G. T. HUXFORD.

ADJUSTABLE, AUTOMATIC FLUID CONTROLLING DEVICE.

APPLICATION FILED MAR. 12, 1912.

1,044,053. Patented Nov. 12, 1912.

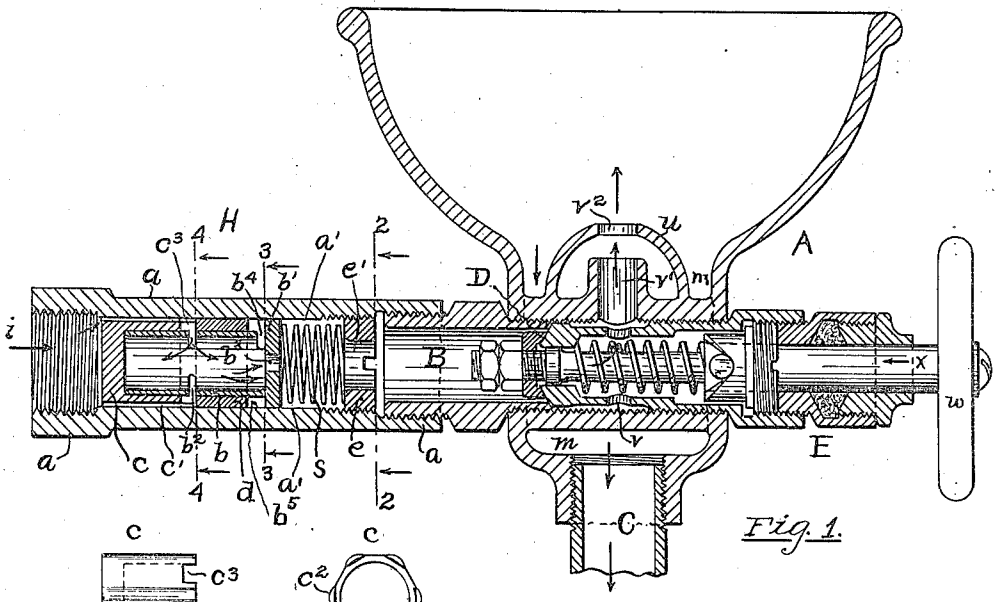

Fig. 1.

Fig. 5.

Fig. 6.

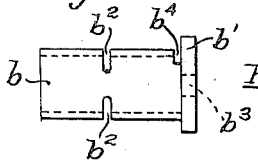

Fig. 8.

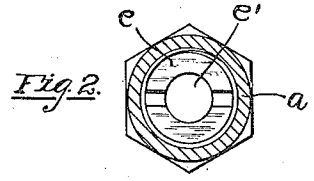

Fig. 2.

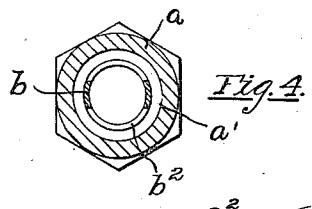

Fig. 4.

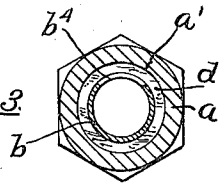

Fig. 3.

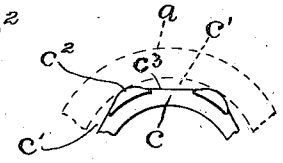

Fig. 7.

WITNESSES

H. Geo. Anderson

Nellie M Gustin

INVENTOR

George T. Huxford.

By Geo. P. Lawrence.

ATTY.

UNITED STATES PATENT OFFICE.

GEORGE T. HUXFORD, OF PROVIDENCE, RHODE ISLAND.

ADJUSTABLE, AUTOMATIC FLUID-CONTROLLING DEVICE.

1,044,053. Specification of Letters Patent. Patented Nov. 12, 1912.

Application filed March 12, 1912. Serial No. 683,358.

To all whom it may concern:

Be it known that I, GEORGE T. HUXFORD, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Adjustable, Automatic Fluid-Controlling Devices, of which the following is a specification.

This invention relates specifically to diaphragmless means for automatically regulating the outflow of fluids under pressure, as, for example, water, so as to maintain and discharge a constant normal volume of the fluid, irrespective of its greater initial inlet pressure, and it consists in the novel construction and arrangement of parts comprising the device, all as hereinafter set forth and claimed.

