(No Model.)

J. STONE.

SLIDE GATE VALVE.

No. 547,817. Patented Oct. 15, 1895.

Fig. 1.

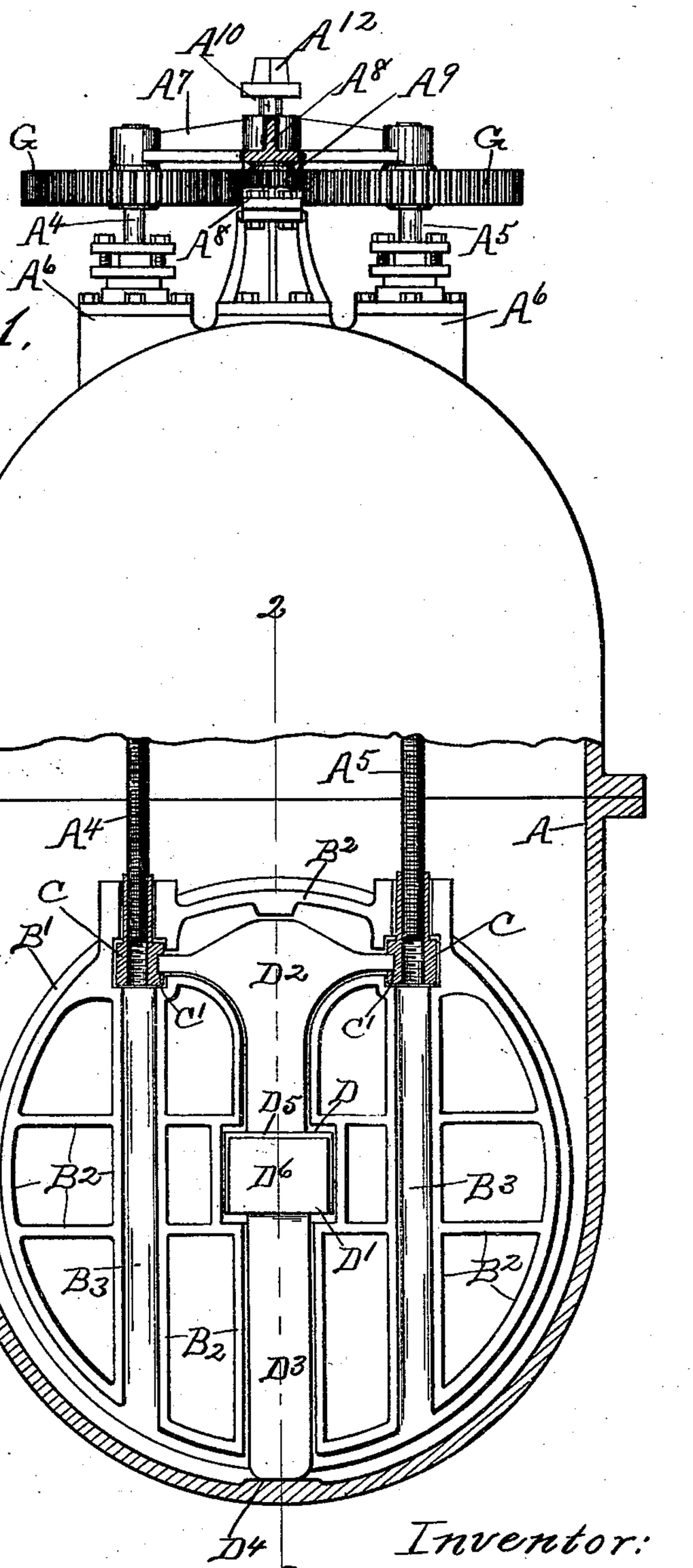
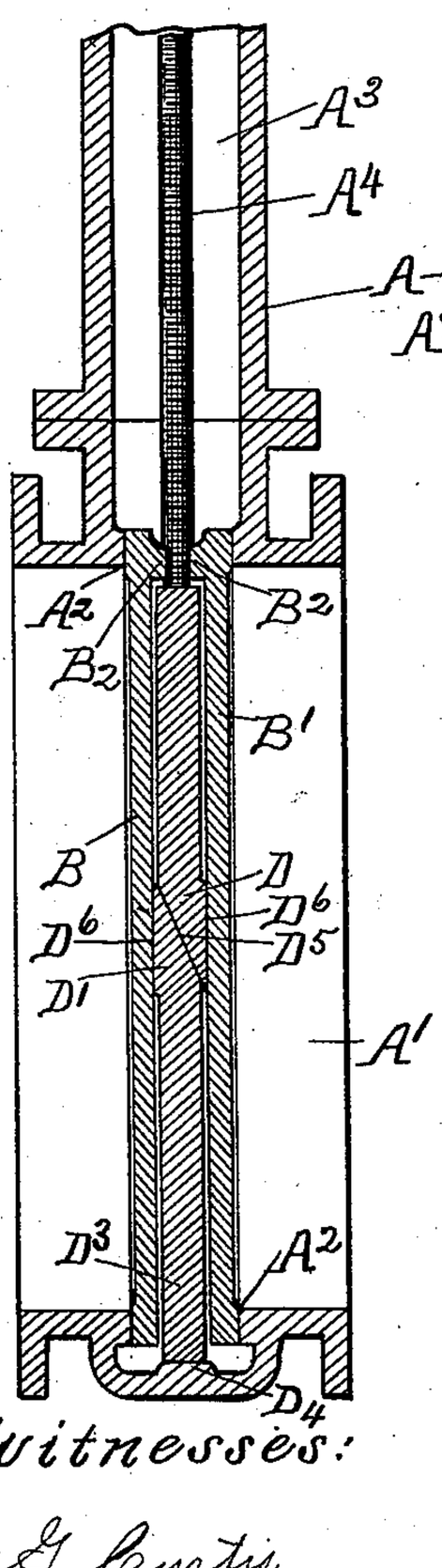


