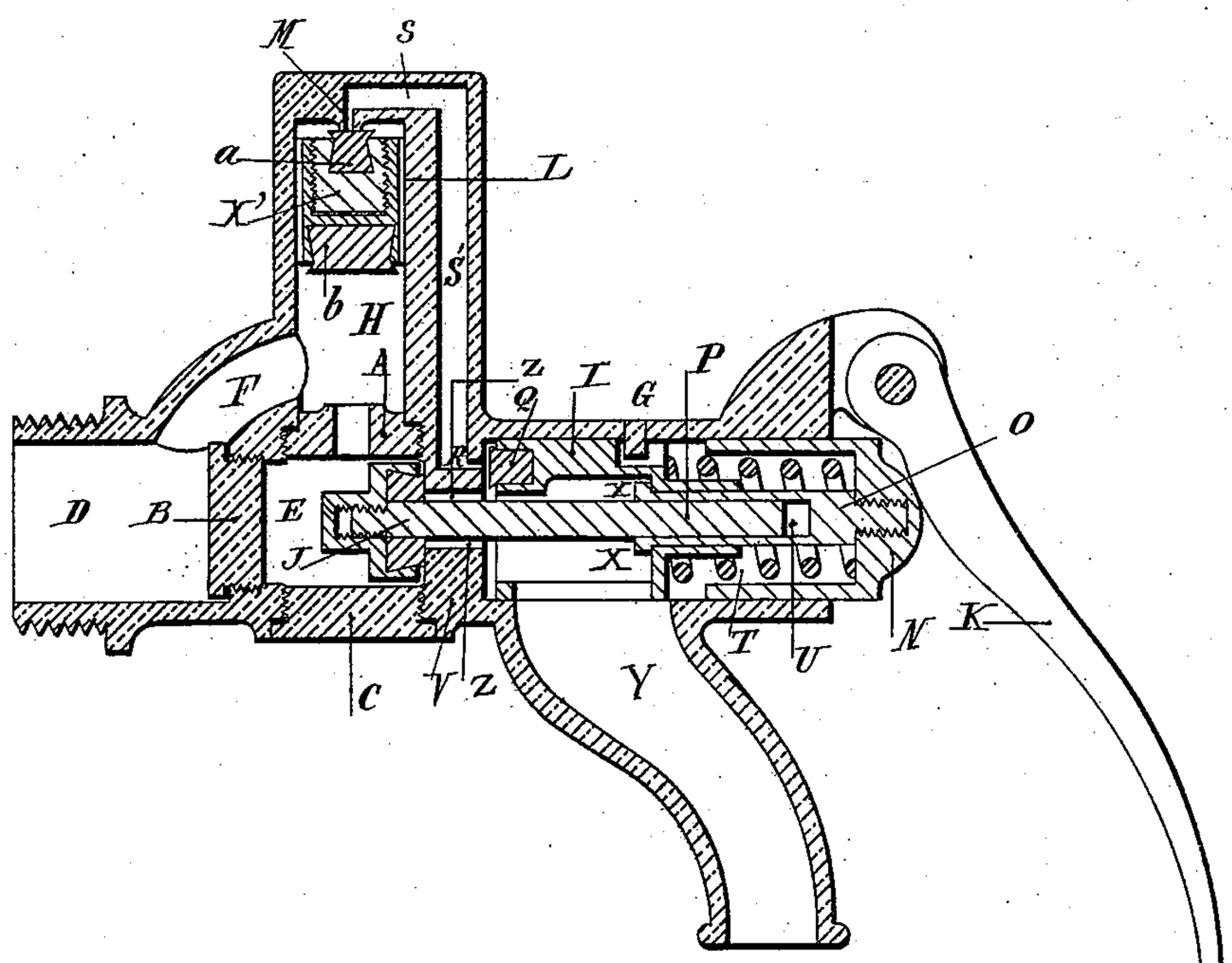
(No Model.)

M. ANDRIVEAU.

WATER COCK.

No. 599,158. Patented Feb. 15, 1898.



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MAURICE ANDRIVEAU, OF PARIS, FRANCE.

WATER-COCK.

SPECIFICATION forming part of Letters Patent No. 599,158, dated February 15, 1898.

Application filed March 3, 1896. Serial No. 581,656. (No model.)

To all whom it may concern:

Be it known that I, MAURICE ANDRIVEAU, of Paris, France, have invented new and useful Improvements in Water-Cocks, of which the following is a full, clear, and exact description.

