

(No Model.)

E. E. & L. C. BEAUVALET.

STOP COCK.

No. 397,332.

Patented Feb. 5, 1889.

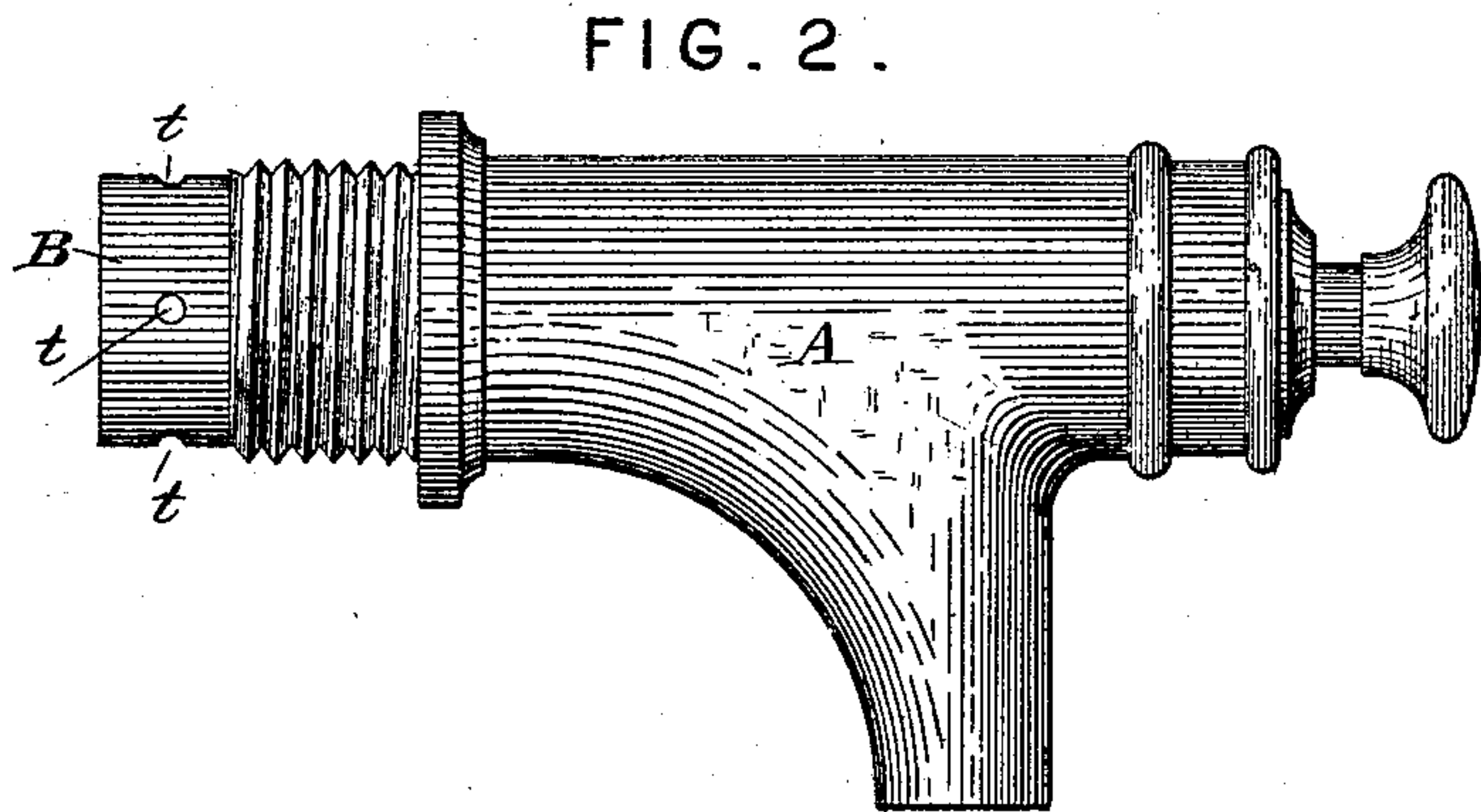
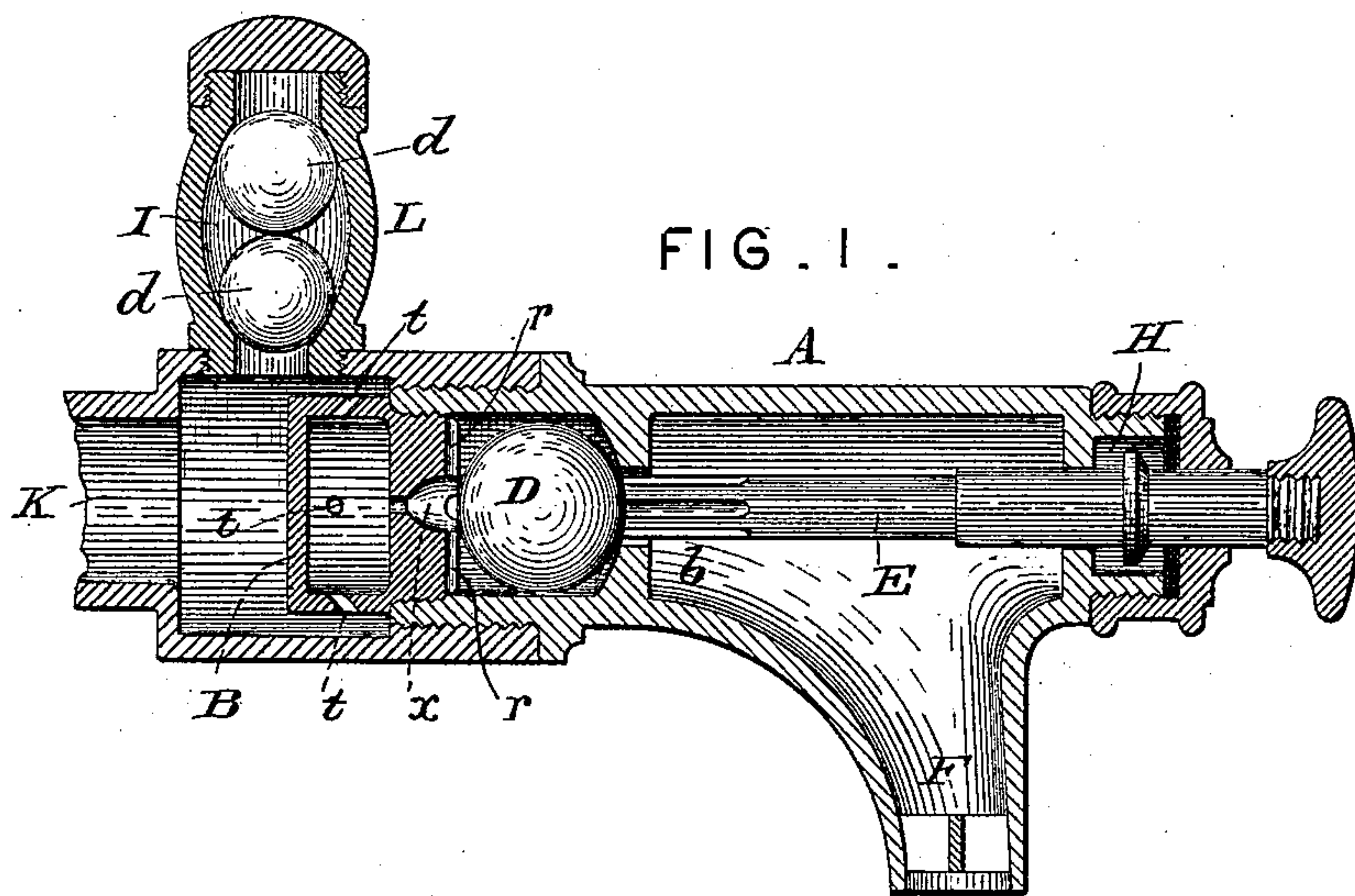
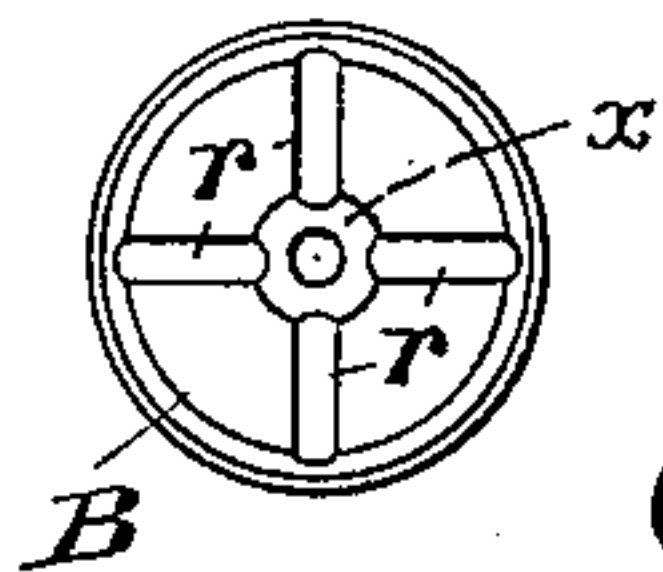


