Feb. 15, 1927. 1,617,503

J. H. SEYMOUR ET AL

GATE VALVE

Filed Aug. 3, 1926 2 Sheets-Sheet 1

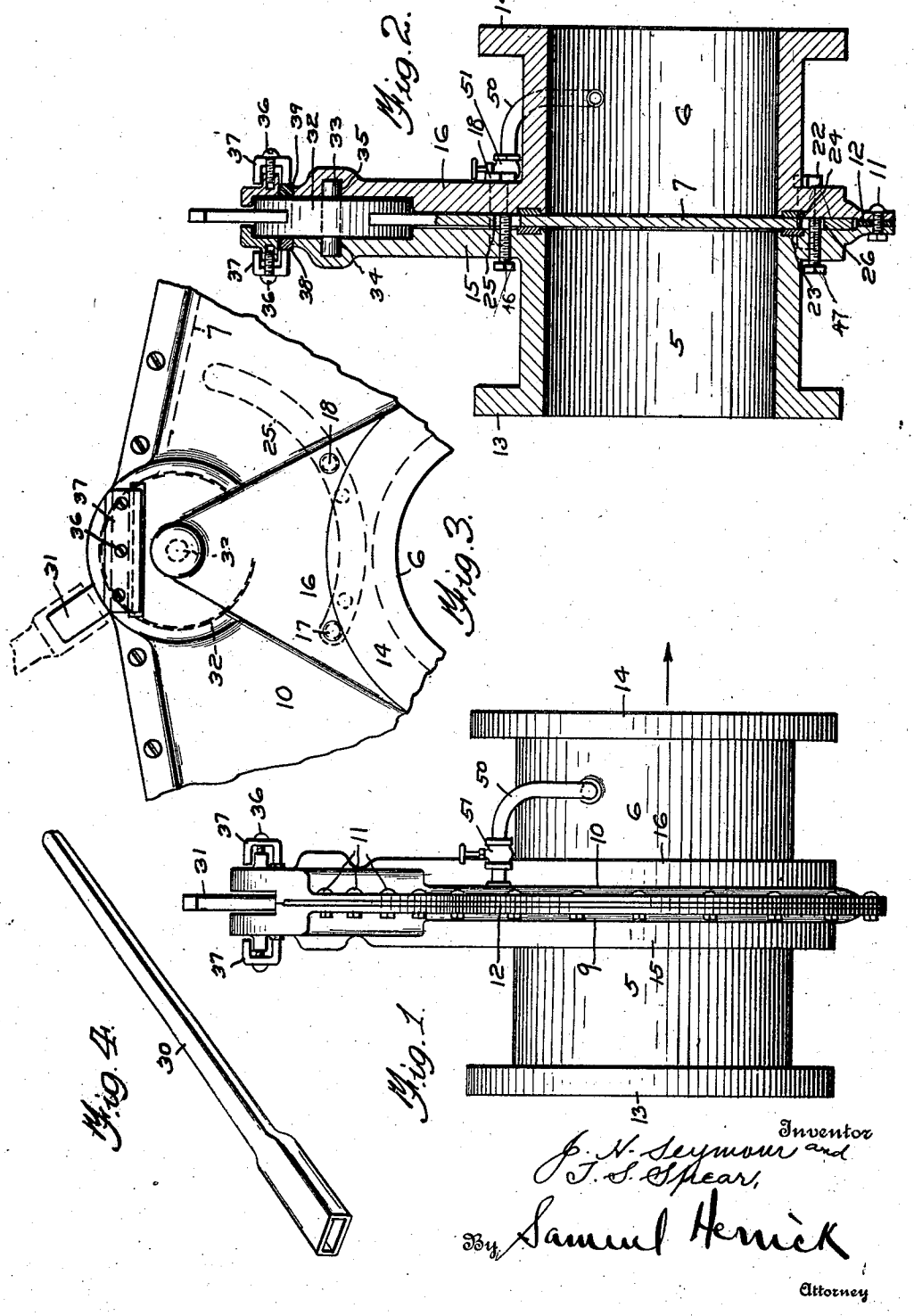


Fig. 2.

Fig. 3.

Fig. 1.

Fig. 4.

