

No. 772,287.

PATENTED OCT. 11, 1904.

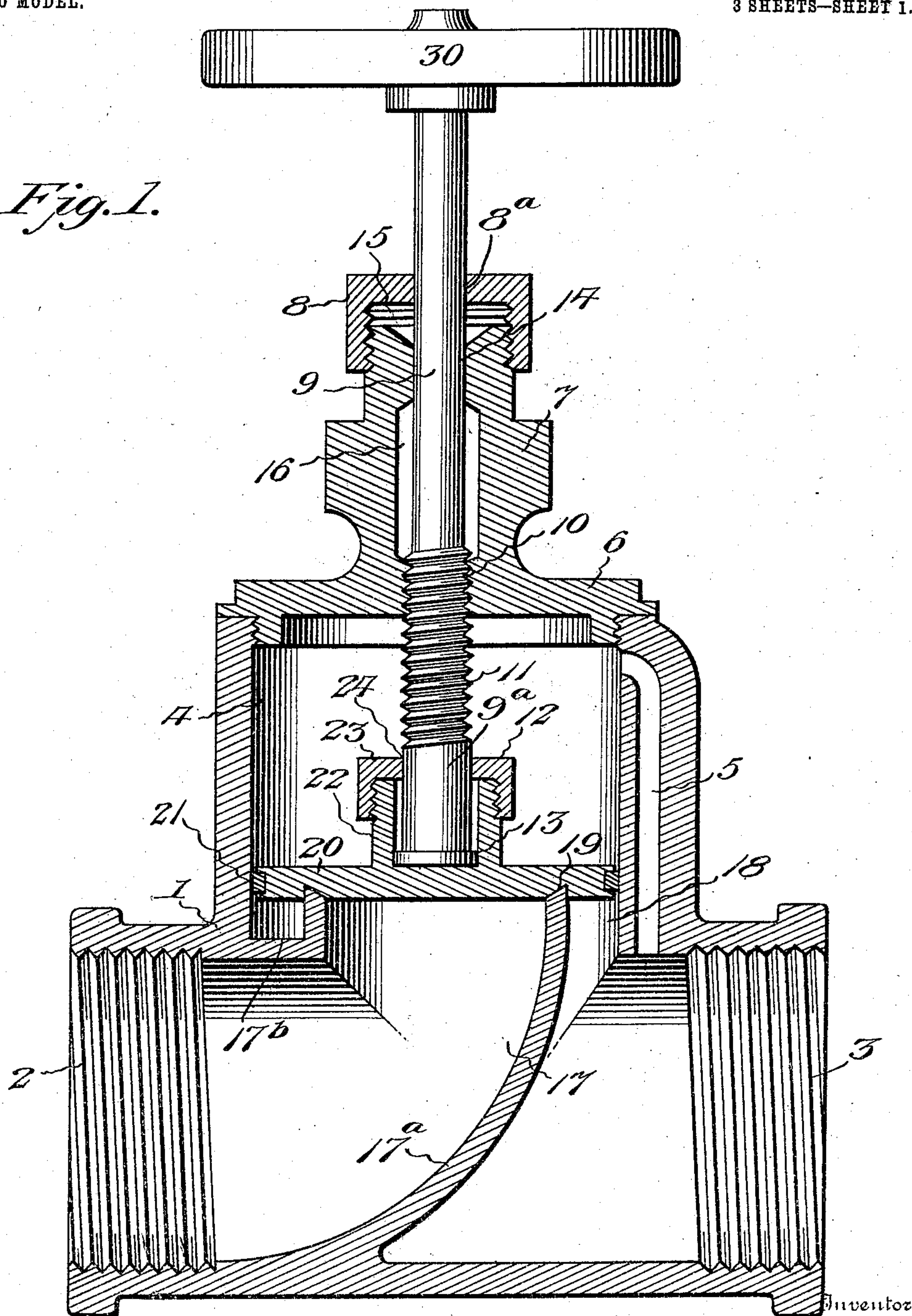
J. C. McCARL.
VALVE.

