Jan. 27, 1925. 1,524,080

L. J. BORDO

GATE VALVE

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Fig. 1.

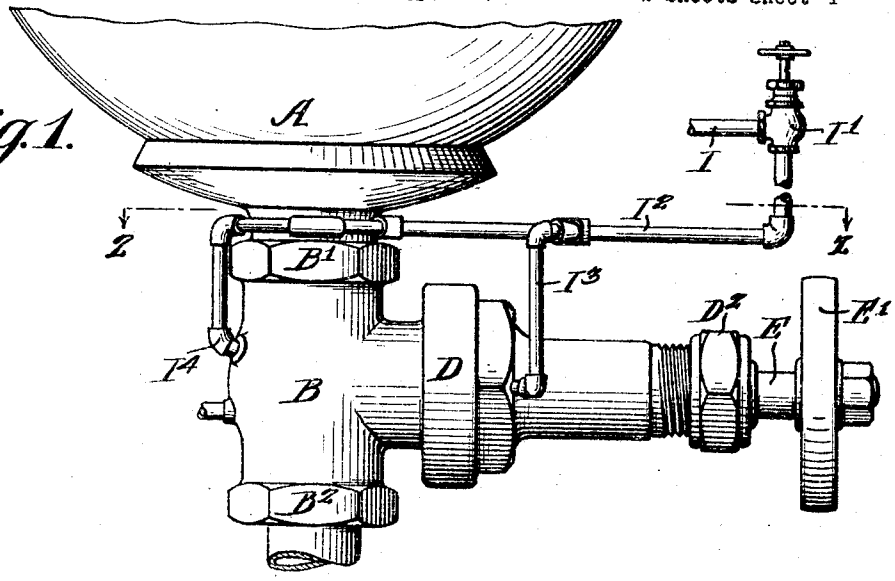


Fig. 2.

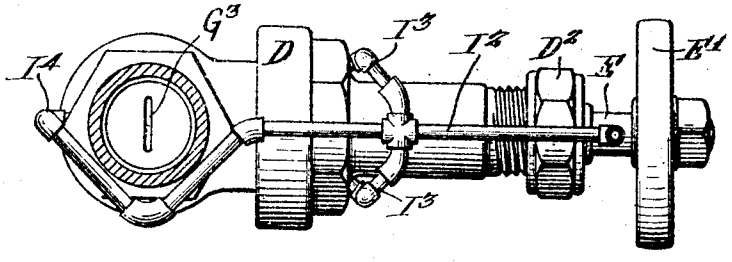


Fig. 9.

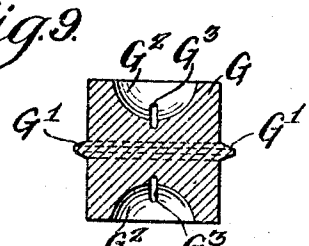


Fig. 10.

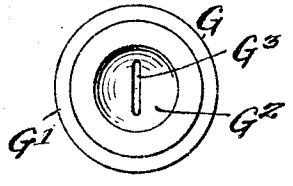


Fig. 6.

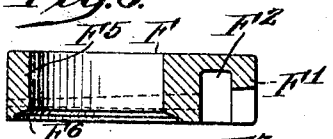
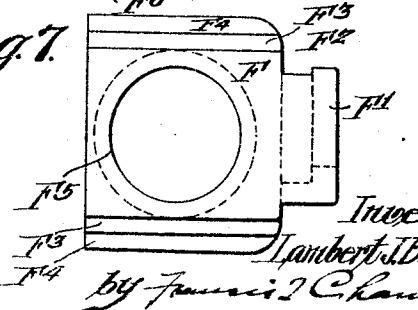


Fig. 7.



