G. W. EDDY.

Stop-Valve.

No. 165,988. Patented July 27, 1875.

Fig. 1.

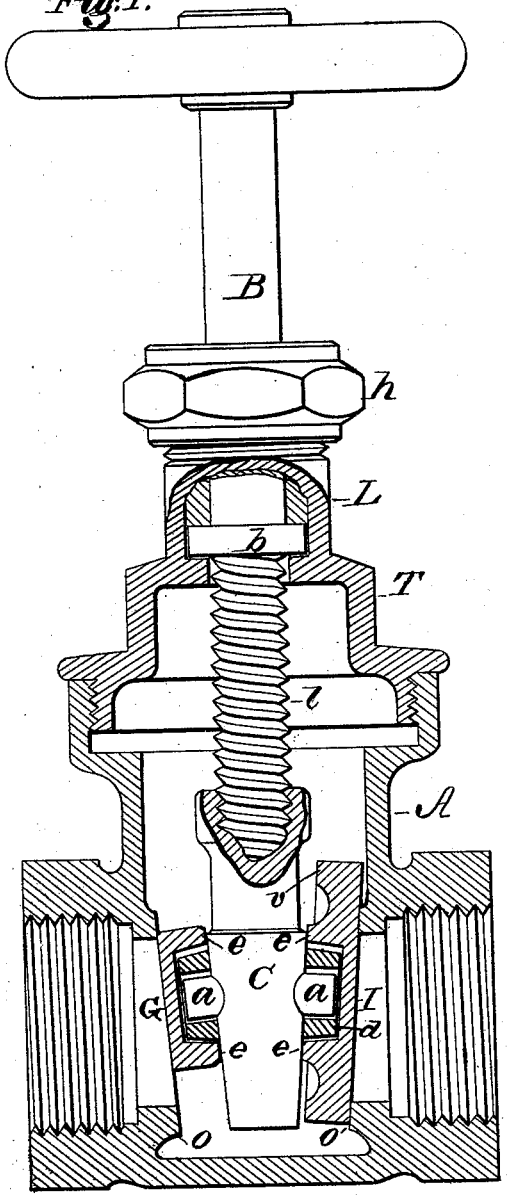


Fig. 2.

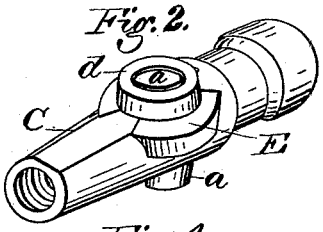


Fig. 3.

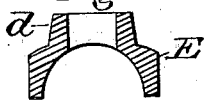


Fig. 4.

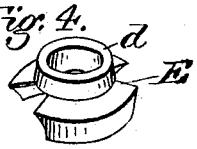


Fig. 5.

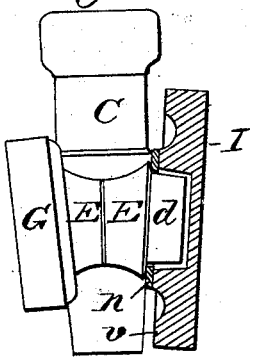
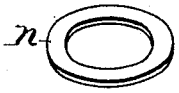


Fig. 6.



Witnesses:

Hill & Dodge

Donn Twitchell

Inventor:

G. W. Eddy,

by Dodge & Son

Attys

UNITED STATES PATENT OFFICE.

GEORGE W. EDDY, OF WATERFORD, NEW YORK, ASSIGNOR TO LYMAN K. EDDY, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN STOP-VALVES.

Specification forming part of Letters Patent No. **165,988**, dated July 27, 1875; application filed July 3, 1875.

To all whom it may concern:

Be it known that I, GEORGE W. EDDY, of Waterford, in the county of Saratoga and State of New York, have invented certain Improvements in Stop-Valves, of which the following is a specification:

My invention relates to stop-valves; and the invention consists of a bar to be used in place of one of the valve-plates, and in the novel construction of the parts used to support and operate the bar and valve-plate. It also further consists in a means of compensating for the wear of the parts, all as hereinafter more fully set forth.

Figure 1 is a side elevation of the valve complete, shown mostly in section. Figs. 2, 3, 4, 5, and 6 are views of portions shown detached, to more fully illustrate their construction.

In constructing my improved valve I make the shell or body A in the usual manner, with a straight through-passage, having two valve-seats, *o*, arranged inside, opposite to each other and slightly inclined, as shown in Fig. 1. The shell A is provided with a cap or plug, T, having a stuffing-box, L, at its outer end, upon which is secured a cap, *h*. The valve-stem B is provided with a collar, *b*, which works in the stuffing-box, and prevents the valve-stem from moving endwise, it simply rotating in its seat. The lower portion of the stem B is provided with a screw-thread, *l*, for operating the valve-plates, as shown in Fig. 1. I then construct a tubular nut or sleeve, C, to fit on the valve-stem, as shown in Figs. 1 and 2, this sleeve being made either straight or slightly tapered, as preferred, and having two studs, *a*, projecting from it at opposite sides, as shown clearly in Fig. 1. I then construct two collars, E, of the form shown in Figs. 3 and 4, they being made concave on their under sides, so as to fit upon the sleeve C, and having a tubular projection, *d*, to fit over the studs *a* of the sleeve C, as shown in Figs. 1 and 2.