APPLICATION FILED DEC. 30, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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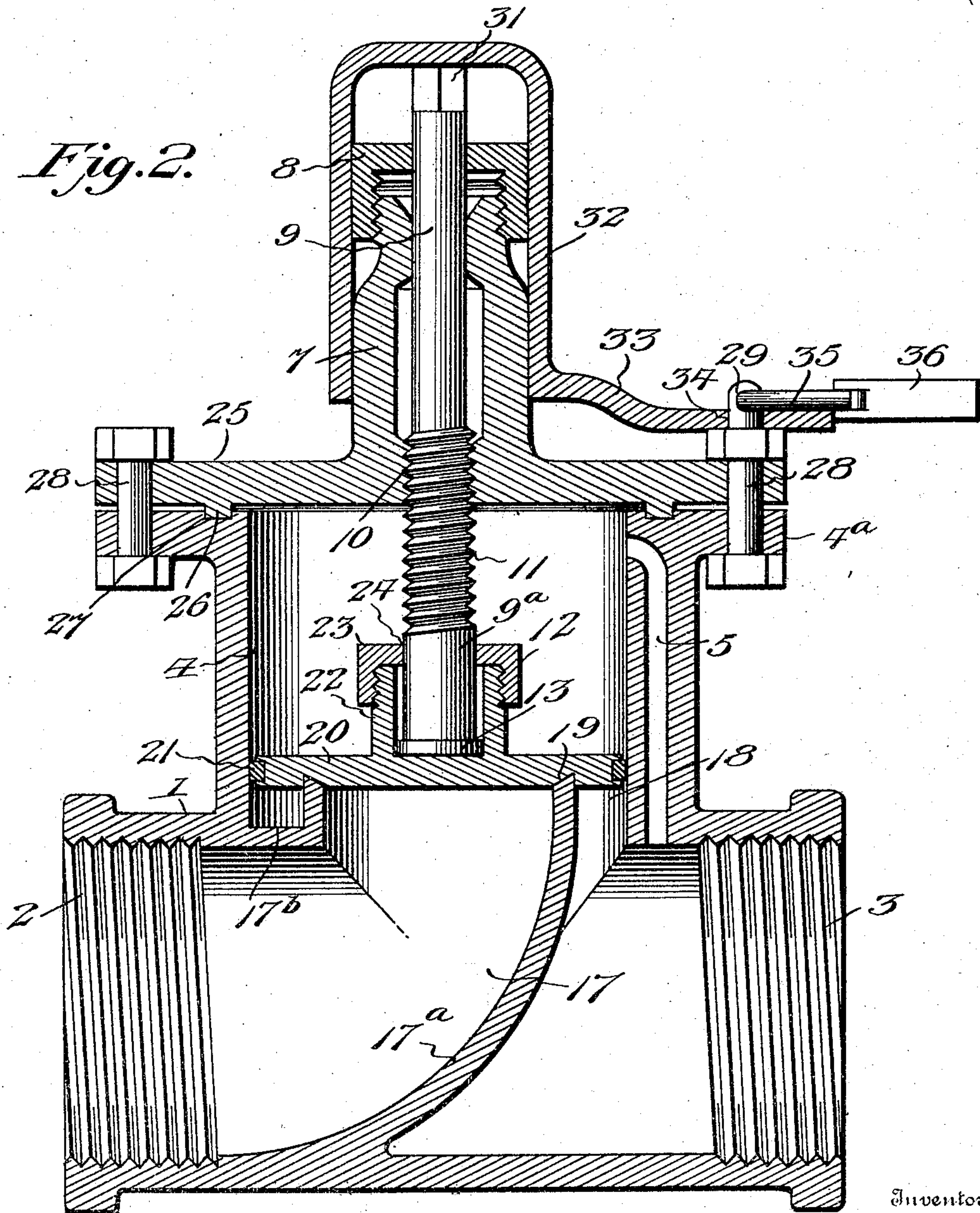
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3 SHEETS—SHEET 2.



