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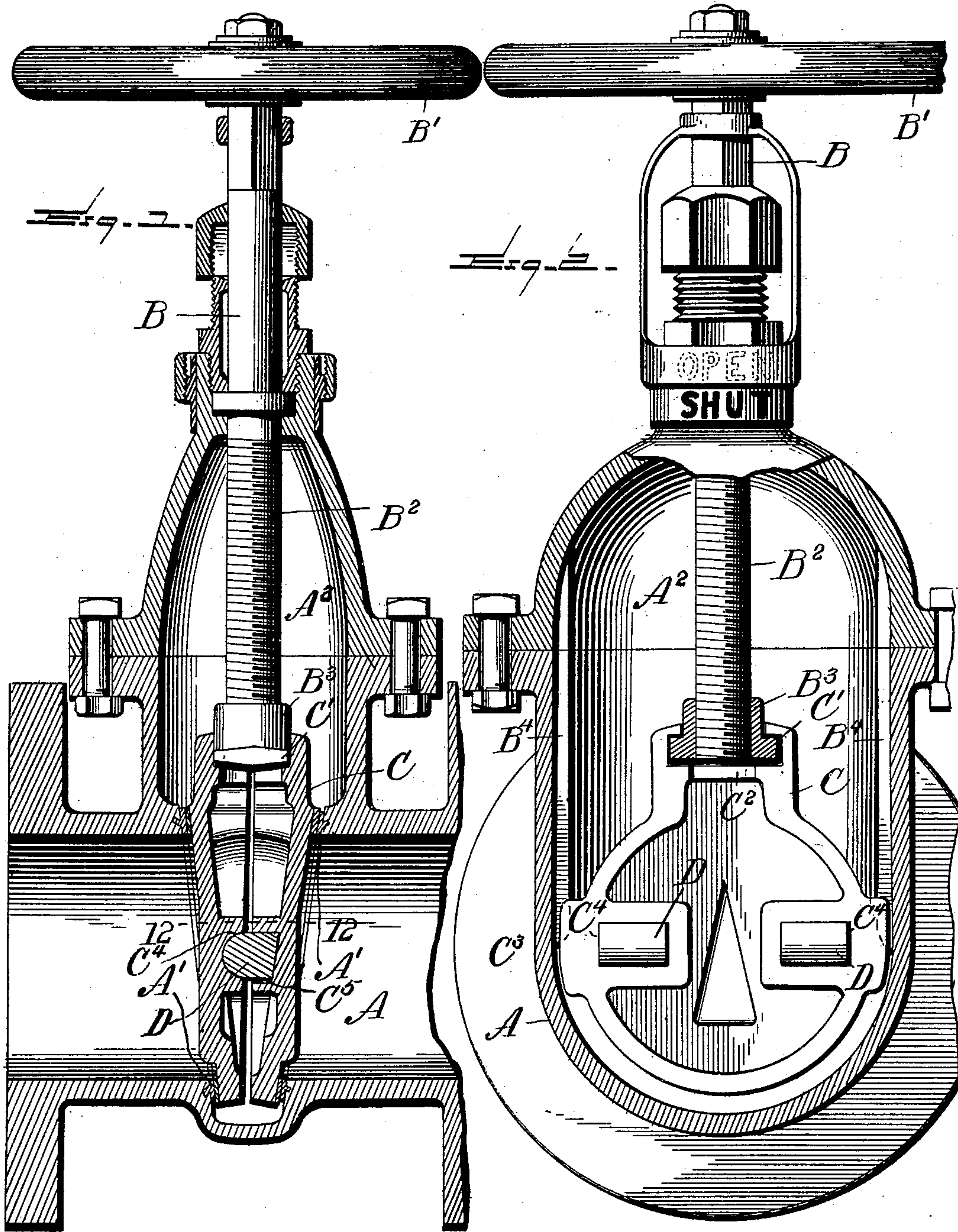
Patented Sept. 3, 1901.

