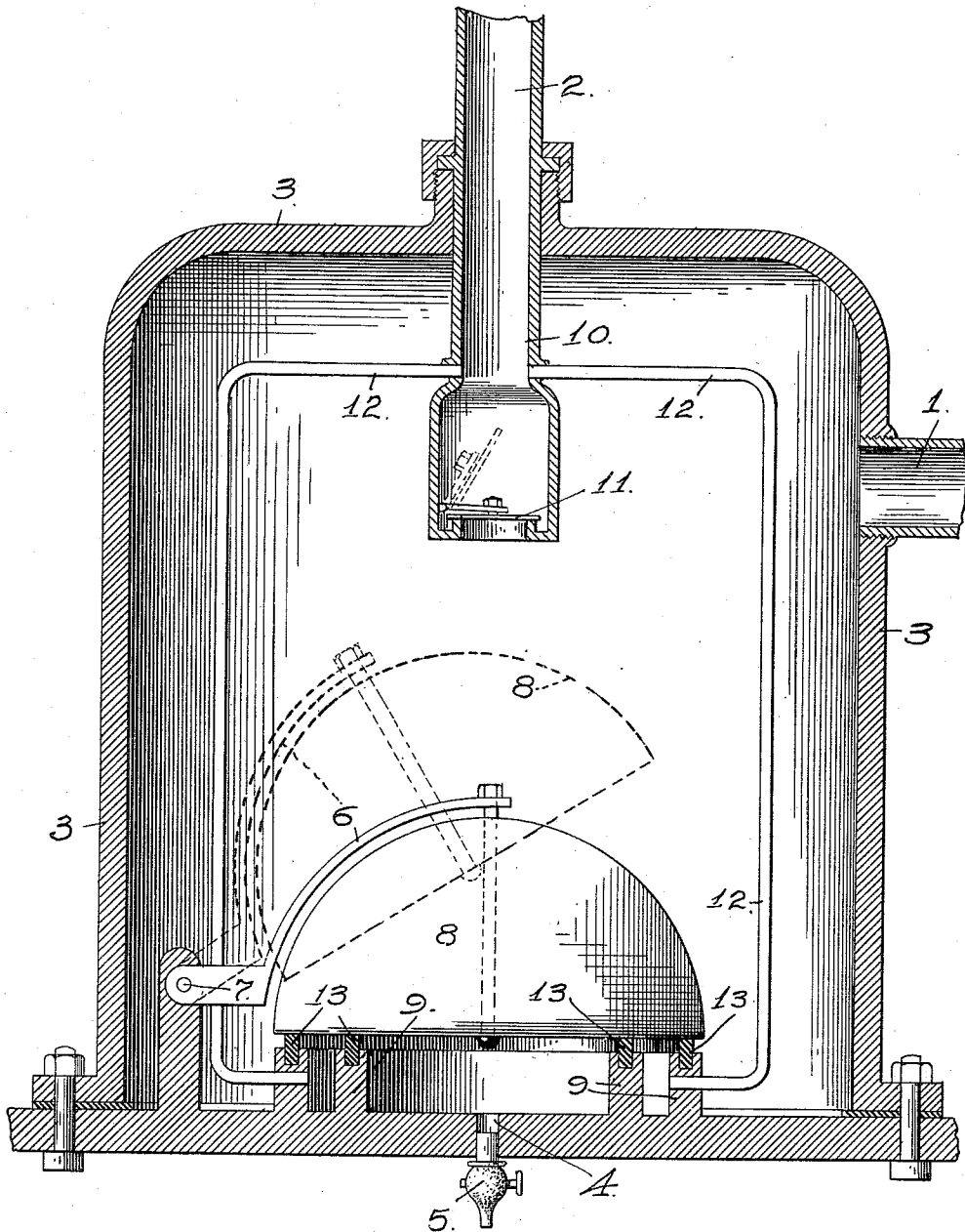


H. P. TANK.
VARIABLE PRESSURE CHAMBER.
APPLICATION FILED FEB. 6, 1911.

995,497.

Patented June 20, 1911.



Witnesses
Arthur L. Slee,
S. Constantine.

Inventor
Henry P. Tank
by Wm F. Booth
his Attorney.

UNITED STATES PATENT OFFICE.

HENRY P. TANK, OF ALAMEDA, CALIFORNIA, ASSIGNOR OF THREE-TENTHS TO LOUIS B. KRIEGER AND FOUR-TENTHS TO BURT L. DAVIS, BOTH OF SAN FRANCISCO, CALIFORNIA.

VARIABLE-PRESSURE CHAMBER.

995,497.

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To all whom it may concern:

Be it known that I, HENRY P. TANK, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented certain new and useful Improvements in Variable-Pressure Chambers, of which the following is a specification.

