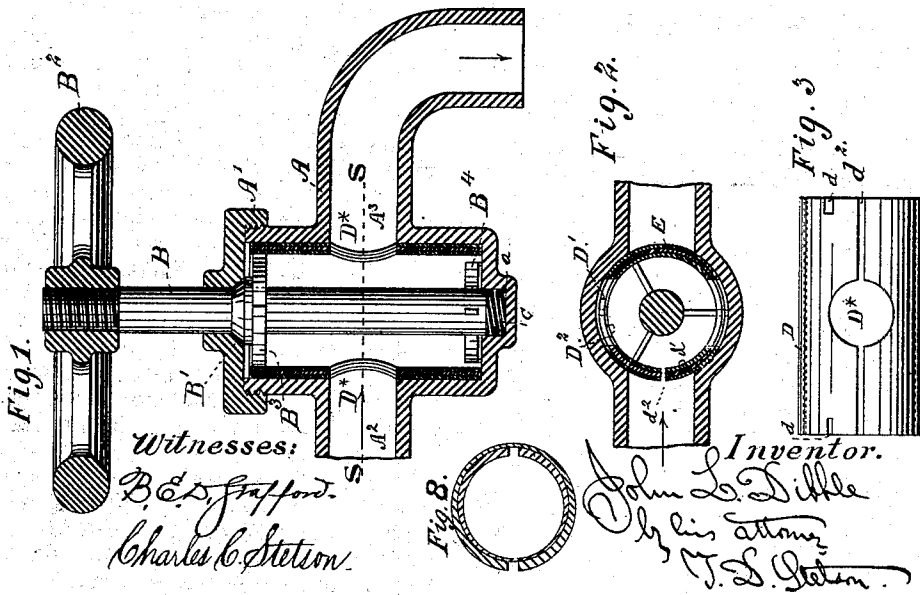
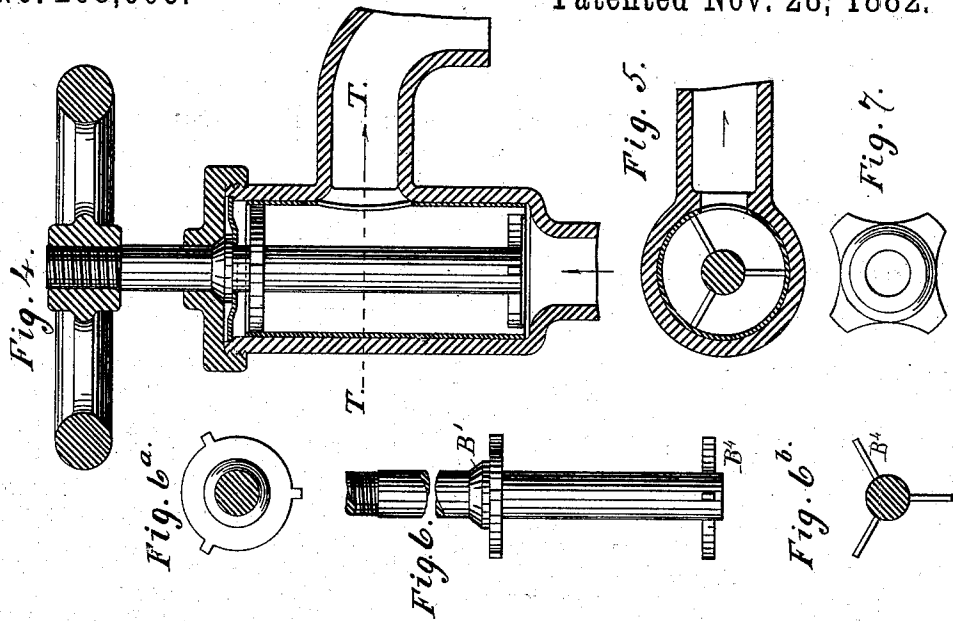


(No Model.)

J. L. DIBBLE.
STOP COCK.

No. 268,006.

Patented Nov. 28, 1882.



UNITED STATES PATENT OFFICE.

JOHN L. DIBBLE, OF BROOKLYN, NEW YORK.

STOP-COCK.

SPECIFICATION forming part of Letters Patent No. 268,006, dated November 28, 1882.