Inventor
J. H. Seymour and
T. S. Spear,
By Samuel Herrick
Attorney

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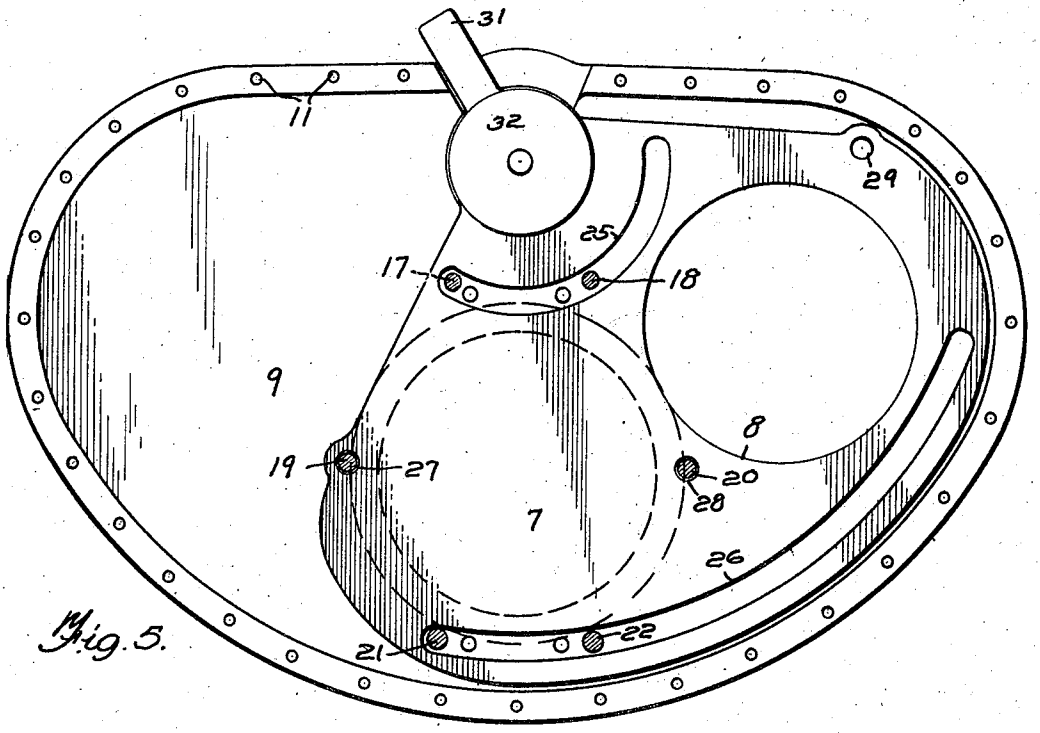


Fig. 5.

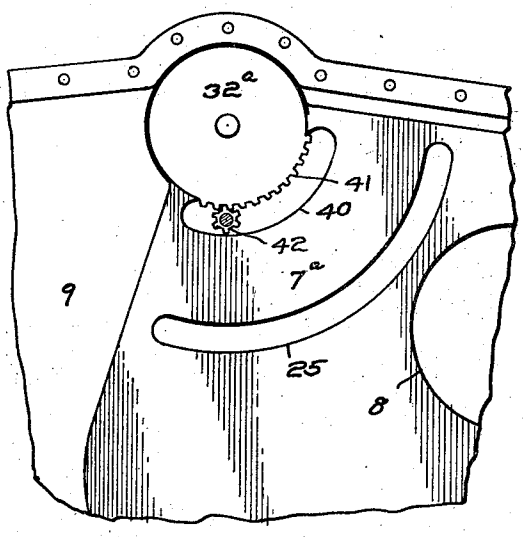


Fig. 6.

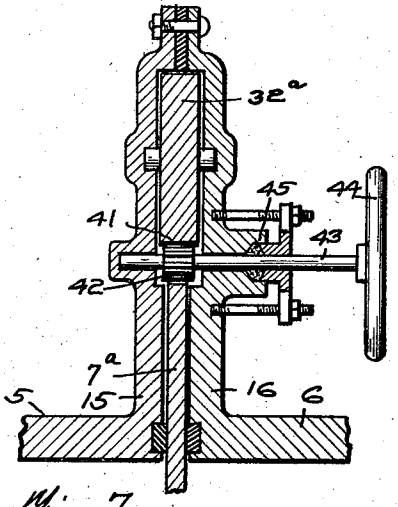


Fig. 7.

Inventor
J. H. Seymour and
T. S. Shear

By Samuel Herrick,
Attorney

Patented Feb. 15, 1927. 1,617,503

UNITED STATES PATENT OFFICE.

JULIUS H. SEYMOUR AND THOMAS S. SPEAR, OF BARTOW, FLORIDA.

GATE VALVE.

Application filed August 3, 1926. Serial No. 126,894.

This invention relates to gate valves of the character of that shown in our copending application Serial Number 123,704, filed on the 20th day of July, 1926, wherein a plate like valve is pivoted to swing laterally across the bore of a conduit for the purpose of opening and closing the same, said valve swinging between two separable sections of a valve casing.

In the application above referred to the valve was not enclosed, but upon the contrary swung into the open.

The device of the present invention embodies a structure wherein the valve plate is housed, throughout its movement, said housing and associate parts being suitably packed to prevent leakage. The invention further contemplates the provision of novel means for actuating the valve plate from the exterior of its protective housing.

Like numerals designate corresponding parts in all of the figures of the drawing.

Referring to the drawings—

Fig. 1 is a side elevation of a valve constructed in accordance with the invention.

Fig. 2 is a vertical sectional view therethrough.

Fig. 3 is a fragmentary end elevation of the valve.

Fig. 4 is a view of the operating lever for the form of the invention illustrated in Figs. 1, 2, 3 and 5.

Fig. 5 is a view of the valve plate with one-half of the housing removed.

