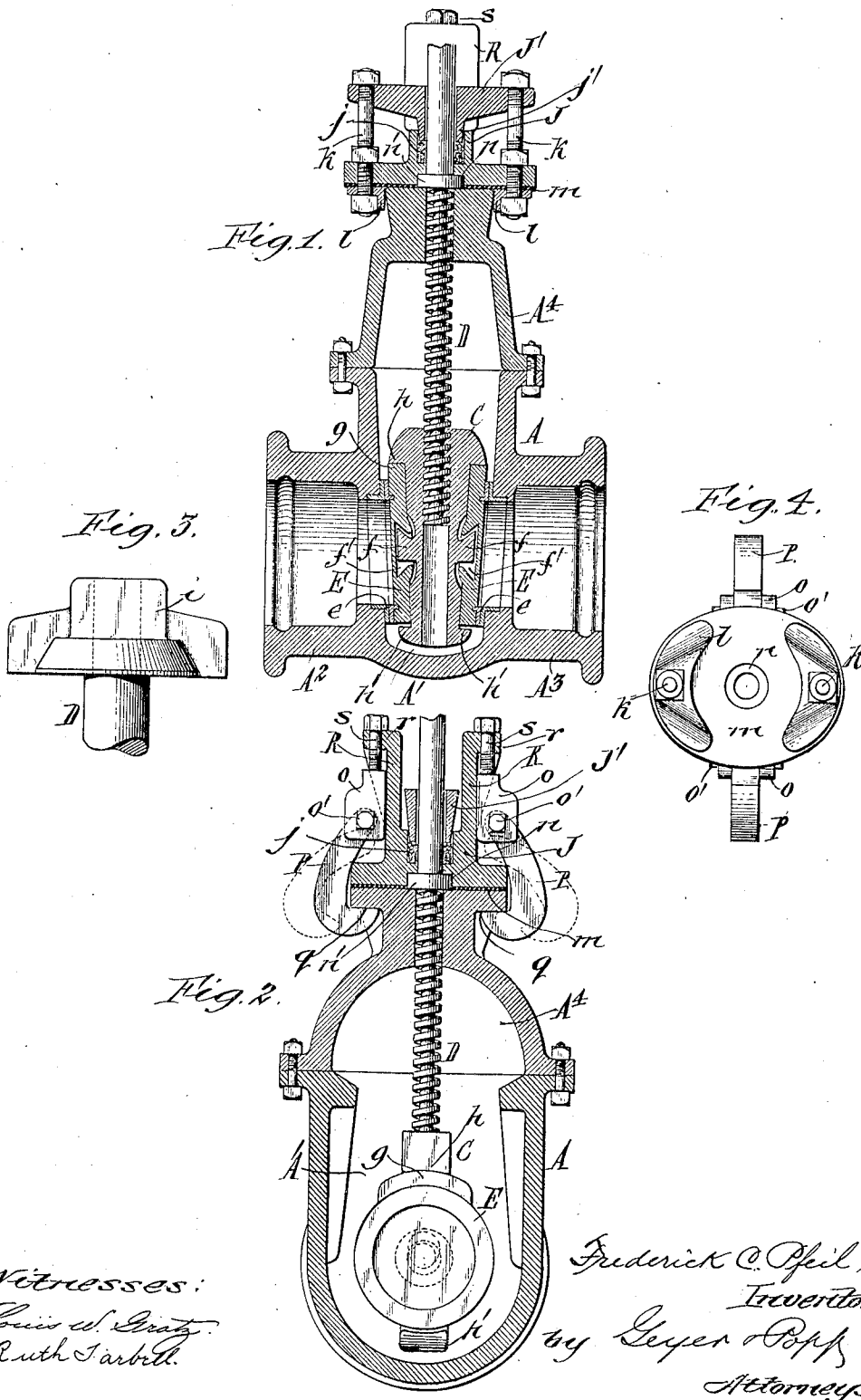


No. 856,546.

PATENTED JUNE 11, 1907.

F. C. PFEIL.
GATE VALVE.

APPLICATION FILED DEC. 5, 1905.



Witnesses:
Louis W. Gratz
Ruth Tarbell

Frederick C. Pfeil,
Inventor
by Geyer & Popp
Attorneys

UNITED STATES PATENT OFFICE.

FREDERICK C. PFEIL, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-
FOURTH TO EDWARD SPERRY, OF BUFFALO, NEW YORK.

GATE-VALVE.

No. 856,546.

Specification of Letters Patent.

Patented June 11, 1907.

