Jan. 10, 1933. C. E. GLEASON ET AL 1,893,859

COMPENSATING VALVE

Filed Oct. 9, 1930

Fig. 1.

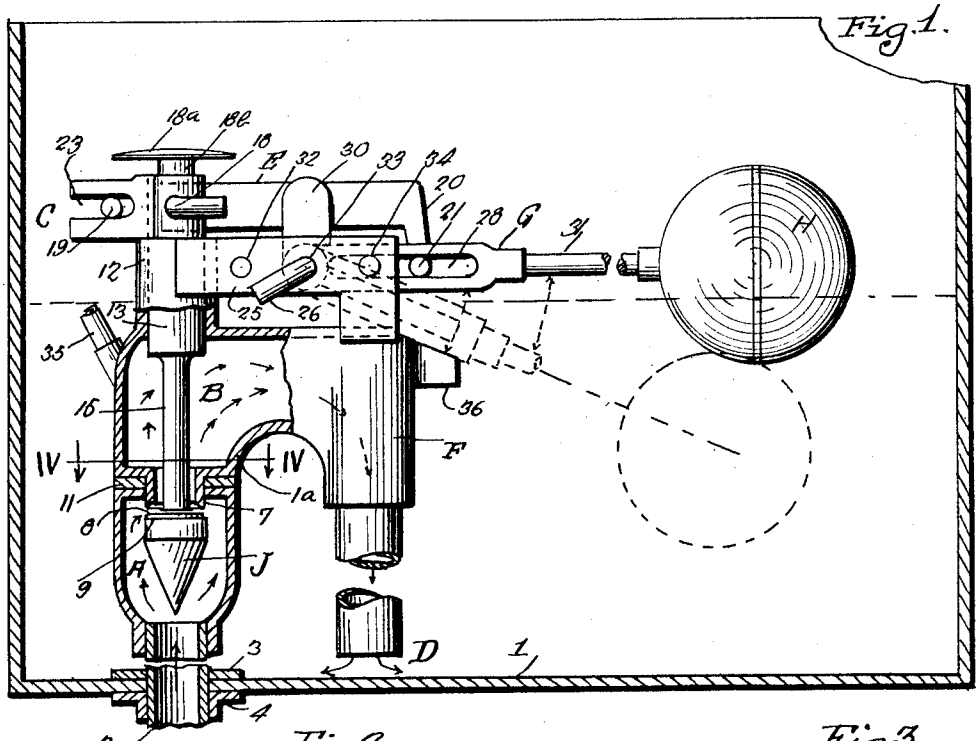


Fig. 2.

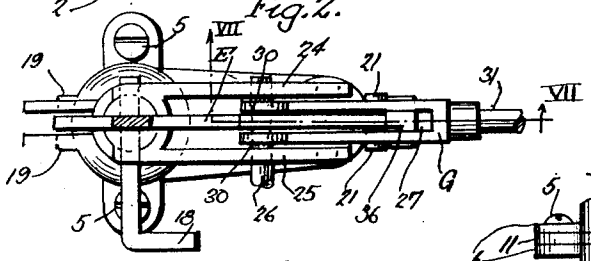


Fig. 3.

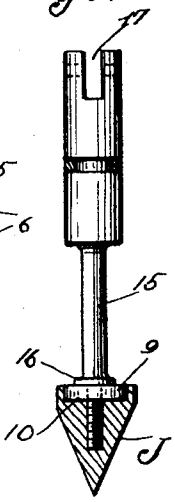


Fig. 8.

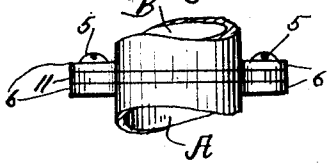


Fig. 5.

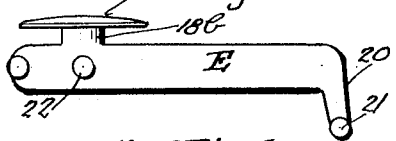


Fig. 4.

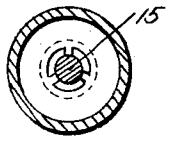


Fig. 6.

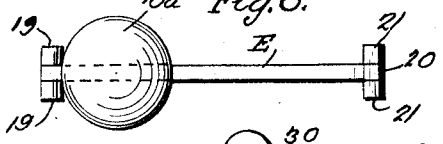
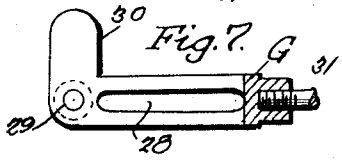


Fig. 7.



