H. H. YORK.

WATER SUBMERGED AIR CHAMBER FOR WATER PIPES.

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Fig. 1.

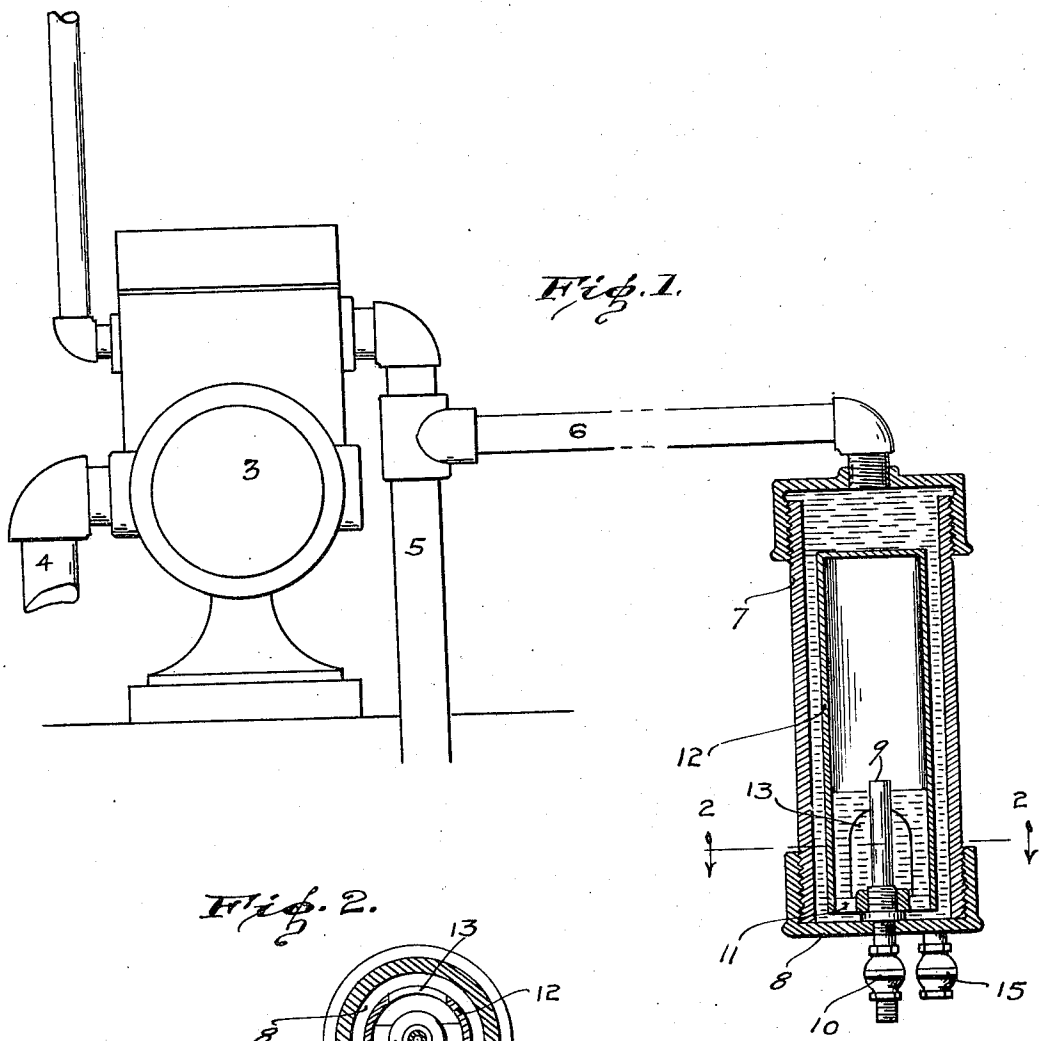
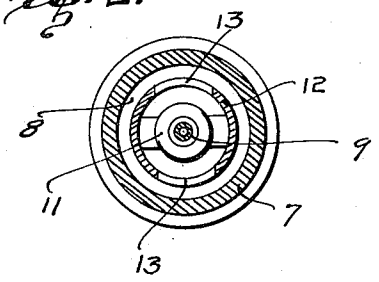


Fig. 2.



Inventor,
Howard H. York.
By Mutum & Woerner
Attorneys

UNITED STATES PATENT OFFICE.

HOWARD H. YORK, OF LOGANSPORT, INDIANA.

WATER-SUBMERGED AIR-CHAMBER FOR WATER-PIPES.

1,216,761. Specification of Letters Patent. Patented Feb. 20, 1917.

Application filed April 27, 1916. Serial No. 93,988.

To all whom it may concern:

Be it known that I, HOWARD H. YORK, a citizen of the United States, residing at Logansport, in the county of Cass and State of Indiana, have invented certain new and useful Improvements in Water-Submerged Air-Chambers for Water-Pipes, of which the following is a specification.

This invention relates to improvements in water pipes wherein water is conducted under pressure, and a ramming action from the valves of a near-by pump, or impact due to the opening and closing of faucets, as in house service, causes disagreeable pounding noises and also tends to destroy the plumbing.