Application filed February 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. DIBBLE, of Brooklyn, Kings county, in the State of New York, have invented certain new and useful Improvements in Stop-Cocks, of which the following is a specification.

For the solid plug usually employed I substitute a thin shell of metal, so conditioned that it will be held outward in tight contact with its seat or inclosing-case both by its own elasticity and by the pressure of the fluid which it is to control. The plug, instead of tapering, as usual, may be cylindrical. Leakage at the neck by which it is turned is prevented by a conical surface at that point, held in tight contact by a gentle spring. The outer and wearing surface of the metal shell is faced with leather or analogous material to aid in the perfection of the contact.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a central longitudinal section. Fig. 2 is a horizontal section through the central portion on the line S S in Fig. 1. Fig. 3 represents the sheet metal detached. Fig. 4 is a central section through a modification. Fig. 5 is a horizontal section on the line T T in Fig. 4. Fig. 6 shows the spindle or central part, detached, in side elevation. Fig. 6^a is a view of the top of the same. Fig. 6^b is a view of the bottom of the same. Fig. 7 is a top view of the peculiar spring employed.

Similar letters of reference indicate corresponding parts in all the figures.

Referring to Figs. 1, 2, 3, A is the case or body of the cock, of cast-brass or other suitable material, having the plug-chamber cylindrical or without taper. In the center of the bottom is a cylindrical recess, *a*, of smaller diameter. The upper portion is screw-threaded on the exterior to receive a screw-cap, A', which is counterbored from below to make a tight fit on the conical portion B' of the shaft B, which is mounted in the line of the axis, stepped at the bottom in the recess *a*, and pressed upward by a coiled spring, C, contained therein. The upper end of the shaft B has a handle, B². Within the casing A the shaft is provided with rigidly-connected arms

B³ B⁴. The set B³ is near the top of the case. The set B⁴ is near the bottom of the case. Each set of arms B³ B⁴ engage in recesses *d* in the sheet-metal shell D of the plug, and constitute the means by which such exterior is turned around as required. I will use the letter D to indicate the entire elastic shell of the plug, using additional marks, D' D², &c., when necessary, to indicate specific portions thereof. The interior of the casing A is finished smoothly and truly cylindrical. The sheet-metal exterior of the plug is in two thicknesses, D' D². Each is formed by bending a piece of sheet metal, specially prepared for the purpose, so that it is considerably thicker at the middle of its width than near each edge. Each has a tendency to spring outward a little, so as to form a portion of a larger cylinder than the interior of the cock into which it is forced. The parts D' D² are applied together with the thick part of one adjacent to the thin part of the other, and consequently with their open joints out of line with each other. A peg or projection, *d'*, on the outermost, D', engages in a corresponding recess in the innermost, D², and insures the maintenance of the correct position. The engagement of the arms B³ B⁴ in the recesses *d* also extends through both thicknesses D' and D² and contributes to the same end.

Liberal openings D* D* are formed in opposite sides of the plug. When by the turning of the cock these orifices D* are brought to coincide with the water-way A² A³ through the casing A the cock is open and the water flows freely across. It is important that the shaft B is of sufficiently small diameter or so shaped as to allow a liberal water-way. When the cock is turned in the position shown in Fig. 1 the passage is open and the water flows freely. When it is turned in the position shown in Fig. 2 it is closed. There is a tendency of the sheet metal D to fit tightly against the interior of the case, not only on the side of the case at which the water is discharged, where it is useful to have such tight contact, but also on the opposite side, where the water is received. I prefer that the joint on the receiving side be not tight. I insure the maintenance of a good pressure within the plug by providing a small aperture, *d*², through which the water can flow freely.

In what I esteem the most complete devel-

opment of the invention the exterior of the outer sheet metal, D' , is surfaced with leather, rubber, or other suitable material, E , this secured by picking or sharply marking the exterior of the metal D , analogous to file-cutting, and pressing the previously-soaked leather or rubber composition firmly upon the surface thus prepared, so as to imprint the metal sharply in the soft coating, and also applying small rivets. When plugs thus surfaced are employed the edges of the apertures for the water-way should be chamfered a little to avoid cutting the soft surface.