The object I have in view is to provide service pipes or analogous tubes, arranged to conduct fluids under pressure to the place of discharge and use, say the outlet nozzle of a drinking fountain, with simple and inexpensive, self-contained, automatically operative diaphragmless means capable of being interposed in the said supply pipe or connected at its outlet end, whereby the improved pre-adjusted regulator or controller forming the subject of my invention will, when in normal use, act automatically to reduce the greater initial pressure of the fluid while flowing through the device, and discharge it under a constant and uniform pressure and volume from the outlet-nozzle or other opening.

In the accompanying sheet of drawings, Figure 1 represents a longitudinal central sectional view of my improved automatic fluid-pressure regulator, connected to a sanitary drinking fountain; Figs. 2, 3, and 4 are transverse sectional views, taken respectively on lines 2—2, 3—3 and 4—4 of Fig. 1; Fig. 5 is a detail side elevation of the initial combined water inlet and piston-guiding member of the device; Fig. 6 is a corresponding end view of it; Fig. 7 is a partial end view of the same, in greatly enlarged scale; and Fig. 8 is a detail side elevation of the piston or movable pressure-controlling member.

The following is a detailed description of my improved pressure-controlling device, including the manner of operation when connected, say to a sanitary drinking fountain; the latter being described first: The bowl or body A of the fountain represented herewith is provided with a suitable, manually actuated valve, casing, packing member, &c., mounted in said body or housing A. Its valve proper, D, is adapted to be self-closing and is secured to the inner end of the spring-pressed stem x, and is normally seated against the adjacent end of the casing. The latter is hollow and provided with openings v in direct communication with inner outlet nozzle v^1 and main outlet v^2 of the dome u above. Upon pressing the wheel w of the valve-stem x in the arrow direction to its adjusted limit, the valve D becomes unseated, thereby allowing uninterrupted flow of water through the coupling B into the casing and outward from the latter's apertures v and nozzle v^1 through the main discharge or service outlet v^2 of the dome u. The waste water returns via chamber m into waste-pipe C—see arrows.

In the improved pressure-controlling devices represented herewith, H designates the device or article of manufacture as a whole, the same adapted to be interposed or connected at i to the main inlet or service supply, its opposite or outlet end adapted to be secured to a coupling B or other analogous member into and from which the pressure-equalized water is discharged for use. The said automatic fluid pressure-controlling device H, forming the subject of my present application for U. S. Letters Patent is adapted to be removably secured to a drinking fountain or other suitable place for use, from which the user desires to draw water having constant pressure and volume. The casing a or short tube, in which the device is mounted, has a piston-guiding element c fixed in its inlet end; said member c is cup-shaped (closed at one end) and bored to receive the controller piston, soon to be described. The outer or peripheral face of the guide c is grooved or polygonal so as to form, when secured in the casing, a plurality of passages c^1 for the direct inflow of the fluid into the piston b, the latter fitting the bore of said member c and capable of short endwise movement therein. The inner (or, as drawn, the left) end portion of the wall is notched or recessed at intervals to provide lateral openings c^3, or water-passages, alternating with the short counter-bored extensions c^2 integral with the guide.

A short annular collar or flange d is rig-

idly secured to the bore a^1 of the casing a; its inlet or left end, say being in engagement with the said ends c^2 of the guide c. An endwise movable annular piston b extends longitudinally through said flange d, its left or open end adapted to bear against the closed bottom end of the member c when the pressure of the intake water at the time is the same as that of the normal or preadjusted pressure and volume of water discharged from the fountain. The opposite or right end b^1 of the piston is disk-shaped and adapted to freely fit the casing's bore. It is or may be integral with the piston and provided with a small central exit opening b^3, through which opening the water discharged from the fountain first passes. The wall of the member b is provided with one or more narrow lateral ports b^2 and b^4; the inner or right edge of the opening b^2 normally registers with the adjacent end of the stationary flange d when the piston is seated against said closed end of member c, thereby providing full open port area. Between the said head b^1 and the flange d is formed an annular water-filled chamber b^5 in continuous open communication with the piston's interior through its port b^4. The function of this chamber is to serve both as a small auxiliary reservoir or equalizing chamber and to prevent the formation of an air-pocket. A helical spring s inclosed in the casing and located between and pressing against the piston's head and adjacent face of the adjusting annular member or nut e, serves to vary the spring's tension as desired.