My invention relates to water-cocks of that class in which an automatic closing takes place, and has for its object to provide a cock which will have a double closing action and which at each operation will supply only a predetermined quantity of water.

The invention is applicable to all cocks adapted to discharge liquids or fluids under pressure, and it will be understood that I do not limit myself to any particular arrangement or application of the cock.

The invention consists in the novel construction, combination, and arrangement of parts hereinafter described and claimed.

Reference is to be had to the accompanying drawing, which is a longitudinal section of my improved cock.

In my improved cock the discharge of the liquid is limited by a cut-off valve moving between two seats during the discharge of the water and adapted to interrupt said discharge by becoming seated on one of the said seats at the end of its movement. With this cut-off valve is combined a sliding valve which establishes and interrupts alternately the communication with the atmosphere of the upper or outer portion of the chamber containing the cut-off valve, said sliding valve thereby serving to modify or vary the pressure in said upper portion of the valve-chamber, so as to cause said cut-off valve to move in one direction or the other.

As illustrated in the drawing, the casing V receives a perforated screw-plug A, forming one of the seats for the sliding cut-off valve L, moving in a chamber H.

D is an inlet of the casing, and F is a channel connecting said inlet to the chamber H.

J is a discharge-valve located in a chamber E, which is separated from the inlet D by a partition B and communicates with the chamber H by means of the perforation in the seat A.

C is a screw-plug closing an opening in the casing V and allowing access to the chamber E when necessary.

Y is the outlet of the casing, and Z is an annular passage whereby said outlet communicates with the chamber E, said passage being adapted to be closed by the valve J.

The cut-off valve L is preferably made in the shape of a female-threaded sleeve receiving a screw-plug X′, the sleeve, as well as the plug, having projecting from their end faces rubber cushions *a b*, the cushion *b* being adapted for engagement with the seat A, while the cushion *a* comes in contact with the seat M, as shown.

On the casing V is also pivoted an operating-lever K, which engages the sliding head N, carrying the sleeve O, which receives the stem P of the valve J, hereinbefore mentioned. The sleeve O is made with a shoulder or enlargement X, against which is adapted to bear one end of a slide I, having guided movement in the casing, said slide being engaged by a pin G, which forms a guide and a stop therefor.

The slide carries a rubber block or valve Q, adapted to close an orifice R, whereby the outlet Y communicates with a passage S S′, leading to the seat M of the cut-off valve L. A spring T is coiled between the head N and the slide I and keeps the latter normally against the shoulder X of the sleeve O.

The normal position of the parts is shown in the drawing. In said position there is a communication from the air through the outlet Y, the orifice R, and the passage S S′ to the upper part of the chamber H. The spring T merely forces the slide I into engagement with the shoulder X without, however, bringing the rubber block Q into engagement with its seat.

When water is admitted from the main to the inlet D, it passes through the channel F into the chamber H and into an annular groove surrounding the seat A of the cut-off valve L. The upper and lower parts of the chamber H communicate only, owing to the play existing between the valve and the walls of the chamber. Any water which thus travels past the cut-off valve L into the upper part of the chamber H escapes gradually through the orifice in the seat M and the passage S S′, connected with said orifice. It will be understood that the diameter of the orifice is proportioned to the amount of play be-

tween the valve and the walls of the chamber H. There is therefore no pressure on the upper face of the cut-off valve L, and the pressure being exerted only against the lower face of said valve it follows that the valve is forced upward until the rubber cushion *a* closes the orifice in the seat M. The outlet having thus been closed, the pressure of the water per square inch will be the same above and below the valve L. The valve will therefore be maintained in its upper position by the difference of the total pressures on its upper and under sides, said difference being equal to the weight of a column of water whose section is equal to that of the orifice in the seat M and whose height is the height or head of the water, plus the volume of water displaced by the cut-off valve, minus the weight of said valve. As the orifice in the seat M is very small, the force keeping the valve against said seat will likewise be very slight.

