

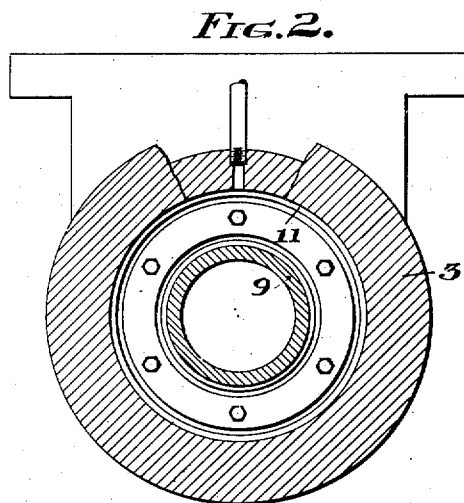
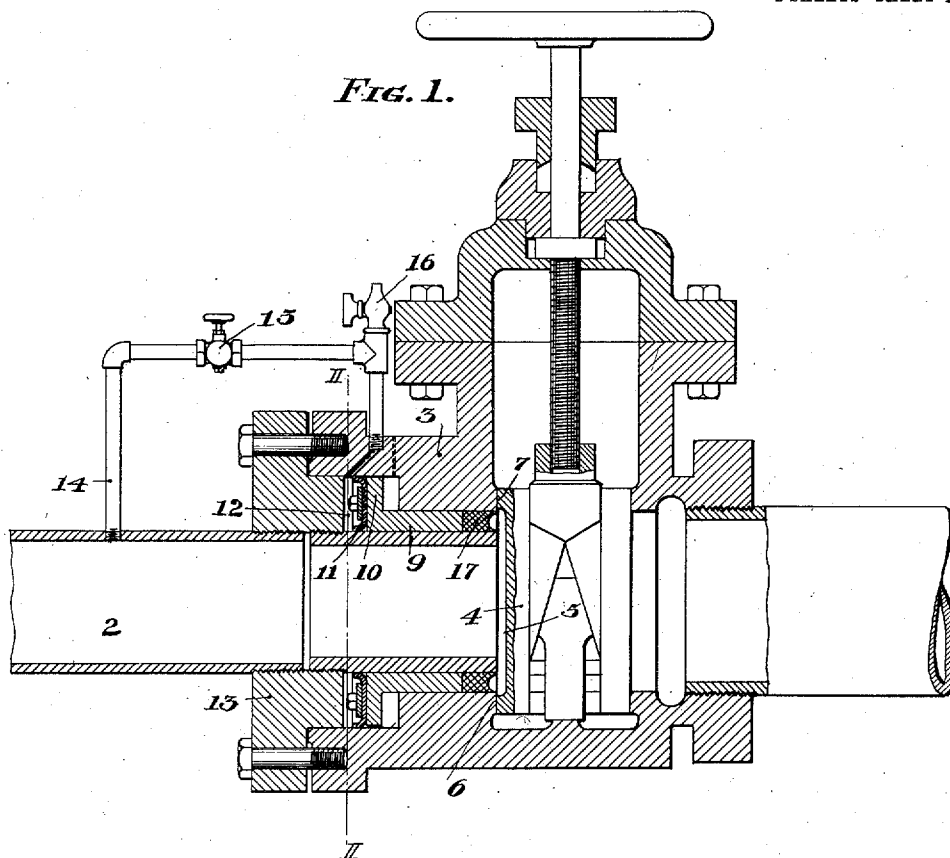
No. 788,953.

PATENTED FEB. 28, 1905.

D. F. HENRY.
GATE VALVE.

APPLICATION FILED AUG. 23, 1904.

