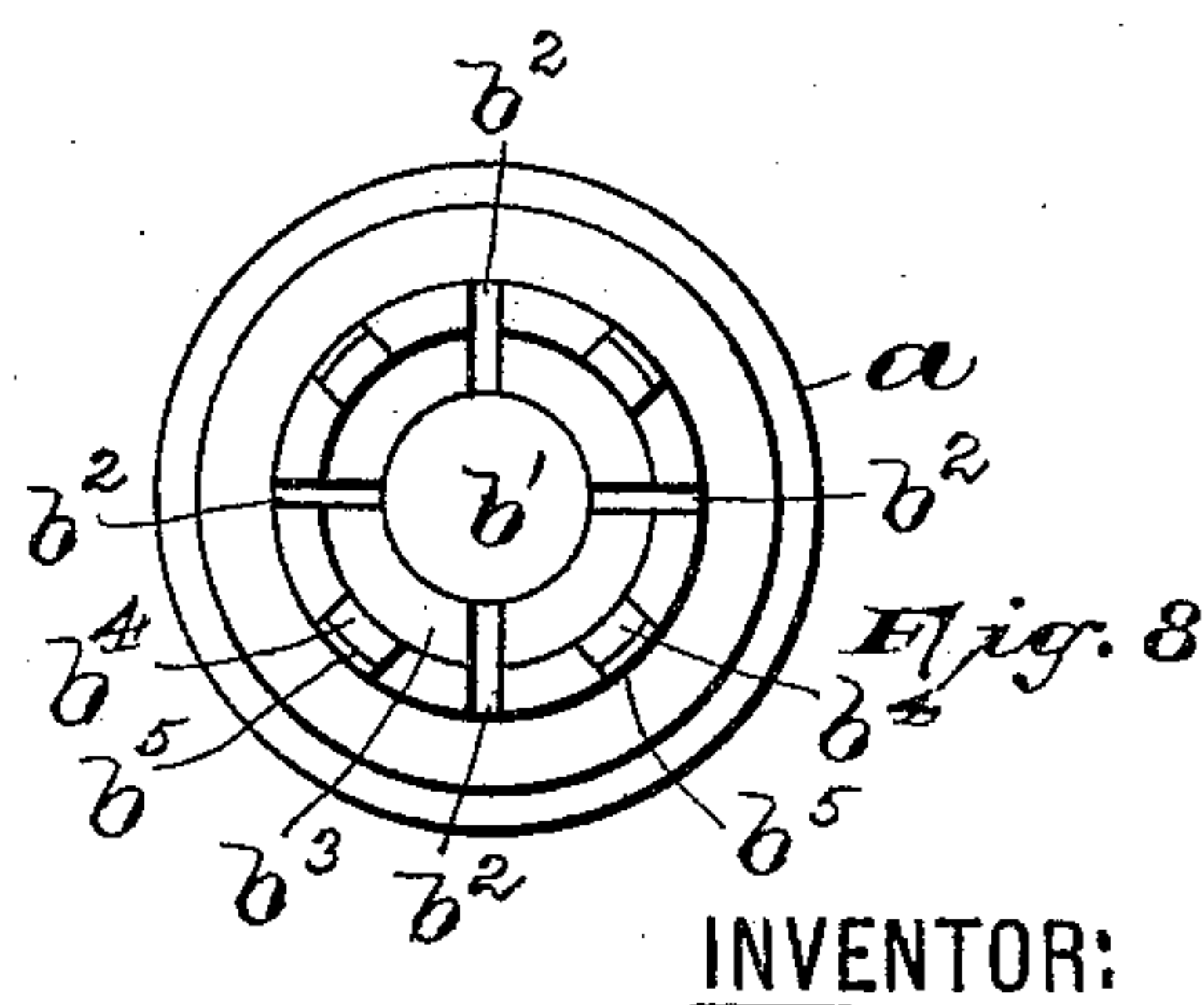
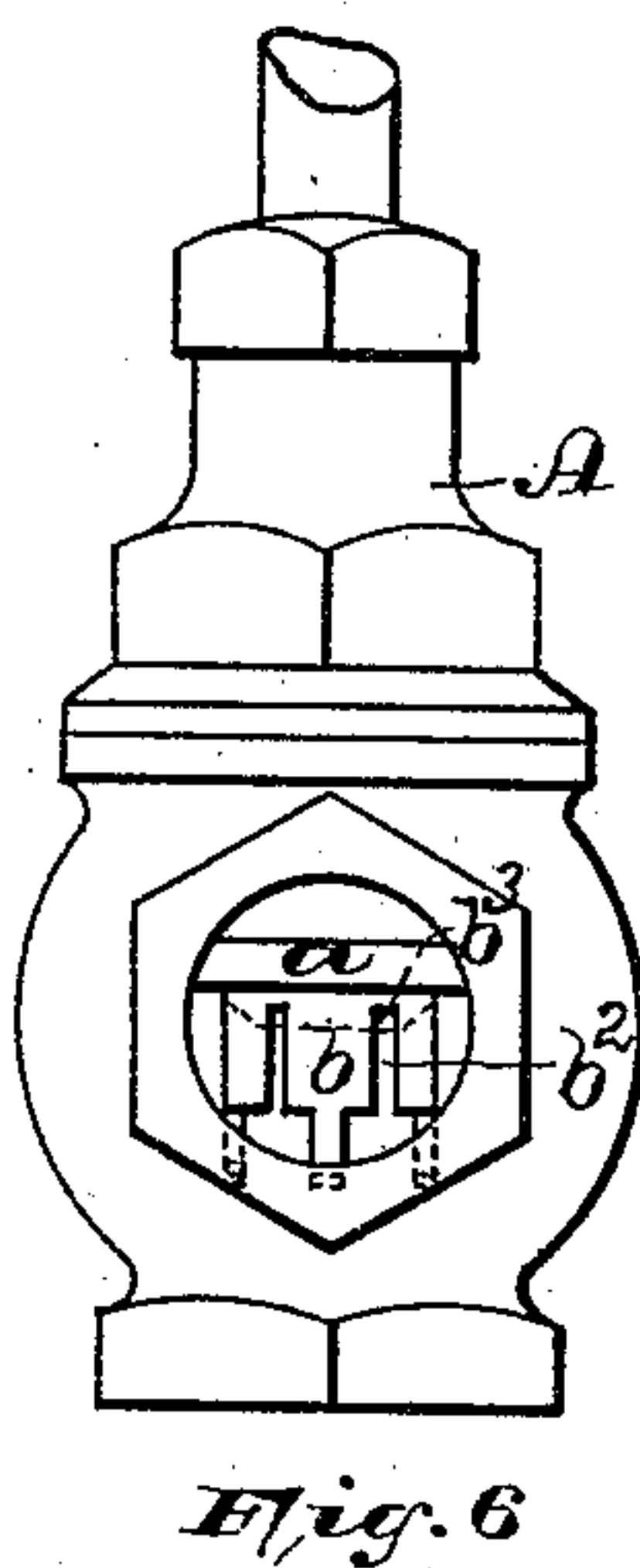