O. L. WHITEMAN.  
GATE VALVE.

(Application filed June 12, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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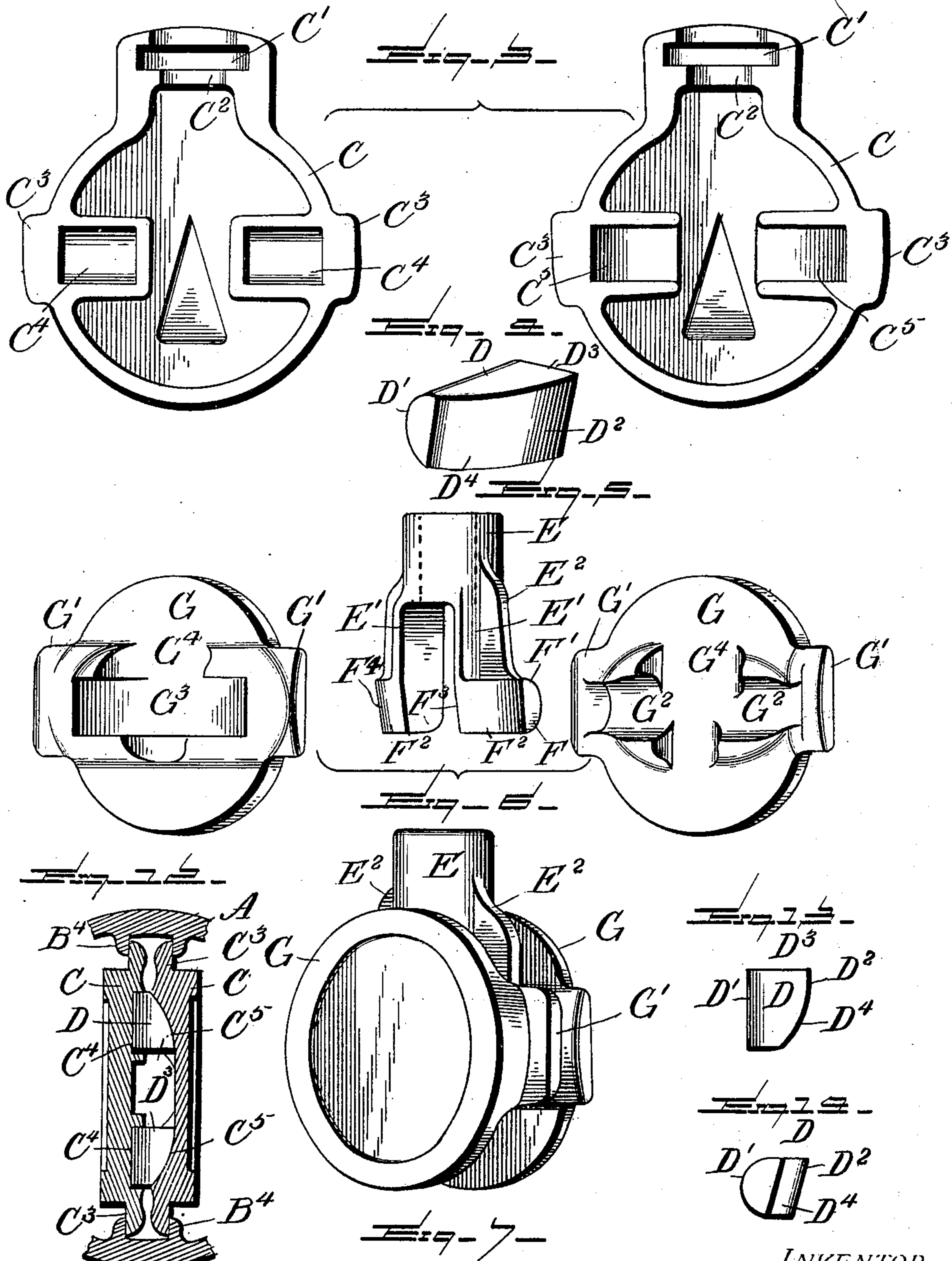
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3 Sheets—Sheet 3.

