

No. 662,517.

Patented Nov. 27, 1900.

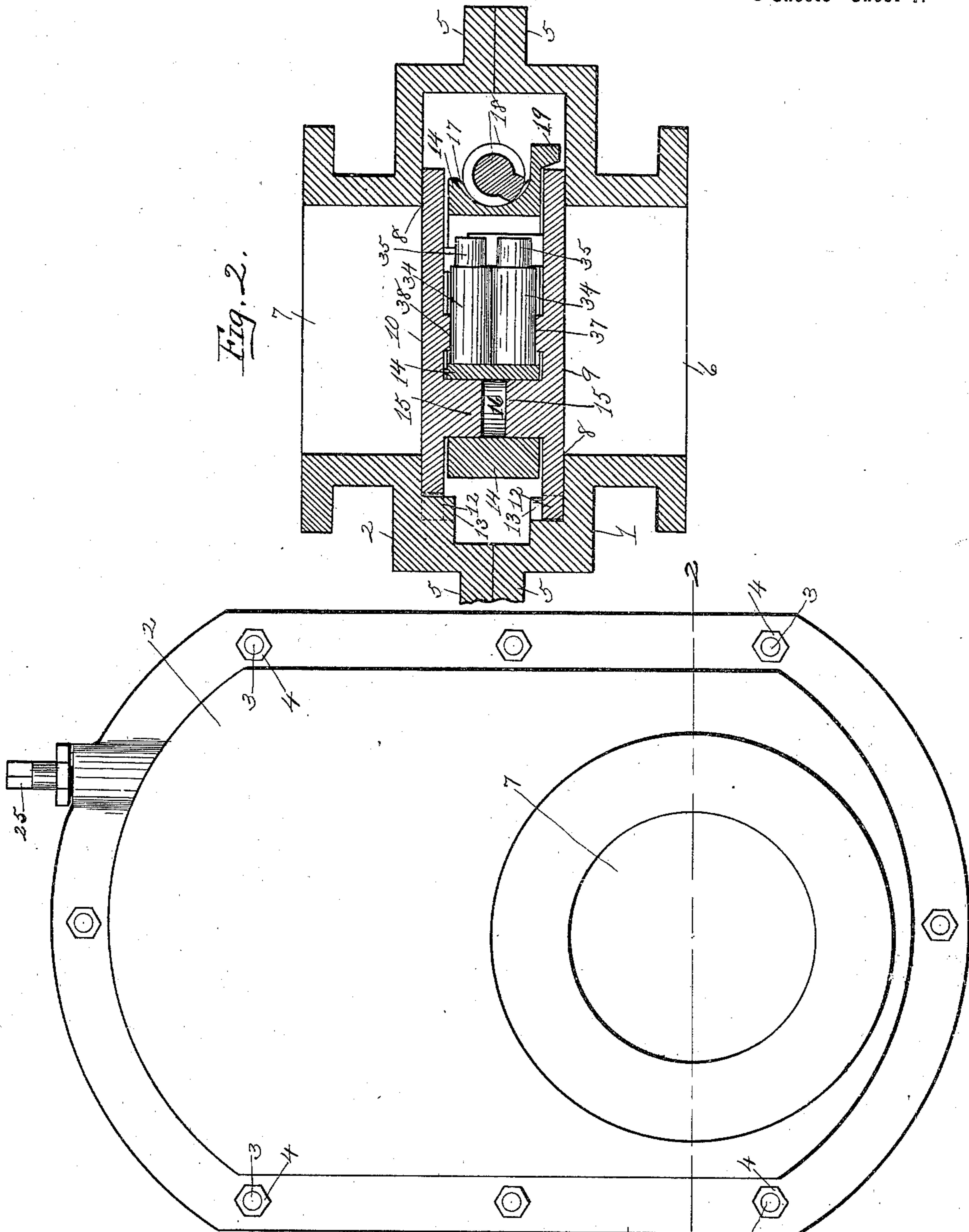
J. BARLOW.

VALVE.

(Application filed June 28, 1900.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
J. J. Fitzgerald
E. M. O'Reilly.

Fig. 1.

Inventor:
James Barlow
By Mosher & Curtis
attys

No. 662,517.

