

(No Model.)

C. H. WATTERS.
VALVE DEVICE.

No. 519,052.

Patented May 1, 1894.

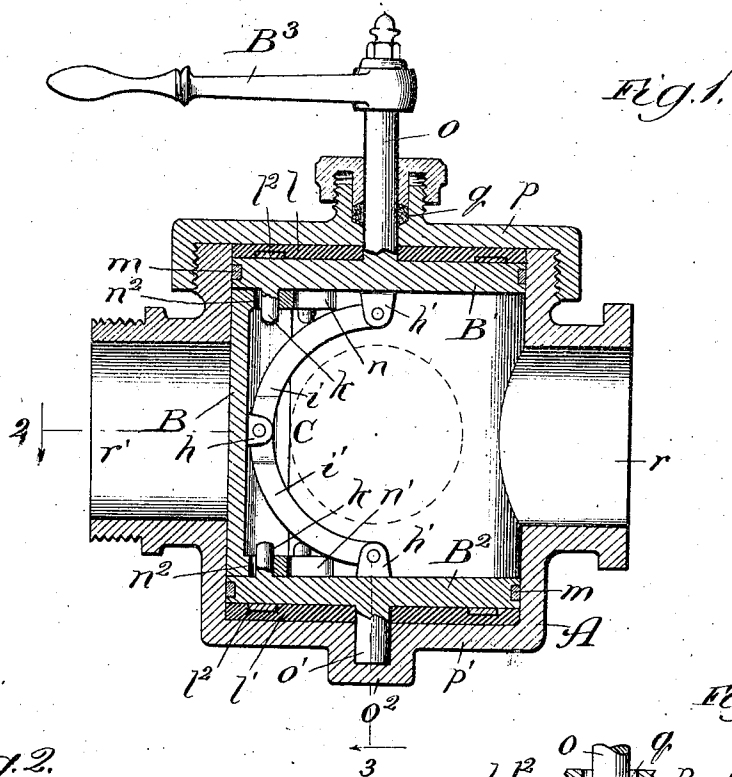


Fig. 1.

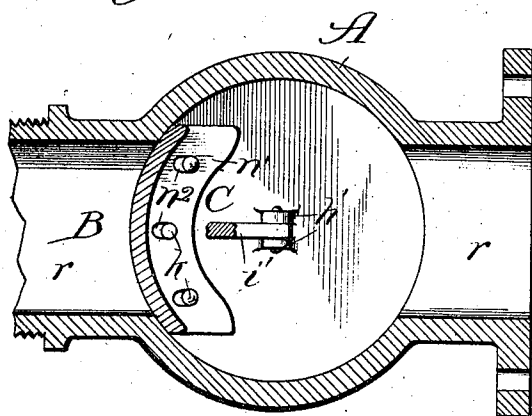


Fig. 2.

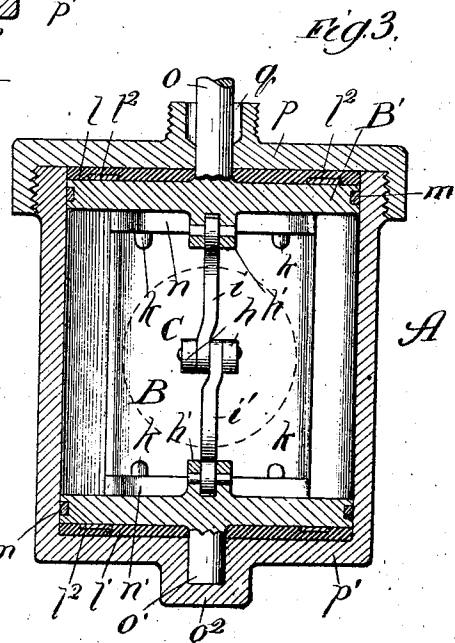


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES H. WATTERS, OF CHICAGO, ILLINOIS.

VALVE DEVICE.

SPECIFICATION forming part of Letters Patent No. 519,052, dated May 1, 1894.

Application filed November 14, 1893. Serial No. 490,924. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. WATTERS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Valve Devices, of which the following is a specification.

The object of my invention is to provide a construction of valve-device whereby the pressure against the valve of the fluid it is designed to control, shall, when the valve is open or shut, (thus in either position of uncovering or covering the passage through its housing) operate to free or loosen it from the wall against which it bears in its housing, and thus facilitate the operation of setting the valve from one position to another with relation to the port controlled by it.

My improvement is particularly applicable to the type of valve-device wherein the valve is rotary and in the form of a concavo-convex plate having heads at its opposite ends and adapted to fit against the concave inner wall of its housing containing the fluid outlet port, with relation to which the valve is turned by a stem at or near the center of the heads. Obviously, with this construction of valve-device, the fluid-pressure against the valve, whether open or shut, tends to force and bind it against the wall of its housing, thus causing such a degree of frictional contact, against the wall, of the valve as to render turning of the latter, to set it with relation to the outlet-port, more or less arduous, according to the pressure of the fluid. To overcome this difficulty I render the valve-heads yielding and connect them, as by a toggle-lever, with the valve in a manner whereby the fluid-pressure on the valve will be so distributed as to exert sufficient thereof against the heads to force them apart and thereby tend to draw toward their center the valve-plate, and thus withdraw it from frictional contact with the housing-wall sufficiently to free it, or reduce the friction, to an extent that will ease the operation of turning the valve.