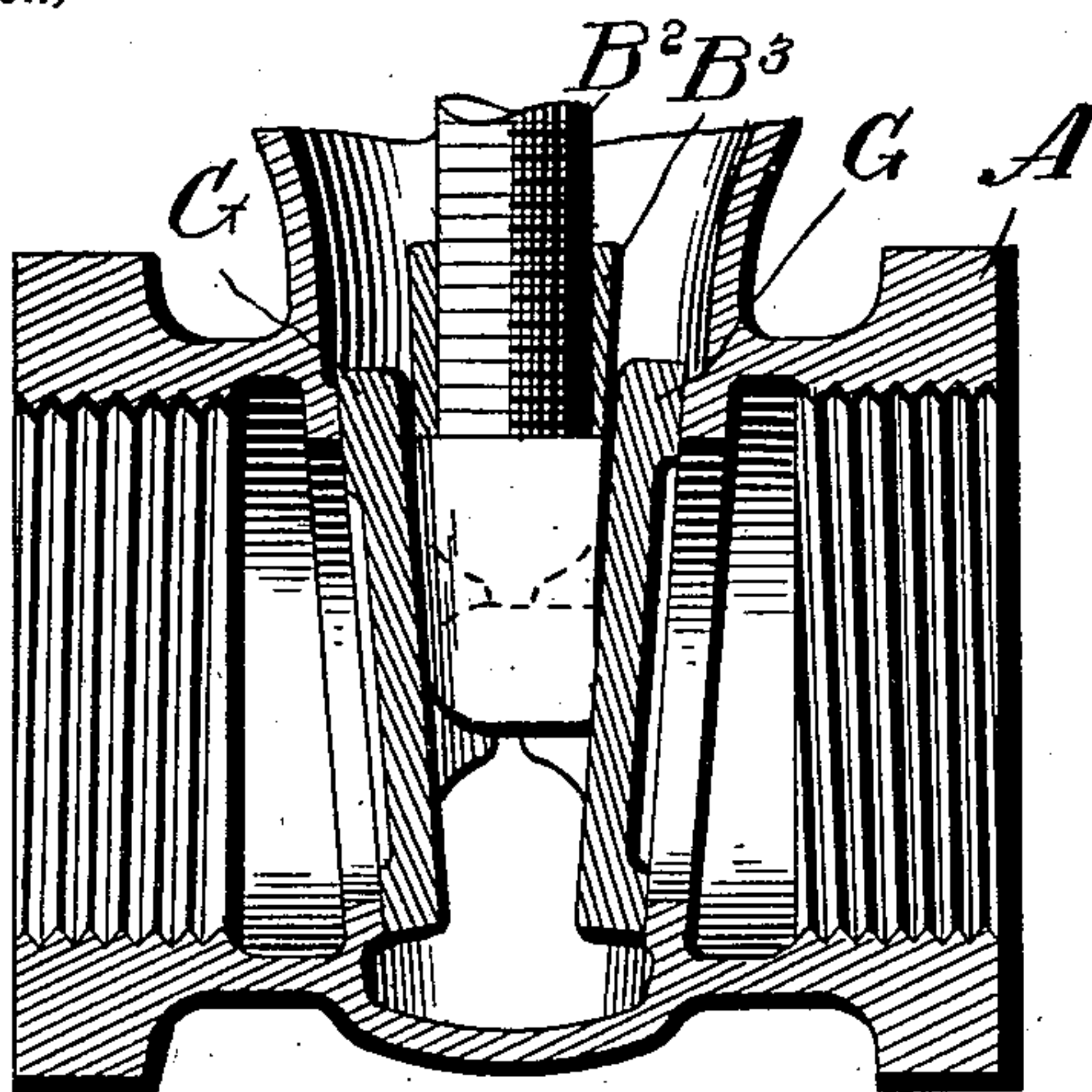


Fig. 8.

