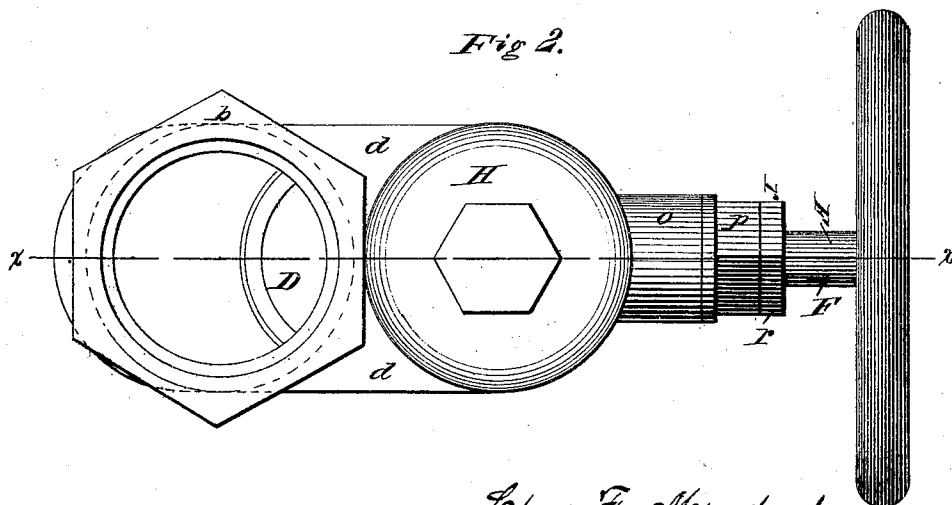
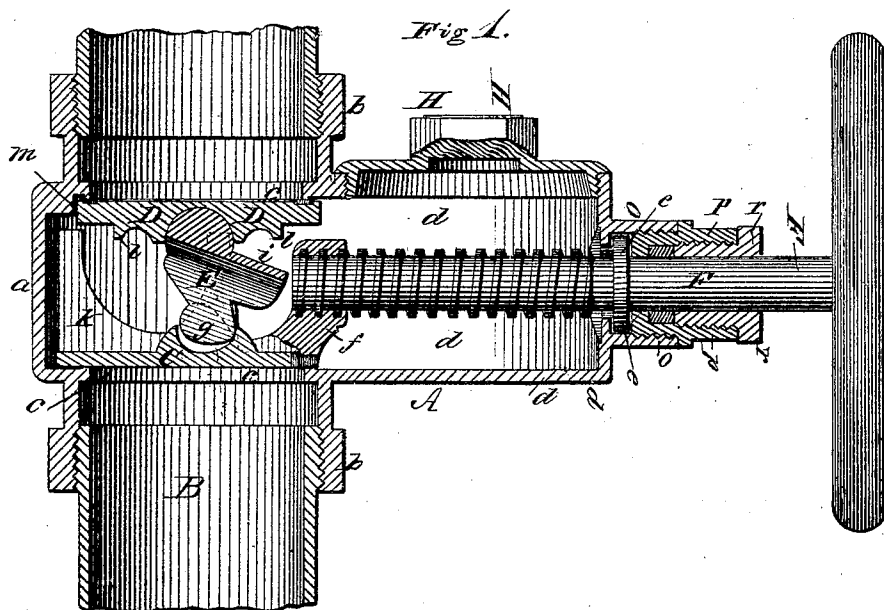


C. F. MURDOCK.
Stop-Valves.

No. 149,330.

Patented April 7, 1874.



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Fig 3.