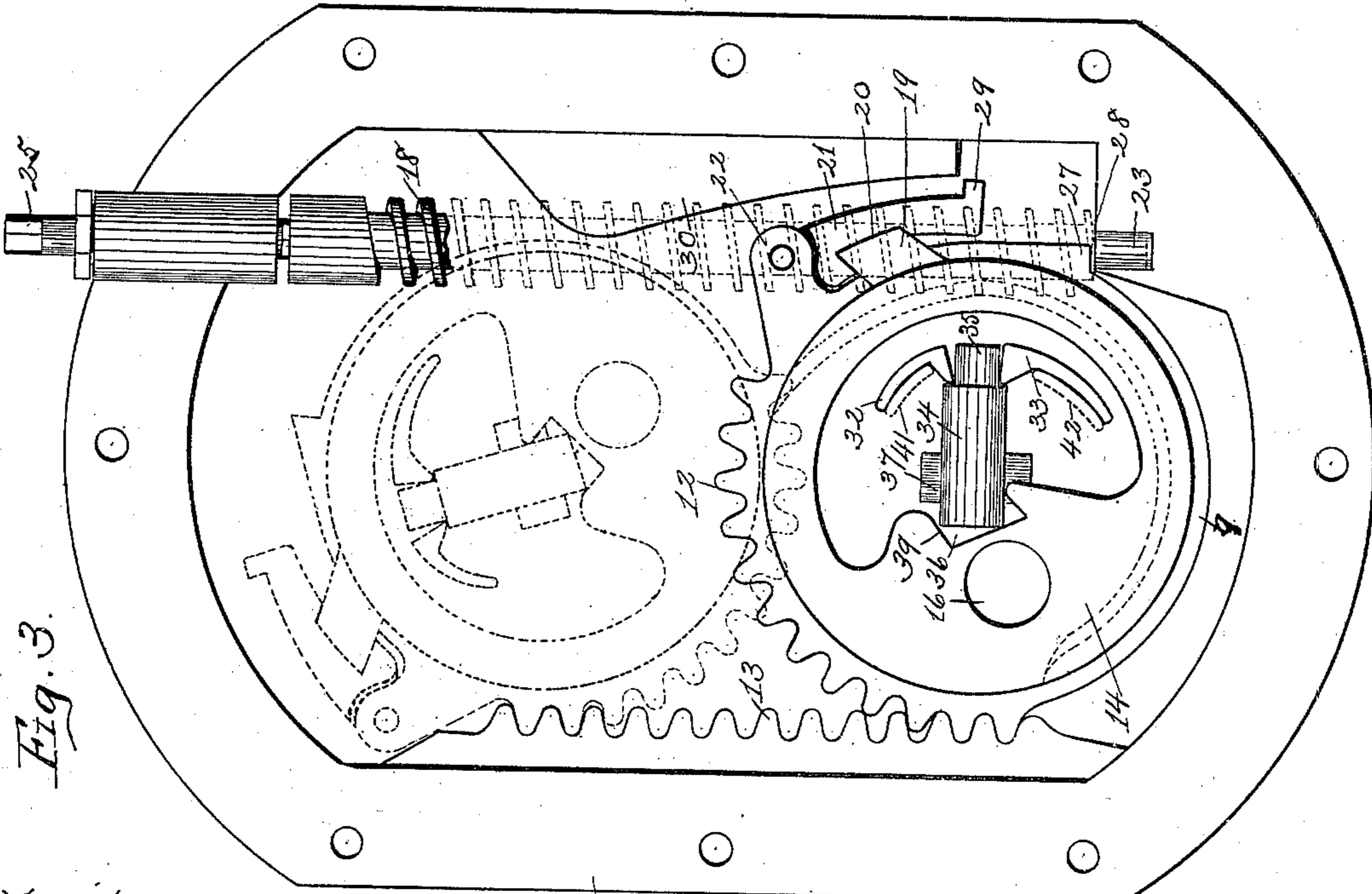