When it is desired to open the cock, the lever K is pressed to force the head N inward. This at first causes a simultaneous movement of the slide I and the head N until the rubber block Q becomes seated and closes the orifice R. The head N continuing to move inward, the sleeve O slides relatively to the slide I and the stem P of the valve J moves in the space U of the said sleeve until the end of the stem abuts against the sleeve, when the valve J will be raised off its seat. The liquid will then have an open or through passage through the cock, passing from the inlet D to the outlet Y, through the passages and chambers F, H, E, and Z. After the communication between the upper part of the chamber H and the atmosphere has been interrupted by the seating of the rubber block Q on the orifice R of the passage S S′, so that said passage constitutes a hermetically-closed receptacle, the valve J is moved inward and the water-outlet is opened. By opening the valve J the water is allowed to escape through the passage Z, creating a suction upon the water in the chambers E and H, the suction being of course strongest at the points nearest to the passage Z. The suction is therefore stronger on the under side of the cut-off valve L than on its upper side. The difference between the two forces is greater than the resistance, due to the small orifice at M, and in consequence thereof there is a preponderance of pressure above the valve L (or a preponderance of suction below said valve) and the valve L will be drawn down from its upper seat M.

The passage S S′ is hermetically closed at the orifice R by the rubber block Q; but it is empty or at least filled only with water subjected to no pressure. The aperture in the seat M being open the water from the chamber H will rush into the said passage S S′, and consequently the pressure above the cut-off valve L is reduced to naught. The preponderance of suction below the cut-off valve tending to draw said valve toward the bottom of the chamber H is less than the absolute reduction of pressure above the valve. The cut-off valve L therefore again rises to seat itself on the orifice in the seat M and close the same; but meanwhile a small amount of water has passed from the chamber H into the passage S S′. The pressure above and below the cut-off valve is approximately the same after the valve becomes seated at M, there being a slight excess of pressure on the lower side, corresponding to the area of the apertured seat M. The preponderance of suction below the valve is, however, sufficient to again draw the valve downward away from the said seat M. This movement is repeated automatically several times until sufficient water has entered the passage S S′ to make the pressure therein equal to that in the chamber H. As above explained, there is sufficient play around the valve L to allow the pressure per square inch to become equalized above and below said valve; but for the reasons above set forth the aggregate pressure on the upper side of the valve is greater than the aggregate pressure on the lower side thereof. Consequently the valve will slowly move downward, being retarded in this movement, as the play is only slight, and finally the discharge of the water will be interrupted when the valve L becomes seated on its lower seat A.

If it is desired to discharge a greater quantity of water, the operator must let go the lever K for a sufficient time to allow communication to be restored between the atmosphere and the upper part of the chamber H, so that the cut-off valve substantially will resume its elevated position shown in the drawing.

The amount discharged at each operation may be regulated by screwing the plug X more or less into the sleeve L of the cut-off valve, thereby reducing or increasing the length of the said valve and increasing or decreasing its stroke correspondingly. The same result may be obtained by changing the weight of the cut-off valve.

My improved cock or valve will operate in any position with the outlet facing upward, downward, or laterally.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a valve or cock, the combination of the casing having two apertured seats, the cut-off valve adapted to move between said seats to seat itself on both, said cut-off valve being arranged to control the discharge of the fluid, and constructed in two sections adjustable longitudinally of each other, so that the length of the valve may be changed, and means for changing the pressure on one side of the valve to cause the same to move from one seat to the other, substantially as described.

2. The herein-described valve or cock, comprising a casing having an inlet and an outlet, a passage through which the fluid may

travel from the inlet to the outlet, a cut-off valve adapted to close said passage, a channel leading from the outlet to the opposite face of the valve to that which is adapted to cut off the fluid, another valve for closing said channel, said second valve being arranged to move outwardly for opening the channel, and a third valve for closing the through-passage of the fluid, said third valve opening inwardly so that it will be closed by the pressure of the fluid, and means for moving said second and third valves, substantially as described.

3. The herein-described valve or cock, comprising a casing having an inlet and an outlet, a passage through which the fluid may travel from the inlet to the outlet, two perforated seats, one of which is located in said passage, a cut-off valve arranged to move between said seats and adapted to close the passage, a channel leading from the outlet to the perforated seat which is located on the opposite side of the valve to that which is adapted to cut off the fluid, another valve for closing said channel, a third valve adapted to close the through-passage for the fluid and having limited movement relatively to the second valve, and means for successively moving said second and third valves, substantially as described.

4. The herein-described valve or cock, comprising a casing having an inlet and an outlet, a passage through which the fluid may travel from the inlet to the outlet, two perforated seats, one of which is located in said passage and the other exteriorly or laterally thereof, a cut-off valve arranged to move between said seats and adapted to close said passage, a channel leading from the atmosphere, to the perforation of the seat which is located laterally of the fluid-passage, a second valve for closing said chamber, a third valve for closing the through-passage for the fluid, and operating means connected to the second and third valves and so arranged that the second valve will close the said channel before the third valve is opened to allow the outflow of the fluid, substantially as described.

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