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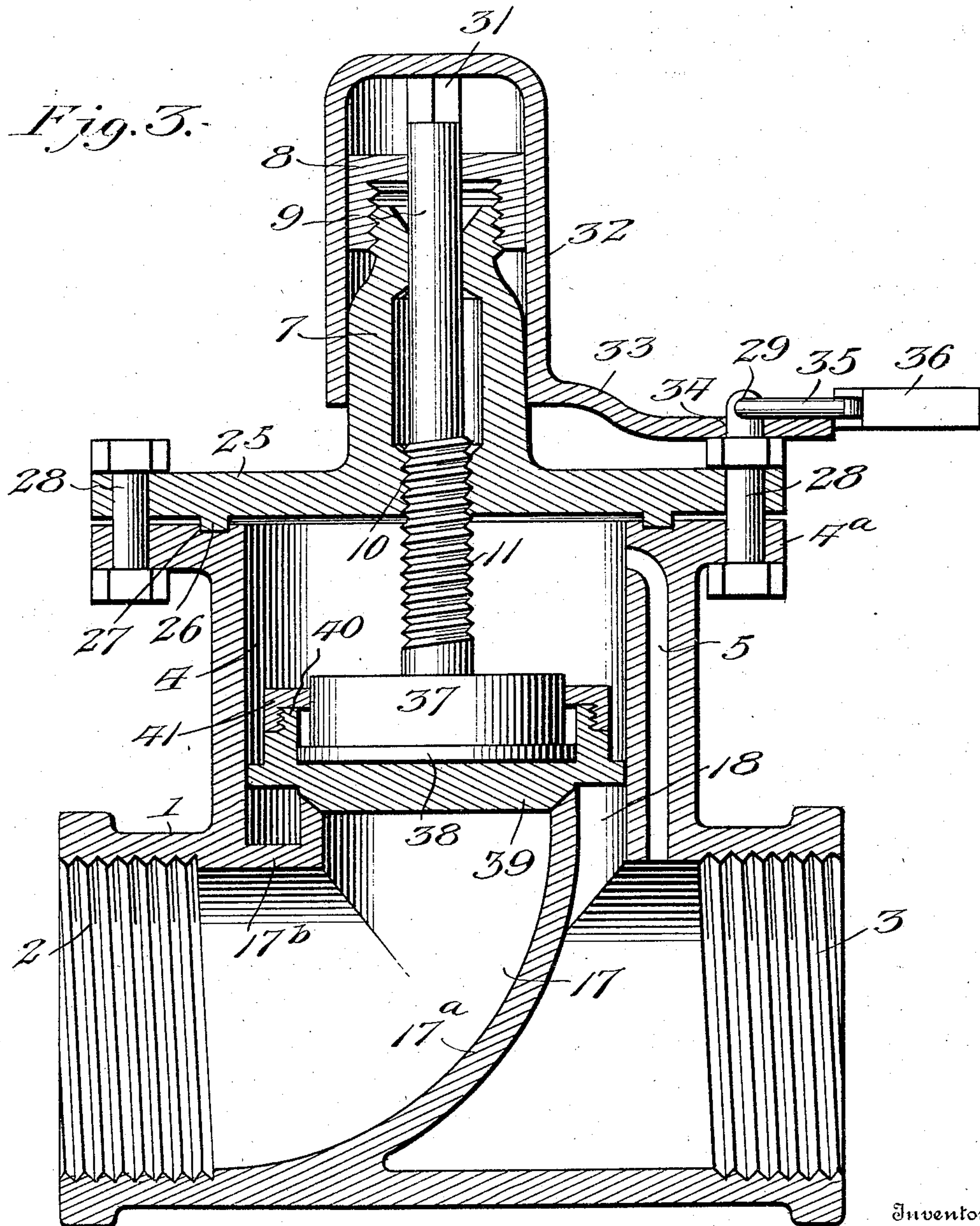
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOSEPH C. McCARL, OF WESTON, WEST VIRGINIA.

VALVE.

SPECIFICATION forming part of Letters Patent No. 772,287, dated October 11, 1904.

Application filed December 30, 1903. Serial No. 187,165. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. McCARL, a citizen of the United States, residing at Weston, in the county of Lewis and State of West Virginia, have invented new and useful Improvements in Valves, of which the following is a specification.

This invention relates to that class of valves adapted to equalize the pressure in conduits to regulate the flow of fluid through the latter, and is more especially intended for use in pipe-lines conveying oil from one receptacle or tank to another, particularly when the connected tanks or receptacles are at different elevations in relation to each other.

The improved valve has an automatic operation and prevents back pressure from causing an overflow in one tank connected to another higher tank in the event that such pressure is in excess of the feed-pressure by causing the valve to be influenced by such back pressure and remain closed. This automatic operation is exceptionally advantageous in transfer operations and obviates the close attention of attendants or operators along a pipeline.

The invention consists in the construction and arrangement of parts hereinafter more fully set forth.