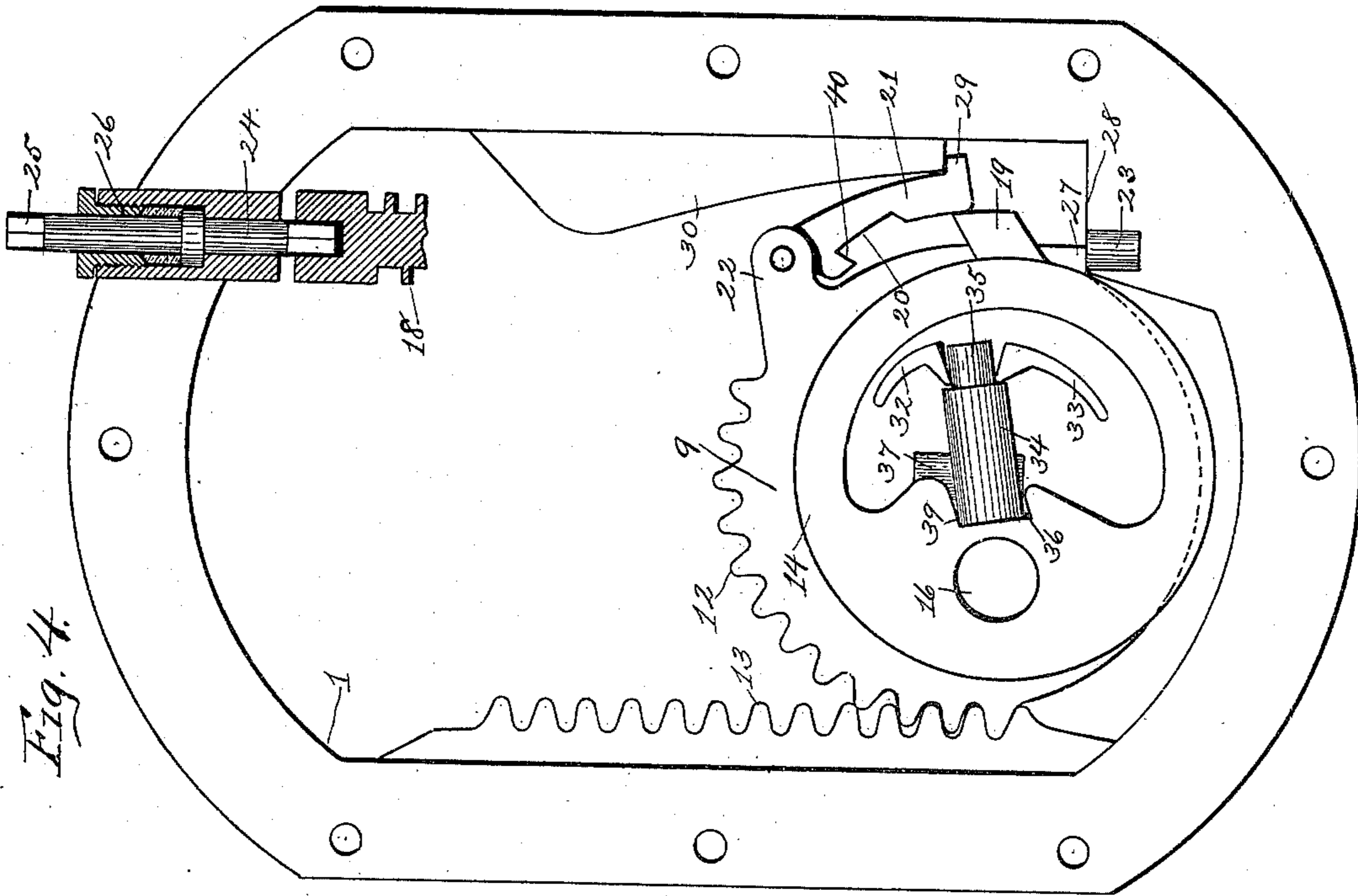
J. BARLOW.
VALVE.