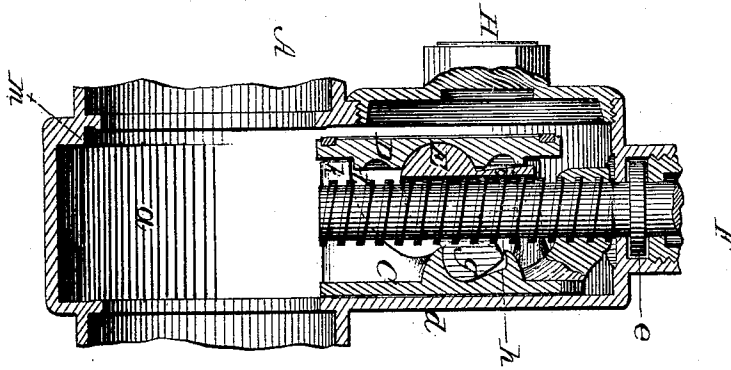
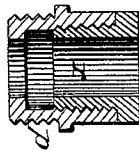


Fig 4.



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Fig 5.

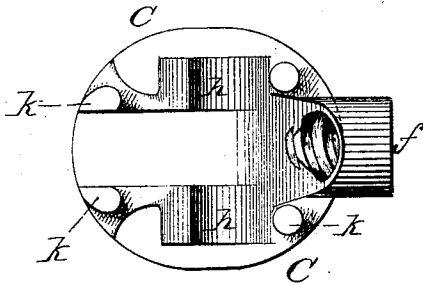


Fig 6.

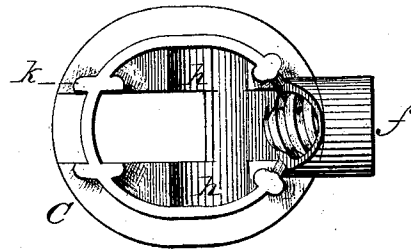


Fig 7.

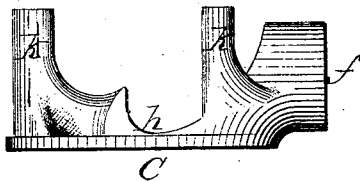


Fig 8.

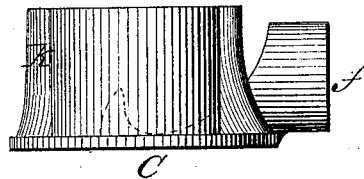


Fig 9.

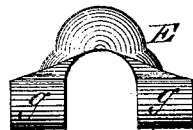
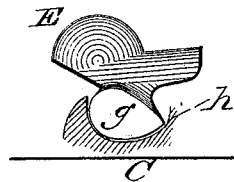


Fig 10.



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UNITED STATES PATENT OFFICE.

CHARLES F. MURDOCK, OF DETROIT, MICHIGAN.

IMPROVEMENT IN STOP-VALVES.

Specification forming part of Letters Patent No. **149,330**, dated April 7, 1874; application filed March 17, 1874.

To all whom it may concern:

Be it known that I, CHARLES F. MURDOCK, of Detroit, in the county of Wayne and State of Michigan, have invented certain Improvements in Stop-Valves, of which the following is a specification:

My invention relates to that class of stop-valves in which the valve plate or plates slide edgewise to and from the seat in a direction at right angles to the axis of the pipe. The invention consists in constructing the case or body with an opening in its side instead of its end, as usual, through which to introduce the valve-plates, whereby the valve is rendered lighter and cheaper and its interior rendered accessible while it is in use. The invention further consists in a peculiar form and arrangement of the brace, by which the valve-plates are forced up to their seats, and in a peculiar manner of constructing said plates, as hereinafter fully explained.

Figure 1 is a longitudinal central section of my valve closed; Fig. 2, an end elevation of the same; Fig. 3, a longitudinal central section of the same open; Fig. 4, a view of the neck and stuffing-box surrounding the valve-stem; Figs. 5 and 6, back face views of two forms of one of the valve-plates; Figs. 6 and 8, edge views of the same; Figs. 9 and 10, respectively, an end and a side view of the brace by which the valve-plates are forced apart against their seats.