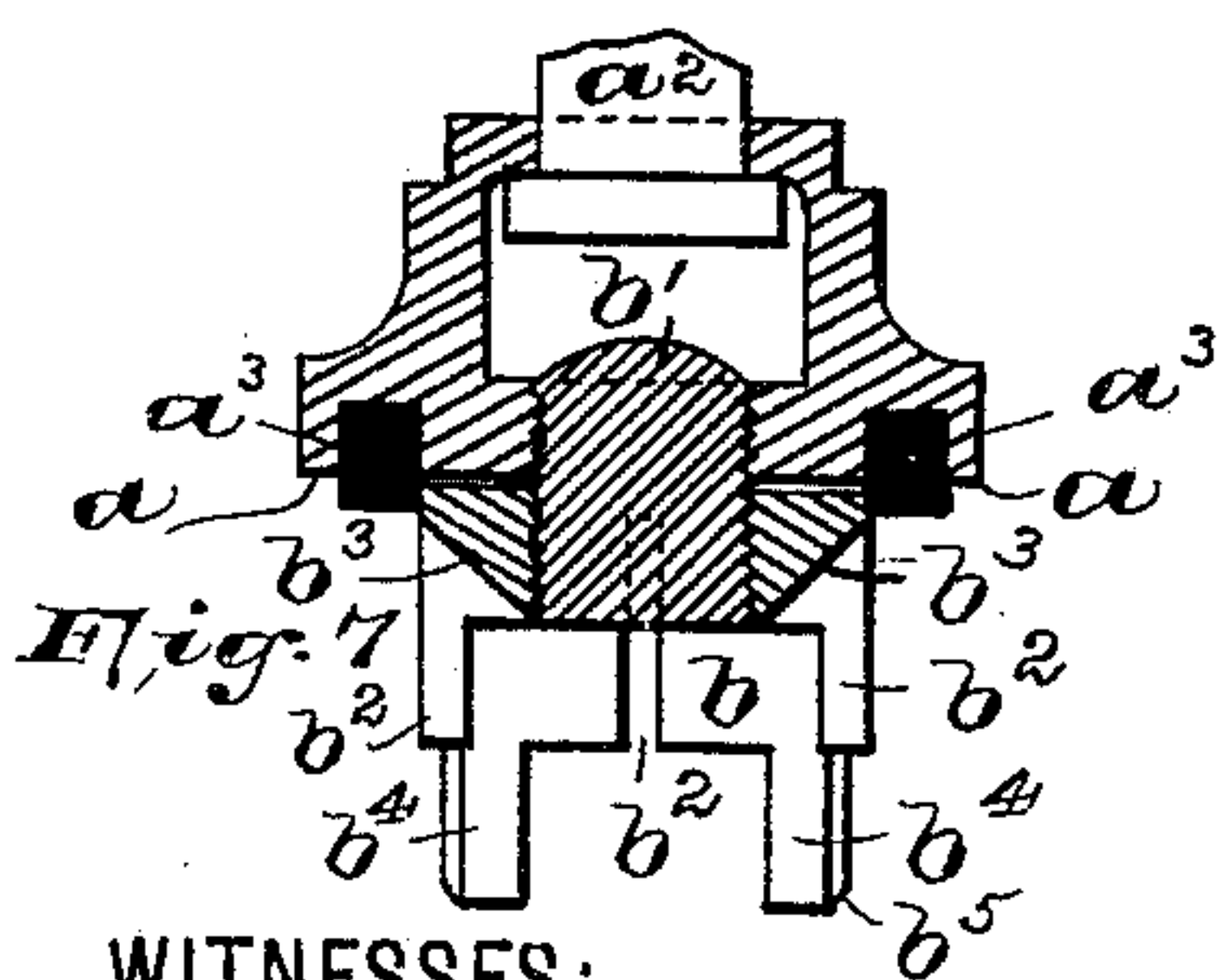
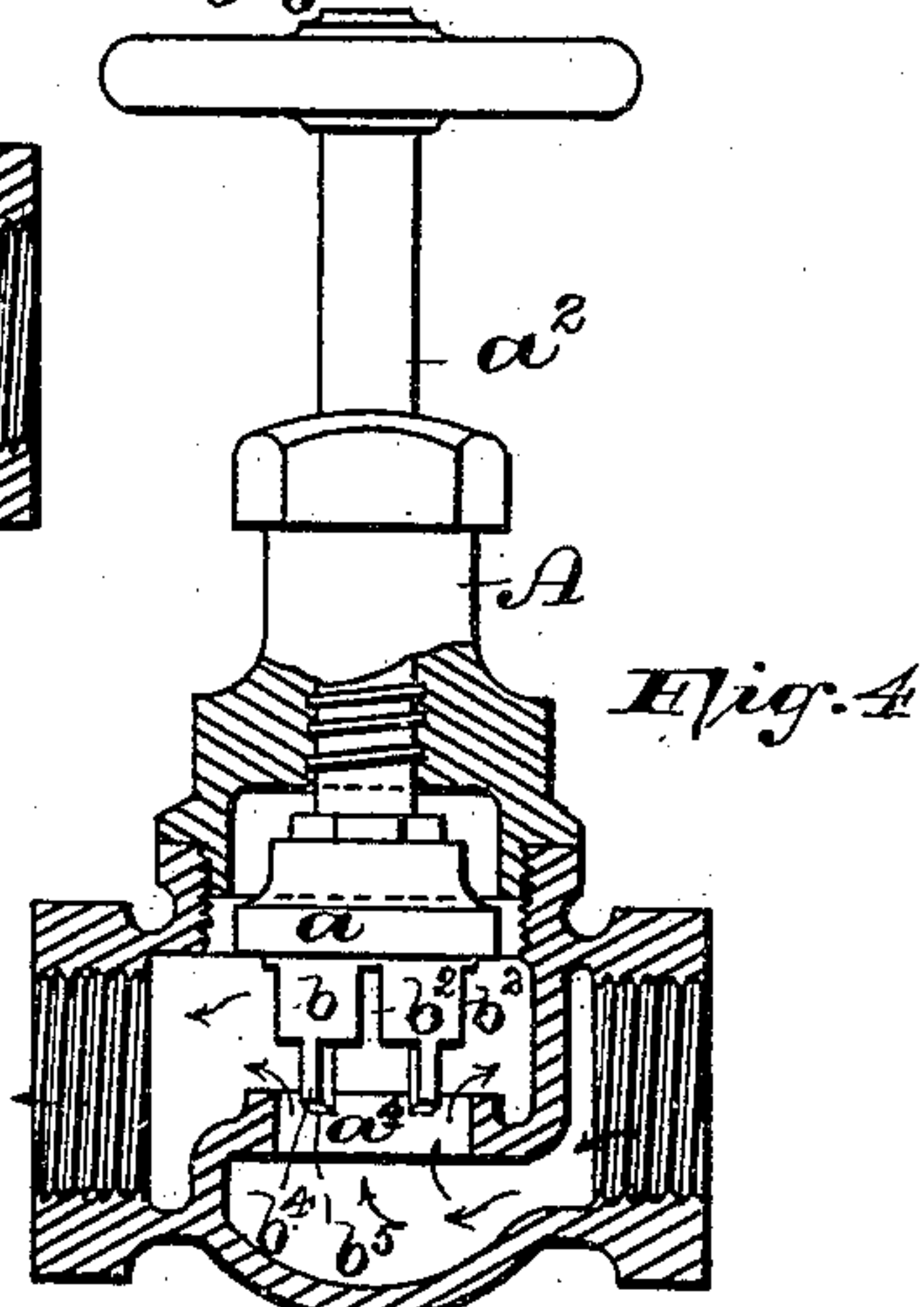