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GATE VALVE

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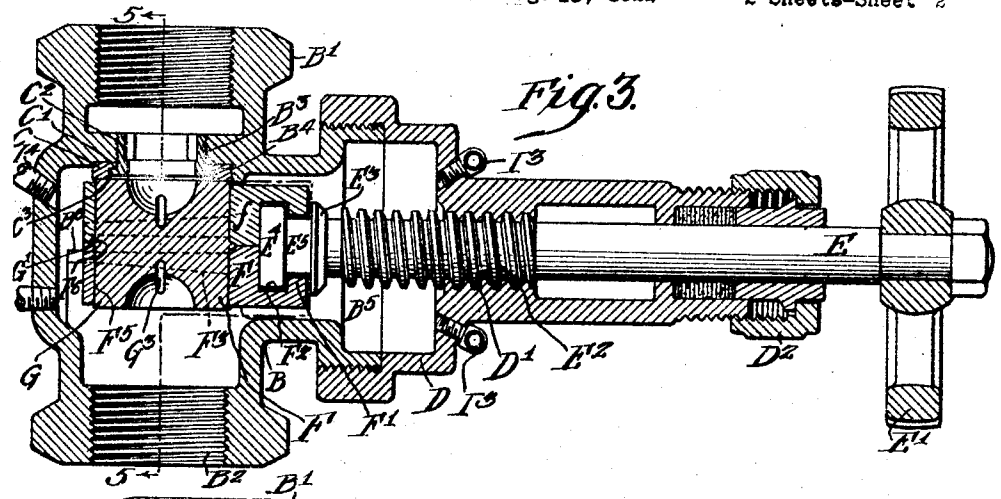


Fig. 3.

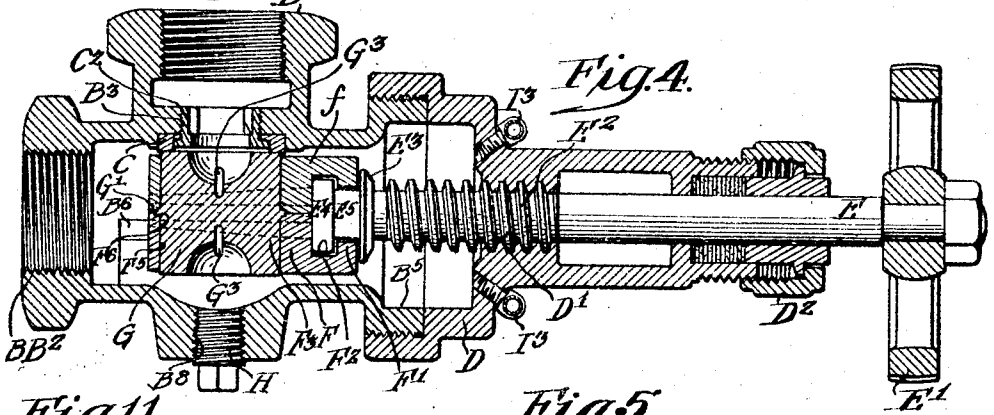


Fig. 4.

Fig. 11.

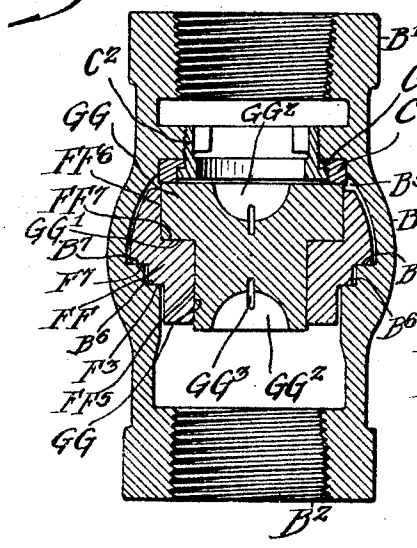


Fig. 5.

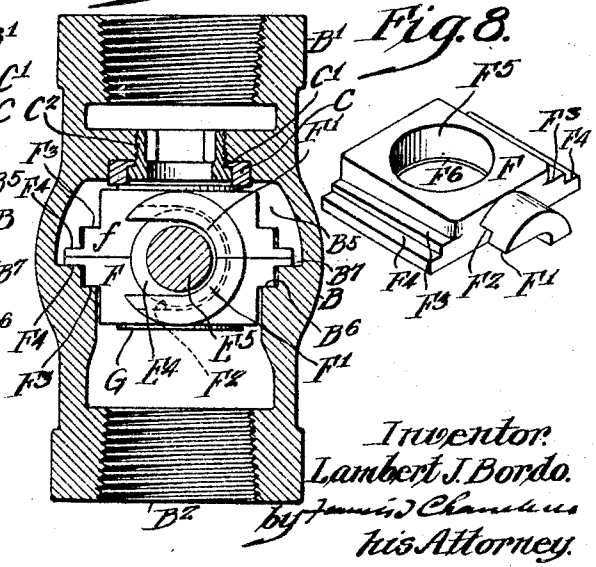


Fig. 8.

