No. 633,217. Patented Sept. 19, 1899.

I. QURIN.

VALVE FOR VESSELS CONTAINING CARBONIC ACID.

(Application filed Jan. 25, 1899.)

(No Model.)

Fig. 1

Section a-b

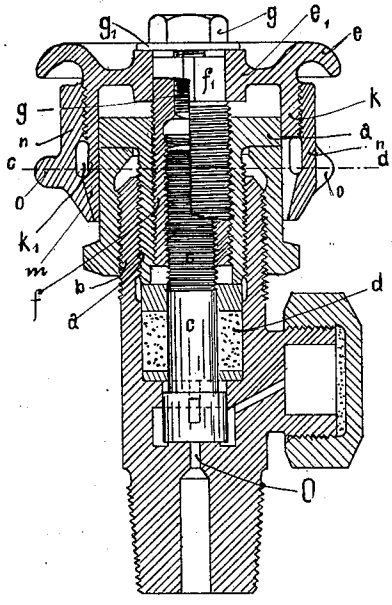


Fig. 2

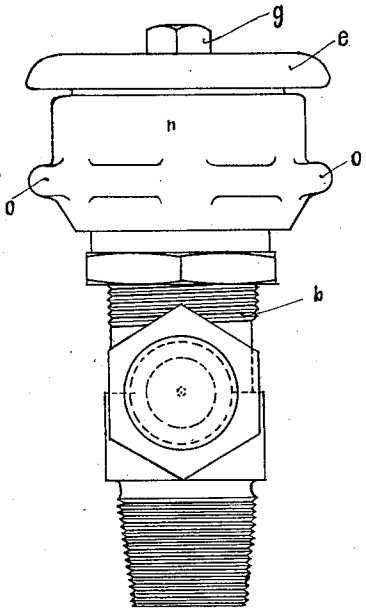


Fig. 3

Section c-d

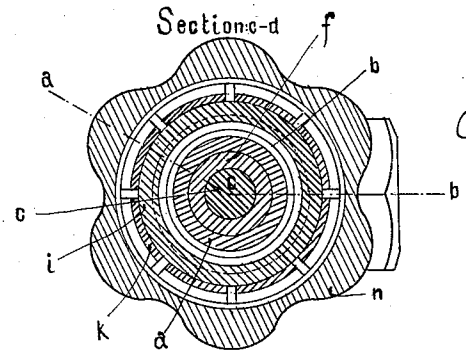
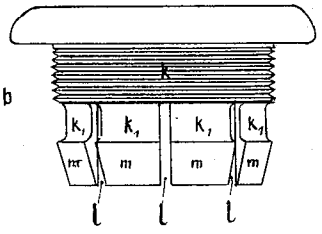


Fig. 4



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VALVE FOR VESSELS CONTAINING CARBONIC ACID.

SPECIFICATION forming part of Letters Patent No. 633,217, dated September 19, 1899.

Application filed January 25, 1899. Serial No. 703,380. (No model.)

To all whom it may concern:

Be it known that I, IGNAZ QURIN, engineer, a subject of the King of Prussia, German Emperor, and a resident of Cologne, in the Province of Rhineland and Kingdom of Prussia, Germany, have invented a certain new and useful Improved Valve for Vessels for Containing Carbonic-Acid and other Gases Under Pressure, of which the following is a specification, reference being had therein to the accompanying drawings.

In the screw-down valves for fluid carbonic-acid and other gases of high tension the following drawbacks have hitherto mostly shown themselves: First, a great force is necessary in order by means of the hand-wheel to press the piston so tightly on the opening of the valve that really no gas can escape; secondly, the valve closing frequently becomes loose, even if the valve-piston is screwed down ever so tightly on its seat, owing to the shaking and concussions on the long journeys by rail and car, more especially during the latter, since the cars often go over rough pavement and bad roads. This causes the contents of the gas-holders—mostly the well-known steel bottles—to escape entirely or partly during the transport, so that the consignments on arriving at their destination often have lost most of their value. It is the object of the present invention to avoid these drawbacks. This is done on the one hand by an arrangement being made in this valve which admits of the valve-piston being well pressed down on its seat, thus closing it absolutely tight with a small amount of force, and on the other hand by two safety devices, which effectively and reliably prevent the escape of the gas during the transport of gas-holders—viz., first, a device which prevents the loosening of the stuffing-box nut, being thus a kind of counter-nut for the same, and then a device which makes it impossible for the commonly-used hand-wheel moving the valve-piston up and down to turn of itself.

In the accompanying drawings the improved valve is shown in Figure 1 in vertical section on two planes along the section-line *a b* of Fig. 3; in Fig. 2, in side view, while Fig. 3 shows a horizontal section to *c d* of Fig. 1, and Fig. 4 shows a detail in an outer and side view.