Referring to the accompanying drawings—Figure 1 is a view in longitudinal vertical sectional elevation of my improved valve-device; and Figs. 2 and 3 are sections of the same

taken, respectively, at the lines 2 and 3 on Fig. 1 and viewed as indicated by arrows.

A is the shell, or valve-housing, shown as of cylindrical form, with the inlet and outlet ports r and r' at its opposite sides and covered at its ends by caps p and p' , at the center of the removable one of which is a stuffing-box q for the valve-stem o .

B is the valve proper, shown as a concavo-convex plate, or section of a cylinder, adapted to fit inside the shell A and conforming, on its exterior surface, to the inner surface of the wall of the housing, against which it fits; and at opposite ends of the valve-plate are bearing-heads n and n' provided with guide-openings n^2 , or recesses, in any desired number, and which should be elongated or at least somewhat larger than the studs which engage them, as and for a purpose herein-after described.

B' and B^2 are heads, preferably of the disk-shape illustrated, from which, respectively, by preference at their centers, extend outwardly the stem o through the stuffing-box, and a bearing o' into a seat o^2 in the end p' ; and the peripheries of the disk-heads may be recessed to hold packing m . Between the heads B' , B^2 and the respectively adjacent ends p , p' , I provide springs, the most desirable form for which is that of soft-rubber plates or disks l and l' , which fill the intervening space, thus serving as packing besides performing their desirable spring-function, and between which and the heads are anti-friction metal plates, or rings l^2 . The heads B' and B^2 have studs k projecting from their inner sides near their edges to coincide and engage with the openings n^2 in the bearing heads n and n' .

The valve-plate, or valve proper B has a flexible connection with the heads B' and B^2 , whereby forcing the latter apart will tend to pull the valve away from the wall of the housing A against which it bears; and the area of the inner surfaces of the heads should together equal that of the inner face of the valve-plate. The particular connection shown in the drawings, and which I believe to be best adapted for the purpose, is formed with the lever device, or toggle-lever, C, having both its members i and i' pivotally attached,

at one end, to a bearing h at or near the center of the inner concave surface of the valve-plate, the lever-members being pivotally attached, at their opposite ends, to bearings h' on the inner sides of the heads B' and B^2 , preferably at their centers. The shape of the lever C is such as to form a portion of a circle, as a half-circle, whereby it extends about the portion of the plane of the openings r and r' and thus avoids obstructing the passage through the housing A .

From the foregoing description the operation will be understood to be as follows: The pressure, which enters at the port r , is exerted against the valve-proper B and tends to bind the latter, in any position, against the wall of the housing A ; but this is counteracted by the outward exertion of the pressure against the yielding heads B' and B^2 , which yield under it, against the springs l, l' , and by their outward movement tend to straighten, as it were, the levers C or pull toward their centers the ends of the members i, i' , attached to the valve-proper B , whereby the latter is caused to follow in the same direction and is thus withdrawn from frictional contact, or at least undue frictional contact, with the housing-wall. Then the valve may, without shutting off or reducing the pressure, be easily turned to open or close it, as by a handle B^3 .

I have shown and described what I believe to be the best construction of valve for the embodiment of the principle involved in my improvement, namely, of causing the pressure against the valve to free it for ready operation instead, as hitherto, of requiring reduction in or shutting off of the pressure to enable the valve to be moved. I do not, however, limit my invention to such particular embodiment, but desire to be understood as including within it any construction for carrying out the same principle. Thus, for example, when the valve B is not too long, one of the yielding heads B', B^2 may be omitted and the adjacent end of the toggle-lever fastened accordingly, as by swiveling, to permit turning of the valve. Then the surface-area of the single head employed should equal that of the valve B .

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

1. In a valve-device, the combination of a valve-plate and a head yieldingly seated on an end of the valve-plate and having a flexi-

ble connection therewith at a point between its ends, substantially as and for the purpose set forth.

2. In a valve-device, the combination of a valve-plate and heads yieldingly seated on the ends of the valve-plate and having a flexible connection therewith at a point between its ends, substantially as and for the purpose set forth.

3. In a valve-device, the combination of a valve-plate and heads yieldingly seated on the ends of the valve-plate and having a lever-connection C therewith at a point between its ends, said connection comprising the pivotal members i and i' , substantially as and for the purpose set forth.

4. In a valve-device, the combination of a valve-plate and heads yieldingly seated upon its ends and having a lever-connection therewith at a point between its ends, said connection comprising the pivotal members i and i' forming a portion of a circle, substantially as and for the purpose set forth.

5. In a valve-device, the combination with the shell having an inlet and an outlet, of a valve-plate for the said outlet having bearing-heads at its opposite ends provided with guides, heads at opposite ends of the valve-plate, having studs engaging said guides, a valve-stem by which to turn the said heads, and a lever-connection formed with members pivotally connected at one end with the valve-plate and at their opposite ends with said heads, substantially as and for the purpose set forth.

6. In a valve-device, the combination with the cylindrical shell having an inlet and an outlet, of a concavo-convex valve-plate for the outlet, having at its opposite ends bearing-heads n and n' provided with guides n^2 , heads B' and B^2 yieldingly seated on said bearing-heads and provided with studs k engaging said guides, springs l and l' confined against the heads in the shell, a stem for the said heads extending beyond the shell, and a lever-device C formed of the curved members i and i' pivotally connected at one end with the valve-plate near its center and at their opposite ends with the said heads near their centers, substantially as and for the purpose set forth.

CHARLES H. WATTERS.

In presence of—

M. J. FROST,

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