Dec. 21, 1926. 1,611,844

W. G. WILSON

GATE VALVE

Filed Jan. 6, 1926

Fig. 1.

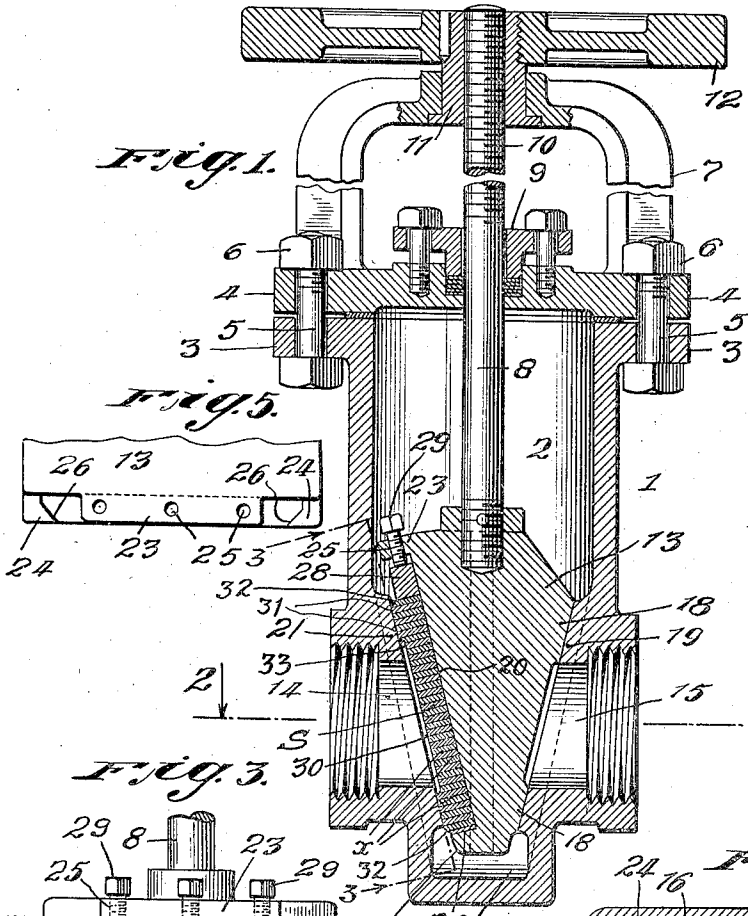


Fig. 5.

Fig. 3.

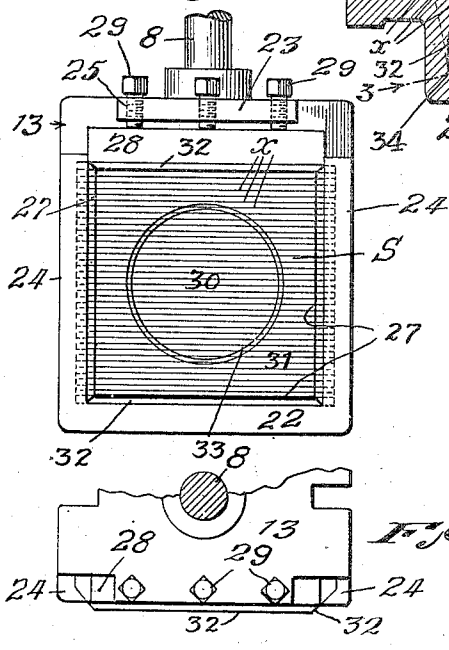
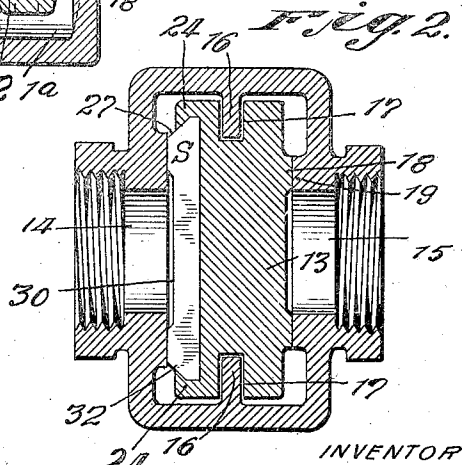


Fig. 4.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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GATE VALVE.

Application filed January 6, 1926. Serial No. 79,575.

This invention relates to gate valves. Its object is to produce a gate valve of a construction better adapted for some purposes than gate valves heretofore made, especially in reference to the prevention of leakage of fluids and liquids passing through the valve at high velocity and pressure. The present invention relates particularly to the construction and mode of operation of the sealing elements.

In the accompanying drawings forming a part hereof and illustrating the invention in the best form now known to me,

Fig. 1 is a vertical central elevation of a valve embodying the present invention.

Fig. 2 is a cross-sectional detail looking down at line 2—2 of Fig. 1.

Fig. 3 shows a face elevation of the packing carrier with the packing removed.

Fig. 4 is a top plan view of a portion of the wedge shaped plug that carries the packing carrier and of details of the packing carrier construction, and shows the packing in place.

Fig. 5 is a partial top plan view of said wedge shaped plug with the packing carrier and packing removed.