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Patented Jan. 27, 1925. 1,524,080

UNITED STATES PATENT OFFICE.

LAMBERT J. BORDO, OF ROSLYN, PENNSYLVANIA.

GATE VALVE.

Application filed August 18, 1922. Serial No. 582,763.

To all whom it may concern:

Be it known that I, LAMBERT J. BORDO, a citizen of the United States of America, and resident of Roslyn, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Gate Valves, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to gate valves of the kind in which the valve in closing is pressed against its seat by a wedge-like motion of the carrier. In valves of this kind, as heretofore constructed, trouble has been met with owing to very considerable wear on the valve and valve seat due to the transverse motion of the valve with respect to its seat and to the very considerable pressure exerted by the wedging action by which the valve is clamped to its seat. Another source of trouble in such valves, particularly when used in connection with tanks containing pulp or similar material, is that the valve casings are very apt to become clogged up. It is the object of my present invention to provide a gate valve which will last longer in good order under the conditions of use and which can be readily kept clean and in which the valve proper can be easily ground to its seat when such grinding becomes desirable.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated and in which—

Figure 1 is a view showing the bottom of the tank with my gate valve connected with it, said view being particularly useful in showing the conduits for cleaining fluid provided to keep the valve casing clean.

Figure 2 is a plan view of the construction shown in Fig. 1, taken on the line 2—2 of Fig. 1.

Figure 3 is a longitudinal sectional view of my improved gate valve in its present construction.

Figure 4 is a view generally similar to that of Fig. 3, as showing the application of the valve to an elbow jointed casing.

Figure 5 is a cross sectional view on the line 5—5 of Fig. 3.

Figure 6 is a sectional elevation of one of the sections of the valve carrier shown in Fig. 5.

Figure 7 is a plan view of the section shown in Fig. 6.

Figure 8 is a perspective view of the section shown in Figs. 6 and 7.

Figure 9 is a sectional view through the valve used in connection with a carrier shown in Figs. 3, 4 and 5.

Figure 10, an end view of said valve, and

Figure 11 is a sectional view showing a modification of my construction in which a non-sectional valve carrier is employed.

A, Fig. 1, indicates the tank with which the gate valve is connected. B is the gate valve casing having, as shown, in Figs. 1, 3 and 5, ports for the entrance and exit of fluid arranged opposite to each other and indicated at B^1, B^2, while in Fig. 4, the exit port indicated at B, B^2, is arranged at an angle to the entrance port B forming what is known as an elbow casing. By preference I internally thread the entrance port B, as indicated at B^3 and on the inside of the casing surrounding this threaded port I form a seat B^4. B^5 indicates the central chamber of the gate valve casing on the sides of which are formed inclined guideways indicated at B^6, B^7, the function of which is to support the valve carrier and force it and the supported valve into contact with the valve seat when the port is closed. At B^8, see Fig. 4, I have indicated an aperture closed by a plug H by which access can be had to the back of the valve when it is desired to grind it to its seat. This, of course, is only necessary where elbow construction is used, as shown in Fig. 4. C is a valve seat resting on the seat B^4 and formed with an inward annular flange C^1, as shown, by means of which, and of the flanged tubular bolt C^2 having the flange C^3, the seat is clamped in position. D indicates the valve casing cap which, as shown, is screwed on to the casing and provided with the usual internal thread D^1 and stuffing box D^2 for the valve stem. E indicates the valve stem having a hand wheel E^1 and a threaded portion E^2 engaging the internal thread D^1 of the cap, the valve stem being

also shown as provided with a valve flange E^3 which, in its uppermost position fits in a seat at the base of the threaded perforation D^1. Below this valve flange the end of the valve stem is continued, as indicated at E^5, with a flange E^4 lying at the base of the portion E^5. F and f are two similar sections making up the valve carrier. From the top of each of these sections extends a lug F^1 undercut by a slot indicated at F^2 and adapted to engage the flange E^4 of the valve spindle, as indicated. Extending laterally from the sides of the sections F and F^1 are the inclined flanges F^3 and F^4 adapted to lie in contact with the inclined guideways of the valve casing indicated at B^6, though, of course, it will be obvious that only one of the carrier sections is in contact with these guideways and equally obvious that only one guideway, such as B^6 or B^7, need be employed and that only one carrier section need necessarily be provided with a contact face. Each carrier section is formed with a cylindrical passage F^5 extending through it and with a conical bearing F^6 formed at the inside of this opening.