Patented Nov. 27, 1900.

(Application filed June 28, 1900.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses:
J. J. Fitzgerald
E. M. O'Reilly.

Inventor:
James Barlow
By Mosher & Curtis,
attys.

No. 662,517.

Patented Nov. 27, 1900.

J. BARLOW.
VALVE.

(Application filed June 28, 1900.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 5.

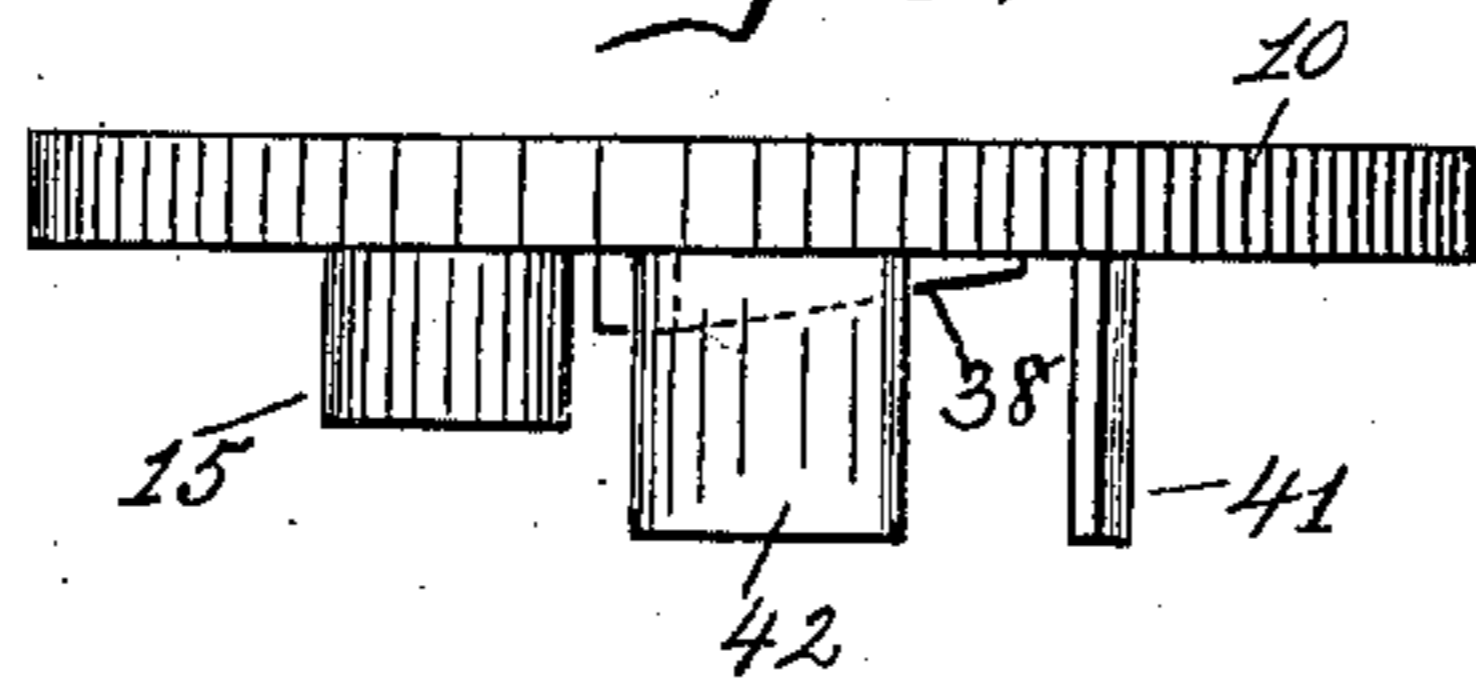


Fig. 6.

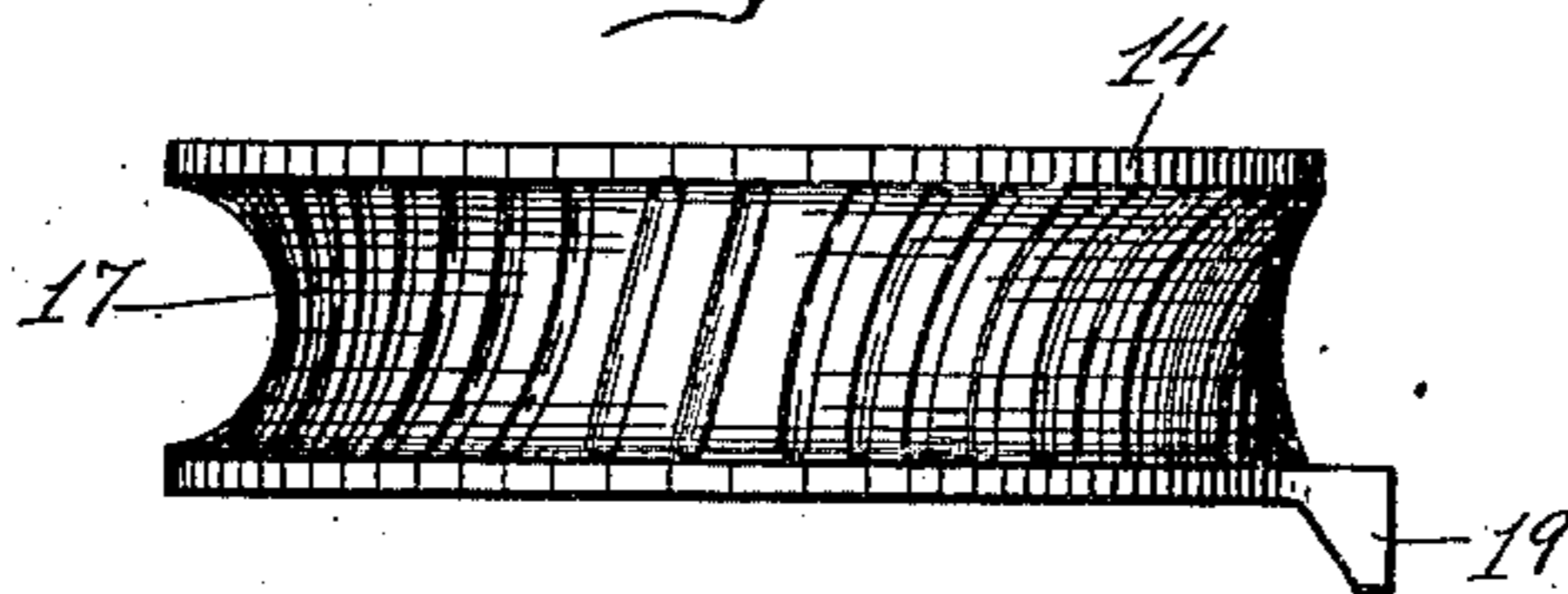


Fig. 7.