The object of my invention is to cushion the hydraulic impacts, from whatever cause arising, with air contained in a chamber which is so submerged in the water of the pipe or other conductor as to resist the air pressure from within the chamber by a like outside water pressure, and to maintain an automatic balance which will not be disturbed by the leakage of air from the chamber through its walls, which is otherwise unavoidable.

The object also is to provide easy means for regulating the air pressure in the chamber without dismantling it and its associated parts, or without stopping the pump where my invention is used with a pump.

A further object is to provide a simple and durable device which can be readily applied to any water service already installed.

I accomplish the above, and other objects which will hereinafter appear, by the mechanism illustrated in the accompanying drawing, in which—

Figure 1, is an elevation and partial vertical section of a pump with my device connected in operative position therewith, said device being in vertical section, and Fig. 2 is a cross section of my invention on the line 2—2 of Fig. 1.

Like characters of reference indicate like parts in the two views.

I have shown my invention as applied to the discharge pipe of a pump, but it may be applied to the service pipe in any building which is supplied with water from any suitable source, as for example, by a municipal water works, or it may be applied, on a suitably larger scale, to the water mains in the streets of a city.

The pump 3, of any usual construction, has a supply pipe 4 and a discharge pipe 5. I introduce a T in the latter and from it run a pipe 6 which discharges through the upper end of a closed tank 7. Through the lower head 8 of the tank is an air-pipe 9 which is provided with a cut-off valve 10, on the outside of the tank and terminates with a threaded end for the attachment of the discharge pipe of an air-pump (not shown). A threaded inner portion of the pipe 9 is screwed into a cross bar 11 at the lower open end of an air-tank 12. The upper end and the side walls of the latter are air-tight, with the exception of openings 13 near the bottom through said side walls. The air-pipe 9 projects upwardly into the tank 12 for a suitable distance above the openings 13, and determines the height of the water-level in the air-tank. The latter is submerged in water by reason of the connection of the interior of the tank 7, through pipe 6, with the discharge pipe 5.

A clean-out pipe 15, controlled by a suitable stop-cock, is provided from the bottom of the tank 7.

In the operation of my invention, any sudden force imparted to the water in the discharge pipe 5 (service pipe or water main, as the case may be), is passed on through pipe 6 to the water in the tank 7, and thence through openings at the bottom of tank 12, to the water contained in the latter, and a resulting rise of the water in the latter will be resisted by the expansive action of the air in the upper part of tank 12. The impact will be resisted and the pounding deadened by the elasticity of the air in tank 12 which acts as a cushion, and because the water pressure on the outside of the air-tank 12 is as great as the air pressure within, there will be no leakage of air through the walls of tank 12, and except for absorption by the water, the supply of air will remain unimpaired.

When it is required to renew or to regulate the supply of air in the tank 12, this will be done through the pipe 9, to the outer threaded end of which the hose of an air-pump may be attached and air pumped directly into the tank 12.

This device operates successfully to cushion the valves in and to insure a steady discharge from a hot water pump in which the generation of steam makes the use of the usual air-chamber impossible. This is due

in large measure to the provision of a water chamber for a relatively larger volume of water at the mouth of the pipe 6, into which the hot water is discharged at each piston stroke of the pump and drawn back again, without heating the water next to the top of tank 12 and around its sides so as to generate steam within the tank 12.

While I have described my invention with more or less minuteness as regards details of construction and arrangement, and as being embodied in certain precise forms, I do not desire to be limited thereto unduly or any more than is pointed out in the claims. On the contrary, I contemplate all proper changes in form, construction and arrangement, the omission of immaterial elements and the substitution of equivalents as circumstances may suggest or necessity render expedient.

I claim:

1. The combination with a pipe containing water under pressure, of a closed tank, a second pipe connecting the interior of the first pipe with the interior of the tank and filling the closed tank with water, a second tank within the first tank air tight except at openings through its lower portion, a stand pipe terminating at one end outside of the first tank and at its other end within the second tank above the highest opening in the second tank, said second tank containing air which is subjected to the direct pressure of the water in the tanks, the water of the first tank entirely surrounding the second tank, with a larger volume at the place of its water supply to regulate the temperature in the second tank.

2. The combination with a pipe containing water under pressure, of a closed tank, a second pipe connecting the interior of the first pipe with the interior of the tank and filling the closed tank with water, a second tank within the first tank air tight except at openings through its lower portion, a stand pipe terminating at one end outside of the first tank and at its other end within the second tank above the highest opening in the second tank, said second tank containing air which is subjected to the direct pressure of the water in the tanks, the water of the first tank entirely surrounding the second tank, with a larger volume at the place of its water supply to regulate the temperature in the second tank, and means for regulating the amount of air in the second tank.

3. The combination with a water service pipe, of a closed water tank having its interior in communication with the interior of the service pipe, an air tank submerged in the water of the first tank and connecting with the latter at its lower portion, a stand pipe terminating at one end outside of the water tank and at its other end within the air tank above the highest opening thereto and a cock to open and close the stand pipe.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 19th day of April, A. D. one thousand nine hundred and sixteen.

HOWARD H. YORK. [L. S.]

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."