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UNITED STATES PATENT OFFICE

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COMPENSATING VALVE

Application filed October 9, 1930. Serial No. 487,572.

The present invention relates to compensating valves, or cocks, suitable for flushing tanks and the like, and more specifically to a type of cock adapted to admit a uniform flow of fluid at various pressures, and having compounded levers arranged to open the inlet valve from a water main against the pressure in the main.

The objects of our invention comprise the following desiderata:—

To provide a device of the kind mentioned having compound levers which are adjustable for different main pressures.

To provide means to open the inlet valve wider against low pressures than against high pressures, thereby admitting a uniform volume of water under varying pressure conditions.

To provide a projectile-like valve of stream-line construction which enables the inflow of water to rush past the valve without noise or vibration.

To provide a curved lateral course for the water to follow from the inlet to the outlet, thereby reducing friction and consequent noise and vibration.

To provide a loose-jointed mechanism that will not be apt to jam under any conditions.

To provide a device of this character that is of sturdy construction; that is regulable to a wide range of water main pressures; that may be inexpensively manufactured on the duplicate part system and sold for a reasonable price; together with other objects and advantages that will hereinafter appear, be particularly pointed out in the claims and illustrated in the accompanying drawing forming a part of this specification and in which:—

Figure 1 is a side elevational view of our invention with parts cut away to show the interior.

Figure 2 is a top plan view with the splash guard removed.

Figure 3 is a detail elevational view of the valve-stem showing the valve in vertical mid-section.

Figure 4 is a section taken on the line IV—IV of Figure 1.

Figure 5 is a side elevational view of the prime lever.

Figure 6 shows a top plan view of Figure 5.

Figure 7 shows the secondary lever in section taken on the line VII—VII of Figure 2.

Figure 8 is a detail showing the manner of securing vessels A and B together.

Similar indicia of reference refer to similar parts throughout the several views.

In carrying out our invention we provide the tank structure 1 which supports the device whose inlet member 2 perforates the bottom portion of the tank, being secured rigidly thereto in an upright position by the flange 3 above, and the flange 4 below. Said inlet connects with a main source of water supply.

The body of the device consists of the lower vessel A and the superimposed vessel B which are secured together by the screws 5—5 passing through the lugs 6—6, as is well shown in Figure 8.

It will be noted that the lower end of the vessel B is closed and provided with the annular portion 7 which projects downwardly through the closed top of the vessel A, said portion being provided on its lower end with the internal, cone-like counter-bore 8 arranged to form a seat for the preferably hard-rubber washer 9 countersunk into the upper end of the projectile-like valve J, well shown in Figure 3. Said washer being centered on the screwthreaded pin 10 which is adapted to interengage a tapped hole in said valve, the gasket 11 being interposed between said vessels and centered about the portion 7, thereby affording a tight joint between said vessels when the screws 5—5 are screwed home.

The vessel B rises to form the neck 12 which is bored vertically to fit the body 13 of the valve stem. The left upper end of said neck is provided with the cross-slotted bracket C for a purpose to be explained.

It will be observed that from its bottom, the right hand wall of the vessel B strikes the arc 1*a* thereby lessening friction and vibration while guiding the inflow of water over to the outlet D as indicated by the arrows.

The lower portion 15 of said valve stem is of reduced diameter and provided with the shoulder 16 to form suitable backing for the washer 9. The upper end of said stem is slotted at 17 to receive the primary lever E, and is bored at one side and tapped at the other to secure the crank pivotal-pin 18 which fastens said stem and lever together for vertical movement.

It will be noted, by reference to Figures 5 and 6, that the lever E is a flat bar provided with the horizontal trunnions 19—19 at the left-hand end, and with the downwardly-disposed member 20 at the right hand end that carries the respective trunnions 21—21 which are preferably of similar size to the trunnions 19—19. Said lever is provided with the transverse hole 22 to accommodate the cranked pivotal-pin 18 which establishes pivotal connection between said lever and the upper end of the valve stem.

As is well shown in Figures 1 and 2 the trunnions 19—19 engage the horizontal slots 23 of the bracket C so as to provide for vertical radial movement of the right hand end of said lever E, using said slots as fulcral points adapted to compensate for vertical movement of the valve stem.

It will be seen by further reference to Figure 1 that the structure F which forms the body of the outlet D extends upwardly to support the respective cheek-pieces 24 and 25 which bridge across in parallelism to connect with the respective sides of said neck. Said pieces being preferably cast integral with the structure B—F. The said cheeks are perforated at suitable distances apart to accommodate the pivotal-pin 26.

