

G. T. LUCKETT.
GATE VALVE.

APPLICATION FILED APR. 26, 1904.

Fig. 3.

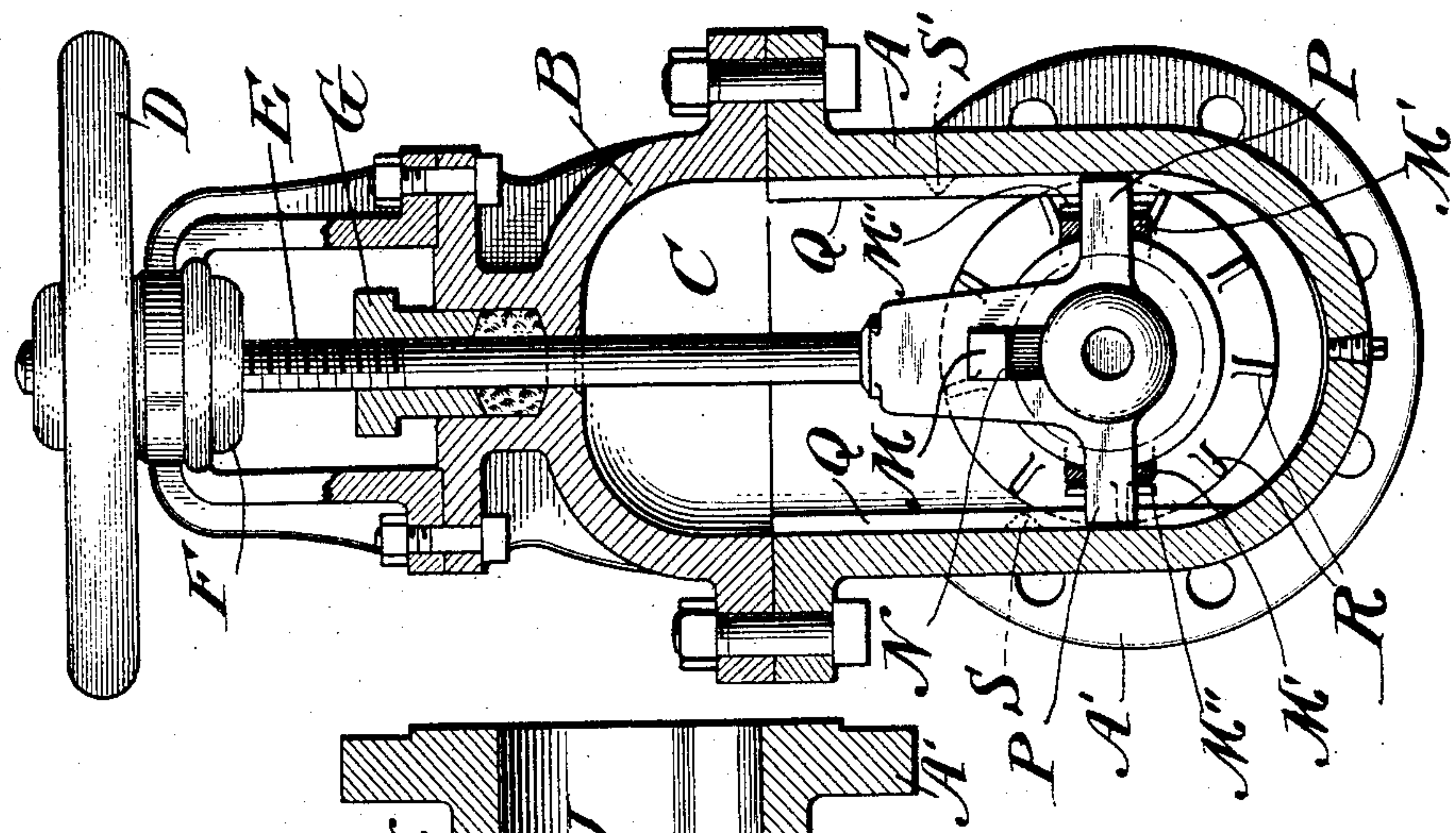


Fig. 2.