2 SHEETS—SHEET 1.



WITNESSES

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INVENTOR

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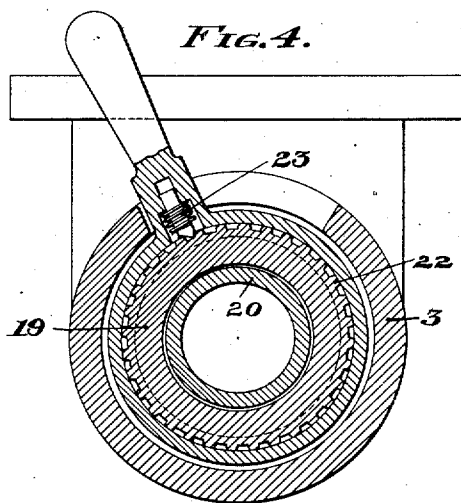
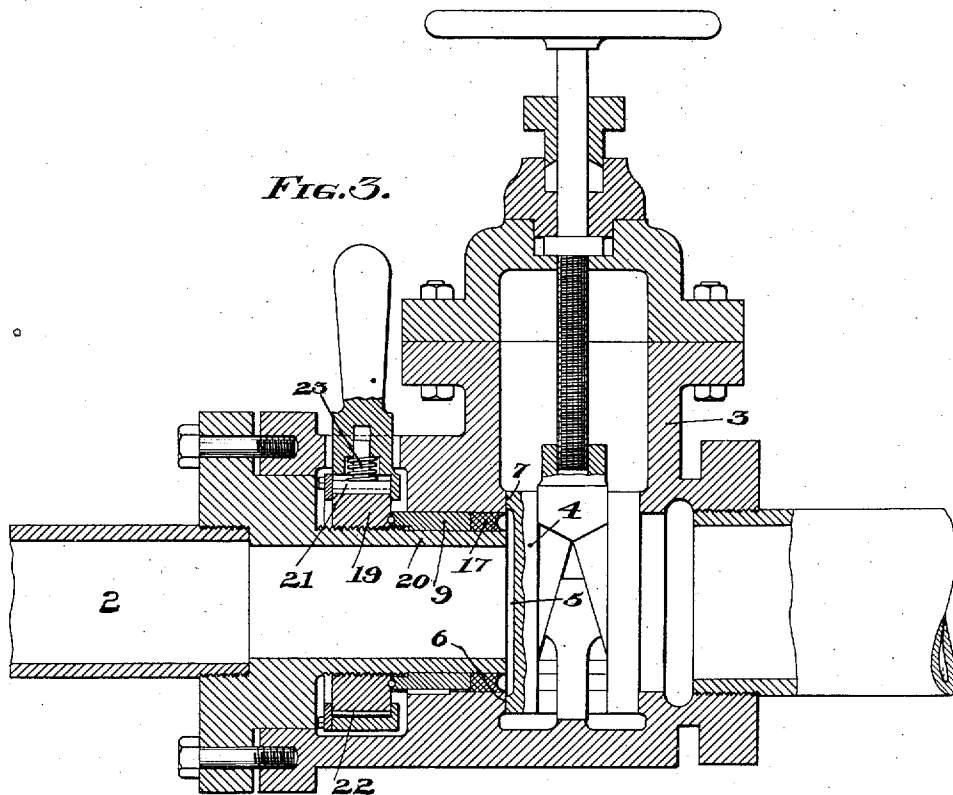
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2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

DAVID F. HENRY, OF MIDWAY, PENNSYLVANIA, ASSIGNOR OF ONE-HALF
TO CHARLES F. GREEN, OF MIDWAY, PENNSYLVANIA, AND BLANCHE D.
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GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 783,953, dated February 28, 1905.

Application filed August 23, 1904. Serial No. 221,837.

To all whom it may concern:

Be it known that I, DAVID F. HENRY, of Midway, Washington county, Pennsylvania, have invented a new and useful Improvement in Gate-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of a gate-valve, illustrating my invention. Fig. 2 is a vertical cross-section on the line II II of Fig. 1. Fig. 3 is a vertical sectional view illustrating a modification, and Fig. 4 is a vertical cross-section of Fig. 3.

My invention relates to an improvement in gate-valves adapted to be used in gas-mains or other places where it is necessary to control the passage of fluid under pressure, and it is especially adapted for use where sand or other grit or cutting material is apt to find lodgment in the parts of the valve.

The object of my invention is to insure the perfect sealing of the valve regardless of the presence of sand, scale, or other foreign substance.

It consists in a packing adapted to reciprocate within the valve-chamber and to seal the joint between the face of the casing and the face of the gate-valve, as is hereinafter more fully described.

I will now describe my invention, so that others skilled in the art may manufacture and use the same.

In the drawings, 2 represents the conduit for conducting fluid under pressure. 3 is the body of the valve-casing, and 4 is the gate-valve. These parts may be of any of the usual forms of construction.

Instead of having a uniform smooth ground face on the gate-valve I cut away a part of the face, forming a recess 5 of about one-fourth of an inch in depth, more or less, and leave an annular ground face 6 adjacent to the periphery of the valve, which seats against the ground face 7 of the valve-casing in the usual manner, making the ordinary ground valve-joint. I do not, however, rely solely

upon this ground joint to prevent the leakage of the fluid.