In the drawings, Figure 1 is a longitudinal vertical section through a valve embodying the features of the invention. Fig. 2 is a similar view through a slightly-modified form of the valve. Fig. 3 is a similar view showing a further modification.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates a cylindrical head having integral tapped collars 2 and 3 at opposite extremities and an enlarged vertically-disposed valve-chamber 4. Communicating with the upper portion of said chamber is a vertically-disposed by-pass 5, formed in the wall of the said chamber adjacent to the collar 3 and opening at its lower end into the cylindrical head adjacent to said collar. Communicating directly with the collar 2, the latter constituting the inlet end of the head 1, is an inlet-passage 17, defined by a curved wall 17^a,

extending from the lower portion of the head upwardly into the valve-chamber 4, and an angular wall 17^b, extending inwardly and upwardly from the upper part of the head, both walls terminating at the same elevation and concentrically arranged in the lower part of the chamber 4. The curved wall 17^a obstructs direct communication of the collar 3 with the collar 2 through the head, and between the upper extremity of the wall 17^a and the adjacent wall of the chamber 4 a passage 18 is provided, which communicates at its lower portion with or continues into the head below, into which the collar 3 opens. The upper ends of the walls 17^a and 17^b are continuous in a circular plane and formed with inward bevels. In other words, the upper extremity of the passage 17 is circular, and the terminals of the two walls defining said passage and continuous with each other provide a valve-seat.

Removably mounted in the upper end of the valve-chamber 4 is a cap 6, having a head 7 rising centrally therefrom formed with suitable exterior nut-faces, and a central vertically-disposed chamber 16, with which a smooth bore 14 communicates and passes out through the upper end of the head. A screw-threaded bore 10 opens into the lower extremity of the chamber 16 and passes down through the cap 6, the bores 10 and 14 being in vertical alinement to compensate for the adjustment and vertical disposition of a valve-stem 9, having its greater portion smooth. On the upper end of the head 7 a cap-nut 8 is removably applied and is adapted to hold in place suitable packing arranged in a recess 15 (not shown) in the upper end of the head 7. On the upper end of the stem 9, as shown by Fig. 1, a hand-wheel 30 is secured, and the lower extremity of the stem is diametrically enlarged and formed with a smooth member 9^a, having a lower flange 13, the lower part of the stem above the member 9^a being screw-threaded, as at 11, to adjustably fit in the screw-threaded bore 10.

Disposed over the valve-seat formed at the upper extremity of the passage 17 is a valve 20, having a suitable peripheral packing 21 to engage the inner surface of the wall of the chamber 4. Rising from the center of the

valve 20 is a tubular head 22, and removably disposed over the said head is a screw-cap 23, through the center of which the smooth member 9^a at the lower extremity of the valve 5 has free movement. The diameter of the inner portion of the head 22 is approximately equal to the diameter of the flange 13; but the opening 24 through the cap 23, in which the member 9^a has movement, is less in diameter 10 than that of the flange or inner portion of the head 22, and hence the valve 20 will be inseparably held in connection with the lower end of the valve-stem until manually detached, and said valve is free to move in relation to 15 its seat after proper adjustment of the stem 9 has ensued. The intermediate screw-threaded portion 11 of the stem 9 moves upwardly into the chamber 16 when said stem is elevated, thereby reducing the friction on the stem 20 without in the least detracting from the effective support therefor provided by the head 7, and in its upward and downward movements said stem slides through the opening 14 and an opening 8^a in the center of the cap 8.

25 In preparing the valve for use the valve 20 is allowed to move vertically in relation to its seat by elevating the stem high enough to relieve the flange 13 from pressing contact against the upper part of the valve within the 30 head 2, the degree of movement of the valve being controlled by the elevation of the stem. The fluid flowing through the collar 2 elevates the valve from its seat and passes down over the seat to the opposite side of the wall 17^a and out 35 through the collar 3. In the event that back pressure materializes and becomes strong enough to have a greater pressure than the feed-pressure of the fluid it influences the valve 20 through the by-pass 5 and closes 40 said valve. This will stop the feed of the fluid into the valve-chamber 4, and the valve will remain closed as long as the back pressure is in excess of the feed-pressure and prevent flooding of a tank or receptacle to which the 45 collar 2 may be connected by a suitable conduit.