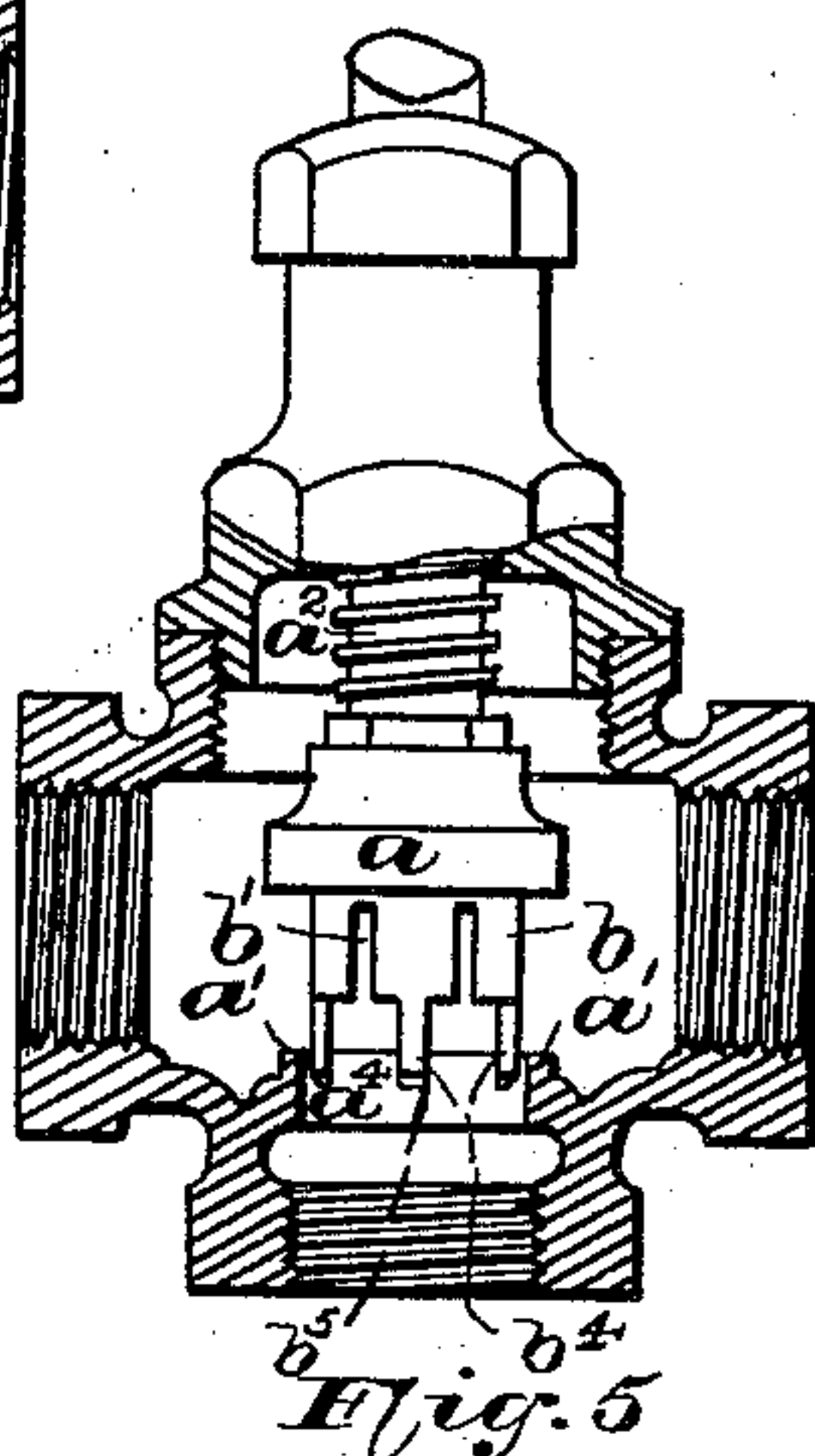
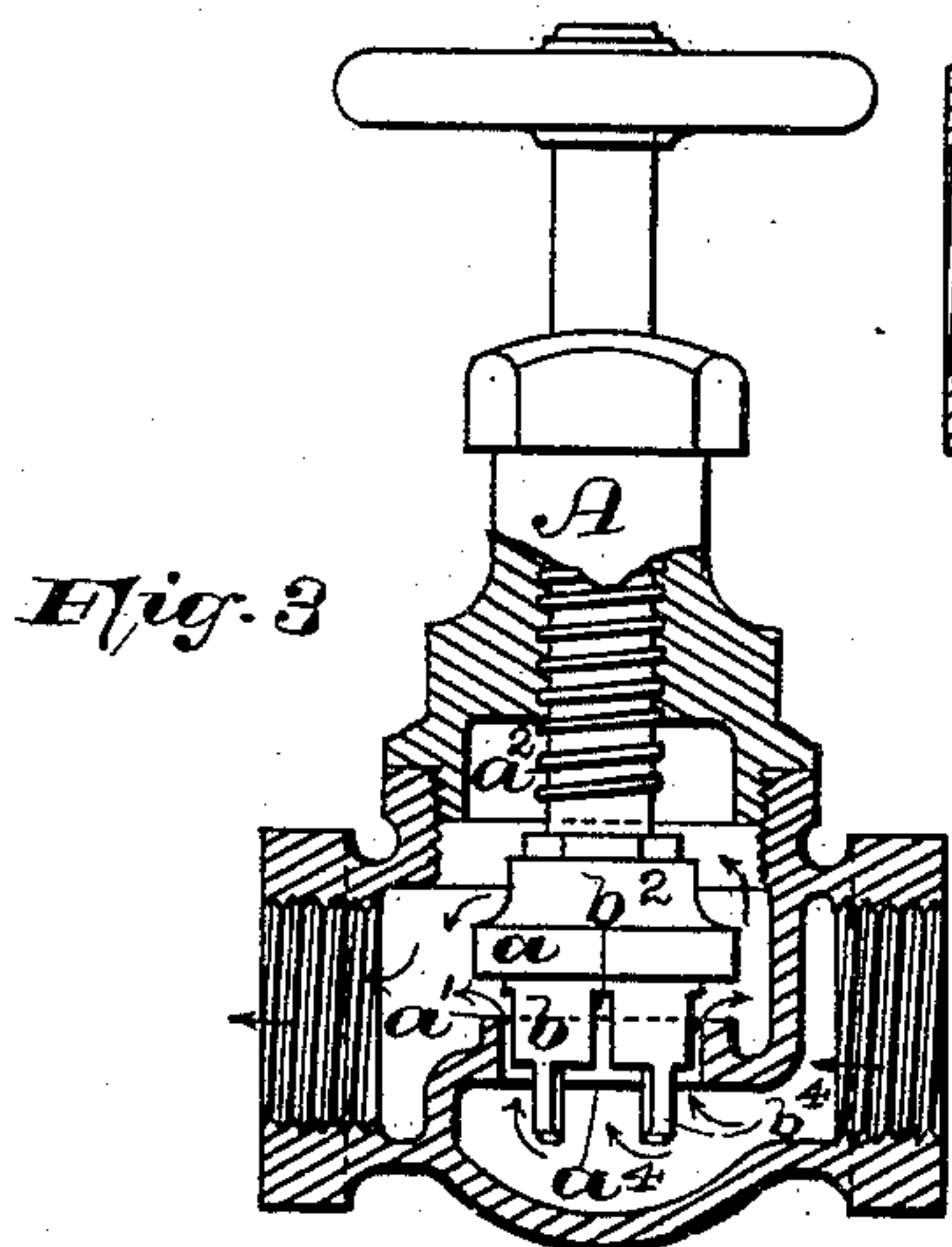