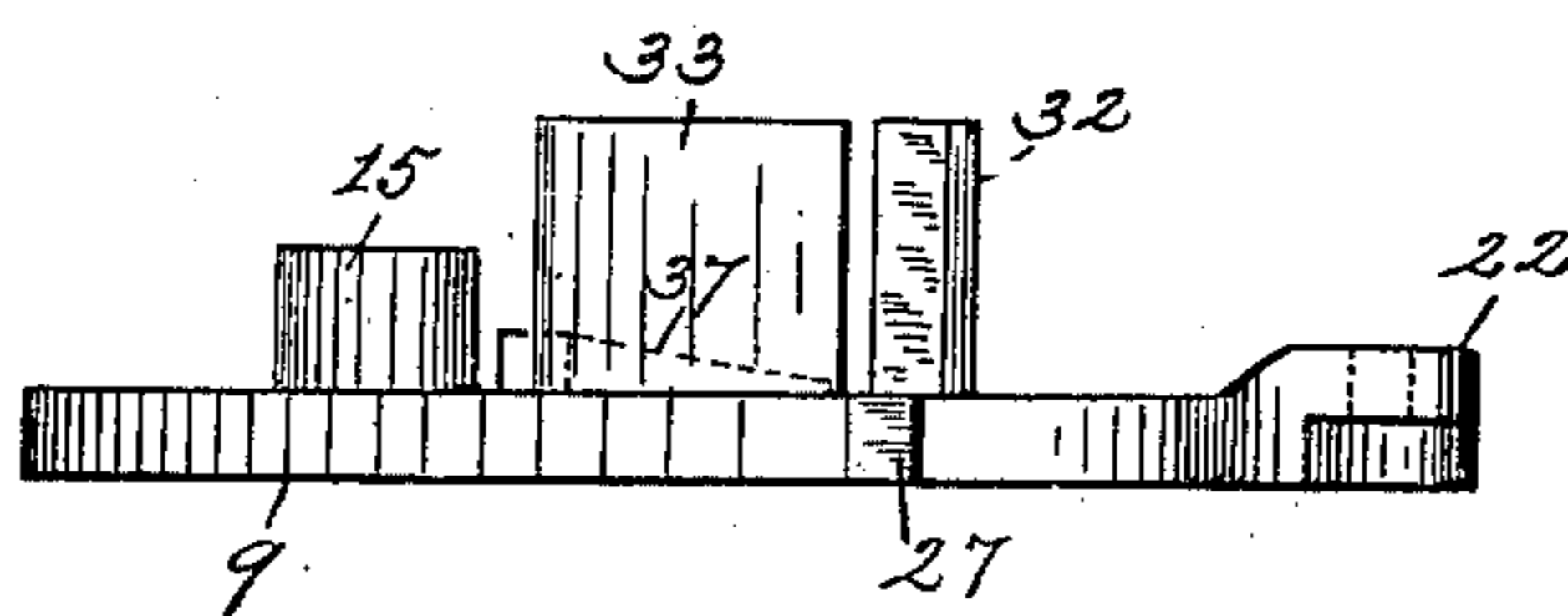
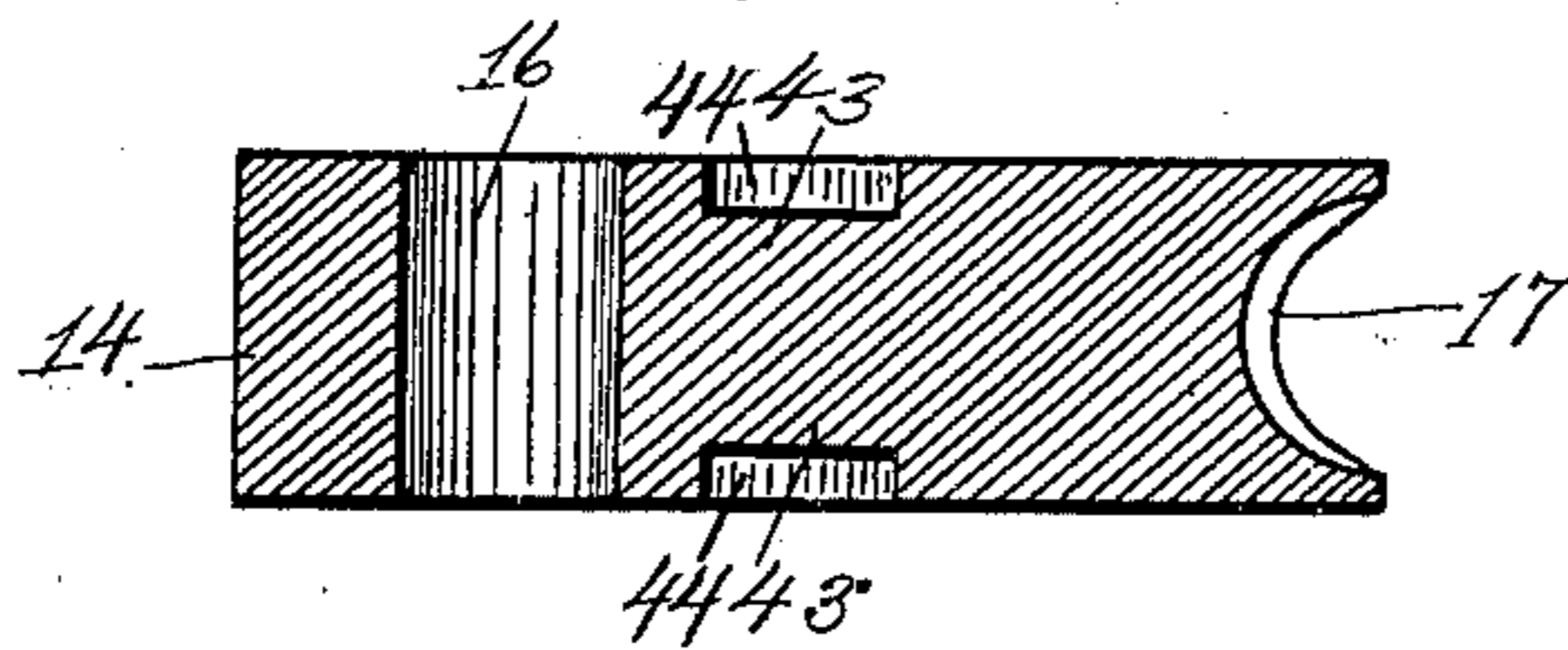