My invention relates to that class of appliances used in connection with automatic fire-extinguishing apparatus, commonly termed "retarding chambers" or "variable-pressure chambers". In this class of apparatus there is a pipe system comprising a main riser, branch pipes, and sprinklers, the latter being of a type which are adapted to be opened by a sufficient rise in temperature; usually by the melting of some valve connection of fusible metal. In this system there is also an alarm valve, automatically operable by the flow of the water due to the relief of pressure by the opening of the sprinklers. This valve by-passes a portion of the water to operate a suitable alarm device. The alarm valve is necessarily of delicate or sensitive operation, so that, in practice, it is found that relatively slight variations in the fluid pressure, due to changes in pressure in the mains, create a water hammer sufficient to open the alarm valve to a slight extent and thereby by-pass water and thus cause a false alarm. To remedy this it is common practice to insert in the system between the alarm valve and the alarm mechanism a variable-pressure chamber which will compensate for such pressure variations and retard the alarm long enough to enable the effect of said variations to pass off without raising a false alarm.

The object of my invention is to provide a variable-pressure chamber of this kind, in which the construction is such that by avoiding the use of diaphragms and springs, I do away with their liability to break and crack and to deteriorate in tension. I gain thereby greater reliability and longer life for the device, together with an advantage in simplifying the construction and in increased efficiency.

With these ends in view, my invention consists in the novel variable-pressure chamber which I shall now fully describe by reference to the accompanying drawing in which the figure is a vertical section of my variable-pressure chamber.

1 is the inlet from the by-pass of an alarm valve.

2 is the outlet to the alarm device.

The inlet 1 enters the side of and the outlet 2 emerges from the top of the shell 3 of the variable-pressure chamber. In the base of the shell 3 is a drain outlet 4 for the excess pressure, said outlet being controlled by a regulating valve 5. Carried by an arm 6 which is hinged at 7 is a float valve 8. This is hollow, in the shape of a hemisphere and best made of glass. It normally seats down upon a pair of spaced annular flanges 9 surrounding the excess pressure outlet 4, so that when thus seated said outlet is cut off from the interior of the shell.

Depending from the outlet 2 in the top of the shell is a pipe 10 which carries in its lower end an upwardly swinging check valve 11. Leading from this pipe, above the valve 11, are the pipes 12 which lead down to and enter through the outer seat flange 9, into the space under the float valve 8 between the two flange seats. The seating of the float valve 8 upon the flange 9 is best effected through rubber facings 13.

The operation of the device is as follows:—When the pressure is constant in the system there is no water by-passed by the alarm valve, and the parts in the pressure chamber are as shown in full lines in the drawing. But if there should come a variation in the pressure or a water hammer which would effect the by-passing of some water from the alarm valve, this water does not go immediately to and sound the alarm, but flows through the inlet 1 into the shell 3. Falling into the bottom of the shell it will float the valve 8 from its seats, to the position shown in dotted lines and thereby open the outlet 4. Through this outlet it will escape, and as such changes in pressure or water hammer are very brief, all this water will pass off through the outlet 4 and none of it will pass to the alarm through the upper outlet 2. No false alarm will, therefore, be made. But in case the flow of water by-passed from the alarm valve should continue, thereby indicating real cause for alarm, the volume of water thus entering the chamber through inlet 1, will be more than can be carried off by the excess pressure or drain outlet 4, and it will rise within and fill the shell, and, lifting the check valve 11 will pass up through pipe 10 and outlet 2 to the

alarm device and so give the signal. The pressure thus introduced to the shell 3 will close down the float valve 8 and so hold it closed. When the alarm is over and the system restored, the water in pipe 10 will close down the check valve 11, and the pressure in the pipe 10, outlet 2 and alarm connections will then pass through the pipes 12 to below the float valve 8 and will lift said valve sufficiently to allow all the water in the shell 3 to drain off through the excess pressure outlet 4.

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

1. A variable-pressure chamber comprising a shell having a fluid inlet, a fluid outlet above its bottom, and a drain outlet in its bottom, the latter being of less capacity than the inlet; and a float valve controlling said drain outlet, adapted to be floated to open said outlet under the initial inlet of the fluid to the shell.

2. A variable-pressure chamber comprising a shell having a fluid inlet, a fluid outlet in its top, and a drain outlet in its bottom, the latter being of less capacity than the inlet; a float valve lying above and controlling said drain outlet and adapted to be floated to open said outlet, under the initial inlet of the fluid to the shell; a pipe depend-

ing from the top outlet into the shell; an upwardly opening check valve in said pipe; and a pipe leading from said depending pipe above its check valve and opening out under the float valve.

3. A variable-pressure chamber comprising a shell having a fluid inlet, a fluid outlet in its top, and a drain outlet in its bottom, the latter being of less capacity than the inlet; a pair of spaced annular flanges in the bottom of the shell surrounding the drain outlet; a swinging float valve adapted to seat upon said flanges for controlling said drain outlet, said valve being adapted to be floated from its seat to open the drain outlet, under the initial inlet of the water to the shell; a pipe depending from the top outlet into the shell; an upwardly opening check valve in said pipe; and a pipe leading from said depending pipe above its check valve and opening out through the outer flange into the space between the two flanges under the valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY P. TANK.

Witnesses:

WM. F. BOOTH,
D. B. RICHARDS.