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

JABEZ STONE, OF WATERFORD, ASSIGNOR TO THE LUDLOW VALVE MANUFACTURING COMPANY, OF TROY, NEW YORK.

SLIDE-GATE VALVE.

SPECIFICATION forming part of Letters Patent No. 547,817, dated October 15, 1895.

Application filed June 12, 1895. Serial No. 552,547. (No model.)

To all whom it may concern:

Be it known that I, JABEZ STONE, a citizen of the United States, residing at Waterford, county of Saratoga, and State of New York, have invented certain new and useful Improvements in Slide-Gate 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 letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in both the figures therein.

Figure 1 of the drawings is a side elevation of my improved valve with the lower part of the case broken away on the front side and one gate removed to afford a better view of the operating mechanism, also with a part of the gear-supporting yoke broken away to show the middle gear-wheel. Fig. 2 is a central vertical section of the lower part of the device unbroken, taken on the broken line 2 2 in Fig. 1.

My invention relates to that class of valves in which a pair of oppositely-placed slide-gates are seated by interposed top and bottom wedges engageable with each other and with the backs of the gates to force the gates apart and to their seats. In such constructions the wedges and their shanks have heretofore been severally provided with an aperture along their vertical axes for the passage of the valve-actuating stem, the stem and stem-aperture of the upper wedge being similarly screw-threaded. Such valves have commonly been made with a single screw-threaded stem and a single pair of wedges engageable with the central part of the gate-disks. In such forms of construction the gate-disks are necessarily separated from each other by a considerable space, equal to the diameter of the stem plus twice the thickness of the threaded walls of the top wedge, plus the distance of the seating movements of the gates. In large valves employing gate-disks several feet in diameter the valve-case is necessarily very heavy and cumbersome. Slide-gate valves of large size have been made heretofore employing a pair of valve-stems instead of a single stem, whereby the stem-diameter might be reduced and the distance between the gates correspondingly diminished. A pair of wedges was provided for each stem; but the wedges were severally provided with a stem-aperture in the usual manner and engaged the gate-disks on opposite sides of their centers. Such a form of construction necessitated a duplication of parts and was attended with other disadvantages hereinafter specified. I have ascertained that by providing a screw-threaded stem with a carrier in the form of a screw-threaded stem-nut, through which the stem can be made to pass, and a pair of wedges located on one side of the path of the stem, and uniting the top wedge and carrier by an offset connection, I can utilize a pair of solid unapertured wedges which cannot be crushed or injured, though thinner than the diameter of the stem and subjected to the greatest desired pressure. I prefer to employ a pair of stems and a single pair of wedges located between the centers of the gate-disks and unite the carriers on the stems with the top wedge by a T connection, whereby I am able to apply the seating power to the center of the gate-disks and obtain a uniform seating-pressure over the entire seating-surface of each disk.