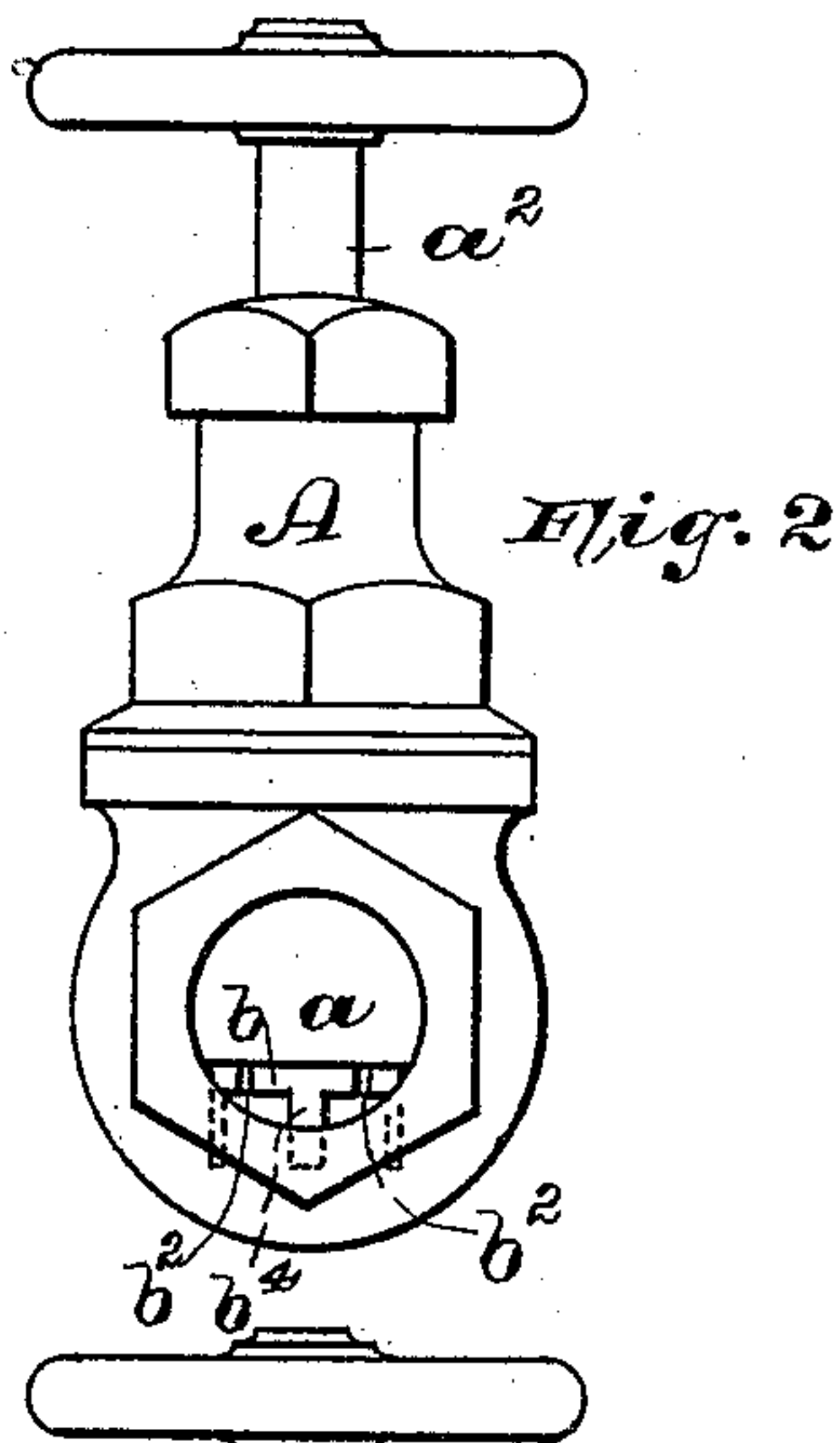
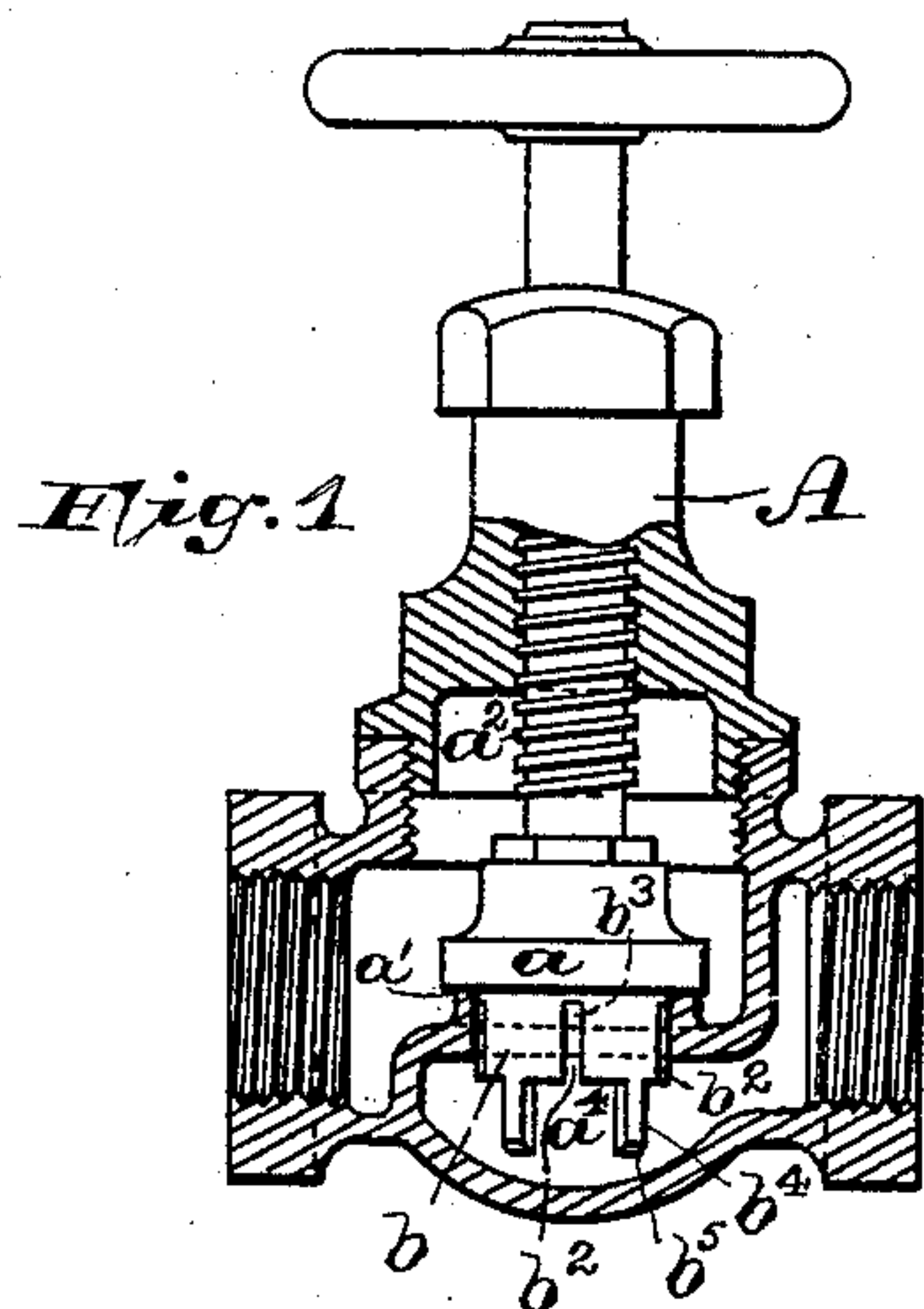
(No Model.)