It will be observed that the secondary lever G is disposed within the cheeks 24 and 25 and is pivotally connected therewith by the pin 26. By reference to Figures 2 and 7 the lever G is seen to be provided with the vertical slot 27, the horizontal slot 28, the perforation 29, the guides 30—30 and the ball-rod 31. When secured within said cheek-pieces by means of the pivotal-pin 26 said lever G is obviously free for up and down radial movement under control of the float H.

It will be noted, reading Figures 1 and 2 from left to right that the trunnions 19—19 are mounted in the slots 23, thus providing a horizontally-adjustable fulcrum for the left hand end of the lever E which extends to the right passing through the slot 17 of said valve-stem which is pivotally secured to said lever by the pin 18, as described; the splash-guard 18*a* mounted on the stem 18*b* integral with said lever being disposed directly above the valve stem. The trunnions 21—21 engage the horizontal slots 28 of the lever G which is pivoted to said guides by the pin 26, thus providing compound levers adapted to open the valve J with more or less forceful effect according to whether the pin 26 is pivoting the lever G from the point 32, 33 or 34.

The upstanding twin guides 30—30 serve to keep the lever E in alinement at all points of the radial movement of the lever G and relieve the strain on the member 20 and the trunnions 21—21.

When operating against low pressures the lever G is pivoted at 32 an arrangement which opens the valve J wide and consequently admits more water than when pivoted at 33 or 34, in which cases the valve will open to a less extent against higher pressures and yet provide a uniform flow of water to the tank; the tube 35 is the refill pipe.

The trip-mechanism is not shown as it is too well known to need description and forms no part of the present invention, sufficient to say, that when the tank is full the float H will rise a little higher than is shown and thus bring the washer 9 in contact with the seat 8, effectually closing the main. When tripped, the water subsides in the tank until the lever G contacts with the rest 36 projecting from the structure F. Obviously the lever G could be pivoted at more than the three points shown, which are merely illustrative. The said levers and associated parts are preferably constructed for free play of said parts, being comparatively loose-jointed, as a precaution against jamming from corrosion of parts which are alternately exposed to air and to water.

Although we have shown and described one embodiment of our invention, it is to be understood that the same is susceptible of various changes, and we reserve the right to employ such changes as may come within the scope of the claims hereto attached.

We claim:—

1. A device of the kind described, comprising a valve structure having an inlet and an outlet for fluid, a valve stem arranged for axial movement in the structure, a valve seat carried by the structure adjacent the lower end of said stem, valve means carried by the lower end of the stem cooperative with said seat and arranged to open against the fluid pressure, a primary lever loosely fulcrumed in bearing means at the upper end of the structure, the body of said lever extending across the upper end of said valve stem, means pivotally connecting the lever with the valve stem, means pivotally connecting the free end of said primary lever with a secondary lever, a float extending from the free end of said secondary lever, means arranged to pivot the fixed end of the secondary lever at different distances from the axis of said valve stem, rest means arranged to limit the downward movement of said float, and guide means carried by and extending upwardly from the pivotal end of said secondary lever and arranged to engage and aline the primary lever.

2. A device of the kind described, comprising a valve structure having an inlet and an outlet for fluid, a valve stem arranged for axial movement in the structure, a valve seat carried by the structure adjacent the lower end of said stem, valve means carried by the lower end of the stem cooperative with said seat and arranged to open against the fluid pressure, a primary lever loosely fulcrumed in bearing means at the upper end of the structure, the body of said lever extending across the upper end of said valve stem, means pivotally connecting the lever with the valve stem, a pivotally mounted secondary lever connected with the primary lever, a float extending from the free end of said secondary lever, means arranged to pivot the fixed end of the secondary lever at different distances from the axis of said valve stem, a pin and slot connection between the primary and secondary levers and rest means arranged to limit the downward movement of said float.

3. In a device as specified in claim 2, the bearing means including a cross slotted open ended member, fulcrum trunnions engaging the relatively stationary end of the primary lever with said member, the connecting means between the two levers including a member depending from the remote end of said primary lever, and trunnions carried by the member engaging slot means of the secondary lever.

4. In a device as specified in claim 2, cheek members rising from the pivoted end of said secondary lever and straddling the primary lever to guide the same in its movements, the pin and slot connection between the primary and secondary levers including longitudinal and horizontal slots in the secondary lever, an arm depending from the free end of the primary lever and said pin extending transversely of the lower end of the arm with the arm and pin ends cooperating with the slot in the secondary lever.

In testimony whereof we affix our signatures.

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MELVIN A. MARTIN.