No. 680,714. Patented Aug. 20, 1901.

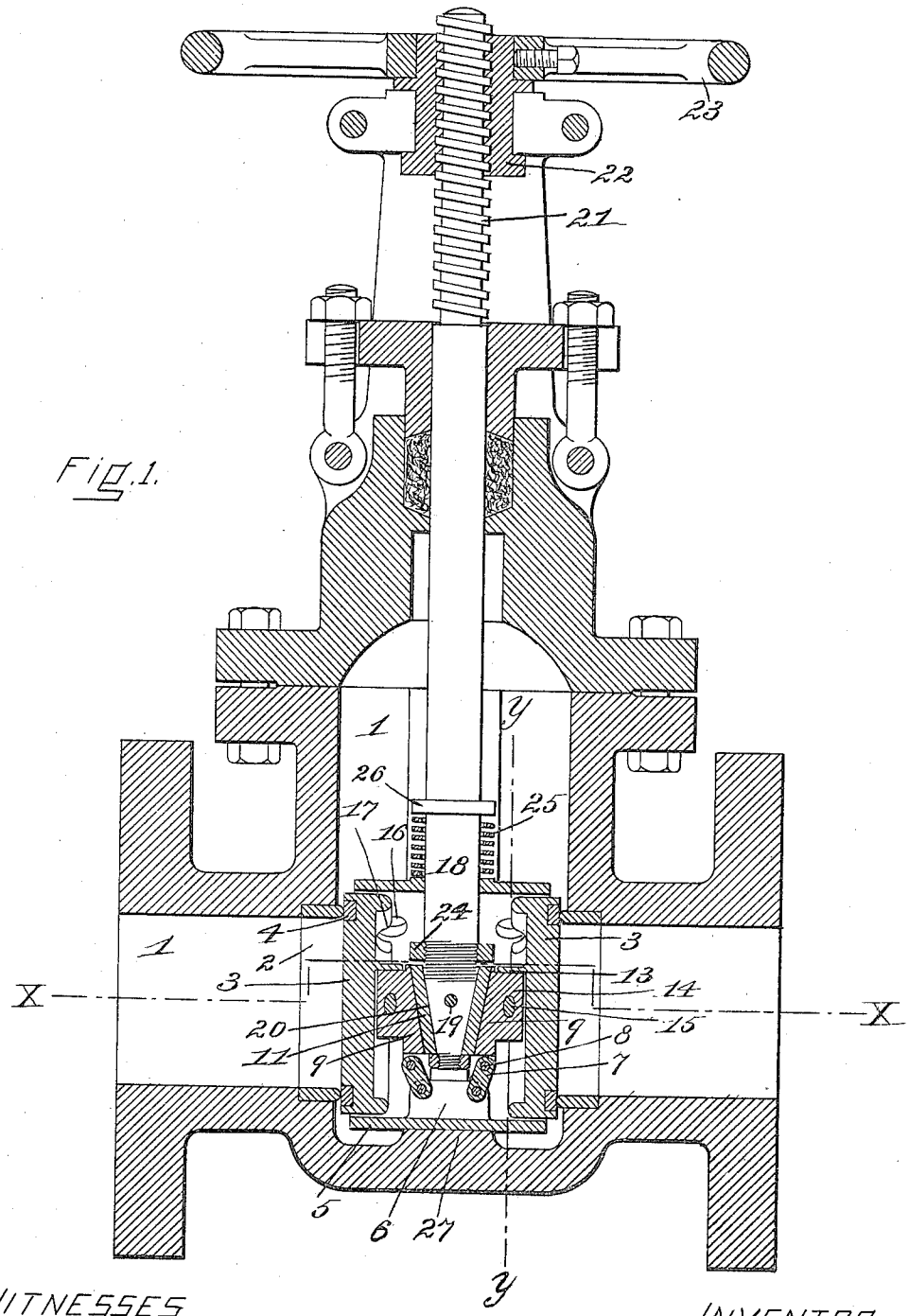
E. D. JEFFERSON.

GATE VALVE.