FIG. 3.



Attest:
Geo. T. Smallwood,
Philip Hanna

Inventor
Ernest C. Beauvalet &
Léon C. Beauvalet by
their attorney
A. Volck

UNITED STATES PATENT OFFICE.

ERNEST EUGENE BEAUVALET AND LÉON CHARLES BEAUVALET, OF PARIS,
FRANCE.

STOP-COCK.

SPECIFICATION forming part of Letters Patent No. 397,332, dated February 5, 1889.

Application filed September 21, 1888. Serial No. 286,054. (No model.) Patented in France May 24, 1887, No. 183,759; in Belgium December 9, 1887, No. 79,858; in Spain December 12, 1887, No. 12,376; in England December 15, 1887, No. 17,276, and in Italy December 23, 1887, No. 22,747.

To all whom it may concern:

Be it known that we, ERNEST EUGENE BEAUVALET and LÉON CHARLES BEAUVALET, of Paris, in the Republic of France, have invented a new and useful Improvement in Stop-Cocks or Valves for Liquids Under Pressure, (for which we have obtained Letters Patent in France, No. 183,759, May 24, 1887; Belgium, No. 79,858, December 9, 1887; Spain, No. 12,376, December 12, 1887; Great Britain, No. 17,276, December 15, 1887, and Italy, No. 22,747, December 23, 1887;) which is fully set forth in the following specification.

This invention relates to a new or improved system of valves or stop-cocks which is applicable to use with liquids under strong or weak pressure. In this system, which is very simple, the liquid under pressure acts upon a rubber (caoutchouc) ball which forms the valve proper and closes the outlet-orifice. By means of a pusher this ball is removed from its seat to allow the liquid to run out.

In the accompanying drawings, Figure 1 is a longitudinal section of one of the improved stop-cocks, together with a portion of the supply-pipe to which it is screwed, and a means (likewise of our invention) for neutralizing the ram action; Fig. 2, a side view of the stop-cock detached; and Fig. 3 an end elevation of a plug which forms part of the said stop-cock.

The body A of the stop-cock has a threaded end which is screwed into the supply-pipe K, and is provided in that end with a ball-chamber, C, which is closed by the plug B, pierced with holes for the passage of the liquid into the said ball-chamber C. This latter communicates with the outlet-pipe F through the outlet-orifice b, which is closed by the rubber ball D, fitting against its seat at the said orifice. The pusher E slides in the said orifice b with plenty of play, and can be channeled, as shown in Fig. 1. It is guided at its other end by a shouldered portion which passes through a stuffing-box or tightly-closed chamber, H, in the head of the stop-cock.

