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GRADUATING UNIT

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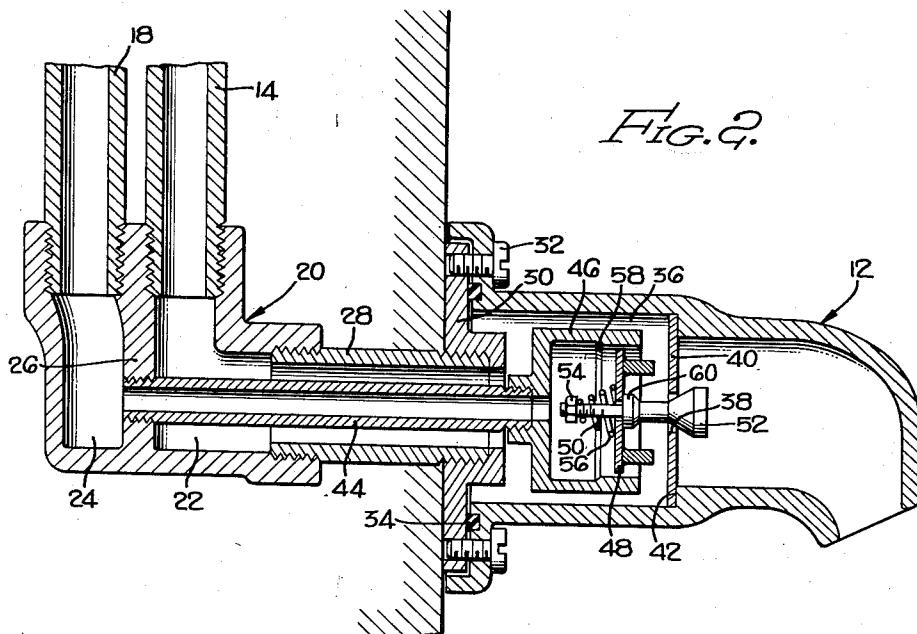


Fig. 2.

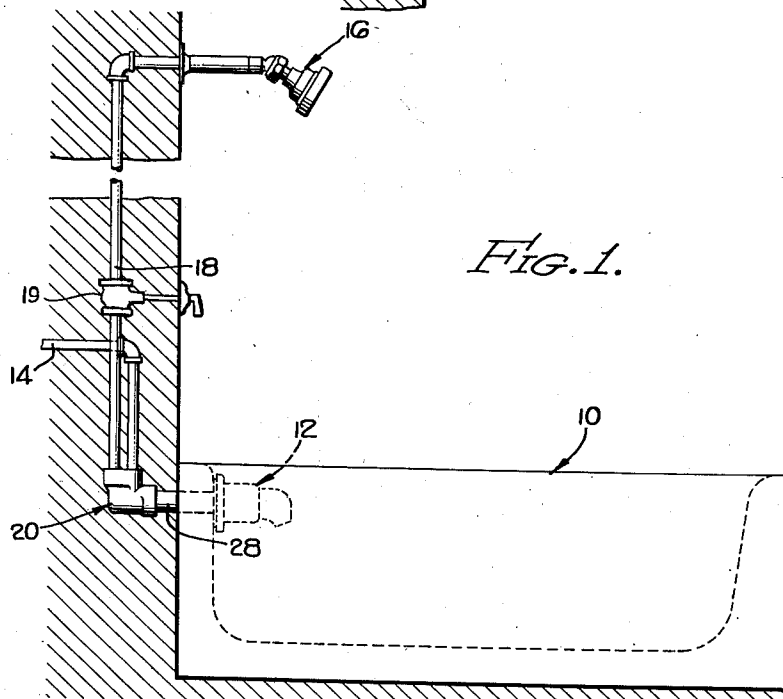


Fig. 1.

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1

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## GRADUATING UNIT

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4 Claims. (Cl. 137—119)

This invention relates to an improved graduating unit. It is an object of this invention to provide a suitable unit for diverting water from a spout or similar outlet to a shower or similar outlet.

It is a further object of this invention to provide such a unit which will close the spout outlet when a small amount of water is being diverted to the shower outlet.

It is a further object of this invention to provide a unit which will divert a sufficient amount of water to accommodate multiple shower outlets either operating all at once or only part thereof operating.

It is still a further object of this invention to provide a graduating unit which permits control of the volume delivered to the shower outlet without eliminating the diverting function of the structure.

Other objects and advantages will be readily apparent from the following description:

In the drawings:

Figure 1 is a side elevation of a tub and shower installation having a graduating unit embodying this invention.

Figure 2 is a side elevation in section of the graduating unit.

Referring first to Fig. 1, a tub 10 is illustrated having a spout outlet 12 to which water is delivered from a suitable water supply pipe 14. The water may be diverted to the shower head 16 through pipe 18, flow through the showerhead being controlled by valve 19 inserted in pipe 18. It will be readily apparent that the graduating unit has many uses and the installation illustrated as having a tub spout and shower head outlet is for purposes of description.

The inlet pipe 14 and shower pipe 18 are screwed into a combination fixture 20 similar to that described in the patent to Bucknell et al., No. 2,152,868, issued April 4, 1939. This fixture is divided into two chambers 22 and 24 by a partition 26. Water is delivered into chamber 22 from supply pipe 14 and flows through pipe 28 which is screwed into fixture 20 at one extremity and the other end screws into the anchor plate 30, which plate is suitably secured to the tub 10. Secured to the plate 30 by screws 32 is spout 12, making all working parts accessible from the face of the tub, and an annular gasket 34 prevents leakage.