In order to reduce the expense of making duplicate valve-plates, which, especially in large-sized valves, is considerable, on account of the cost of the bronze used and the labor of finishing them, I make my valve with but a single plate, I, and on the opposite side use a bar or oblong plate, G, as shown in the left-hand side of Fig. 5; this bar or plate, which may be made wholly of iron, being of such a size as to reach across the opening and bear at each side on the seat, its function being simply to furnish a means for forcing the valve-plate at the opposite side up against its seat, this bar G being of course fitted on the collar E the same as the valve-plate I is. While, therefore, the construction of the valve is such that two valve-plates may be used, if desired, yet by substituting this bar G one valve-plate may be dispensed with, the remaining plate I serving to close the passage tight. The cost of this bar G is a mere trifle, and by its use material and labor are saved.

The valve-plate I is circular in form, and it, with the bar or plate G, is cast with a central circular recess on their inner faces, somewhat larger in diameter than the projections *d* of the collars E, which are intended to fit in these central recesses, as shown in Figs. 1 and 5, the studs *a* being also made to fit loosely in the tubular projections *d*, the object being to allow of some lost motion between these two plates and the sleeve C, for a purpose hereinafter stated. The plate I is also provided on its inner face with an annular rib, *e*, for the purpose of stiffening it, and which, when the valve is closed tight, bears upon the collar E, thus preventing the plate I from springing, even when made comparatively thin and light, there being also a similar rib, *v*, near its outer edge, which also assists to make it more rigid and keep it true.

It will be observed that neither the studs *a* nor the projections *d* have any bearing on the bottom of the central recess in the plates I and G, and that, consequently, there is no tendency to press out the central portion of the valve-plate, as there otherwise would be when it is pressed tight against its seat. This peculiar construction of the plate I, with these annular ribs *e* and *v*, not only renders it very rigid, but the disposition of the metal is such that, if by any means the plate should be sprung, it will tend to resume its normal or original shape as soon as released from pressure, thus tending to preserve its outer faces

true and straight, which is an absolute necessity in this style of valves, in order to keep them tight and make them work properly. Furthermore, when the valve is partially opened the rib *v* bears against the lower end of the sleeve, so that it is firmly supported and held from tipping further.

The projections *d* of the collars E, together with the recesses in which they fit in the plates I, are made slightly conical, and the ribs *e*, together with that portion or shoulder of the collars E with which the ribs come in contact, are beveled slightly, so as to permit the valve-plate I to tip sufficiently to adjust itself to its seat. The collars E, being fitted loosely on the studs *a*, are also free to turn laterally on the sleeve C, thereby assisting the valve-plate to seat itself properly.

To compensate for the wear of the parts I provide one or more thin washers, *n*, as shown detached in Fig. 6, so that, when the parts become so worn that the valve will not close tight, it is only necessary to insert one of these washers between the plate I and the collar E, as shown in Fig. 5, by which means the valve will be rendered as tight as when new.

In constructing a valve on this plan the sleeve C, the collars E, and the plates I and G may all be cast so as to require but very little finishing, the face of the plates alone requiring to be made smooth and true, the loose fitting of the collars on the studs, and of the projections in the recesses, enabling them to be cast sufficiently smooth to answer without further finish. By these means the production of the valve is very much cheapened.

It is obvious that the collars E may be cast solid on the sleeve C, if preferred, and also that, instead of having the sleeve move longitudinally on the stem, the latter may be made to screw out and in, the sleeve being secured upon its lower end in such a manner as to permit the stem to turn freely therein, while both move longitudinally together.

It will be seen that when thus constructed the plates I and G, when the valve is closed, will first drop to their position as the stem is turned, after which, by a further movement of the stem, the collars E will be pressed down between the plates, thereby crowding them outward against their seats without causing them to slide at all thereon, and that when opened the reverse occurs, the plates being first loosened and then withdrawn. This is a very important feature, as it prevents the scratching or wearing of the face of the plates and their seats, which is a serious objection to all valves in which the plates slide on their seats, as they are tightened up or released.

By constructing the valve-plate with the annular ribs *e*, and making the bearing near the periphery of the plates, instead of at their center, as is usually done, there is much less liability of springing the plates by excessive or undue pressure, and thus much larger valves can be made on this plan than where the pressure is at the center of the plates, and plates of the same area can also be made lighter or thinner, thereby saving in the amount of metal required, while this method of construction is equally applicable to the smaller sizes.

By these several improvements I am enabled to make this style of valves, of all the various sizes required, with the minimum amount of expensive metal and much less labor in finishing the parts, and at the same time produce a valve that is more durable than those generally used.

Having thus described my invention, what I claim is—

1. The combination, in a stop-valve, of a valve-plate, fitted to cover the opening on one side, with a bar or plate, G, which, while it does not close the opening, will bear against the sides or face thereof, and thus afford a means of crowding the valve-plate to its seat, substantially as shown and described.

2. The stem B, in combination with the sleeve C, provided with the studs *a*, and the collars E, all constructed to operate as set forth, as a means of operating the plates I and G.

3. The washer *n*, in combination with the valve-plate I and its sleeve or support, to compensate for wear of the parts, as set forth.

GEORGE W. EDDY.

Witnesses:

JOS. T. K. PLANT,

WM. G. NOLEN, Sr.