Figs. 4 to 7, inclusive, show a modified form in which the water is received axially to the plug. This form is adapted for the faucets of stationary wash-basins and analogous uses. I esteem it practicable to provide a stout cross-bar, in which is a recess corresponding to the recess a in Fig. 1, and a spring corresponding in form to the spring C in said figure; but I prefer, in applying my invention to this class of faucets, the form and arrangement of spring shown in section in Fig. 4 and in plan view in Fig. 7. The arms B^4 for this form of cock should be arranged, as shown in Figs. 6 and 6^b, to allow a flow of the water in the axial line. The same construction of this portion may be adopted in all forms of the cock. The upper arms, B^3 , are short spurs on the periphery of a plate. The lower arms, B^4 , are longer, and extend from the central shaft, B .

Other modifications may be made by any good mechanic. Leather may be employed as the soft surface E when the cock is to be used for oils which are destructive to rubber. This material may be used for most fluids; but a rubber surface will endure acids which leather will not. I prefer for miscellaneous uses a coating of rubber.

Parts of the invention may be used without the whole. Instead of the compound construction shown by the two thicknesses D' D^2 , I can realize a good portion of the advantages of the invention by using a single thickness. I esteem it important that the metal be graduated in thickness from near the edge to near the middle of its width, about as shown, in order that the elastic tendency of the same to expand may induce about a uniform degree of pressure against all portions of the interior; but the device may be used with success without the tapering thickness.

The elastic shell D may be made in more than two thicknesses or layers. The projection d' may be omitted, and the engagement of the arms B^3 B^4 may be relied on alone to keep the separate layers of sheet metal in their proper relation.

For straight-way cocks I prefer the spring C under the spindle, as in Fig. 1. A spiral metal spring is not essential; rubber may serve.

The parts are subjected to but little wear, and the whole is self-compensating. It is not necessary to screw down hard, and it is always in condition to turn easily and shut tightly.

The proportions and the rigidity and the force with which the shell should spring outward to insure a sufficiently firm contact with the interior of the case to induce absolute tightness under all conditions as to pressure may vary with the size of the cock, and to some extent with the nature of the fluid for which the cock is especially designed. Cocks for fluids which insinuate themselves or "creep" with great force under gentle pressures require a stronger outward pressure, due to the elastic force of the shell. I do not confine the invention to sheet metal. For large cocks I propose to cast the shell, taking care to cast it first as a continuous shell or complete hollow cylinder and to turn the exterior truly a little larger than the intended size. One side being sufficiently thinner than the opposite to give the proper uniformity of outward pressure, the casting is afterward cut upon on the thin side, and is then ready to be compressed together and inserted.

I believe it practicable to employ other material than metal. Hard rubber may serve well. But for all general purposes and ordinary sizes I prefer sheet metal, with the thickness tapered either in the process of manufacture or by some subsequent treatment.

I claim as my invention—

1. In a stop-cock, the elastic plug-shell D , formed of a single piece of metal, in combination with a turning shaft, B , and connections thereto, which allow the shell to be expanded by the pressure of the fluid, and with the casing A , having the water-way A^2 A^3 , as herein specified.

2. In a stop-cock, the elastic plug-shell D , in combination with a soft exterior facing, E , and with the shaft B , arms B^3 B^4 , and inclosing-case A , as herein specified.

3. In a stop-cock, the compound elastic shell D , composed of two thicknesses of sheet metal, D' D^2 , arranged, as shown, so that the joint of one shall come opposite a continuous portion of the other, as herein specified.

4. The casing A , shaft B , elastic shell D , arms B^3 B^4 thereto, conical surface B' , and spring C , arranged to serve relatively to each other and to the casing A of a stop-cock, as herein specified.

5. The elastic shell D , compounded of two layers of tapering thickness, arranged as shown, and provided with the engaging projection d' and the aperture d^2 , in combination with the operating-shaft B , with its arms B^3 B^4 , conical surface B' , spring C , and inclosing-case A , arranged for joint operation, as herein specified.

In testimony whereof I have hereunto set my hand, at Brooklyn, New York, this 11th day of February, 1882, in the presence of two subscribing witnesses.

JNO. L. DIBBLE.

Witnesses:

FRANK W. STONE,
CHARLES D. STONE.