The modified form of the valve shown by Fig. 2 embodies the essential features of construction shown by Fig. 1, and like reference-numerals are applied to corresponding parts. 50 In this instance the top of the valve-chamber 4 is formed with an outstanding flange 4^a, having a circumferential groove 27 formed in the inner portion thereof to receive a depending circumferential rib 26 of a cap 25, having a 55 head 7 similar to that heretofore set forth and a closing-cap 8. The cap 25 has its periphery coinciding with the periphery of the flange 4^a, and through the latter and said cap 25 securing-bolts 28 are passed at regular intervals. 60 The valve-stem 9 in this instance has its upper end 31 constructed with angular faces for the reception of a key or wrench. It is frequently necessary to prevent adjustment of valves in pipe-lines and the like by 65 unauthorized persons after a preliminary ad-

justment has been made. For this purpose a cap 32 is constructed to fit over the upper exposed end of the valve-stem 9, the cap or cap-nut 8, and a portion of the head 7. This cap 32 has a horizontal arm 33 projecting there- 70 from and formed with an opening 34, which is fitted over the upper extended end of one of the bolts 28, the said extended end of the bolt thus engaged being provided with an opening 29 therethrough to receive the shackle 75 35 of a lock 36. Those persons authorized to adjust the valve will carry keys to such lock, and when it is found necessary to adjust the valve-stem and the valve coöperating therewith the lock will be detached and the cap 32 80 removed. By this means tampering with valves in a conduit or pipe-line with nefarious objects in view will be obstructed.

Fig. 3 shows a construction of valve similar to that illustrated by Fig. 2, and the corre- 85 sponding parts therein have like reference-numerals applied thereto. The lower end of the valve-stem 9 in this instance has an enlarged head 37 fixed thereto and provided with a flange 38 at its lower end. The valve 39 in 90 this instance is formed with an upper enlarged chamber 40, to which is secured a cap 41, having an opening therethrough to permit the head 37 to move therein. The advantage of this illustration as to change in proportion 95 is that a greater surface will be provided to bear on the valve 39 and materially increase the strength of the valve structure as an entirety and also render the seating of the valve in this instance by the head more effective. 100

In addition to the uses of the improved valve as set forth it can also be conveniently employed in connection with distilleries, refineries, ice, water, gas, and steam plants, and also for controlling all fluids where it is nec- 105 essary to use a gate and check valve. Another advantage of the valve construction hereinbefore disclosed is that the stem 9 when at its greatest elevation raises the valve 20 from the seat, thus allowing the fluid to pass back 110 through the collar 3 and down over the wall 17^a and out through the collar 2. By means of this structural provision the valve may be flushed to remove any sediment or scale that might enter and lodge on the seat and obstruct 115 the proper seating of the valve. This adjustment of the valve to have the flushing operation practically ensue, as set forth, is accomplished without separating the parts of the valve structure, as in ordinary check-valve 120 arrangements.

The valve will be found exceptionally useful for the purpose for which it has been devised, and it will be understood that such materials will be employed in its construction as 125 found best adapted for the purpose.

Having thus fully described the invention, what is claimed as new is—

1. A valve, having a cylindrical head with collars at opposite extremities, a passage ex- 130

tending inwardly and upwardly from one of the collars, and a valve-chamber with a by-pass in its wall, the upper extremity of the wall of the passage being of less diameter than the valve-chamber and the latter having a communicating passage with the head adjacent to the collar opposite that from which the passage extends, and a valve disposed over the upper end of the wall of the passage and having an adjustable stem to loosely hold the valve so that the latter may be automatically operated to close.

2. A valve-casing, having lower oppositely-disposed inlets and outlets, a passage extending upwardly from the inlet and defined by an inclosing wall, and an upper valve-chamber having an inner diameter greater than the upper end of the wall of the passage, a by-pass being formed in the wall of the chamber to provide communicating means between the outlet and the upper part of the said chamber, combined with a closure for the chamber, a valve-stem vertically movable in the said closure and chamber and having a lower smooth extremity with a terminal flange, and screw-threads above said extremity, and a valve vertically movable in the valve-cham-

ber and having a central hollow means in which the lower smooth extremity of the stem of the valve is mounted for free sliding movement, whereby the valve may be adjusted to have an automatic closing operation in relation to the upper end of the passage.

3. A valve-casing, having a cylindrical head with an inlet and an outlet at opposite extremities, a passage extending inwardly and outwardly from the inlet, and a valve-chamber with a by-pass in its wall, communicating with the outlet, the upper extremity of the wall of the passage being of less diameter than the valve-chamber, a valve disposed over the upper end of the wall of the passage and having an adjustable stem to loosely hold the valve so that the latter may be automatically operated to close, an inclosing cap removably fitted over the upper part of the valve-casing and the upper end of the stem, and means for locking the cap in applied position.

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

JOSEPH C. McCARL.

Witnesses:

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W. C. DAUSER.