The function and manner of adjustment and operation of my improved automatic water-controlling or regulating device may be described as follows: It is assumed that the apparatus H is adjusted so as to deliver through the aperture e^3 of the normally stationary spring-pressed piston a certain volume of water to be discharged upward in the form of a column from an open nozzle v^1, say of a drinking fountain (Fig. 1), to a predetermined or normal height, corresponding to the pressure of the water issuing from the orifice e^3. Now, in case the pressure of the inlet water at i increases, the same, upon passing through the ports b^2 into the piston, impinges against the underside of the head b^1 and tends to move the piston a slight distance inward, thereby compressing the spring and correspondingly closing the inlet ports b^2 a like extent. Therefore, it will be apparent that upon thus contracting the port's normal area by reason of the increased initial pressure, in coöperation with the counteracting spring, the device is capable of automatically reducing the pressure and volume of water flowing from the piston's outlet e^3 and fountain-nozzle v^1 to the said normal pressure and height; the latter being automatically maintained at all times whenever the initial inlet pressure exceeds the normal preadjusted pressure of the discharge at the fountain.

I claim as my invention:—

1. In a fluid-controlling device for automatically discharging fluid, as for example, water, therefrom at a constant pressure and volume, the combination of a hollow or chambered casing member having its ends adapted to be secured to intake and discharge piping, respectively, one or more stationary piston-guiding members mounted within the casing, the outer or bottom end of the guide adjacent the intake end of the casing being closed, a tubular piston movably fitted in said guides having its discharge end provided with an aperture having a predetermined area, lateral ports formed in the piston's wall in open communication with the main or initial intake water, and adjustable, resilient means, coperable with the piston, for automatically controlling variations in pressure of the said initial intake water during its passage through the device, whereby it is capable of being discharged therefrom under a predetermined constant normal pressure and volume.

2. In a fluid-controlling device for automatically discharging fluid, as for example, water, therefrom at a constant pressure and volume, the combination of a hollow or chambered casing member having its ends adapted to be secured to intake and discharge piping, respectively, annular collars fixed to the bore of said casing, the end portion of the bottom or outer collar being permanently closed, a tubular piston movably fitted and guided in said collars, the inlet or bottom end of the piston being open, an apertured piston head slidably fitting the casing's bore, the size of said aperture corresponding with the constant, predetermined volume and head of water to be discharged from the device, when in normal use, narrow, lateral ports formed in the piston's walls, means for the passage of intake water through the ports into the piston and outward therefrom through its apertured head, an annular nut adjustably mounted in the discharge end of the casing's chamber, and a pressure-controlling spring disposed between the adjacent faces of said nut and piston-head, constructed and arranged whereby the area of the piston's ports is automatically reduced when the pressure of the main inlet water exceeds that of the said constant normal outflow or discharge.

3. In an automatic fluid-controlling device of the general character described, the combination with a longitudinally bored tubular casing having main inlet and discharge ends, one or more suitably disposed annular guide collars secured to the interior

of the casing, the end of the collar adjacent the said inlet end being water-tight, and passages for the inflow of intake water between the casing's bore and the periphery of the last-named collar, of a tubular piston endwise movable in the latter, provided with a head having a continuously open hole or perforation therethrough for the outflow of water, narrow lateral ports formed in the piston's barrel in normal open communication with the said passages for the intake water, and an adjustably mounted spring engageable with the piston's head for varying the degree of pressure or force, whereby the device is adapted to discharge a steady or constant predetermined normal volume and pressure of water therefrom.

4. In a pressure-controlling device of the general character described, the combination of a bored casing having open ends, a ported tubular piston endwise movable therein having an apertured head at its discharge end, means engaging the outer face of the piston's head for varying the intake pressure, and an annular chamber in continuous open communication with the piston's interior adapted, when in use, to prevent the formation of an air pocket therein.

In testimony whereof I have affixed my signature in presence of two witnesses.

GEORGE T. HUXFORD.

Witnesses:
GEO. H. REMINGTON,
CALVIN H. BROWN.