G is the valve of generally cylindrical form adapted to fit in the cylindrical openings F^5 of the carrier sections and having a centrally located bevelled annular rim G^1 which is adapted to fit in the conical bearings F^6 of the carrier sections, as shown, and preferably the two faces of the valve G are hollowed out, as indicated at G^2, and they form in the bottoms of the depressions slots G^3 adapted to receive the end of a screw driver or similar tool. I is a conduit leading from a reservoir of steam or water under pressure and connecting through a valve I^1 with a conduit I^2 having branches I^3 and I^4 connected with the valve casing so that water under pressure or steam can be admitted to the casing to clean it out.

In the construction shown in Fig. 11, the valve carrier, here indicated at FF, is made in a single piece with the seat FF^7 at the base of a cylindrical portion FF^6 and another cylindrical portion FF^5. In this construction the valve is indicated at GG and is formed to fit in the valve carrier, as shown, and with a recess GG^2 and slot GG^5 in its rear end.

In operation and in my present construction, as illustrated in Figs. 3, 4 and 5, the valve seat C being secured in place as described, the valve G is inserted in the two carrier sections and the carrier sections then assembled with the valve stem by the means described and lowered into the valve chamber so that the inclined guideways on the rear carrier section will rest in contact with the inclined guideways formed at the sides of the valve chamber. When it is desired to grind the valve to its seat this can readily be done by inserting a bolt in the slot at the rear of the valve and rotating it in the carrier and in contact with the valve seat. When the working face of the valve becomes worn the valve can be reversed, bringing its outer face into operative relation with the valve seat either by reversing the position of the valve in the carrier or by reversing the position of the carrier and this reversal of the carrier will also be made when the wedge faces on the sides of the carrier section in contact with the guideways become unduly worn, thereby bringing fresh wedge surfaces on the carrier surfaces into operation.

In the modification illustrated in Fig. 11, the valve is not reversible but is readily replaceable and has the advantage of the previously described construction in that it provides for the rotation of the valve in the carrier so that it can be ground on its seat.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A gate valve comprising a casing with ports opening from a central chamber, a valve seat surrounding one of said ports and inclined guideways, in combination with a valve carrier movable on said guideways to and from a position in which it lies opposite to the valve seat and a valve rotatably held in said carrier so that its rear side is accessible from the back of the carrier.

2. A gate valve comprising a casing with ports opening from a central chamber, one of said ports being internally threaded and surrounded on the inside of the casing with a seat, said casing having also inclined guideways, in combination with a valve seat having an inner annular flange resting on the seat in the casing, a tubular bolt screwed in the threaded port and having an outwardly extending flange by which it holds the valve seat in position, a valve carrier movable on said guideways to and from a position in which it lies opposite to the valve seat and a valve rotatably held in said carrier so that its rear side is accessible from the back of the carrier.

3. A gate valve comprising a casing with ports opening from a central chamber, a valve seat surrounding one of said ports and inclined guideways, in combination with a valve carrier movable on said guideways to and from a position in which it lies opposite to the valve seat, said carrier being made up of two similar separable sections, each having a cylindrical opening formed in it to receive a cylindrical valve and a seat for a flange of the valve formed at the inner ends of said openings, and each section having guideway contacting flanges, and a cylindrical valve having a central annular flange rotatably held in the assembled carrier sections.

4. A gate valve comprising a casing with

ports opening from a central chamber, a valve seat surrounding one of said ports, inclined guideways, and a lateral chamber into which the valve and carrier move when the valve is open, in combination with a valve carrier movable on said guideways and carrying a valve, said carrier and valve being movable into the lateral chamber but of such dimensions as not to close the chamber, and one or more cleaning conduits entering the casing and whereby a fluid can be introduced to clean the casing.

LAMBERT J. BORDO.