Fig. 8.



Witnesses:
J. J. Fitzgerald
E. M. O'Reilly.

Inventor:
James Barlow.
By Mosher & Curtis
attys

UNITED STATES PATENT OFFICE.

JAMES BARLOW, OF WATERVLIET, NEW YORK.

VALVE.

SPECIFICATION forming part of Letters Patent No. 662,517, dated November 27, 1900.

Application filed June 28, 1900. Serial No. 21,889. (No model.)

To all whom it may concern:

Be it known that I, JAMES BARLOW, a citizen of the United States, residing at Watervliet, county of Albany, and State of New York, have invented certain new and useful Improvements in Valves, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings and the reference characters marked thereon, which form a part of this specification.

Similar characters refer to similar parts in the several figures.

Figure 1 of the drawings is a top plan view of my improved valve laid down on one of its sides. Fig. 2 is a vertical cross-section taken on the broken line 2 2 in Fig. 1. Fig. 3 is a view similar to that shown in Fig. 1 with the upper section of the valve-case and the gate contiguous thereto removed and showing the other gate in a closing position with a portion of the worm or screw-threaded stem broken away. Fig. 4 is a view similar to that shown in Fig. 3, showing the position of the actuating parts when the gates are fully seated. Fig. 5 is an edge view of the upper gate detached. Fig. 6 is a similar view of the worm-actuated lever-carrier. Fig. 7 is an edge view of the lower gate detached. Fig. 8 is a central cross-section of a modified form of gate-carrier.

The object of my invention consists in providing a durable, cheaply-constructed, and easily-operated valve adapted for use in connection with comparatively large conduits.

The valve-case, preferably made of cast-iron, comprises two sections 1 and 2, which are secured together in the usual manner, as by bolts 3 and nuts 4, passed through apertures in the flanges 5. The case is shown in the drawings as laid down flat on one side or section. In the following description the section 1 will be called the "lower" section and section 2 the "upper" section or side of the case, although when in use either side may be uppermost or the sides may extend vertically without interfering with the successful operation of the valve.

The egress-passage 6 in the lower section and ingress-passage 7 in the upper section are each provided with an annular seat 8, adapted to receive the circular slide-gates 9 and 10. Both of these gates have a toothed segment 12, adapted to engage with the correspondingly-toothed rack 13 on the edge of the case. This rack forms what may be called a "resistance-track" for the gates, which are moved along the tracks by communicating to them a rotary movement.

As a means for imparting to the gates a rotary movement I provide what may be termed a "carrier" 14, which is circular in general outline and adapted to be interposed between the gates, being secured in position by means of a stud or fulcrum 15, projecting from one or both of the gates and adapted to enter an aperture 16 in the carrier. I prefer to provide a stud on each gate which shall extend half-way only through the carrier, as shown. The periphery of the carrier is provided with teeth 17, partly around the same, forming a toothed segment adapted to engage with the screw-threaded stem or worm 18. The carrier is detachably secured in a position such that its toothed segment is concentric with the gates and the toothed segments on the gates by means of retaining and releasing mechanism consisting of a catch 19, projecting from the lower periphery of the carrier and adapted to fit the slot 20 in latch 21, which latch is pivoted upon a projection 22 from the lower gate. The screw-threaded stem or worm has a bearing at one end in the valve-case near the gate-seats, as at 23. The other end of the stem is provided with an end aperture rectangular in cross-section adapted to receive a spindle 24, made rectangular at each end and inserted through a stuffing-box in the case into the end aperture of the stem, with one of its rectangular ends 25 projecting from the stuffing-box and adapted to receive a wrench, by means of which rotary movements may be communicated to the stem. A tight joint is formed by means of the stuffing-box in the usual manner, the gland 26 being employed to hold the packing and spindle in place. The screw-threaded stem and the screw-threaded carrier form a worm-gear, and by rotating the stem in one direction the gates are carried along their

resistance-tracks from the closing position shown by solid lines in Fig. 3 to the open position shown by dotted lines in the same figure, and by turning the stem in the opposite direction the gates are carried from the position shown by dotted lines in Fig. 3 to that shown by the solid lines in the same figure. As soon as the gates reach the closing position shown by solid lines in Figs. 3 and 4 the stops 27 on the gates come in contact with the abutments 28 on the case, which prevents a further rotary movement of the gates along their tracks. The hook 29 on the end of the latch passes beyond the end of the guard-flange 30, fixed upon the case, and a further rotary movement of the stem in a direction to close the gates imparts a movement to the carrier, which is oscillatory upon its fulcrum, the latch being opened sufficiently to permit the catch 19 to escape from the slot 20, as shown in Fig. 4.