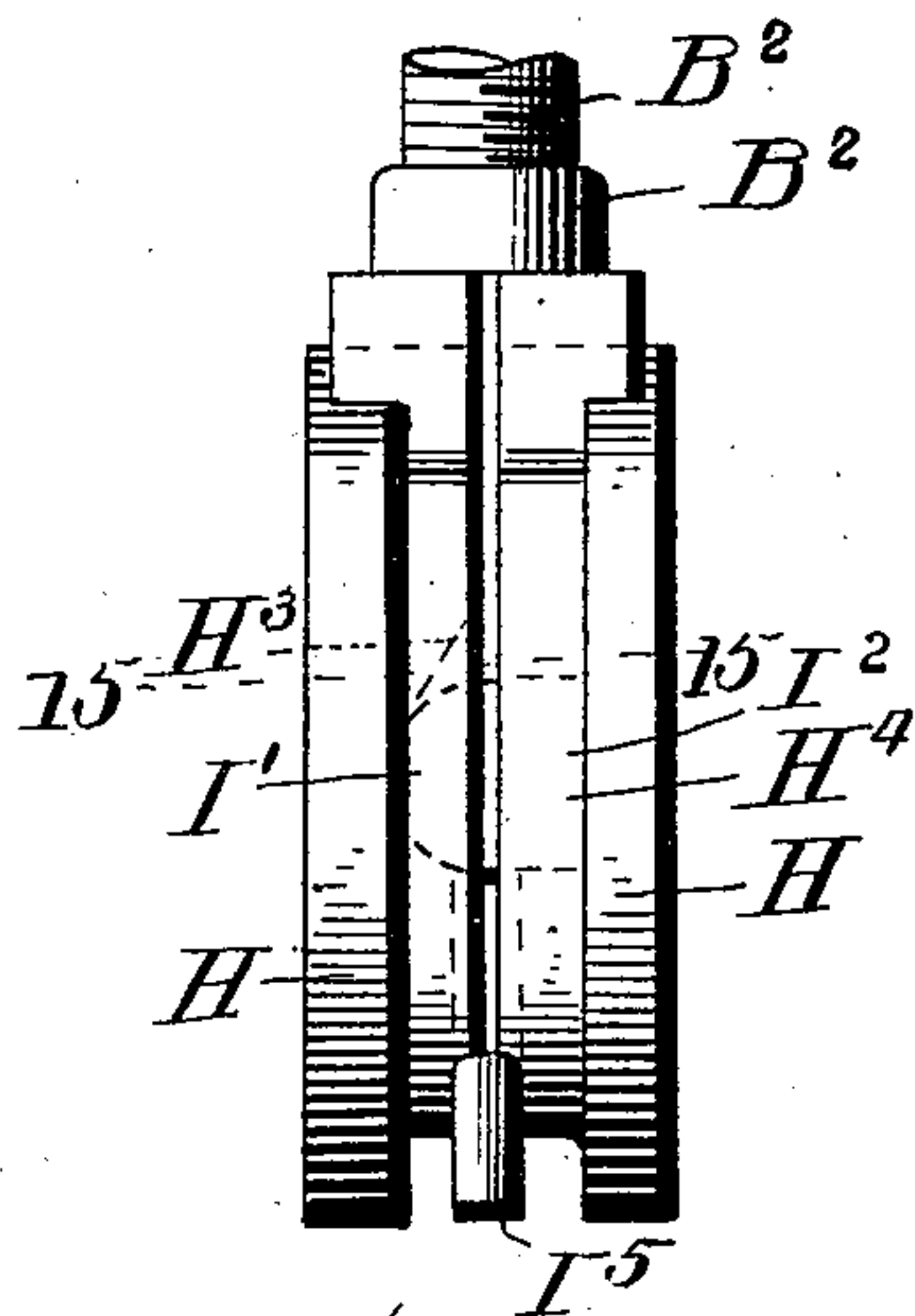


Fig. 9.