Referring to the drawings, A is the valve-case, provided in the usual manner with the passage-way A′, surrounded by the annular gate-seats A^2, and with the gate-chamber A^3 in the upper part. The screw-threaded stems A^4 and A^5 pass up through stuffing-boxes A^6 and have end bearings in the cross-bar A^7, supported by a yoke A^8, bolted to the upper end of the case. Each stem is provided with a gear-wheel G, fixed thereon and meshing with a central gear A^9, fixed on a spindle A^{10}, rotary in fixed bearings mounted on the case, all in the previously well-known manner. The spindle A^{10} is provided with the plane-sided end A^{12}, adapted to receive an operating wrench or key.

B and B′ represent the gate-disks, which are shown seated to close the valve-passage. The gates are provided on their backs with strengthening ribs or flanges B^2, which are

arranged to stiffen the gates and at the same time afford passage-ways B^3 for the stems when the gates are drawn up into the gate-chamber and the valve opened. Each stem is provided with a carrier C in the form of a stem-nut apertured along its vertical axis and interiorly screw-threaded to fit the stem. The carriers are partially inclosed by the gate-flanges, so that they severally engage the flanges of both gates and carry the gates with them in their vertical movements along the stems.

D is the top wedge and D′ the bottom wedge. The top wedge is united with the carriers by the T connection D^2. Each end of the horizontal part of the connection has a bearing in one of the carriers, entering a recess C′ therein, as seen in Fig. 1. The bottom wedge is provided with the depending shank D^3, adapted to engage the stop D^4, located in its path in the bottom of the case. The two wedges are provided with the inclined surfaces D^5, adapted to engage each other and force the opposite vertical surfaces D^6 into engagement with the central part of the respective gates to seat them in the usual manner. It will be observed on inspection of Fig. 2 that the gate-flanges approach each other very closely and that the wedges are solid. The carriers are located near the edge of the disks, where less strength is required, and by thickening and extending the flanges beyond the periphery of the gate the gate can be recessed more deeply at these points to receive the carriers.

By having a single pair of wedges engageable with the centers of the gates the power is applied at the most favorable point, whereas with two pairs of wedges the action of the bottom wedges would seldom, if ever, be uniform, causing an unequal pressure upon the different parts of the seating-surface.

An accumulation of sand or other obstruction upon one stop in the bottom of the valve-case might cause the gates to be imperfectly seated and stopped in their downward movement before the other bottom wedge engaged its stop.

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

1. In a slide-gate valve, the combination with the case and a pair of screw-threaded stems, of a pair of gates, a pair of stem-actuated gate-carriers between the gates, top and bottom gate-actuating wedges engageable with each other, an offset-connection between the top wedge and a gate-carrier, and means for supporting and controlling the bottom wedge, substantially as described.

2. In a slide-gate valve, the combination with the case and a pair of screw-threaded stems, of a pair of gates a pair of stem-actuated gate-carriers between the gates, top and bottom gate-actuating wedges engageable with each other, a T-connection between the top wedge and both carriers, whereby the wedge is supported in a position central to the gates, and means for supporting and controlling the bottom wedge, substantially as described.

In testimony whereof I have hereunto set my hand this 5th day of June, 1895.

JABEZ STONE.

Witnesses:
GEO. A. MOSHER,
FRANK C. CURTIS.