Water flowing through pipe 28 enters chamber 36 formed in spout 12. The water then flows through a central aperture 38 in check washer 40 and hence out spout 12. The washer 40 is retained in the spout 12 by means of a shoulder 42 formed thereon.

A tube 44 screws into the partition 26 and communicates with the chamber 24. Secured to the opposite extremity of tube 44 is a cylinder 46 which houses piston washer 48, which piston washer has a diameter smaller than the inner diameter of the cylinder. Consequently, while water is flowing through the spout a portion of the water is diverted through the cylinder filling tube 44, chamber 24 and pipe 18. However, with water

2

flowing from the spout the shower head is closed and the water pressure is equal on both sides of the piston washer 48 and it is inoperative.

Projecting through a central aperture in piston washer 48 is a piston 50 which carries at its foremost extremity a valve head 52 adapted to seal off aperture 38 in the washer 40. Also carried by the piston 50 is a nut 54 which anchors spring 56, which also bears against the piston 50.

When the shower head is closed the water pressure on either side of the piston washer 48 is substantially equal and the water pressure on valve head 52 moves the valve head 52 and the remaining structure to the right, in Fig. 2, permitting flow through the spout. When the shower head is opened and water flows thereto, however, the pressure on the piston washer 48 is unequal causing same to overcome the force of the water on the valve head 52 and move the piston washer to the left. This force upon spring 56 pulls the valve head 52 into seating engagement in aperture 38 closing off flow through spout 12.

As a greater demand for water is created by use of multiple shower heads, the pressure differential on piston washer 48 is increased, causing the washer to move further to the left compressing spring 56. To accommodate the increased demand for water the inner bore of cylinder 46 is stepped as at 58 to provide a greater difference between the diameter of the piston washer 48 and the cylinder 46, thereby permitting a greater volume of water to flow.

As the water pressure in the chamber 36 is increased it is apparent that it will urge the valve head 52 toward the open position against the urging of spring 56 by varying the effective area of the valve head and the strength of the spring 56. In this manner the valve head may be held in the seated position against any pressure which may be present in the spout chamber 36, while still permitting relative movement between the piston washer 48 and valve head 52, thus allowing the piston washer to move after the valve head 52 seats in the check washer 40 passing step 58 and allowing a greater volume of water to flow to the shower outlet. Movement of the piston washer towards the valve head is limited by shoulder 60 formed on the piston.

While what hereinbefore has been described is the preferred embodiment of this invention, it is readily apparent that alterations and modifications can be resorted to without departing from the scope of this invention and such alterations and modifications are intended to be included within the scope of the appended claims.

We claim:

1. A graduating unit for a combination fixture having two outlets and a single inlet comprising: a valve seat in one outlet, a cylinder having an internally stepped bore on said remaining outlet and defining portions of different diameters, a piston washer having a central aperture positioned in said cylinder, a piston passing freely through said aperture and carrying valve means at one extremity for closing said valve seat and means at the opposite extremity for holding said valve means in closing position on said seat while permitting movement of said piston washer to the large diameter portion of said stepped bore.

2. A graduating unit for permitting flow through one of two outlets at a time supplied by a single inlet and comprising: valve means in one of said outlets, piston means in the other of said outlets, spring means operably connecting said piston means to said valve means so that flow through the last mentioned outlet closes said valve means terminating flow through said first mentioned outlet while permitting movement of said piston means relative to said valve means after flow is cut off through

3

said first mentioned outlet, and means in said last mentioned outlet responsive to relative movement of said piston means to said valve means for increasing the volume of flow through said last mentioned outlet.

3. A graduating unit for a fixture having a spout outlet and a shower outlet comprising: an anti-siphon washer in said spout outlet having a central aperture therein, means on said shower outlet having an internally stepped bore defining portions of large and small diameters, a piston washer disposed within said shower outlet adjacent the step formed therein and in the portion of small diameter, a piston passing freely through said piston washer and said anti-siphon washer and having a valve head formed on the extremity projecting through anti-siphon washer and spring means on the extremity projecting through said piston washer and bearing against said piston washer to permit movement thereof relative to said piston and into said portion of large diameter.

4. A graduating unit for a fixture having a spout outlet and a shower outlet comprising: an anti-siphon washer in said spout outlet having a central aperture therein, means on said shower outlet having an internally stepped

4

bore, a piston washer disposed within said shower outlet adjacent the step formed therein and in the portion of smaller diameter, a piston passing through said piston washer and said anti-siphon washer and having a valve head formed on the extremity projecting through anti-siphon washer and spring means on the extremity projecting through said piston washer and bearing against said piston washer to permit movement thereof relative to said piston and into said portion of large diameter, and a shoulder formed on said piston limiting movement of said piston washer towards said valve head.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

15	90,483	Bartholomew	May 25, 1869
	1,902,624	Dotterweich	Mar. 31, 1933
	2,009,651	Conde et al.	July 30, 1935
	2,152,868	Bucknele et al.	Apr. 4, 1939
	2,164,411	Kennedy	July 4, 1939
20	2,274,787	Groen	Mar. 3, 1942