The water or other liquid under pressure acting on the ball D forces it against its seat over the orifice b, and thus prevents all over-

flow. If it is wished to draw water, it suffices to press on the head of the pusher E, the ball D being forced from its seat and permitting the liquid to run out through the orifice b and outlet-pipe F. On releasing the pusher the pressure acts on the ball D, closes anew the orifice b, and keeps it closed hermetically, thus avoiding the leakage which takes place with the other existing systems. In order to insure the more certain closing and retention of the ball, the inlet a and the outlet b are placed in the walls of said chamber at points on diametrically-opposite sides of the ball.

The plug B, screwed into the body A of the stop-cock and confining the ball D in the chamber C, has an interior chamber, C', which the liquid enters through the holes t, pierced in the walls thereof and inclined backward—that is, in a direction opposite to the flow of the arriving liquid. A central hole, x, puts it in communication with the ball-chamber C. By this construction the pressure is hardly noticeable while the liquid is running.

In order that the ball D may not close hole a when it is forced back by the pusher E, grooves r are formed in the face of the plug, which grooves furnish passages for the liquid around the ball. With this arrangement the ball-chamber C can be shortened to such an extent that the plug B touches the ball D, or, in other words, so that the length of the chamber equals the diameter of the ball. The pusher E then compresses the ball D to give passage to the liquid through the outlet-orifice b. A small spring (say a spiral compression spring) in the chamber H may be used to aid in returning the pusher E.

To neutralize the ramming action, which takes place when a stop-cock is suddenly closed, thereby checking suddenly the flow of liquid, and which, unless neutralized, might affect ball D, the piece L is arranged on the supply-pipe K, said piece having a chamber, l, communicating with the supply-pipe K, closed by a screw-cap at its outer end and containing two rubber balls, d. The relief-chamber l is provided with a ball-seat or retaining-wall, both at top and bottom—that is to say, on opposite sides of both balls which are retained

between the said seats or retaining-walls, as shown.

The opening for the supply-pipe K into the chamber *l* being larger than the holes *t*, and the pressure being also largely diminished by the particular interior arrangement of the plug B, the blows of the ram exert themselves principally on the balls *d*, which yield to and neutralize the shocks. If these shocks were allowed to exert their influence on the ball D, they would tend to compress the ball, and the latter's resilience on the cessation of the blow would be liable to cause it to leave the orifice and permit leakage past it.

The invention extends, generally, to the combination, with a stop-cock having a ball-chamber and an elastic yielding or rubber-ball valve held in place by the pressure of the liquid behind, of a relief-chamber communicating with the liquid-conduit behind the ball-valve, and provided with yielding relief appliances therein, and also to the like combination limited to a ball-chamber having its inlet more contracted than the inlet into the relief-chamber. The invention extends also, generally, to a stop-cock having an elastic yielding ball for the valve held in place by the pressure of the liquid and provided with a hollow plug or closing-piece behind the said ball, with backwardly-inclined inlet-holes.

The characteristic part or parts of the invention can be easily applied to screw-cocks, to bayonet-closures, to water-closet valves, or

generally to all stop-cocks where the liquid is admitted under pressure. In these different applications the arrangement L can be applied to the body of the stop-cock or to the supply-pipe, as in Fig. 1.

The pusher or means for forcing the ball D from its seat can of course be modified, according to circumstances.

We claim as our invention or discovery—

1. In a stop-cock or valve, and in combination with the pusher and the rubber ball, the ball-chamber having on its inlet side a hollow plug or closing-piece, in which are backwardly-inclined inlet-holes, substantially as described.

2. In a stop-cock or valve, and in combination with the rubber ball and pusher, the ball-chamber having the end away from the ball-seat formed by a hollow plug with backwardly-inclined holes in the side walls of the central chamber in said plug, and a central hole from said central chamber into the ball-chamber, the said plug being also provided with grooves extending from said central hole, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

ERNEST EUGENE BEAUVALET.
LÉON CHARLES BEAUVALET.

Witnesses:

G. DUPONT,
V. BIVAUT.