Feb. 2, 1954 F. J. CANTALUPO 2,667,900

FLOW CONTROL DEVICE

Filed July 28, 1948

Fig. 1.

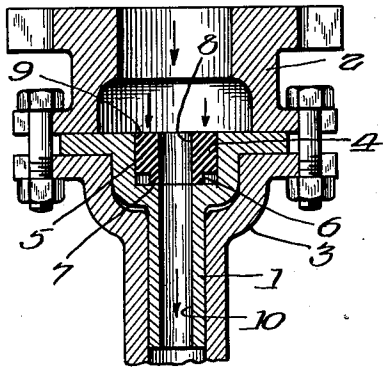
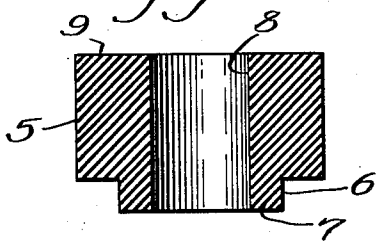



Fig. 2.



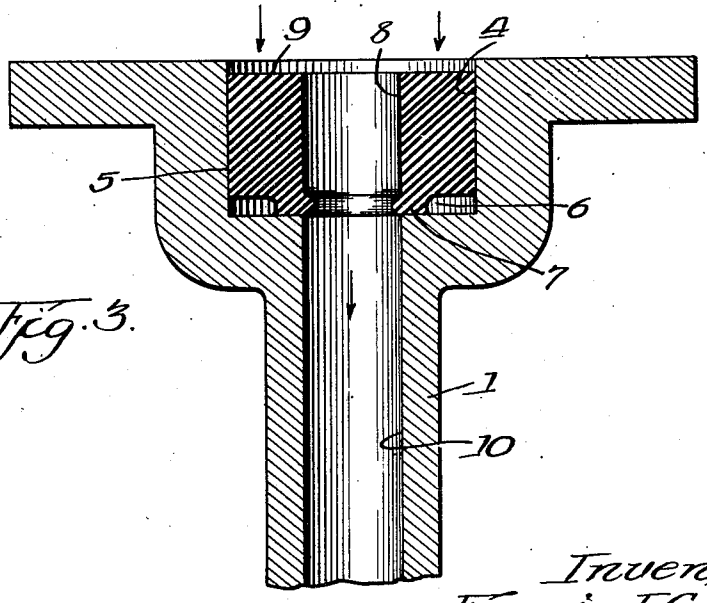




Fig. 3.

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## FLOW CONTROL DEVICE

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1 Claim. (Cl. 138—45)

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This invention relates to a fluid flow control device. More particularly, it is concerned with an improvement over the previous types of similar control devices as for example, those covered by the Lindstaedt Patents Nos. 2,188,366, granted January 30, 1940, and 2,264,539, granted December 2, 1941, and also the Brown Patent 2,389,134, granted November 20, 1945.

One of the more critical services to which devices of this type have been subjected has been in spraying means and in automatic clothes washing machines in which the control of the mixed or tempered water being added is closely watched in order to provide for the desired liquid mixture within the washing machine tank or other container.

However, in such service it has been found that the previous devices have not been sufficiently accurate or flexible in response under the varying conditions of service and frequently as a result the mixture within the container or tank of the washing machine was not of the desired temperature or mix.

Accordingly it is one of the more important objects of this invention to provide for a flow control device in which by a relatively simple construction the accurate and sensitive control over the flow of fluids into the tank is assured at all of the working temperatures and pressures normally encountered in automatic washing machine service and the like.

Another important object of this invention is to provide for a construction in which a relatively large variety of materials may be used for the pressure responsive device without detracting from its performance, that is, the construction itself permits of a wide versatility in the selection of materials used for the purpose, such as rubber, synthetic composition, plastics, resilient materials and the like.

Other objects and advantages will become more readily apparent upon proceeding with a description of the specification read in light of the accompanying drawings, in which

Fig. 1 is a fragmentary sectional assembly view showing the flow control apparatus installed within a pressure vessel, but devoid of actual line pressure.

Fig. 2 is a magnified view of the flow control device as a single unit.

Fig. 3 is a magnified view of the pressure responsive device, but showing the latter when under the influence of fluid pressure.

Referring now to Fig. 1, a nozzle generally designated 1 is clamped between two members 2

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and 3 forming a body in any suitable manner so as to be maintained in leak-proof or fluid-tight relation, the fluid flow being in the direction indicated by the arrows. The nozzle 1 is provided with a cylindrical chamber 4 in which the novel rubber washer 5 forming the subject matter of this invention is placed, preferably being snugly received therewithin as indicated. It will be noted that the inner end of the chamber 4 (downstream end) is defined by an annular transverse surface. The rubber washer 5 is shaped as indicated at its inner end portion with an outer annular recessed end 6 to form a raised face and thus create a reduced annular chamber as indicated at 7 between the end periphery of the chamber 4 and the outer periphery of the raised face 6 of the said washer.

Thus, as water flows for example through the central passage fluid pressure is applied against the surface 9 at the upstream end of the rubber washer which in turn causes the entire washer mass 5 to be moved with the raised face 6 on the downstream side at 7 to be compressed and forced radially inward within the flow passage to reduce the diameter of the rubber washer passage 8 accordingly thereby to restrict the said passage and to reduce the flow rate below that which would exist at the same pressure if the passage had not been restricted. It will be apparent that by the proper selection of rubber softness and dimensions of the diameter and thickness of the washer projection 6, the flow can be accurately controlled as desired.

Depending upon function, the diameter of the central hole 8 in the downstream end of the housing should be substantially equal within manufacturing limits of the port 10.

It should be apparent that as compared with the previous patents referred to, the flow control device of this invention is far more sensitive in response to fluid flow and, at the same time, this is accomplished without any additional expense.

It is, of course, apparent that while only a single form of the invention has been illustrated and described it may assume other forms falling within the terms of the claim as hereinafter set forth.

I claim:

A flow control device with upstream and downstream passages, the combination including a body having an annular chamber in communication with the passages, the end limit of said chamber adjacent the downstream passage being defined by an end transverse annular surface, a washer-like member between the upstream and

downstream passages and having a compressible reduced annular end portion adjoining the downstream passage, the said washer-like member except for said reduced end portion being fitted snugly within the said annular chamber, the reduced annular end portion abutting said transverse annular surface limit of the chamber and having a central flow passage therethrough, the reduced portion of the said washer-like member being compressible and deformable annularly inwardly into the downstream passage under the influence of end applied fluid pressure within the inlet passage thereby to restrict the fluid flow



through the central passage immediately adjacent the inner periphery of the reduced annular end portion of the said washer-like member.

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