Fig. 6 is a view of the valve plate with a part of the housing, illustrating a modified form of actuating means for the valve plate and

Fig. 7 is a vertical sectional view through the structure of Fig. 6.

The device of the invention comprises a two part casing consisting of the sections 5 and 6. The valve plate or web 7 is mounted to swing between the sections 5 and 6 and has an opening 8, formed therethrough. When this opening is in alignment with the bore of the conduit, the valve is "open" and fluid may flow through the valve casing, while when the web 7 is in the position illustrated in Figs. 2 and 5, the valve is "closed". The sections 5 and 6 carry complemental housing webs 9 and 10 which are fastened together at their outer edges by bolts or screws 11, the confronting edges of the housings having a strip of packing 12 between them. The valve casing sections 5 and 6 have outer flanges 13 and 14 and inner flanges 15 and 16, respectively. The inner flanges are traversed by bolts 17, 18, 19, 20, 21 and 22. These bolts tend to draw the flanges 15 and 16 toward each other and to bind packing rings or gaskets 23 and 24 into fluid tight contact with the valve plate or web 7. Bolts 17 and 18 pass through an arcuate slot 25 of the web while the bolts 21 and 22 pass through arcuate slot 26. Bolts 19 and 20 pass through corresponding openings 27, 28 and 29 of the valve plate or web. The valve may be shifted by placing an operating handle 30, (see Fig. 4) upon an extension 31 of the hub 32 of the valve plate. This hub is provided with a pivot bolt or spindle 33 and the housing sections 9 and 10 are provided with recesses 34 and 35 for the reception of this pin. Screws or bolts 36 pass through U-shaped clamps 37 which may be drawn toward the outer faces of the housing sections 9 and 10 by said screws. When these screws are tightened the lower edges of said clamps are caused to compress packing strips 38 and 39 into fluid tight engagement with the hub 32, to thereby prevent leakage outwardly past said hub and to that part of the housing in which the member 31 moves.

A modified form of operating means for the valve plate is illustrated in Figs. 6 and 7. In this case, the extension 31 and lever 30 are dispensed with and the top of the housing is completely sealed. Valve plate 7^a is provided with an additional arcuate slot 40. The hub 32^a is provided with an arcuate row of teeth with which a pinion 42 meshes. This pinion is mounted upon the shaft 43 of a hand wheel 44. A suitable stuffing box 45 packs the shaft 43. It is manifest that rotation of the hand wheel will cause the pinion 42 to act upon the teeth 41 to move the valve plate either to open or closed position according to the direction of rotation of the hand wheel.

When the valve is to be moved either to open or close the same, the bolts 19 and 20 are removed while the bolts 17, 18 and 21, 22 are merely loosened. Then set screws 46 and 47 are tightened. These set screws go through one-half of the valve casing and bear against the other half and their function is merely to slightly separate the two halves of the valve casing at the time that the valve is being moved. This relieves a good deal of the friction upon the valve and

renders its operation easier. It is true that slightly separating the two sections of the valve casing may result in a small amount of leakage but since it takes but a short time to move the valve, this leakage may be disregarded. As soon as the valve has been moved to the desired position the set screws are loosened, the bolts 17, 18, 21 and 22 are tightened and the bolts 19 and 20 are restored to their former position and tightened. Since these bolts traverse the valve plate it follows that after they have once been put in place the valve can not be accidentally moved.

We preferably, though not necessarily, include bypasses 50 in our structure. These bypasses lead from the housing to the valve casing and include valves 51 in their length. Their function is to equalize the pressure between the wings of the valve plate housing (i. e., those spaces into which the valve plate moves) and the interior of the conduit of which the valve casing sections 5 and 6 constitute a part. This facilitates movement of the valve by relieving unequal pressures thereon.

It is to be understood that the invention is not limited to the precise construction set forth but that it includes within its purview whatever changes fairly come within either the terms or the spirit of the appended claims.

Having described our invention what we claim is:

1. A structure of the character described comprising a pair of valve casing sections disposed face to face, packing gaskets upon their confronting faces, a web like valve plate having arcuate slots formed therein movable between said gaskets, bolts traversing said slots for drawing the valve casing sections together, bolts traversing the valve casing sections and the valve for holding the valve in adjusted positions and complemental valve housings upon said sections into which the valve swings in its movement across the valve casing sections.

2. A device of the character described comprising a pair of valve casing sections and laterally extending valve housing sections, means for fastening said sections together face to face, a plate like valve pivoted for swinging movement in the valve housing sections and adapted to swing across the valve casing sections, said valve plate having arcuate slots concentric with the pivot of the valve plate, packing means carried by the valve casing sections, and engaging said valve, a shaft projecting to the exterior of the valve housing sections at a point inwardly of the pivot of the valve plate, operating means upon said shaft, means for packing said shaft to prevent leakage, an arcuate rack along the edge of one of said arcuate slots and a pinion carried by the shaft and meshing with said rack and packing means at the edge of the valve housing sections outwardly of the valve.

In testimony whereof we affix our signatures.

JULIUS H. SEYMOUR.
THOMAS S. SPEAR.