2 Sheets—Sheet 1.

J. E. SAGUE.
VALVE.

No. 430,042.

Patented June 10, 1890.



WITNESSES:

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John A. Masdeeb

INVENTOR:

James E. Sague.

BY Fred C. Fraentzel, ATTORNEY.

(No Model.)

2 Sheets—Sheet 2.

J. E. SAGUE.
VALVE.

No. 430,042.

Patented June 10, 1890.

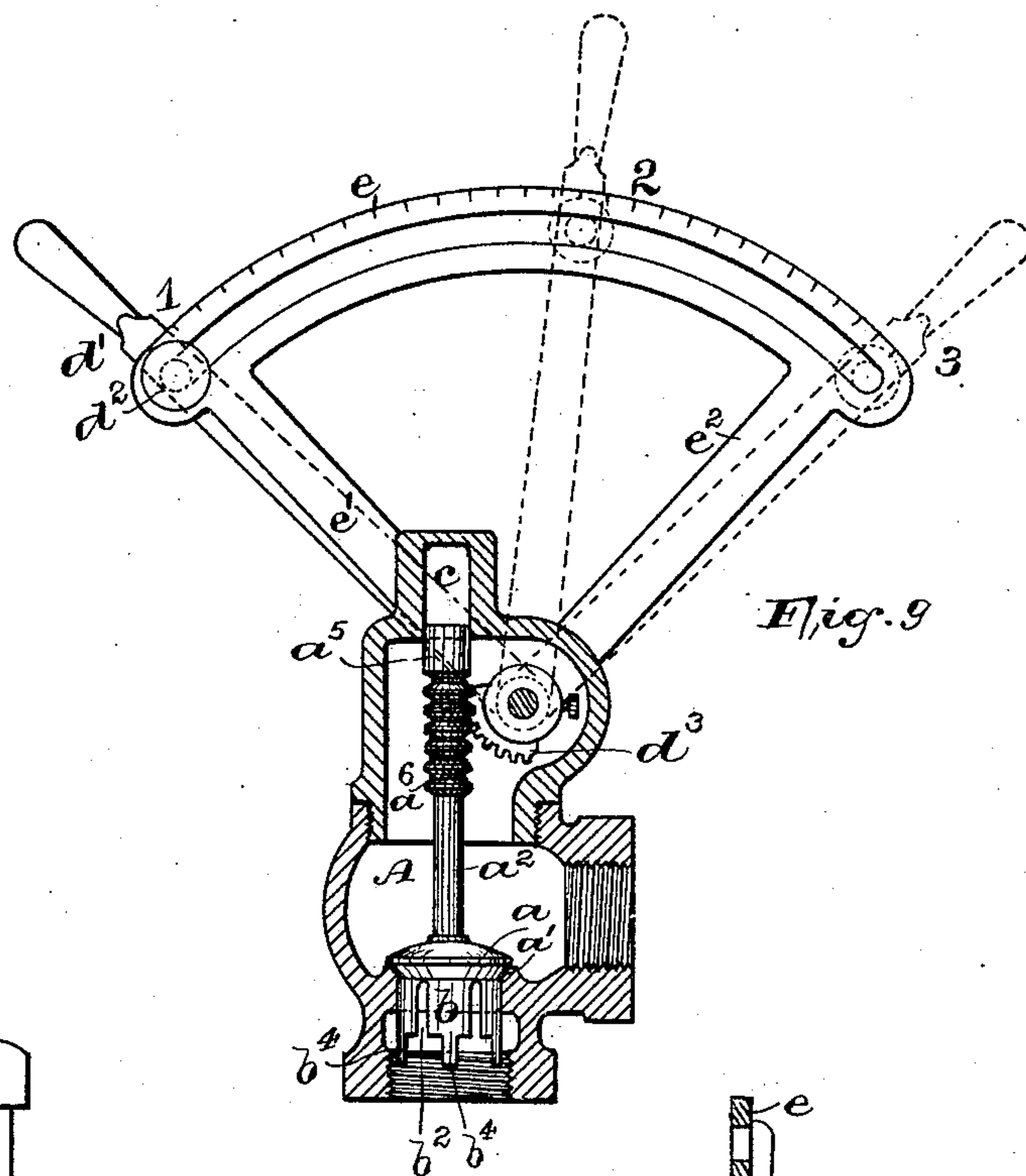


Fig. 9

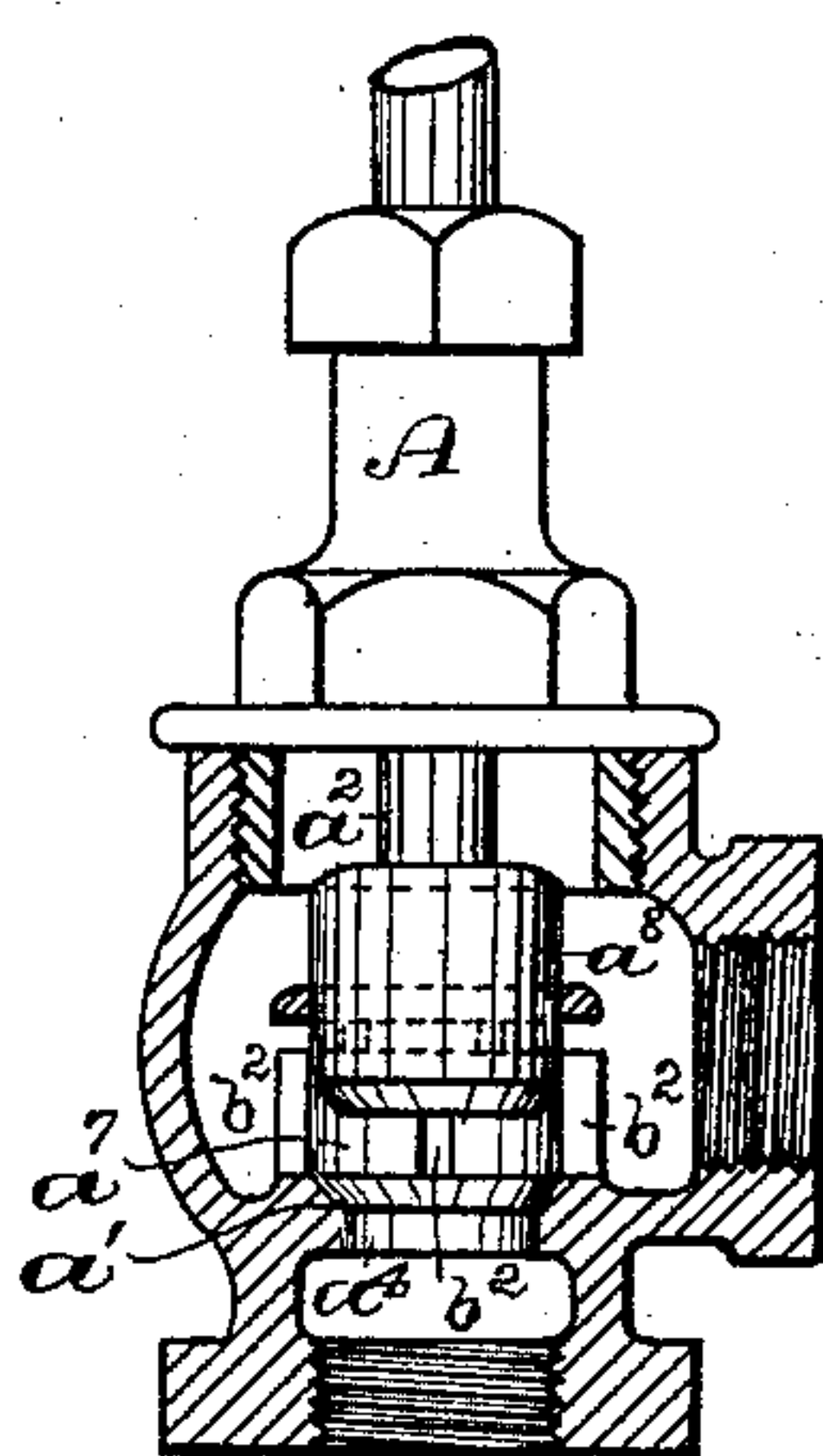


Fig. 11

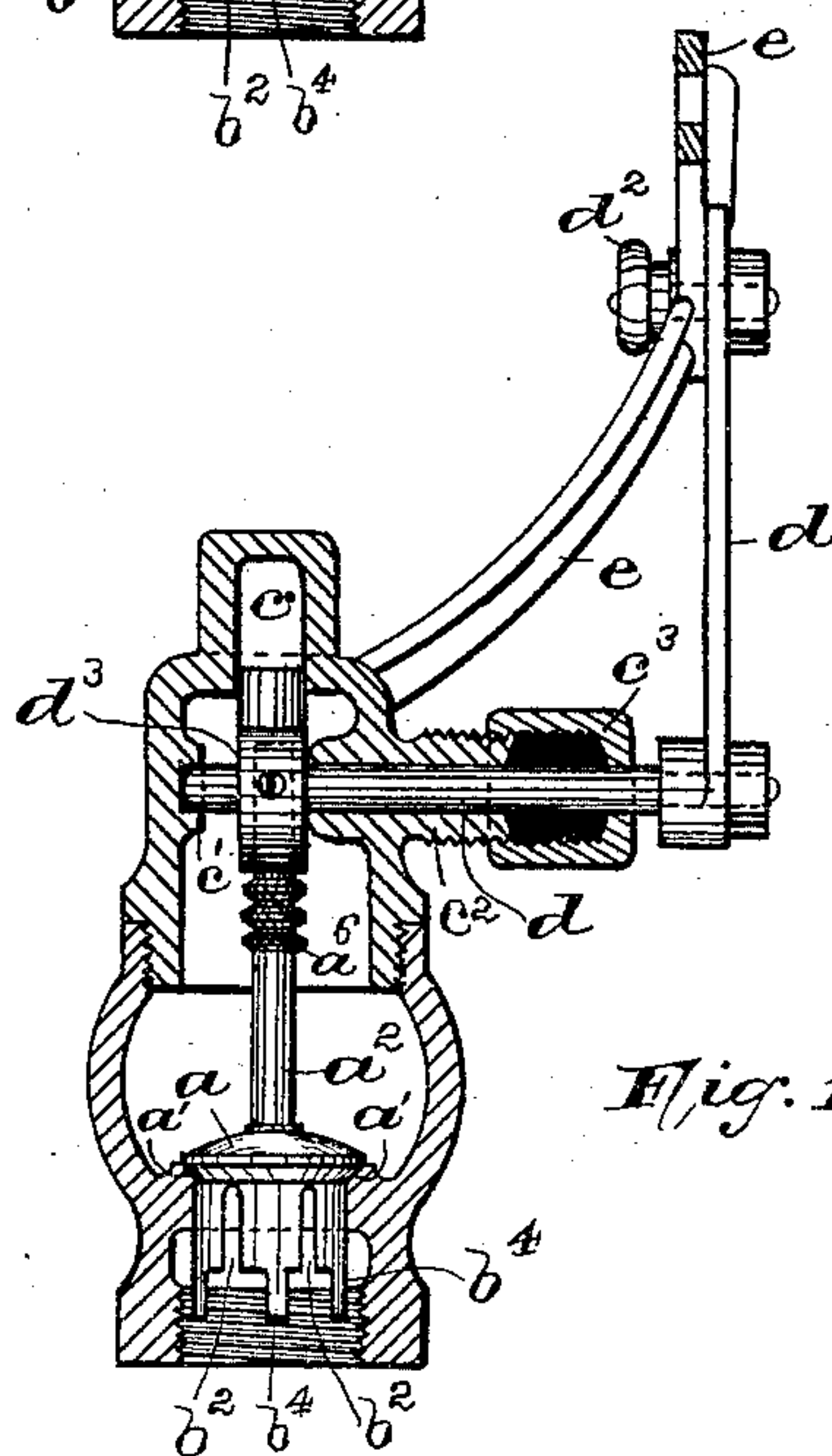


Fig. 10.

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UNITED STATES PATENT OFFICE.

JAMES E. SAGUE, OF ROCHESTER, NEW YORK.

VALVE.

SPECIFICATION forming part of Letters Patent No. 430,042, dated June 10, 1890.

Application filed October 23, 1889. Serial No. 327,965. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. SAGUE, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The primary object of this invention is to properly regulate the supply of heat in rooms or railway-cars after the same have once been heated up; and the invention is designed to provide a valve for heating purposes the valve-disk of which is provided with a heat or steam supply regulating-piece, by means of which the admission of the heating medium or liquid therethrough may be readily regulated.

In the accompanying two sheets of drawings, in which is illustrated a valve, which may be of any well-known construction, provided with my heat-supply regulator, Figure 1 is a vertical section of a globe-valve in which the valve-disk is shown in its closed position on the valve-seat, and secured thereto is my hollow and cylindrical regulating-piece provided with the slots or ports therein for gradually admitting and thereby regulating the flow of the steam or liquid through the valve. Fig. 2 is an end elevation of the valve shown in Fig. 1; and Figs. 3 and 4 are views similar to that shown in Fig. 1, that illustrated in Fig. 3 showing the valve-disk partly off its seat and illustrating by means of the arrows the heating medium or liquid passing through the slots or ports in the regulating-piece, while in Fig. 4 the valve is shown wide open. Fig. 5 illustrates my regulating-piece as applied to the valve-disk in a cross-valve, and Fig. 6 is an end elevation of the same. Fig. 7 is an enlarged cross-section of the valve-disk and the regulating-piece secured thereon, and Fig. 8 is a plan view of the under side of the valve-disk and the regulating-piece shown in Fig. 7. On Sheet 2, Fig. 9, is a sectional view of a different form of valve, the valve-disk of which is provided