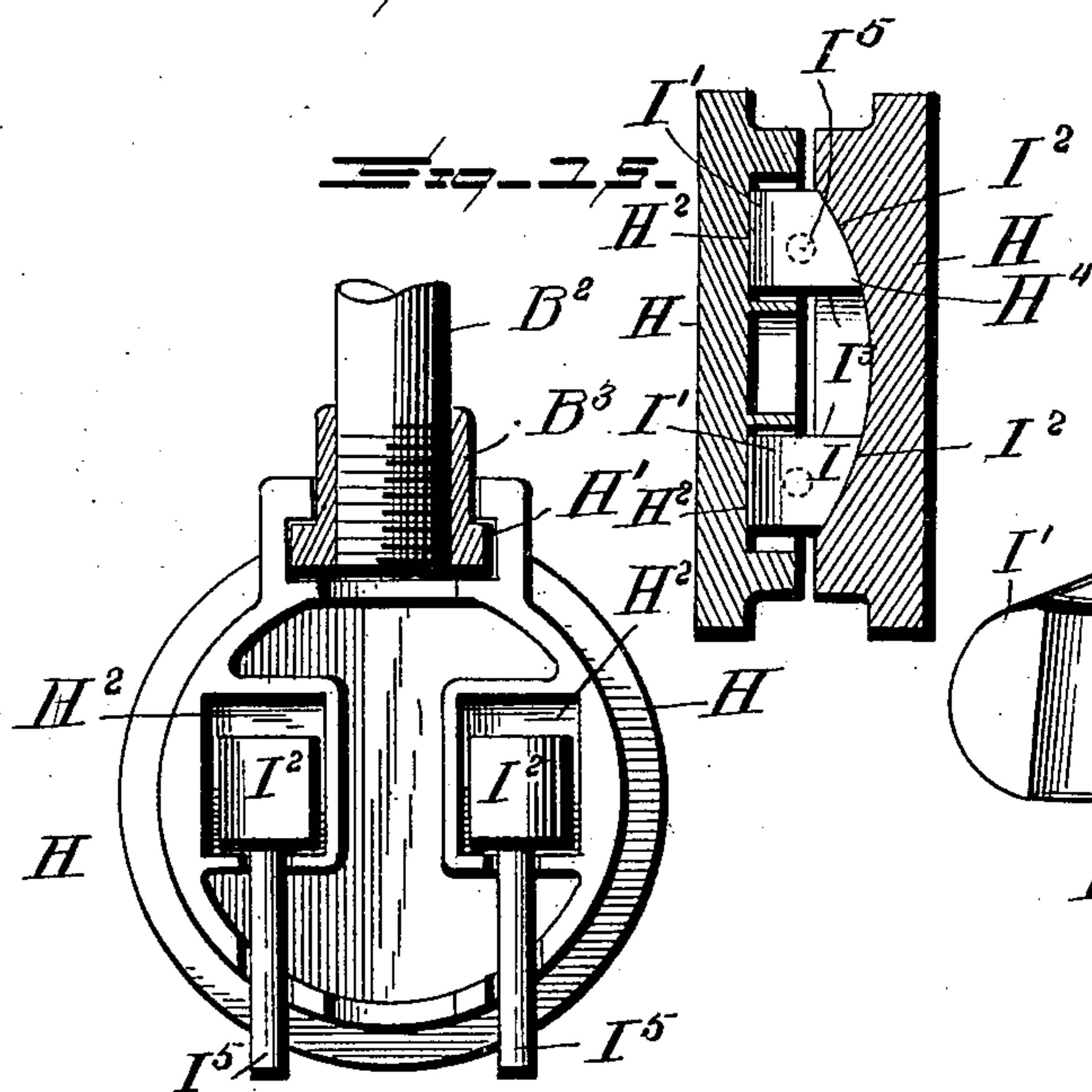


Fig. 10.