The carrier has near its middle portion an aperture 31, adapted to receive the uprights 32 and 33, projecting from the back of the lower gate, and the rolls 34, arranged one above the other, with journals 35, loosely supported between the uprights 32 and 33, as shown in Fig. 3. The other ends of the rolls rest loosely within the groove or channel 36 in the carrier. The lower roll rests upon the wedge-shaped incline 37, secured to the central portion of the lower gate, and the upper roll is adapted to engage the wedge-shaped incline 38 on the upper gate. It will be seen that when an oscillatory movement upon its fulcrum 15 is imparted to the carrier it has the function of a lever being moved from the position shown in Fig. 3 to that shown in Fig. 4, which causes the wall 39 of slot 36 to engage the contiguous ends of the rolls 34 and force them up the inclines, thereby forcing the gates farther apart and firmly to their seats. To open the valve, it is only necessary to operate the screw-threaded stem or worm in the opposite direction, which causes the lever-carrier to oscillate upon its fulcrum from the position shown in Fig. 4 to that shown in Fig. 3, thereby unseating the gates by forcing the rolls down the inclines. During this movement the gates are held in the position shown in Fig. 4 against a rotary movement by means of the hook 29 on the latch until the catch 19 passes along to its receiving-slot 20 and engages the inclined slot or wall 40 and lifts the latch to free its hook 29 from the end of the guard-rail, after which further rotary movement of the stem causes the carrier and gates to rotate together along the resistance-tracks to the position indicated by dotted lines in Fig. 3, the latch and catch serving to lock the carrier and gates securely together.

It is unnecessary to extend the guard-rail the whole distance traveled by the gates, because the inclination of the slotted wall 40 and that side of catch 19 engaging with such wall serve to maintain the parts in a locked

position while the stem is pressing against the periphery of the carrier.

The upper gate is provided with the projections 41 and 42, adapted to engage with the upright projections 32 and 33 on the lower gate and, in connection with the fulcrum 15, hold the two gates in fixed relation to each other, so that when the carrier is detachably secured to the lower gate by the releasing mechanism, consisting of a catch and latch, as before explained, the upper or other gate is caused to partake of the movements of the carrier and of the lower gate. The two gates and carrier are thus locked together, moving as one solid body to carry the gates to and from their open and closed positions and when the carrier is released from the gates by the releasing mechanism it is capable of an independent oscillatory movement upon its fulcrum-pivots to seat and unseat the gates, as already explained.

It will be observed that the oscillatory movement of the carrier when performing its lever function is eccentric to the center of the gates; but when it is performing the function of a carrier its movement is concentric. This eccentric movement causes the peripheral teeth of the carrier engaging the stem at the time of such movement to slightly overreach the teeth on the stem while the carrier is passing from the position shown in Fig. 3 to that shown in Fig. 4; but the oscillatory movement of the carrier is so small that the eccentric movement of the teeth will not interfere with the successful operation of the mechanism, as before explained. If, however, in larger valves it is desirable to have a considerable oscillatory movement of the carrier, the toothed segment of the carrier can be made of the proper form, varying slightly from the circular form, to cause the teeth of the segment to be uniformly acted upon, or approximately so, by the teeth of the stem.

By giving separate and independent movements to the lever-carrier for the purpose of seating the gates I am able to carry the gates to their closing position without any pressure or wear upon their seating-surfaces, the only movement of the gates when such pressure is applied being toward their seats.

In Fig. 8 I have shown a modified form of mechanism for acting upon the seating-inclines to seat the gates, consisting of a solid central portion 43 of the carrier itself adapted to engage the seating-inclines during the oscillatory or eccentric movements of the carrier.

The carrier may be grooved from its central part to its periphery to form the inclines 44, adapted to receive and engage the seating-inclines on the gates.

When the circular form of the toothed portion of the carrier is departed from in large valves for the reason above stated, it may be divided into two segments, that one engaged by the stem or worm to impart rotatory movements to the gates being concentric with the

gates and that one engaged by such stem to impart oscillatory movements to the carrier being concentric with the carrier-fulcrum.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a valve, the combination with gate-seats and resistance-tracks leading toward such seats; of a pair of gates movable one on each track; a seating-incline on the back of each gate; a carrier interposed between the inclines and connected with the gates; means for communicating rotatable movements to such carrier and gates, whereby the gates roll along such tracks; stops for arresting the rotatable movements of the gates when opposite their respective seats; releasing mechanism for disconnecting the carrier and gates when the movements of the gates are arrested by the stops, whereby the continued movement of the carrier along the seating-inclines forces the gates firmly to their respective seats, substantially as described.