A represents the body or case of the valve, made of the same general form as those now in common use, and consisting of a main or central portion, *a*, having two necks, *b*, to receive the ends of the connecting-pipe, two internal annular seats, *c*, for the valve-plates to bear upon, and a lateral extension, *d*, into which the valve-plates pass as they slide from their seats. B and C are the valve-plates, which are caused to slide in the body and to bear upon the respective seats *c*, in the manner and by the means hereinafter described. As these valve-plates are of greater diameter than the throats or openings of the valve, it is obvious that special provision must be made to admit of their introduction into the case or body. This is the case, not only with my valve, but with all valves of this class in which the sliding

plates are employed. This end of admitting the plates has heretofore been accomplished by making the outer end of the lateral portion or extension *d*, through which the valve-stem passes, removable, said end being made of an enlarged circular form and closed by a screw cap or cover. This enlargement of the end, in order to permit the application of the circular cover, rendered the valves much heavier than would otherwise be necessary, and also added to the labor and cost of finishing them up in the course of manufacture. The interior of the valve could not be examined while there was a head of steam or water against it.

The object of my invention is to dispense with the enlarged circular end on the extension of the body, and thereby to render the valve lighter, cheaper, and more pleasing in appearance, and also to permit access to the interior of the valve while it is in use. These results I accomplish by making the opening, through which the valve-plates are introduced, in the side instead of the end of the portion *d* of the case or body, as shown in Figs. 1, 2, and 3. The outer end of the portion *d* is left solid and unbroken, except where the valve-stem passes through, and is made of such size and shape that it just permits the valve-plates to slide up into it clear of their seats, the object being to dispense with as much metal as possible and render this portion of the body light and of a pleasing and symmetrical form. The opening through which to insert the plates is made in the side and closed by a cap or cover, H, screwing therein, as shown in Figs. 1, 2, and 3. The opening may be made in either side of the portion *d*, as desired. It is preferably made of a circular form and closed by the screw-cap or cover H, as shown, but it may be made of any other form which will admit the plates; and of whatever form made, it may be closed by a cover bolted, keyed, or otherwise secured in place. While it is preferred, for various reasons, to make the portion *d* of the form represented, it may be made of any other form desired, provided the opening for the admission of the plates is in one of the four sides or faces. When the opening is made in the wide face or side of the portion *d* of a circular form, as shown, the plates may

be inserted flatwise therein, but a narrower opening may be made in one of the narrow sides, and the valve-plates inserted edgewise.

The great feature of importance is inserting the valve-plates through one of the sides of the portion or extension *d*, instead of through its end, as usual. The form of the opening, and the manner of securing the cover, are matters of secondary importance. Another great advantage of the side opening, in addition to those above named, is that, when the valve is closed against a head of steam or water, its whole interior may be exposed to view by removing the cover. It is obvious my method of constructing the body is applicable to all valves of this class, with sliding valve-plates, no matter how they are arranged and operated.

In my present valve the operating parts are the two valve-plates C and D, the brace E between them, and the screw-stem F, by which they are moved. The screw-stem extends out through a stuffing-box in the end of the extension *d* of the case, and is provided with a collar, *e*, to prevent it from moving endwise, and with a hand-wheel by which to turn it, as usual. At its inner end the screw-stem passes through a nut or arm, *f*, formed rigidly on the back of the plate C, at or near its upper or outer edge, as shown in Figs. 1 and 3, so that by turning the screw the plate C may be moved in either direction. The brace E stands in an inclined or oblique position between the two valve-plates, and has its ends supported in seats or bearings on the back of the plates, as shown. That end which bears against the plate D is made of a spherical form and seated in a corresponding cavity in the plate, in order that the latter may tip freely in any direction to bear tightly on its seat or throat in the case or body. The spherical end of the brace also permits the plate D to turn or rotate thereon, so that the wear will be rendered nearly uniform on all portions of its face. The end *g* of the brace which bears against the plate C is made eccentric or cam-shaped, and mounted in an inclined seat or bearing, *h*, formed on the back of the plate, as shown in Figs. 1, 3, and 10, for a purpose hereinafter explained. This end of the brace is forked or split, as shown in Fig. 9, so that when the valve is opened it rides up astride of the screw-stem, as shown in Fig. 3. The brace is provided with a lip, *i*, which, when the valve is open in the least, bears against the side of the screw, as shown in Fig. 3, so as to hold the brace in its inclined position, and prevent it from straightening up and forcing the valve-plates apart. The plate C is provided on its back with four arms or studs, *k*, extending toward the plate D for the purpose of preventing the latter from tipping too far when the valve is open. The two arms at the inner or lower side of the plate C also answer another purpose—that of carrying or sliding the plate D outward as the valve opens. The plate D is provided on its back with an annular flange,