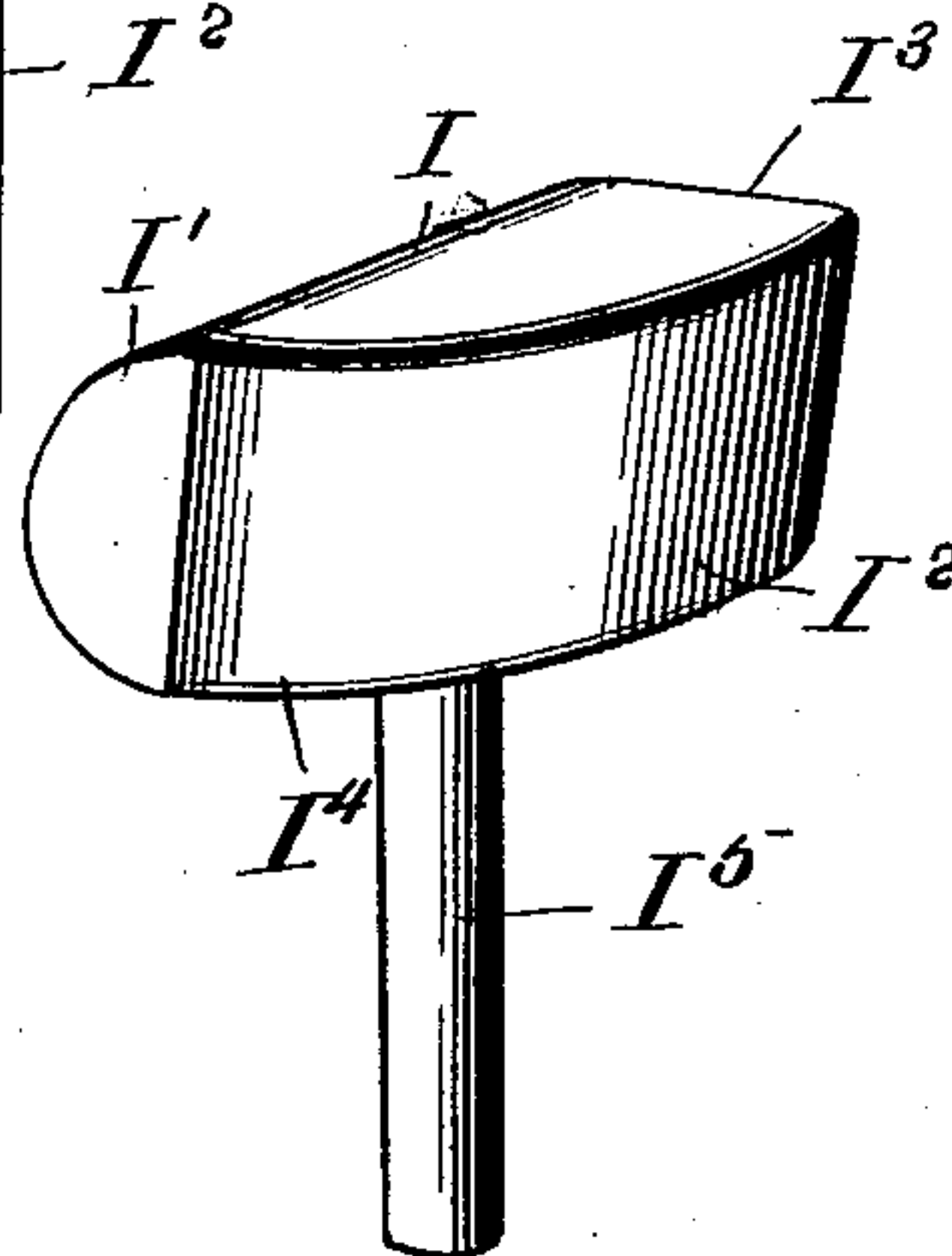


Fig. 11.

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# UNITED STATES PATENT OFFICE.

OWEN L. WHITEMAN, OF COXSACKIE, NEW YORK.

## GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 681,900, dated September 3, 1901.

Application filed June 12, 1901. Serial No. 64,300. (No model.)

*To all whom it may concern:*

Be it known that I, OWEN L. WHITEMAN, a citizen of the United States, residing at Coxsackie, in the county of Greene, State of New York, have invented certain new and useful Improvements in Gate-Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to sliding gate-valves, and particularly to a structure for permitting a movement of the valve upon its supporting device, whereby it shall be accurately seated upon the bearing provided therefor.

The invention has for its object to provide a form of rocker or bearing adapted to be disposed between the opposite gates or valve-disks comprising the sliding gate, whereby a movement or oscillation of the disks upon the rocker is secured in two directions to insure a complete seating of the valve and a wedging action by which the opposite disks are forced into contact with their bearing-surfaces or seats.

A further object of the invention is to provide an improved form of rocker having a laterally-curved face and an opposite longitudinally-curved face, the latter being tapered from the top of the rocker downwardly when it is desired to secure the wedging action between the opposite disk comprising the valve.

Other objects and advantages of the invention will hereinafter appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a vertical longitudinal section through a valve-casing having the invention applied thereto. Fig. 2 is a section at a right angle to Fig. 1 with parts in elevation. Fig. 3 is a detail elevation of the opposite disks or gates separated. Fig. 4 is a detail perspective of the rocker. Fig. 5 is a perspective of a modified application of the invention embodying a carrier adapted to support the rockers. Fig. 6 is a similar view of the gates or disks adapted to engage the rockers of the carrier shown in Fig. 5. Fig. 7 is a detail perspective of the parts shown in Figs. 5 and 6 assembled. Fig. 8 is a vertical longitudinal section of the modification shown in Fig. 7 applied to a threaded casing.

Fig. 9 is a side elevation of a further modified form of the invention in which the rocker is provided with a downwardly-extending arm. Fig. 10 is a central vertical section through Fig. 9 with one of the gates removed. Fig. 11 is a detail perspective of the rocker used in connection with the modification shown in Figs. 9 and 10. Fig. 12 is a horizontal section of the form of rocker shown in Fig. 4 as applied to the valve-gates shown in Fig. 3. Figs. 13 and 14 are a plan and end elevation, respectively, of the rocker shown in Fig. 4; and Fig. 15 is a cross-section on the line 15 15 of Fig. 9.

Like letters of reference indicate like parts throughout the several figures of the drawings.

In Figs. 1 and 2 the improved structures of gate and rocker are shown in connection with a valve-casing and operating device simply for the purpose of illustration; but the invention is capable of application to any desired form of valve-casing and in connection with any suitable operating mechanism. In the illustration given the elbow A is provided with the opposite valve-seats A' and the valve-chamber A<sup>2</sup> above the same, into which the sliding valve is adapted to move. Through this chamber and connected with the sliding valve in any suitable manner to reciprocate the same is a valve-stem B, which is provided at its upper end with a handle B' and at its lower portion with a threaded section B<sup>2</sup>, adapted to engage a threaded nut B<sup>3</sup>, held by the valve gates or disks C, the preferred form of which is shown in Fig. 3. When used in connection with this form of gate or disk, the opposite members C are provided at their upper portion with a recess C', adapted to retain the nut B<sup>3</sup> in position when the members of the valve are assembled, as shown in Fig. 1, opposite their respective seats. Beneath this recess a circular opening C<sup>2</sup> is provided, which permits the necessary space for the reception of the threaded portion B<sup>2</sup> of the stem as the valve rides upwardly thereon. The opposite edges of each of the disks have formed thereon a projecting lug C<sup>3</sup>, adapted to travel in contact with guide-flanges B<sup>4</sup> upon the sides of the casing, by which the line of travel of the valve-gates is assured and the parts held together. One member or