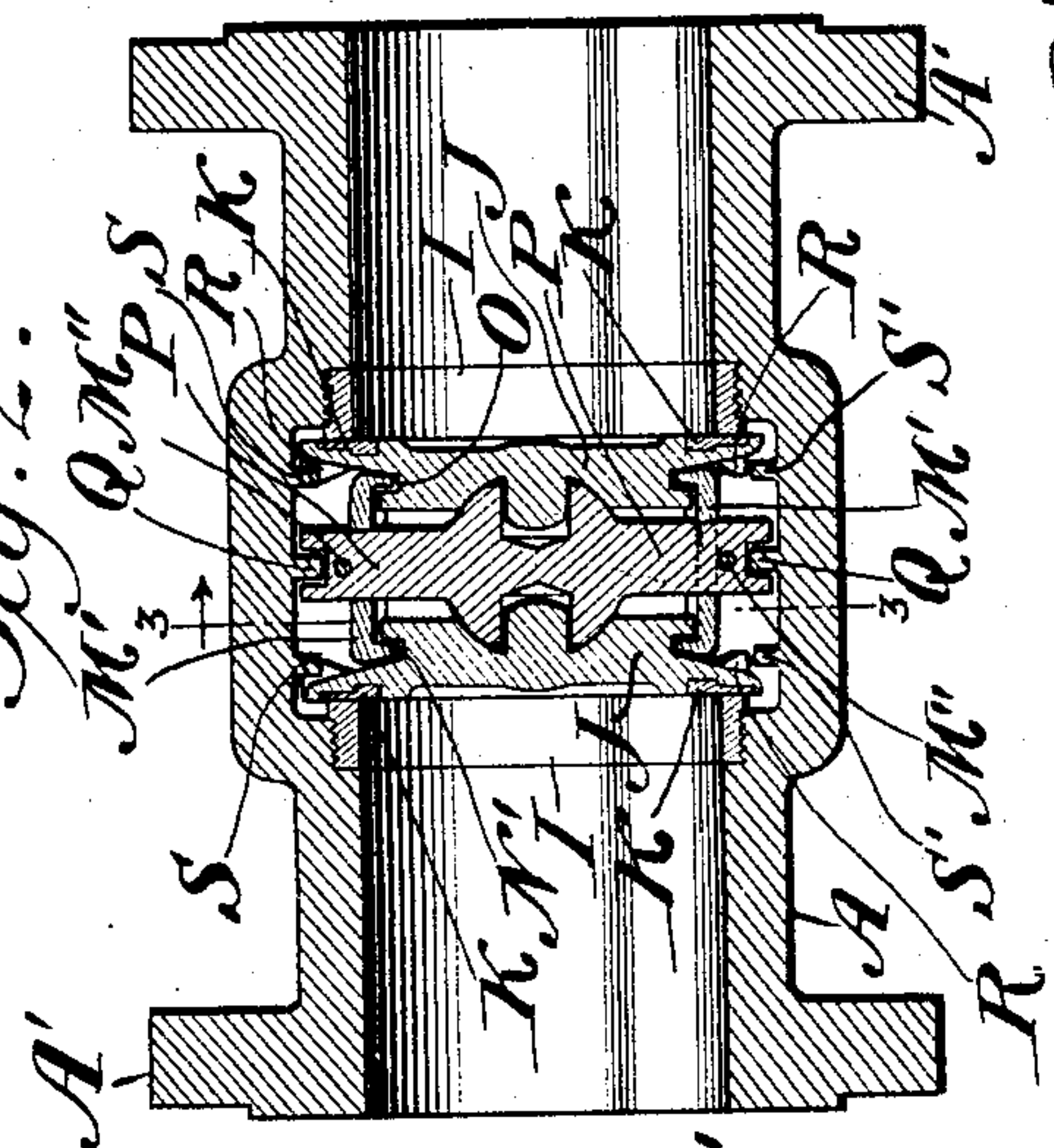