7, as shown in Figs. 1 and 3. When in opening the valve the brace E is tipped so as to allow the plates to fall away from their seats, the flange *l* of plate D drops down behind the two inner arms *k* of plate C, as shown in Fig. 3, so that as the plate C is drawn back by the screw the arms *k* carry the plate D back also. Under ordinary circumstances the valve is arranged, as shown in Figs. 1 and 3, in a horizontal position, with the plate D uppermost. When the valve is open the various parts are in the positions shown in Fig. 3, the valve-plates being drawn up in the extension *d* of the body, and the brace resting astride of the screw-stem, with the lip *i* of the brace bearing against the screw so as to hold the brace in an inclined position and prevent it from straightening up and forcing the plates apart in case any of the parts bind or meet with obstructions. Upon turning the screw-stem in the proper direction it will slide the valve-plate C inward toward its seat. The plate C will carry with it the brace E, which will in turn carry the valve-plate D, the brace being held in position and prevented from tipping by its lip bearing on the screw-stem. The plate D stands a little in advance of the plate C, and is brought to a stop in front of its seat by coming in contact with a shoulder, *m*, in the case or body before the plate C is fairly home, opposite its seat. When the plate D stops, it becomes a fixed bearing or fulcrum for the spherical end of the brace. At the instant this stoppage occurs, the lip *i* passes off from the end of the screw-stem and leaves the brace free to tip or swing, so that as the screw continues to move the plate C inward, the latter straightens the brace up between the two plates, which are thereby forced apart tightly against their seats, as shown in Fig. 1. When the motion of the screw is reversed, it slides the plate C outward and tips the brace so that the plates are permitted to fall away from their seats. The lip of the brace then rides up on the screw, the inner arms *k* of the plate C engage with the flange *l* of the plate D, and the plates and brace all slide outward together. As the brace is straightened up to force the plates apart, its eccentric or cam-shaped head, rocking in the inclined seats, moves the brace endwise and thereby forces the plates apart more rapidly and to a greater extent than would otherwise be the case. Another advantage resulting from the use of the eccentric head on the brace is, that as the head rolls in its inclined seat its point of bearing changes or shifts backward, so that the brace may be tipped a greater distance than could otherwise be done without passing the center. In order to prevent the eccentric head from slipping in its seat, it may be provided with teeth or cogs, working in corresponding cogs in the seat. In constructing the valve the eccentric head on the brace may be used with a flat seat, but not with as good results as the in-

clined seat. When the inclined seat is used, the brace is moved endwise a distance equal to the rise of both the head and the seat, whereas if a flat seat is used it would not, like the inclined one, aid by moving the brace endwise. The brace may be used in connection with a single valve-plate by forming a seat or shoulder in the case or body to support one of its ends.

Having thus described my invention, what I claim is—

1. The valve-body A, having an opening for the admission of the valve-plates made in one side of the extension *d*, and closed by a cover, H, as shown and described.

2. In combination with the valve-plates C and D, the brace E, having the eccentric head *g*, as and for the purpose described.

3. In combination with the brace E having the eccentric head *g*, the valve-plate C having the inclined seat or bearing *h* for said head, as shown.

4. In combination with the screw-stem F and brace E, the valve-plate C provided with the arms *k*, and the valve-plate D provided with the flange or shoulder *l*, as shown.

CHARLES F. MURDOCK.

Witnesses:

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J. McKENNEY.