gate of the valve is provided with bearing-recesses  $C^4$ , which are curved transversely to a vertical line passing through the center of the gate and are adapted to receive the lateral curved face  $D'$  of the rocker  $D$ , as shown in Fig. 4, while the opposite gate or member is provided with corresponding recesses  $C^5$ , which are curved longitudinally of a vertical line passing through the disk and are adapted to receive the longitudinally-curved face  $D^2$  of the rocker  $D$ , so as to permit a movement of one of the parts upon the other in a horizontal line across the valve. It will be understood that, as shown in Fig. 12, the rockers are placed with the larger or wider end  $D^3$  thereof toward the center of the gate or disk. It will also be seen that the longitudinally-curved face  $D^2$  of the rocker is slightly tapered from the top downwardly, as at  $D^4$ , Fig. 14, so that a vertical movement of the valve upon the rockers effects a wedging action to separate the opposite disks or valve from each other and bring the same into engagement with their seats. This construction permits a relative movement of the gates or disks in their relation to each other, whereby a rocking action in a vertical plane is secured by the bearing of the face  $D^2$  of the rocker in the recess  $C^5$  of the gate, while the tapered face  $D^4$  of the rocker tends to spread the gates from each other and force the same toward their seats, the recess  $C^5$  being slightly wider than the face  $D^2$  to permit this action, Fig. 1.

In Figs. 5 to 8, inclusive, a modified form of the invention is shown, in which the rockers are secured to a carrier  $E$ , which is interiorly threaded and carried by the threaded end  $B^2$  of the valve-stem. This carrier is provided with depending arms  $E'$ , forming a yoke, and may be suitably braced by means of ribs  $E^2$ , so as to receive the crushing strain upon the opposite separate portions of the yoke instead of the cylindrical body of the carrier. The rockers  $F$  in this form of the invention are formed integral or attached to the lower end of the carrier  $E$  and are provided with the laterally-curved face  $F'$  and the opposite longitudinally-curved face  $F^2$ , corresponding to the similar faces shown in Fig. 4, while the enlarged ends of the rockers are shown at  $F^3$  and the taper of the longitudinal face at  $F^4$ . The opposite gates or disks  $G$  used in connection with this form of the invention are provided with flanges  $G'$ , adapted to engage the guides in the casing, by which the gates are held in proper relation to the carrier and rockers just described. One of these gates is provided with a suitable recess  $G^2$ , formed in two parts to correspond with the rocker-sections  $F$  at the lower end of the carrier, which form recesses curved transversely to a vertical line through the disk and correspond to the recesses  $C^4$ , as shown in Fig. 3, while the opposite member is provided with a recess  $G^3$ , extending longitudinally of the vertical line through the disk

and corresponding to the recess  $C^5$ , as shown in Fig. 3. The walls of these recesses are suitably cut away, as shown at  $G^4$ , to permit the proper seating of the disks upon the carrier  $E$ , the yoke portions  $E'$  of which extend downward into contact with the disks. It will be seen that the laterally-curved faces  $F'$  in this form of the invention when seated in the recesses  $G^2$  permit a rocking of the gate upon the rocker in a horizontal line, while the engagement of the longitudinally-curved faces  $F^2$  of the rocker with the recesses  $G^3$  permit the rocking of the opposite gate in a direction at a right angle to the other gate.

In Figs. 9, 10, and 11 a further modified form of the invention is illustrated, in which the threaded stem  $B^2$  is adapted to engage a nut  $B^3$ , seated in a suitable recess  $H'$ , formed in the opposite gates or disks  $H$ , comprising a sliding gate. One of the gates  $H$  is provided with a recess  $H^2$ , curved transversely to a vertical line passing through the gate and adapted to receive a laterally-curved face  $I'$  of the rocker  $I$ . (Shown in Fig. 11.) The opposite gate is provided with a recess  $H^4$ , curved longitudinally to a vertical line passing through the gate and adapted to receive the longitudinally-curved face  $I^2$  of the rocker  $I$ . The wider end  $I^3$  of the rocker is disposed toward the center of the valve, as shown in Fig. 15, while the tapered portion of the longitudinal face  $I^2$  is indicated at  $I^4$ . Each of the recesses  $H^2$  is provided with a beveled or inclined face  $H^3$ , extending above the curved face  $H^2$ , as shown in Fig. 9, and each of the rockers  $I$  is provided with a depending stem  $I^5$ , adapted to project below the gates  $H$ , so as to contact with a portion of the casing, thereby forcing the rocker upward, and by contact of the curved portion  $I'$  with the inclined surface  $H^3$  the disks or gates are forced apart and brought into firm contact with the respective seats to be engaged. It will be understood that the laterally and longitudinally curved faces of the rockers permit the same relative adjustment of the disks or gates upon the rockers in this form of the invention as in the others before described, while the wedging action is facilitated by means of the depending stems  $I^5$ , which when engaging the fixed portion of the casing force the rockers upward to separate the valve-gates.

