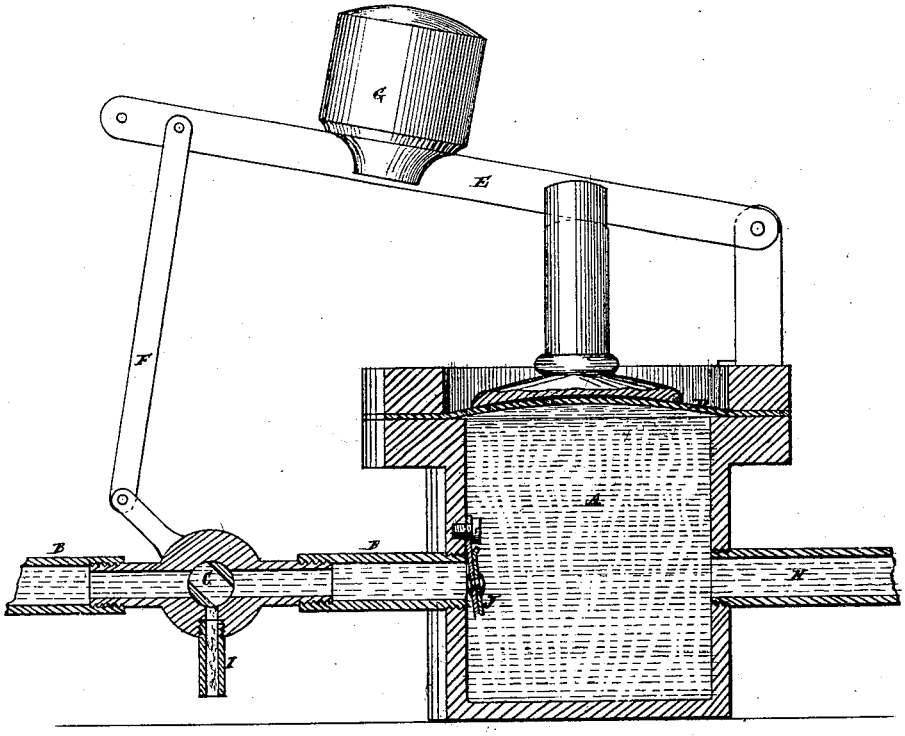
N. C. LOCK.

WATER PRESSURE REGULATOR.

No. 109,526. Patented Nov. 22, 1870.



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NATHANIEL C. LOCK, OF SALEM, MASSACHUSETTS.

Letters Patent No. 109,526, dated November 22, 1870.

IMPROVEMENT IN WATER-PRESSURE REGULATORS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, NATHANIEL C. LOCK, of Salem, in the county of Essex and State of Massachusetts, have invented a new and useful Water-pressure Regulator, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and which represents a sectional elevation of an apparatus constructed in accordance with my invention.

The object of my invention is to reduce the pressure in service or other pipes drawing their supply from mains below the pressure of the water in said mains, and so that such reduction will be permanent, although the same may be regulated to bear any fixed relation to the pressure in the main.

In all apparatus heretofore designed for this purpose no provision has been made to guard against the drawing off of the contents of service-pipes and other fittings about a house while the mains are being flooded or sluiced for clearing the sediment deposited in them, which operation is performed periodically by all water-supply companies, and which, at certain elevations, is as liable to damage such fittings, by collapsing them, as an excessive interior pressure would be by bursting them.

My apparatus consists in a receiver interposed between the main or supply-pipe and pipe or pipes in which it is required to establish a reduction of pressure, and fitting said receiver with a piston or diaphragm capable of yielding to the pressure of the water in the receiver, which piston or diaphragm being loaded to any reduced pressure required, is caused, on any tendency to excess of pressure taking place in the receiver, to close a cock or valve and shut off the supply from the main; or, on the pressure being reduced in the receiver, by draught on it below the load placed on its piston or diaphragm, then the latter operates automatically to open said cock and admit water to the receiver till the original pressure on it is restored.

This much of my apparatus has heretofore been known in various modified forms, and to guard against the possibility of collapsing the water-fittings of a house, or draining the water out of those portions exposed to fire, which would be thereby damaged when the mains are being drawn off, is the object of my invention, which consists in the arrangement of a check-valve within the receiver, so as to close and prevent the backward flow of the water therefrom, and from the pipes or other attachments supplied by it.

Referring to the accompanying drawing—

A represents the receiver, which may be a metal vessel, of any desired capacity.

B is the supply-pipe or pipes and intermediate connection, which serves to admit water to the receiver from the main or other source, under pressure, upon a cock, C, being opened for the purpose.

This cock is under the control of the pressure of the water in the receiver, by means of, for instance, a flexible diaphragm, D, of rubber or sheet-metal fitted over the top of said receiver, and having resting upon it a weighted lever, E, which is connected by a rod, F, with an arm or crank attached to the cock.

The weight G, on said lever, is made adjustable along it, to regulate the pressure under which the diaphragm D, in rising, is made to close the cock and shut off supply from the main.

A spring balance may be substituted for the weight.

The load thus thrown upon the movable diaphragm is fixed at any desired point below the pressure in the main, so that, however great the latter, the receiver is always kept supplied with water at a lower and uniform pressure, by the diaphragm rising and closing the cock whenever the pressure by influx of water increases, and by said diaphragm falling or collapsing and opening the cock to readmit water whenever, by draught on the receiver, the pressure in the latter is reduced below the point determined by the weight.

In this way water is supplied from the receiver by an outlet-pipe, H, to a boiler, or several pipes throughout a house, at a uniform pressure, which is below the pressure in the main.

To prevent the receiver becoming overcharged, by leakage, past the cock C when closed, I provide an outlet or waste-pipe, I, so arranged in relation to the cock that, on the pressure in the receiver being increased to raise the diaphragm D, the cock C will, in being turned by it, allow of a slight discharge through said waste-pipe, which thereby forms a safety-vent.

Arranged over the mouth of the supply-pipe B to the receiver, is a check-valve, J, made to freely admit water from the supply-pipe, but closing against egress thereof from the receiver back into the main, whereby the water in the receiver, and the attachments supplied by it, are prevented from being drained on the water being run off from the main; thus, in the case of a house-boiler supplied by the receiver, doing away with all danger of the boiler's collapsing.

I do not restrict my invention to the precise details here shown, as these may be variously modified without departing from the principle or characterizing features of the same.

What is here claimed, and desired to be secured by Letters Patent, is—

The arrangement of the check-valve J in the receiver A, with relation to the pipes B H, loaded movable diaphragm D, and valve or cock C, substantially as described.

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