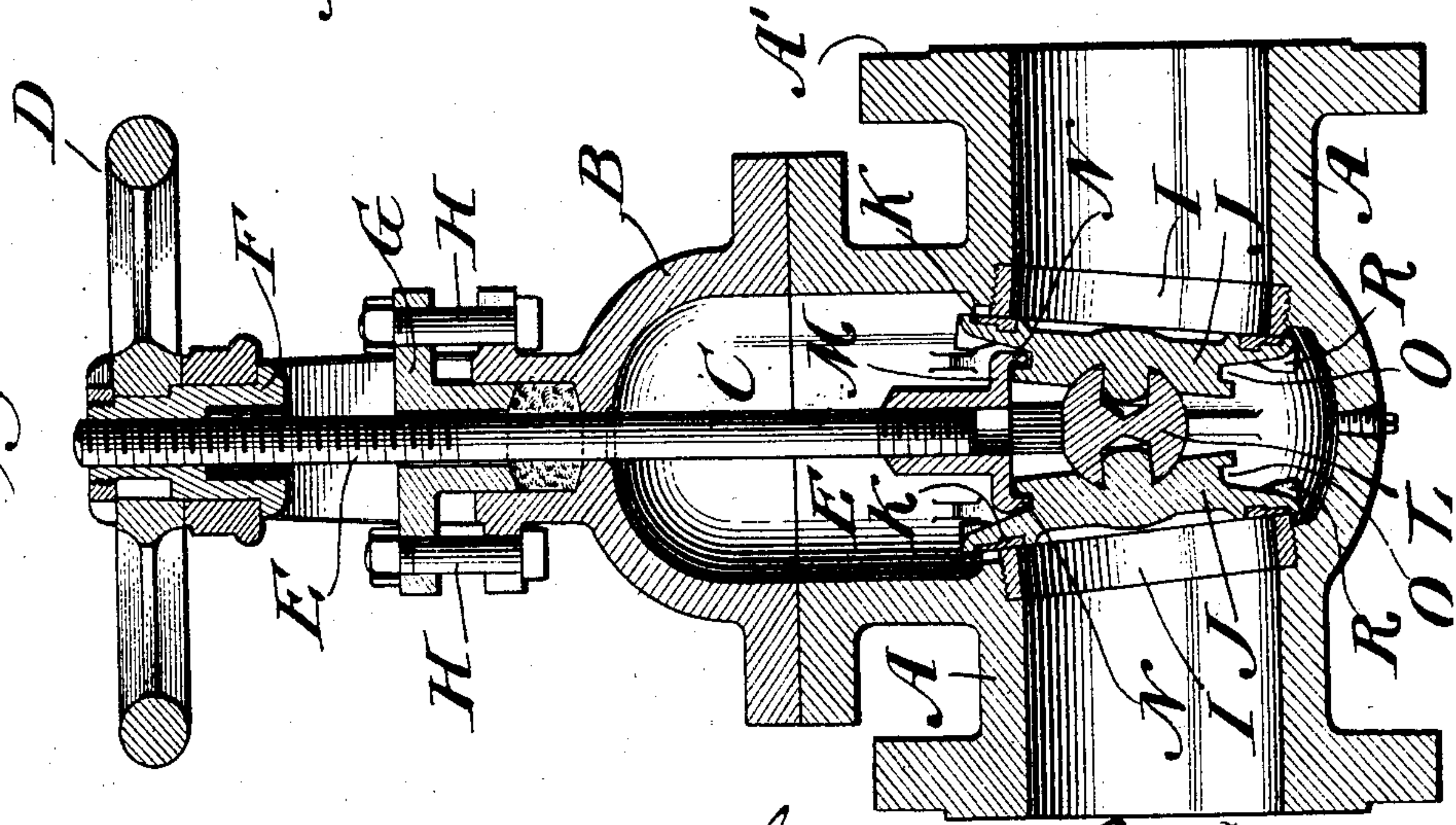