Adjacent to the face of the gate-valve 4 and below the face 7 is a movable sleeve 9, which fits over the outer face of the conduit 2 or over an extension thereof and is adapted to reciprocate in a cavity formed in the valve-casing 3. This sleeve 4 at its end farthest away from the gate-valve is provided with an annular flange 10, to which is secured an annular cup-packing 11, and in front of the flange 10 is a space or chamber 12, formed in the valve-casing. The chamber is formed, preferably, by leaving a space between the body of the casing and the valve-union 13.

Leading from the conduit 2 is a pipe 14, provided with a stop-cock valve 15 and a bleeding-valve 16. This conduit 14 leads, by means of a suitable channel, into the chamber 12 in the rear of the cup-packing 11.

Between the face of the gate-valve 4 and the reciprocating sleeve 9 is a rubber packing 17, preferably having a concave or cup-shape outer face.

The operation is as follows: After the gate-valve 4 has been closed in the usual manner the stop-cock valve 15 is opened, allowing the fluid-pressure to pass through the pipe 14 into the chamber 12 and exert its pressure against the flange 10 of the sleeve 9, and thereby move the sleeve and the rubber packing 17 over the joint between the ground face 7 of the valve 4 and the valve-casing 2, thus making a tight sealed joint. Owing to the concave or cup-shaped face of the rubber packing 17 the edge of the packing-ring will be pressed tightly against the joint between the gate-valve and the casing by the pressure of the gas within the cup. When it is desired to open the gate-valve, the stop-cock valve 15 is closed and the bleeding-valve 16 is opened, which allows the gas in the chamber 12 to escape to atmosphere through the bleeder-valve, and thereupon the constant fluid-pressure in the conduit 2 acting against the face of the packing 17 will retract the same, moving it away from the gate-valve and allowing the valve to be raised in the usual

manner. The packing-ring 17 serves to make a tight joint whether the ground faces of the valve and valve-casing be perfectly true or not, and in case these faces should be cut or injured by sand, scale, or other foreign substance there still remains the tight joint caused by the flexible packing bearing against the meeting edges of the two metals.

In Figs. 3 and 4 I show a modification, in which mechanical means are used to advance and retract the packing-ring 17. These consist of a screw-nut 19, the thread of which engages with a thread formed on the outer face of the sleeve 20, the face of this nut 19 bearing against the face of the sleeve 9. In order to rotate the nut and cause it to move back and forth on the sleeve 20, I employ a ratchet 21, which is adapted to engage with ratchet-teeth 22, formed on the outer circumference of the nut and to engage thereon by means of a spring-pawl 23, which enables the nut to be turned in either direction.

The advantages of my invention will be appreciated by those skilled in the art.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A gate-valve having a circular face arranged to register with a face of the casing and extending at right angles to the plane of the joint between the valve and casing, a flexible packing movable over said registering faces, and means for moving said packing in a path at right angles to the plane of the joint and to a position overlapping the joint between the registering faces; substantially as described.

2. An improvement in gate-valves consisting in a movable flexible packing, said pack-

ing being adapted to be brought over the joint between the gate-valve and the valve-casing, a movable sleeve adapted to bear against the flexible packing, said sleeve having a pressure-face and a conduit for conducting fluid-pressure against the pressure-face of the sleeve; substantially as described.

3. An improvement in gate-valves consisting in a flexible packing having a cup face and adapted to be brought over the valve-joint, a movable sleeve having a pressure-face situate in a fluid-pressure chamber, and a fluid-pressure conduit leading to the pressure-chamber, each conduit being provided with a stop-cock valve and a bleeder-valve; substantially as described.

4. An improvement consisting in a gate-valve having a countered face, a flexible packing having a cup face and adapted to be moved within the recess formed by the countered face and means for causing the packing to pass within the countered face of the valve and over the valve-joint; substantially as described.

5. A gate-valve having a circular recess in the valve with a face in line with a circular face on the casing, a flexible packing movable in the path at right angles to the plane of the joint between the valve and the casing, and means for moving the packing into the valve-recess to a position where it overlaps the joint; substantially as described.

In testimony whereof I have hereunto set my hand.

DAVID F. HENRY.

Witnesses:

GEO. B. BLEMING,
GERTRUDE M. VIERS.