The operation of the invention will be apparent from the foregoing description, and it will be seen that one of the essential features is the rocker having the opposite laterally and longitudinally curved faces in connection with similar seats on the adjoining or abutting faces of the valve gates or disks. This construction permits the rockers to be made of solid material and removes all strain in the wedging action of the valves to their seats from the threaded cylindrical connection and in the form shown in Figs. 3 and 4 dispenses with the necessity of such connection. It also presents a construction in which



the stem-nut, valve-disks, and rockers can be located in the smallest possible space, thus economizing in the metal used and materially reducing the size of the valve-casing required to receive and operate a valve for any particular size of pipe. This construction also simplifies the valve structure, so as to materially reduce the cost of the same, and presents a construction of parts not liable to be disarranged in the operation of the valve.

It will be obvious that changes may be made in the details of construction and configuration of the several parts and that the rocker may be applied to any desired form of valve-gates or in connection with different forms of casings and operating mechanisms.

Having described my invention, what I claim is—

1. A gate-valve rocker comprising an elongated body having a laterally-curved face and an opposite longitudinally-curved face; substantially as specified.

2. A gate-valve rocker having a laterally-curved face and an opposite longitudinally-curved face, the latter being tapered from the top of the rocker downwardly; substantially as specified.

3. A gate-valve comprising opposite gates or disks having elongated recesses therein curved in opposite directions, an elongated rocker having opposite laterally and longitudinally curved faces to correspond with said recesses; substantially as specified.

4. A gate-valve comprising a gate or disk provided with recesses at each side of its vertical center curved transversely to a vertical line therethrough, an opposite gate or disk provided with recesses curved longitudinally to a vertical line therethrough and in alignment with the first-mentioned recesses, and rockers having laterally and longitudinally curved faces adapted to seat in said recesses; substantially as specified.

5. A gate-valve comprising a gate or disk having recesses therein curved transversely to a vertical line therethrough, an opposite gate or disk provided with recesses curved longitudinally to a vertical line therethrough, rockers having laterally and longitudinally curved faces adapted to seat in said recesses,

and a recess at the upper portion of each of said gates or disks adapted to receive a stem-nut; substantially as specified.

6. A gate-valve comprising a gate or disk having recesses therein curved transversely to a vertical line therethrough, an opposite gate or disk provided with recesses curved longitudinally to a vertical line therethrough, rockers having laterally and longitudinally curved faces adapted to seat in said recesses, a recess at the upper portion of each of said gates or disks adapted to receive a stem-nut, and guide-lugs at the opposite sides of each of said disks adapted to engage a flange within the valve-casing; substantially as specified.

7. A gate-valve comprising opposite gates or disks one of which is provided with recesses curved transversely to a vertical line therethrough and the opposite disk with recesses curved longitudinally to a vertical line therethrough, rockers adapted to be seated in said recesses and having a laterally-curved face and an opposite longitudinally-curved face extending from the inner to the outer end of the rocker and tapered from the top of the rocker downwardly; substantially as specified.

8. A gate-valve comprising opposite gates or disks one of which is provided with recesses curved transversely to a vertical line therethrough and the opposite disk with recesses curved longitudinally to a vertical line therethrough, rockers adapted to be seated in said recesses and having a laterally-curved face and an oppositely longitudinally curved face extending from the inner to the outer end of the rocker and tapered from the top of the rocker downwardly, a valve-casing provided with guide-flanges, guide-lugs carried upon the opposite disks or gates, a stem-nut seated in the upper portion of said gates, and a rotatable threaded stem adapted to pass through said nut; substantially as specified.

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

OWEN L. WHITEMAN.

Witnesses:

EDWIN F. TIEL,

EDWIN P. MOORBY.