with the regulating-piece, and showing a lever attachment secured to said valve by means of which the valve-disk may be raised from its seat. Fig. 10 represents a section taken through a plane at right angles to that shown in Fig. 9, illustrating more clearly the arrangement of the hand-lever and its immediately-arranged mechanism engaging with the valve-stem for lifting the valve-disk from the seat. Fig. 11 is a sectional view of a corner valve provided with a modified arrangement of the graduated steam-ports.

In the above-described views, A designates a valve for heating purposes, which may be of any well-known construction.

As shown in Figs. 1, 2, *et seq.*, the valve-disk *a* and its seat *a'*, as well as the valve-stem *a²*, are of the construction found in valves of the class described in the above. In said views the valve-disk *a* is provided on its under side thereof with a regulating-piece *b*, which extends down therefrom and which is cylindrical and hollow and may be directly cast on the disk *a* in one piece or secured thereon by means of a screw or bolt *b'*, as shown in Fig. 7. As will be noticed more especially from Fig. 1, the regulating-piece *b* extends down into the opening *a⁴*, surrounded by the valve-seat *a'* and fits into the same, and when the hand-wheel on the valve-stem *a²* has been entirely lowered the packing *a³* in the valve-disk *a* rests upon the valve-seat *a'*, and the valve is closed, or the circumferential edge of the valve-disk and the seat may be conical, as is clearly illustrated in Figs. 9 and 10. The upper or cylindrical part of the regulating-piece *b* is provided with any desirable number of slots or ports *b²* in its circumference, which may be of any width and which extend up to, or nearly to, the under side of the valve-disk. Said slots or ports are inclined at *b³* from the inner side of the cylindrical regulating plate or piece to the outer side thereof, as is evident from Fig. 7. Around and extending downwardly from the lower edge of the regulating-piece *b* are the guiding arms or posts *b⁴*, which are slightly chamfered at *b⁵* on their lower ends, and which posts project and extend at all times down into the opening *a⁴* in the valve and thus cause the straight up-and-down movement of the valve-disk and its