In the drawings, casing 1 has an upper chamber 2 and a flange 3 to which the bracket plate 4 that covers chamber 2 is fixed by bolts 5 and nuts 6. Plate 4 carries an upstanding bracket 7 for supporting the valve spindle 8 that passes upwardly through plate 4, a gland 9 therein and has a threaded, upper end portion 10 through a threaded thimble 11 to which is fixed a handle 12. All the foregoing is old and well-known. The bottom of casing 1 has a chamber 1^a for reception of the under end of the wedge shaped plug 13. The intake port is indicated by 14 and the outlet port by 15, these two ports being entrant into the lower portion of chamber 2 wherein the wedge shaped plug 13 is reciprocably mounted. The lower portion of the casing chamber is formed with opposed guide ribs 16 which are received in opposed guide slots 17 formed in the wedge shaped member 13. Outlet or discharge port 15 is enclosed by a downwardly and inwardly slanting valve seat forming wall 18 which cooperates with the downwardly and inwardly slanting, flat, annular sealing surface 19 of the plug 13 on its wall opposed to the discharge port. The valve plug 13 on its side toward the intake port 14 is formed with a quadrangular recess, the bottom wall 20 of which slants downwardly and inwardly. The intake port is surrounded by a downwardly and inwardly slanting, valve seat forming wall 21 for engagement with the packing or sealing element generally indicated by S. The under wall of the packing, receiving recess is indicated by 22 and its upper wall by 23. These two walls are parallel and project in the direction of the intake port from the slanting wall 20. The side walls of the packing, receiving recess are indicated by 24. Said upper wall 23 is provided with threaded holes 25. The side walls 24 are dovetailed at 26.

Packing S as herein shown is made up of separate strips x of packing material, preferably of asbestos or the like. They are laid one upon another, their side edge portions 27 being backwardly tapered so that these side edges fit into the dovetailed grooves 26. The bottom lamina or strip x rests on the wall 22. Thus a packing body in which the several laminæ are separately removable, is formed in the recess between the walls 22 and 23 and between the dovetailed wall 24, as a quadranglar block, the upper lamina having a transverse, clamp bar 28 placed upon it and this bar being clamped compressively downward by screws 29 through the threaded holes 25. The packing block is thus compressed solidly in place. It is formed with a round, central recess 30 in its exposed surface, the recess being enclosed by the marginal sealing face forming portion 31 which projects beyond the bottom of the recess and into sliding contact with the opposed valve seat 21. The upper and under laminæ of the block are tapered rearwardly at 32 and the peripheral wall 33 of the recess also tapers rearwardly and inwardly towards the bottom of the recess. The diametric dimension or area of the recess is substantially greater than the diametric dimension or area of the port opposed to the recess. Consequently, in sliding movements of the sealing block, in opening or closing movements, the sealing face is prevented from protrusion into the opposed port. The upper and under tapered corners 32 of the sealing block serve to space its projecting sealing face 31 from the under wall 22 and also from the clamp bar 28; and also serve to support the laminæ edges in the sealing face between the tapered corners 32

and the tapered wall 33 of the recess 30. Consequently the upper and under tapered edges in the sealing face and the tapered edges of the laminæ that form the wall 33 of the recess are protected from tearing and abrasion during the opening and closing movements. This is important because if abrasion or tear occurs in the sealing face, it is rapidly communicated to adjacent portions of the sealing face and leakage of the seated valve results. The sealing face projects beyond the recess, the exposed face of the clamp bar and the edge 34 of wall 22.

While the port 14 has been referred to as an intake port and the port 15 as an outlet or discharge port, as a matter of convenience in description, it is to be noted that either port may be the intake port and either port the outlet or discharge port.

What I claim is:

1. In a valve, the combination with a casing having an intake and outlet port; of a flat, tapering, valve seat enclosing one of said ports and a flat sealing member composed of superposed, flat, lengthwise extending strips of suitable material and means for clamping each strip in place on a reciprocable carrier; and said carrier.

2. In a valve, the combination with a casing having an intake and outlet port; of a flat, tapering, valve seat enclosing one of said ports and a flat sealing member composed of superposed, flat, lengthwise extending strips of suitable material and means for clamping each strip in place on a reciprocable carrier; and said carrier; said strips being separable.

3. In a valve, the combination with a casing having an intake and outlet port; of a flat, tapering, valve seat enclosing one of said ports and a flat sealing member composed of superposed, flat, lengthwise extending strips of suitable material and means for clamping each strip in place on a reciprocable carrier; and said carrier; said sealing member having opposed tapered edge walls and the carrier being formed with guideways for the tapered edge walls.

4. In a valve, the combination with a casing having a tapered, flat valve seat surrounding a port, of a wedge shaped sealing member carrier provided on one of its flat sides with a rectangular recess for holding a sealing member; a sealing member; and sealing member clamping means; the carrier being formed with dovetail opposed guide walls for edges of said member; such member having a flat sealing surface opposable to the flat valve seat and also to the port.

5. In a valve, the combination with a casing having a tapered, flat valve seat surrounding a port, of a wedge shaped sealing member carrier provided on one of its flat sides with a rectangular recess for holding a sealing member; a sealing member; sealing member clamping means; and opposed dovetail guide walls for edges of said member; such member having a flat sealing surface opposable to the flat valve seat; and the sealing surface being composed of edges of laminæ of suitable material and the sealing member being composed of straight, flat, lengthwise extending strips superposed one on the other and the sealing member clamping means comprising a removable bar and set screws.

6. In a valve, the combination with a casing having a valve seat surrounding a port, of a sealing member carrier provided on one of its sides with a recess for holding a sealing member and also a clamp bar therefor; said sealing member; said clamp bar; said recess having an under wall for supporting said sealing member and also having an upper wall opposed to the clamp bar; and means for locking the clamp bar against said sealing member, said recess having opposed, dovetail, guide walls each for reception of an edge wall of said sealing member and said sealing member having a sealing surface opposable to said valve seat.

Signed at New York in the county of New York and State of New York this 23″ day of December A. D. 1925.

WYLIE GEMMEL WILSON.