Fig. 1.



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UNITED STATES PATENT OFFICE.

GUSTAVUS T. LUCKETT, OF NEW YORK, N. Y., ASSIGNOR TO MORRIS W. KELLOGG, OF ELIZABETH, NEW JERSEY, AND WILLIAM B. OSGOOD FIELD, OF NEW YORK, N. Y., COMPOSING THE FIRM OF M. W. KELLOGG & COMPANY, OF NEW YORK, N. Y.

GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 786,043, dated March 28, 1905.

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To all whom it may concern:

Be it known that I, GUSTAVUS T. LUCKETT, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented a new and useful Improvement in Gate-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 illustrates a longitudinal vertical section of a gate-valve embodying my invention. Fig. 2 illustrates a horizontal section. Fig. 3 illustrates a transverse vertical section on the line 3 3 of Fig. 2, certain of the parts being shown in elevation.

My invention relates to so-called "gate-valves," and more particularly to that form in which there are two substantially flat disks arranged to be seated and unseated by means of a suitably-actuated stem. The disks are set at a slight angle relative to each other, so that when they are depressed they shall engage with suitable seats arranged at a like angle, whereby under the action of the stem a tight and reliable closure to the passage of steam or other fluid or liquid is secured.

In the drawings, A represents the body of the gate. It may be made of such material and in such special manner as desired. It is usually provided with flanges A' A' at both ends, as shown, whereby connection may be made with the line-pipes.

B is the bonnet of the gate, within which is the chamber for the reception of the valve-disks when elevated.

D is the hand wheel or lever whereby in the case illustrated the gate is manipulated. It is mounted upon a threaded spindle E, which works in a threaded nut F, as usual.

G is the gland of the stuffing-box, provided with bolts H or with other means for compressing the packing, as preferred.

It will be understood that my invention is equally applicable to the so-called "hydraulically-operated" and to the so-called "inside" screw-valve. I illustrate the form shown in the drawings as one form only of many in which the invention may be employed.

I I are the two valve-seats. They may be made of cast-steel, cast-iron, babbitt, or such

other metal as preferred and are set at a slight angle relative to each other corresponding to that of the valve-disks J J. Their opposed faces are, as usual, ground true and finished to present a suitable surface to the disks of the valve.

J J are the two valve-disks. They are provided, respectively, with annular packing-rings K K, which may be made of such material as preferred. I prefer to employ bronze. The disks are held to the lower end of the spindle by a ball-and-socket connection L and by what I term "stay-bars" M and M'. The stay-bar M is arranged, as shown, at the upper part of the valve-disks, and it has downwardly-presented lips N N, which engage, respectively, annular recesses or grooves O O, made on the back or rear surface of the valve-disks J in such manner that as these disks are revolved the lips N N will travel through the annular grooves or recesses O O without binding. The other stay-bars, M' M', are located at both sides of and on about the central line of the valve-disks, (see Fig. 2,) and their lips N' N' likewise engage in the same annular grooves or recesses O O in which the lips N N of the stay-bar M engage. It will readily be understood from this method of supporting and holding the two valve-disks—that is to say, by a centrally-located ball-and-socket joint on the end of the spindle and the stay-bars having lips which enter loosely into the annular grooves described—that there is nothing rigid or immovable in the confinement of the disks. On the contrary, they are within certain limits perfectly free to move in any direction, whereby they will automatically and with exactness adjust themselves to their respective seats.

The stay-bars M' M' in the example illustrated pass through a cross-head P and are each held in place by a pin M''. The cross-head P is grooved at its ends, (see Fig. 2,) and in the grooves vertical slideways Q enter, so that the valve in its upward and downward movements is guided by the cross-head engaging with the slideways instead of there being guiding devices upon the disks of the valves, as heretofore, and the engagement between the slideways Q and the grooves in the ends of the cross-head P is such that there is

some play permitted in the parts, so that there is no jamming or binding during the movements of the gate. The guides Q extend downwardly at least to the axial line of the gate. (See Fig. 3.)