regulating-piece and prevents the possibility of the latter from striking upon the valve-seat a' , which might be the case when the posts or arms b^4 are not employed.

5 The operation of the valves shown on Sheet 1, and the manner of regulating the flow of the heating medium through the steam-port or opening a^4 , is as follows: After the valve-disk has been lifted entirely from its seat, as
10 shown in Figs. 4 and 5, and the room or railway-car has been rapidly heated to the desired temperature the valve-stem and disk are screwed down, so that all the steam has to pass through the ports or slots b^2 , and as the total
15 width of these ports is very small, compared with the circumference of the valve-seat, the amount of steam admitted is small compared with what it would be in a valve not provided with the regulating attachment. This
20 allows of a large movement of the valve stem or handle for a small change in the admission of steam, and thus makes the regulation much more easy and accurate and lessens the danger of overheating caused by turning
25 the wheel or handle too much and thus raising the valve-disk too far from its seat.

In car-heating it is necessary to provide a valve which can be opened wide enough to admit a large amount of steam, in order to
30 heat the cars rapidly, and it is then necessary to shut off the steam-supply to the amount necessary to maintain the temperature and prevent overheating. In practice it has been difficult and almost impossible to do this with
35 the ordinary valve, as a quarter-turn of the valve-handle would often be found to admit more steam than necessary, and as their closeness of adjustment is generally impracticable it is very difficult to maintain a uniform degree of heat, the valve either being entirely
40 closed or opened too much, causing extreme changes of temperature. The ports in my valve can be so proportioned that three turns or more of the handle will give only the same
45 amount of steam-supply as one-quarter of a turn on the ordinary valve. This makes the valve much more easy to regulate, and lost motion in the valve-spindle or lack of care causes much less change in the temperature.