(Application filed Dec. 28, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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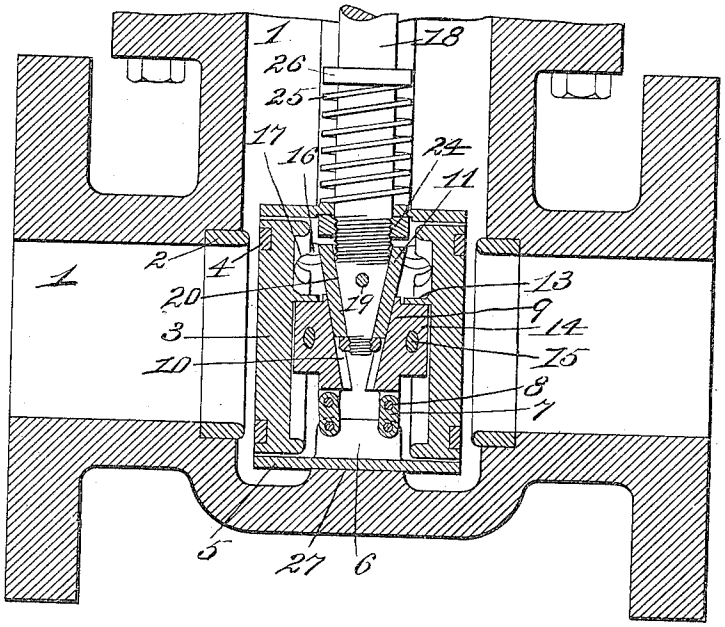


Fig. 2.

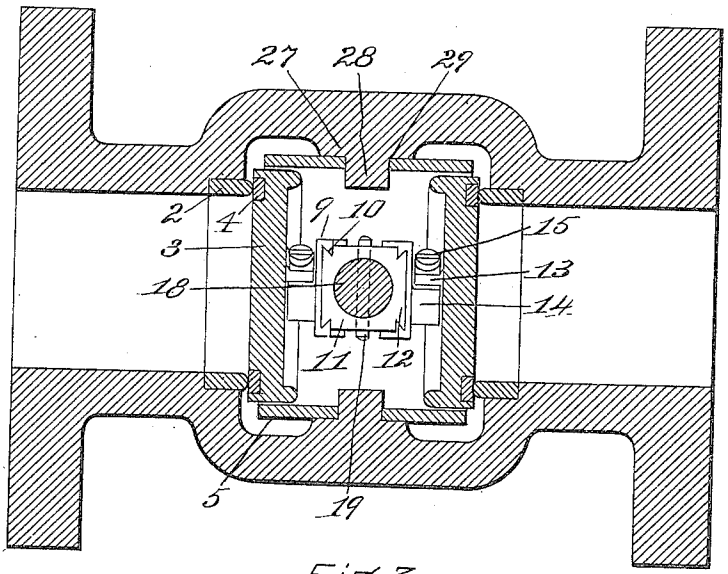


Fig. 3.

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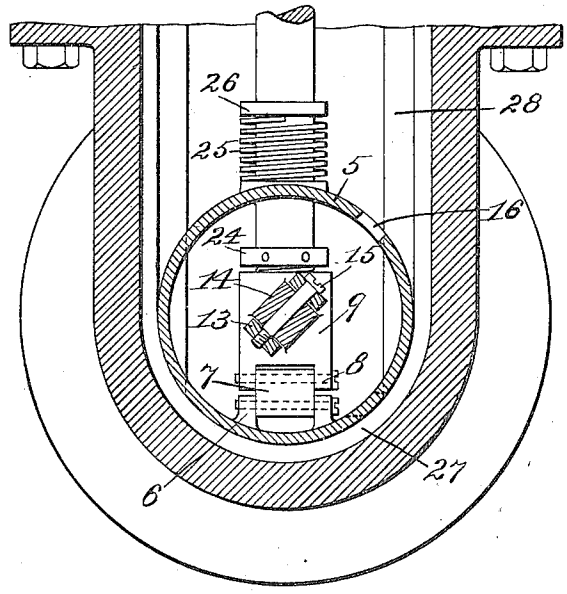


Fig. 4.

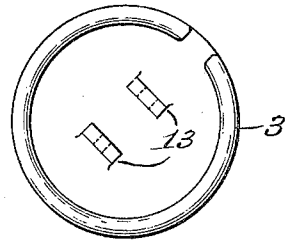


Fig. 5.