On the back or rear side of the valve-disks I construct a series of rigid lugs R R, and upon the side of the valve-chamber I make inwardly-projecting rigid studs S S', which are arranged in pairs on opposite sides of each disk, one of each pair being lower than the other, as shown clearly in Fig. 3, so that as the disks are elevated into the chamber C one of these lugs R will engage with the left-hand stud S, and in the downward movement of the gate another lug R on the opposite side of the disk will engage with the stud S', so that at each opening and closing of the gate both of the disks will be positively revolved somewhat, always in the same direction, thus preserving uniformity of wear and avoiding the possibility of imperfect closure because of so-called "steam-marks," "soft spots," &c. In addition to this positive rotation of the disks they will automatically rotate, as friction may induce such rotation upon coming in contact with their seats, respectively.

I desire to call attention to the following features of my invention, some of which have been briefly suggested above, to wit: In my valve-gate the disks are supported by a centrally-located ball-and-socket joint, whereby universal movement of the disks within prescribed limits is secured; also, the difficulties arising from expansion and contraction are minimized. Further, the disks are centrally braced, thus preventing diaphragmatic action; also, the employment of guiding devices located midway or about midway between the two disks transversely of the gate and extending across it certainly to its axial line affords most perfect and efficient guiding facilities and entirely frees the valve-disks from any jamming or binding action, permitting their free rotation, as described. Again, under my construction the disks are supported by the ball-and-socket joint and the stay-bars above described and by them alone and in such manner that they are neither of them under any immediate confinement. On the contrary, within all necessary limits they are free to move in any and every direction, thus affording the greatest facilities for automatically and accurately adjusting themselves to their seats. Also by the employment of the stated supporting devices the disks are afforded the utmost freedom in rotation, so that binding or jamming of the valve during its upward and downward movement is avoided, and the rigid lugs R and studs S S' secure positive rotation of the disks. This is an important feature. Also all parts of the construction are not only relatively inexpensive and simple to make, but likewise there is no delicate part. All the elements or members may be easily and in-

expensively made heavy and durable in construction, so that the life of the valve will be materially lengthened.

It will be obvious to those who are familiar with this art that modifications may be made in the details of construction of the apparatus without departing from the essentials thereof. I therefore do not limit myself to the details.

I claim—

1. A gate-valve having a stem and means to actuate it, guides at each side of the gate which extend at least to its axial line when closed, a cross-head on the stem which engages with the guides and disk valves movably attached to the stem by a ball-and-socket joint and each supported at three points by stay-bars carried by the stem.

2. A gate-valve having a stem and means to actuate it, guides at each side of the gate which extend at least to its axial line when closed, a cross-head on the stem which engages with the guides, disk valves movably attached to the stem by a ball-and-socket joint and each supported at three points by stay-bars carried by the stem, and rigid devices on the disks which engage with other rigid devices on the body of the gate during the seating and unseating of the valve, whereby the disks are positively revolved.

3. A gate-valve having a stem and means to actuate it, a cross-head on the stem which engages with guides on the body of the gate, disk valves supported centrally by a ball-and-socket device upon the stem and additional supports or stays for the disks likewise carried by the stem and which engage with the disks at three separated points.

4. A gate-valve having a stem and means to actuate it, disk valves supported by a centrally-located ball-and-socket device upon the stem and additional supports or stays for the disks likewise carried by the stem and which engage with the disks at three separated points.

5. A gate-valve having disk valves set at an angle to each other and supported upon a stem which moves transversely of the gate, the means of attaching the disks to the stem being such as to support them centrally and also at three separated points near their edges and to permit universal movement of the disks within defined limits.

6. A gate-valve having a stem and means to actuate it, disk valves carried by the stem and movably held to it at three separated points and guiding devices for the disks and stem located transversely of the gate, about on its axial line when closed and about midway between the disks.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUSTAVUS T. LUCKETT.

Witnesses:

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