Application filed December 5, 1905. Serial No. 290,387.

To all whom it may concern:

Be it known that I, FREDERICK C. PFEIL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Gate-Valves, of which the following is a specification.

The gate-valves of water mains are usually inclosed by a casing or stop cock box, and when the stuffing box of such a valve, as ordinarily constructed, is required to be repacked, it is necessary to remove the stop-cock box and tear up the street, in order to gain access to the valve.

The principal object of my invention is to so construct the valve that its stuffing-box can be readily removed without disturbing the remaining parts of the valve, the stop-cock box or the street-pavement, thus permitting the stuffing box to be conveniently repacked and saving the time and labor incident to this operation with a gate-valve of ordinary construction.

A further object of my invention is to improve the construction of the gate-disks and their carrying-head with a view of relieving their supporting studs or pivots from undue strains.

In the accompanying drawings: Figure 1 is a vertical longitudinal section of a valve embodying the invention. Fig. 2 is a vertical section at right angles to Fig. 1. Fig. 3 is an enlarged side elevation of the upper portion of the valve spindle and its removable head or cap. Fig. 4 is a bottom plan view of the detached stuffing box.

Similar letters of reference indicate corresponding parts throughout the several views.

A indicates the casing of the valve which may be of ordinary construction, A¹ being the central valve-chamber, A², A³ the usual end chambers or branches and A⁴ the dome which forms an upward extension of the valve-chamber and receives the gate, when the latter is raised.

The gate consists of a head or nut C which engages the lower end of the customary screw-stem or spindle D, and valve-disks E, E applied to opposite sides of the head and adapted to bear against the usual valve-seats *e*. In the preferred construction shown in the drawings, these, disks are swiveled or loosely mounted upon studs or pivots *f* projecting

from opposite sides of the head C, so that they may bear squarely against their seats. These studs enter sockets *f*¹ in the rear sides of the valve-disks and their upper sides are hook-shaped or undercut and said sockets are correspondingly undercut to retain the disks on the studs. The contracted outer ends of the sockets are large enough to admit the studs.

As shown in Fig. 1, the two valve-disks and their seats *e* converge downwardly, so that upon lowering the gate by means of the screw-spindle D, the disks are tightly wedged against their seats. In order to relieve the studs *f* from the thrust or strain incident to the tightening of the gate, the disks E are provided at their upper edges with lugs *g* which abut against stops or shoulders *h* arranged on the upper portion of the head C, as best shown in Fig. 1, sufficient clearance being left between the lower sides of the studs and the corresponding sides of the sockets *f*¹ to exert such strain wholly against the stops *h*. To likewise relieve the studs from strains in opening the gate, the head C is preferably provided below the disks E with similar lugs or shoulders *h*¹ which engage against the lower edges of the disks upon raising said head.

The spindle D passes upwardly through a central opening of the dome A⁴ and through a stuffing box of any suitable construction and is provided at its upper end with the usual removable cap or head *i* which fits upon the square end of the spindle. The stuffing box shown in the drawings consists of a base J having a socket *j* for receiving the usual packing and a gland J¹ having a plunger *j*¹ which enters said socket, the base and gland being united by clamping bolts *k* which pass through the same, as shown in Fig. 1. The base J is provided on its under side with curved bars or cleats *l* which bear against opposite sides of the dome A⁴ and serve to center the stuffing box thereon. These cleats are preferably secured to the base by the clamping bolts *k*. Between the top of the dome and the bottom of the stuffing box the usual packing sheet *m* is interposed. The base of the box is provided with a circular recess *n* which receives the usual collar *n*¹ of the spindle D.

Instead of being bolted to the top of the dome A⁴, as heretofore, the stuffing box is removably seated on the dome and connected

therewith by a suitable coupling device which can be conveniently manipulated from the surface of the ground by a suitable wrench or tool, for readily releasing or securing the box.

5 The means preferred for this purpose consist of a pair of vertically-movable slides or followers *o* carried by the stuffing box, and hooks *P* pivoted by horizontal bolts *o'* to said followers and adapted to engage under a flange *g* at the upper end of the dome *A*⁴, as shown by full lines in Fig. 2. These followers are suitably guided on the outer sides of a pair of standards *R* which rise from the base *J* of the stuffing box on opposite sides of the gland *J*¹. The followers are raised and lowered by rotary vertical screws or bolts *s* passing loosely through perforated lugs *r* at the upper ends of the standards *R* and engaging screw threaded openings in the followers.