In order to obtain a tight closing of the valve with the least possible force, the following arrangement is made in the valve: The hand-wheel *e*, which is used for screwing down the valve, carries on its lower side in the middle a hollow pin *f*, which engages with an external thread of the stuffing-box nut *a*, having the shape of a coupling-box. The hollow pin *f* has also a thread on its inner side, which, however, is finer than the outer thread, thus having more threads for the same length than on the outside. The outer thread of the valve-piston *c* fits into the fine inner thread of the pin *f*. The inner and outer threads of the pin *f* have the same direction. If the hand-wheel *e* is turned in such a manner that its hollow pin *f* in the stuffing-box nut *a* screws itself upward, then since the fine inner thread of the pin *f* works against the corresponding outer thread of the valve-piston *c* the latter is raised, but always less than the pin *f* rises in the stuffing-box nut *a*. For instance, if the fine thread of the piston *c* has twice as many threads to the unit of length as the outer thread of the pin *f* the piston *c* will only rise half of the distance upward that the hand-wheel *e* or its pin *f* is raised toward the stuffing-box nut *a*. Thus in order to raise or lower the piston the distance of one thread two complete revolutions of the hand-wheel must be made in the nut *a*. It will thus be seen that by turning the hand-wheel *e* a greater force can be exerted on the piston *c* than hitherto, so that with the same amount of force as hitherto the valve can be closed much tighter and more reliably, since in counter distinction to the procedure when the valve is opened—that is, when the hand-wheel is screwed up and the latter being screwed down—the piston *c* moves a lesser distance in order to completely close the opening *o* in the valve.

The pin *f* could of course be made in one piece with the body of the hand-wheel; but in consideration of the separate construction being easier and having regard to the fitting together of the various parts which in the present construction must be pushed or screwed into each other the pin *f* is in this case separated from the hand-wheel *e* and fitted with an upper smooth projection *f'* into a corresponding square or round opening in the nave *e'* of the hand-wheel *e* and

held in position by the round heated screw *g* or by a nut.

While by means of the above arrangement it is possible to tightly close the valve-opening *o* by the piston *c*, the devices for securing the different parts against becoming loose during the transport are as follows: The stuffing-box nut *a*, which is formed like a coupling-box and can be screwed up and down with its exterior thread in the corresponding inner thread of the upper end *b* of the valve-body, (the so-called "pot,") whereby its chief object of tightening the valve-spindle *c* by pressure on the packing *d* is attained, lays itself with its upper flange-like end on the end of a box *i*, serving as counter-nut for securing the stuffing-box nut *a*, and therefore capable of being screwed up and down with an inner thread on the corresponding outer thread of the upper end *b* of the valve-body, and thereby pressed more or less against the stuffing-box nut *a* or its flange, so that the latter can be screwed very tight in the position once assumed and is immovably held therein. In this manner a loosening of the stuffing-box nut *a*, and thereby of the packing *d*, surrounding the valve-spindle *c*, during the transport is entirely prevented; but in order also to prevent the slightest turning of the hand-wheel *e*, and thereby the slightest raising of the valve-spindle *c* by shocks, concussions, or the like during the transport, the following safety device is employed: The hand-wheel *e* has on its lower side a box-like projection *k*, which incloses the outer surface of the counter-nut *i* and also the outer surface of the flange of the stuffing-box nut *a* if this flange is given the same diameter as the stuffing-box nut. This projection *k* ends downward in a neck-like piece *k'*, made thinner by turning, to which is joined a ring *m*, tapering toward the point like a cone. This ring, as well as the neck *k'*, as is plainly to be seen in Fig. 4, is broken by several slits *l* on the surface, and thus split into several strips, whereby they act with elastic force. The box *k* has an outer thread, and over this is screwed a holdfast-ring *n*, whose upper cylindrical end engages with its inner thread the outer thread of *k*, while the inner surface of its lower narrowed hollow cone-like end lays itself over the elastic strips, (forming the ring *m*,) pressing them against the circumference of the counter-nut *i* of the stuffing-box. The more therefore the ring *n* is screwed upward the tighter are the strips pressed against the counter-nut *i* and the more firmly is the hand-wheel secured against an involuntary turning.

In order that the ring *n* may be easily turned by hand, it is provided with a rough surface or projections *q*, which serve as a handle.

What I claim as my invention, and desire to secure by Letters Patent, is—

Improved valve for vessels for containing carbonic-acid and other gases under high pressure, characterized by the combination of, first, a hollow pin *f*, mounted at the bottom of the hand-wheel *e* and fitted with an outer thread to the stuffing-box nut *a* and with a finer inner thread to the valve-spindle *c*, second, a counter-nut *i* screwed on the upper end *b* of the valve, provided with an outer thread, and pressing with its lower end against the flange-like upper end of the stuffing-box nut *a*, third, an outward threaded socket *k*, fitted on the hand-wheel *e* and inclosing the counter-nut *i*, which socket terminates below in a conical ring divided in a series of elastic flaps *m*, fourth, a press-ring *n*, screwed on the outer thread of the socket *k*, with a lower cone-like end inclosing all flaps *m* of the socket *k* and pressing the same against each other and against the counter-nut *i* of the stuffing-box.

In witness whereof I have hereunto set my hand in presence of two subscribing witnesses.

IGNAZ QURIN.

Witnesses:
W. MARSEILLE,
WILLIAM H. MADDEN.