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UNITED STATES PATENT OFFICE.

EUGENE D. JEFFERSON, OF LOWELL, MASSACHUSETTS.

GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 680,714, dated August 20, 1901.

Application filed December 28, 1900. Serial No. 41,382. (No model.)

To all whom it may concern:

Be it known that I, EUGENE D. JEFFERSON, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Gate-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.

The present invention relates to valves, and more particularly to that class of valves known as "straightway" valves.

It has been heretofore proposed to construct a straightway valve in which the valves are mounted in a carrier movable in the valve-chamber, the valve-operating mechanism comprising means for actuating the valves in the carrier and independent means for moving the carrier in the valve-chamber. This construction, however, is objectionable in that through ignorance or mistake on the part of the operator the carrier may be moved before the valves have been withdrawn from their seats, and the consequent sliding of the valves in close contact with their seats will cause excessive wear or breakage of these parts.

The object of the present invention is to improve a straightway valve of the above type by providing valve-operating mechanism so constructed and arranged that movement of the valves across their respective valve-seats while in contact therewith will be impossible.

A further object of the present invention is to produce a gate-valve in which the valves may properly engage their seats and be forced into close contact therewith.

To the above ends the present invention consists in the valve hereinafter to be described and claimed.

In the accompanying drawings, Figure 1 is a sectional view of my improved valve closed. Fig. 2 shows the valves withdrawn from their seats and the carrier about to be lifted. Fig. 3 is a sectional view on line *x x*, Fig. 1. Fig. 4 is a sectional view on line *y y*, Fig. 1, looking toward the left; and Fig. 5 shows the back face of one of the valves removed from the carrier.

In the illustrated embodiment of my invention, 1 represents a valve-chamber, and 2 the valve-seats, located on opposite sides of the same.

3 represents the valves, which preferably are provided with removable contact-rings 4 to allow replacement of these parts in case of wear or injury. The valves 3 are mounted in a carrier 5 and arranged to have movement therein toward and from their respective valve-seats, and the carrier 5 and contained valves are arranged to be withdrawn from between the valve-seats to afford a straight passage-way through the valve-chamber.

The mechanism for operating the valve is as follows: Pivotally mounted between the ears 6, projected from the bottom of the carrier 5, are the links 7, which are pivotally connected at 8 to the blocks 9, carrying the valves 3. These valve-blocks are provided, as clearly shown in Fig. 3, with the dovetail guideways 10, which are oppositely inclined to the vertical. A wedge-block 11, having correspondingly-shaped sides 12 engaging these guideways, is arranged to be vertically reciprocated, moving the valve-blocks 9 and valves 3 carried thereby toward or away from the valve-seats.

In order to permit the valves 3 to adjust themselves and properly to engage their respective seats, I have provided a pivotal connection between said valves and the valve-blocks. This connection comprises the ears 13, projected from the back face of the valve 3, the lug 14 on the valve-block 9, and the screw 15, passing through said lug and ears. The hole 16 in the carrier 5 and notch 17 in the valve 3 allow the screw 15 to be inserted and removed. The wedge-block 11 is vertically reciprocated by means of the valve-spindle 18, to the end of which it is secured by means of the pin 19, which at the same time prevents any rotation of the spindle in its bearing 20. The mechanism for reciprocating the spindle is of the usual form, and consists of the threaded portion 21, the revoluble nut 22, and the hand-wheel 23, secured thereto. The carrier 5 is lifted and depressed by the reciprocation of the spindle 18 by means of a collar 24, secured to the spindle above

the wedge-block 11, which collar engages the top of the cage after the spindle has been raised a sufficient distance to cause the wedge-block 11 to withdraw the valves 3 from their seats. The continued upward movement of the spindle lifts the carrier in the valve-chamber, affording a straight passage-way through the valve-chamber. A spiral spring 25, engaging at one end the collar 26, secured to the valve-spindle, and at the other the carrier 5, acts to prevent the carrier from being lifted as the valve-spindle is drawn upward until the collar 24 engages the carrier and positively raises it. By means of this same spring 25 and collar 26 the carrier 5 will be forced down as the spindle descends until the bottom of the carrier strikes the abutment 27, when farther downward movement of the spindle will compress the spring, the wedge-block at the same time forcing the valves into contact with their respective seats. In order to maintain the carrier in proper position in the valve-chamber, guides 28 on the walls of the valve-chamber have been provided, which engage the grooves 29, formed in the carrier.