10 In the normal position of the parts, the hooks *P* are tightly interlocked with the flange *g* of the dome, the followers *o* having been raised for this purpose by turning the bolts *s* in the proper direction by a suitable key or wrench, not shown, thus drawing the stuffing box down against the dome and forming a tight joint between these parts. When it is desired to remove the stuffing box for repacking it or other purposes, the cap *i* of the spindle *D* is first removed by means of a suitable gripping tool, not shown in the drawings. The followers *o* are next lowered by turning their actuating screws *s* in the proper direction by the above-mentioned key. By this movement of the followers, the coupling hooks *P* are lowered and loosened and at the same time swung outwardly out of engagement with the flange *g* of the dome by riding on the upper edge of the base *J* of the stuffing box, the inner edges of the shanks of the hooks being properly formed and arranged to produce this action. This unlocked position of the hooks is shown by dotted lines in Fig. 2. The stuffing box being now released from the valve casing is bodily lifted off the latter and the spindle *D* and withdrawn through the stop-cock box by the gripping tool above referred to, leaving the remaining parts of the valve intact and undisturbed. After repacking the stuffing box, it is replaced on the dome *A*⁴ by the use of said gripping tool and again fastened to the dome by raising the followers *o*, as hereinbefore described, the receding followers permitting the hooks *P* to swing inwardly into engagement with the flange *g* by gravity and the continued upward movement of the followers causing the hooks to be tightly clamped and locked in place. Finally, the cap *i* of the spindle is replaced.

As the stuffing box can by this improved construction be removed and replaced without in any way disturbing the inclosing stop-cock box or the pavement, the operation of repacking it is greatly facilitated, saving

much time and labor and avoiding the objection of tearing up the pavement.

I claim as my invention:

1. The combination with the valve-case, the gate and its operating spindle, of a stuffing box for the spindle removably mounted on the case, a coupling device connecting the stuffing-box with the case, and means for automatically moving the coupling device to its uncoupled position when loosened, substantially as set forth.

2. The combination with the valve-case, the gate and its operating spindle, of a stuffing box for the spindle removably mounted on the case, a coupling device carried by the stuffing box and engaging the case, said coupling device having means for automatically disengaging it from the case when loosened, and means carried by the stuffing box for tightening the coupling device, substantially as set forth.

3. The combination with the valve-casing, the gate or valve and the operating spindle of the gate, of a stuffing box for the spindle removably mounted on the casing and comprising a base, a gland and bolts connecting the base and gland but disconnected from the casing, and coupling means independent of said bolts for detachably securing the stuffing box to the casing, substantially as set forth.

4. The combination with the valve-casing, the gate or valve and the operating spindle of the gate, of a stuffing box for the spindle removably mounted on the casing, vertically-movable slides or followers mounted on the stuffing-box, coupling hooks carried by said slides and engaging with the top of the casing, and means for swinging the hooks out of engagement with the casing when said slides are lowered, substantially as set forth.

5. The combination with the valve-casing, the gate or valve and the operating spindle of the gate, of a stuffing box for the spindle removably mounted on the casing, vertically-movable slides or followers guided on the stuffing-box, and coupling hooks pivoted at their upper ends to said slides and engaging with the casing, the hooks and the stuffing box having co-operating faces constructed and arranged to swing the hooks laterally out of engagement with the casing when the slides are lowered, substantially as set forth.

6. The combination with the valve-casing, the gate or valve and the operating spindle of the gate, of a stuffing box for the spindle removably mounted on the casing, vertically-movable slides or followers guided on the stuffing-box, operating screws for the slides accessible from the top of the stuffing box, and laterally-swinging hooks pivoted at their upper ends to said slides and engaging with the top of the casing, substantially as set forth.

7. The combination with the valve-casing,

the gate or valve and the operating spindle of the gate, of a stuffing box for the spindle removably seated on the casing and having standards provided with perforated lugs, 5 vertically movable slides guided on said standards, vertical bolts passing through said perforated lugs and engaging screw threaded openings in the slides, and laterally-swinging hooks pivoted at their upper 10 ends to the slides and engaging with the top of the casing, substantially as set forth.

8. The combination with the valve casing, the gate or valve and the operating spindle of the gate, of a stuffing box for the spindle re-

movably mounted on the casing and provided on its underside with centering bars or cleats arranged on opposite sides of the casing, coupling hooks carried by the stuffing box and engaging with the casing, and means 20 for tightening and releasing said hooks, substantially as set forth.

Witness my hand this 27th day of November, 1905.

FREDERICK C. PFEIL.

Witnesses:

CARL F. GEYER,
RUTH TARBELL.