50 On Sheet 2 in Figs. 9 and 10 is shown a valve, the valve-disk a of which is conical and is provided with the regulating plate or piece b . The valve-stem a^2 in this construction does not project out of the top of the valve-casing, as in Figs. 1, 2, &c., and is provided with a
55 head or collar a^5 , adapted to slide or reciprocate within a chamber c , formed in the top of the valve-casing.

60 Within bearings c' and c^2 in the valve-casing is arranged a shaft or spindle d , working through a stuffing-box c^3 , and on the end of said shaft or spindle d is arranged a hand-lever d' , which has a pin thereon provided with a set-nut d^2 , by means of which the said
65 lever may be secured or tightened in any position within a slot in the segment-arm e , which

is secured or attached by means of arms e' and e^2 to the valve-casing. On the end of the shaft or spindle d is arranged a segment-gear d^3 , which engages with the rack or thread a^6 , 70 as illustrated in said Figs. 9 and 10.

When the valve-disk rests upon its seat and the valve is closed, the hand-lever d' is in the position indicated by the number 1 to the left on the segment-arm e , as shown in Fig. 9. 75 By bringing over the lever d' from its position 1 on the segment-arm to the position 2, in which the lever is indicated by dotted lines, the heating medium is gradually admitted through the slots or ports in the regulating-
80 piece secured to the valve-disk, and when the lever is thrown over to stand in the position indicated by dotted lines at 3 the valve has been opened to its full extent.

With the valve-disk and its regulating-piece 85 moved by a direct-motion lever, as in the last-described construction, this advantage is attained that the operator can plainly see by means of the graduations on the segment-arm the exact opening of the valve. 90

The advantages derived from the present invention are that the supply of steam or other heating medium may be diminished by passing the same through the slots or ports in the regulating piece secured to the valve-disk, 95 and that but a slight change is made in the steam-supply, owing to a large movement of the valve. By this means the admission of the steam through the valve is regulated more accurately. 100

It will be understood that the present construction of the valve may be used in all cases where it becomes necessary to regulate the flow of fluids nicely and accurately.

I do not wish to be understood as limiting 105 the regulating-piece to the precise number of ports or slots shown herein in the accompanying drawings, as it is evident that the degree of sensitiveness may be varied at pleasure by employing one or more slots and 110 by altering the widths of the same.

In the valves as ordinarily constructed the full opening is secured when the valve-disk is raised or lifted from its seat a distance equal to one-quarter of its diameter; but in 115 the present construction the valve-disk may be made to move up any desired distance before the full opening is secured, according to the length of the cylindrical regulating-plate and its slots or ports therein, which lengths 120 may be varied to suit the different-sized valves.

Another great advantage in the present construction is that it is not necessary to exercise great care to regulate the flow of the 125 heating medium through the valve, as a number of complete turns of the valve may be made before the steam-port or main admission-opening below the valve-disk has been entirely opened, and consequently a lack of 130 care in adjusting the valve does not make such a difference in the heating of the car or

room, and the heat can be governed more accurately and with less trouble than with the ordinary valve.

In lieu of attaching my improved regulating-plate provided with the graduated steam ports or slots b^2 therein directly to the under side of the valve-seat, I may arrange said ports directly in the valve-seat instead of the valve-disk, as will be evident from Fig. 11. In said figure, in which an angle-valve is represented in cross-section, the valve-seat a' is provided with an upwardly-projecting annular casing a^7 , provided with any desirable number of slots or ports b^2 therein, and into said hollow casing extends the spindle or valve-stem a^2 , provided on its lower end with a plunger a^8 , which is turned and which tightly fits into said annular casing and rests upon the valve-seat when the valve is closed, as will be clearly understood from said figure.

Of course it will be understood that I do not limit the constructions described in the specification herein to the exact number of slots or ports shown, as I may use one slot or port or any number of such slots or ports.

Having thus described my invention, what I claim is—

1. In a valve for regulating the flow of steam through radiators, the stem a^2 , provided with a thread thereon, the hollow valve-disk a , loosely arranged on one end of said stem and having an annular groove for the reception of a packing, and also having a valve-seat a' , in combination with the hollow regulating-piece secured to the under side of said disk, extending downwardly therefrom into the steam-port in the bottom of the valve, admission ports or slots therein which are inclined from their inner sides of the regulating-piece directly beneath the valve-disk and behind the packing therein, and downwardly-projecting guiding-arms arranged between said slots, which project down into the steam-port and hold the valve-disk centrally above the same, substantially as and for the purposes set forth.

2. In a valve for regulating the flow of steam, the stem provided with a thread thereon, and means for raising and lowering the same, the valve-disk a , arranged on one end of said stem, and also the valve-seat a' , in combination with the hollow regulating-piece secured to the under side of said disk, and extending downwardly therefrom, admission ports or slots therein which are inclined from their inner sides directly below the under side of the valve-disk, and downwardly-projecting guiding-arms arranged between the slots, which project down into the steam-port and hold the valve-disk centrally above the same, as and for the purposes set forth.

3. In a valve, in combination with the valve-seats surrounding the steam port or opening in the bottom of the valve, of a valve-disk arranged on said seat, a regulating-piece attached to said disk, said regulating-piece being cylindrical and extending down from said valve-disk into said steam-port and provided with slots or steam-ports therein, by means of which the flow of steam or other medium is regulated from the port above which said regulating-piece is arranged, and a valve-stem secured to said disk provided with a rack thereon, a toothed segment-wheel engaging with said rack, said rack and segment-wheel being arranged within the valve-casing, and a hand-lever extending through said casing for operating said segment-wheel, and the valve-stem and its valve, for the purposes set forth.

4. In a valve, in combination with the valve-disk, having arranged thereon on its under side a cylindrical and hollow regulating-piece with steam ports or slots in its sides, and provided with a threaded valve-stem on the top of said disk, a spindle or shaft arranged in bearings in the valve-casing, and a stuffing-box, as set forth, one end of said spindle or shaft being provided with a toothed segment-wheel thereon within the valve-casing, engaging with the threads on the valve-stem, and the opposite end of said shaft having a handle or lever thereon, for the purposes set forth.

5. In a valve, in combination with the valve-disk having arranged thereon on its under side a cylindrical and hollow regulating-piece with steam ports or slots in its sides, and provided with a threaded valve-stem on the top of said disk, a spindle or shaft arranged in bearings in the valve-casing, and a stuffing-box, as set forth, one end of said shaft being provided with a toothed segment-wheel engaging with the thread on the valve-stem within the valve-casing, and the opposite end of said shaft having a handle or lever thereon provided with a pin and set nut or screw, and a slotted segment secured to the valve-casing by means of arms, to which segment said lever is adapted to be secured by means of said set-nut, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 19th day of October, 1889.

JAMES E. SAGUE.

Witnesses:

DE L. CRITTENDEN,
W. D. ARMATAGE.