The operation of my improved valve is as follows: Assuming the parts to be in the position shown in Fig. 1, rotation of the nut 22 by means of the hand-wheel 23 will raise the valve-spindle 18, and the wedge-block 11, carried thereby, will withdraw the valves 3 from their seats, the spring 25 preventing movement of the carrier with the spindle until collar 24 on the spindle engages the top of the carrier. The position of the parts is now as shown in Fig. 2, and as the upward movement of the spindle is continued the carrier will be raised in the valve-chamber. The valve may be closed by rotating the hand-wheel in the opposite direction, the carrier being forced down with the spindle by the spring 25 until the carrier strikes the abutment 27, when its downward movement will be stopped. The continued descent of the spindle and wedge-block 11 relative to the carrier will now force the valves outwardly against their seats.

Having thus described my invention, I claim as new and desire to secure by Letters Patent of the United States—

1. A gate-valve, having, in combination, a valve-chamber provided with valve-seats, a carrier movable in said chamber, pivotally-mounted valves arranged to slide in said carrier, and valve-actuating mechanism operating first to positively withdraw said valves from their seats and then to lift said carrier and valves from between the valve-openings, substantially as described.

2. A gate-valve, having, in combination, a valve-chamber provided with valve-seats, a carrier movable in said chamber, valves slidingly mounted in said carrier, a longitudinally-movable spindle, a valve-actuating wedge-block carried by said spindle and provided with dovetail guides, valve-blocks interposed between said wedge-block and the valves and pivotally connected with the valves, a stop on said spindle normally out of contact with said carrier, arranged to engage and lift the carrier when the valves have been withdrawn from their seats, and means for moving the spindle, substantially as described.

3. A gate-valve, having, in combination, a valve-chamber provided with valve-seats, a carrier movable in said chamber, pivotally-mounted valves arranged to slide in said carrier, mechanism for actuating the valves in the carrier and for moving the carrier in the valve-chamber, and means to prevent movement of the carrier when the valves are in contact with the valve-seats, substantially as described.

4. A gate-valve, having, in combination, a valve-chamber provided with valve-seats, a carrier movable in said chamber, pivotally-mounted valves arranged to slide in said carrier, mechanism for actuating the valves in the carrier and for moving the carrier in the valve-chamber and means to prevent movement of the valves when the carrier is withdrawn from between the valve-seats, substantially as described.

5. A gate-valve, having, in combination, a valve-chamber provided with valve-seats, a carrier movable in said chamber, pivotally-mounted valves arranged to slide in said carrier, a spindle longitudinally movable in the chamber and in the carrier, mechanism connected with said spindle for positively actuating the valves in the carrier, a stop for limiting the relative movement of carrier and spindle in one direction, a spring acting normally to prevent relative movement in the other direction, and means to actuate the spindle, substantially as described.

6. A gate-valve, having, in combination, a valve-chamber provided with valve-seats, a carrier movable in said chamber, valves slidingly mounted in said carrier, a wedge-block movable in said carrier, valve-blocks interposed between said wedge-block and the valves, connections between said valve-blocks and the valves, links for supporting the valve-blocks pivotally connected at one end to the carrier and at the other to the valve-blocks, means for actuating the valves in the carrier, and means for moving the carrier in the valve-chamber, substantially as described.

7. A gate-valve, having, in combination, a valve-chamber provided with valve-seats, a carrier movable in said chamber, valve-blocks carried thereby, valves pivotally connected to said blocks, means for actuating said valve-blocks and for moving the carrier, and means to prevent movement of said carrier when the valves are in contact with their seat, substantially as described.

8. A gate-valve, having, in combination, a

valve-chamber provided with valve-seats, a carrier movable in said chamber, valves carried thereby, pivotally-supported valve-blocks for actuating said valves, means for actuating said blocks and for moving said carrier, and means to prevent movement of said carrier when the valves are in contact with their seats, substantially as described.

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

EUGENE D. JEFFERSON.

Witnesses:

JAMES STUART MURPHY,

ALICE B. BARNES.