2. In a valve, the combination with gate-seats and resistance-tracks leading toward such seats; of a pair of gates movable one on each track; a seating-incline on the back of each gate; a lever-carrier interposed between the inclines, having at one end a fulcrum on the gates, at the other end a toothed segment, and opposite the seating-inclines operative connections therewith; releasing mechanism for locking the carrier against oscillatory movements relatively to the gate at certain periods, and for permitting such oscillatory movements at certain other periods; a screw-threaded stem engageable with the toothed segment whereby a rotary movement is communicated to the gates and carrier while locked together, and an oscillatory movement to the carrier when released; means for limiting the rotary movement of the gate when released from the carrier; means for operating the releasing mechanism, substantially as described.

3. In a valve, the combination with gate-seats and resistance-tracks leading toward such seats; of a pair of gates movable one on each track; a seating-incline on the back of the gates; a pair of rolls extending transversely of the seating-inclines and engageable therewith, one roll with one incline and the other roll with the other incline; journal-supports on one of the gates for loosely supporting one end of each roll; a lever-carrier, interposed between and detachably secured to the gates, having at one end a fulcrum on the gates, at the other end a toothed segment and operatively engageable with the movable ends of the rolls whereby oscillatory movements of the lever-carrier will force the rolls up and down the inclines; a screw-threaded stem or worm engageable with the toothed segment of the carrier; means for limiting the rotary or track movements of the gates when opposite their seats, and means for releasing the lever-carrier from the gates at the end of their track movement, substantially as described.

4. In a valve, the combination with gate-seats and resistance-tracks leading toward such seats; of a pair of gates movable one on each track; a seating-incline on the back of each gate; a lever-carrier interposed between the gates having at one end a fulcrum secured to one of the gates near its edge, at the other end a toothed segment and intermediately of its ends means for operatively engaging the seating-inclines; means for detachably securing the carrier to the gates with the toothed segment concentric to the gates; a screw-threaded stem or worm engageable with the toothed segment; means for releasing the carrier from the gates at the end of the track movement of the gates whereby the screw-threaded stem afterward communicates to the carrier an oscillatory movement independently of the gates, substantially as described.

5. In a valve, the combination with gate-seats and resistance-tracks leading toward such seats; of a pair of gates movable one on each track; a seating-incline on one or both of the gates; a lever-carrier interposed between the gates, having one end fulcrumed upon one or both of the gates, the other end provided with a toothed segment eccentric to its fulcrum, and the intermediate portion provided with means for operatively engaging the seating-inclines; a screw-threaded stem or worm engageable with the toothed segment; means for maintaining the carrier in a position such that its toothed segment will be concentric with the gates during a part of its movements; means for releasing the carrier from its concentric position during the remainder of its movements, substantially as described.

6. In a valve, the combination with gate-seats and resistance-tracks leading toward such seats; of a pair of gates movable one on each track; a seating-incline on one or both of the gates; a lever-carrier interposed between the gates, having one end fulcrumed upon one or both of the gates, the other end provided with a toothed segment and the intermediate portion provided with means for operatively engaging the seating-inclines; a screw-threaded stem or worm engageable with the toothed segment; means for securing the carrier to the gates during their track movement and releasing the carrier at the end of such movement; and means for holding the gates against any track movement while oscillatory movements are imparted to the lever-carrier by the stem or worm, substantially as described.

7. In a valve, the combination with gate-seats and resistance-tracks leading toward such seats; of a pair of gates movable one on each track; a seating-incline on one or both of the gates; a lever-carrier interposed between the gates, having one end fulcrumed upon one or both of the gates, the other end provided with two toothed segments, one concentric to its fulcrum and the other concentric to the gates and the intermediate portion

provided with means for operatively engaging the seating-inclines; a screw-threaded stem or worm engageable with the toothed segments; means for maintaining the carrier in
 5 fixed relation to the gates while the stem is in engagement with that segment which is concentric with the gates; means for releasing the carrier from the gates while the stem is in engagement with that segment which is
 10 concentric with the carrier-fulcrum, substantially as described.

8. In a valve, having a pair of gates rotatably movable toward their seats, and provided with carrying, stopping and seating mechanism comprising stops and a lever-carrier ful-
 15 crumed at one end upon one or both of the

gates, and having on its other end a worm-actuated toothed segment; a retaining and releasing mechanism consisting of a latch and catch, one on the carrier and the other on one
 20 of the gates, interlocking with each other and a keeper for retaining the latch and catch in a locked position during the rotary movements of the gates, and releasing the latch
 25 from the catch at the end of such rotary movements, substantially as described.

In testimony whereof I have hereunto set my hand this 15th day of June, 1900.

JAMES BARLOW.

Witnesses:

GEO. A. MOSHER,
 FRANK C. CURTIS.