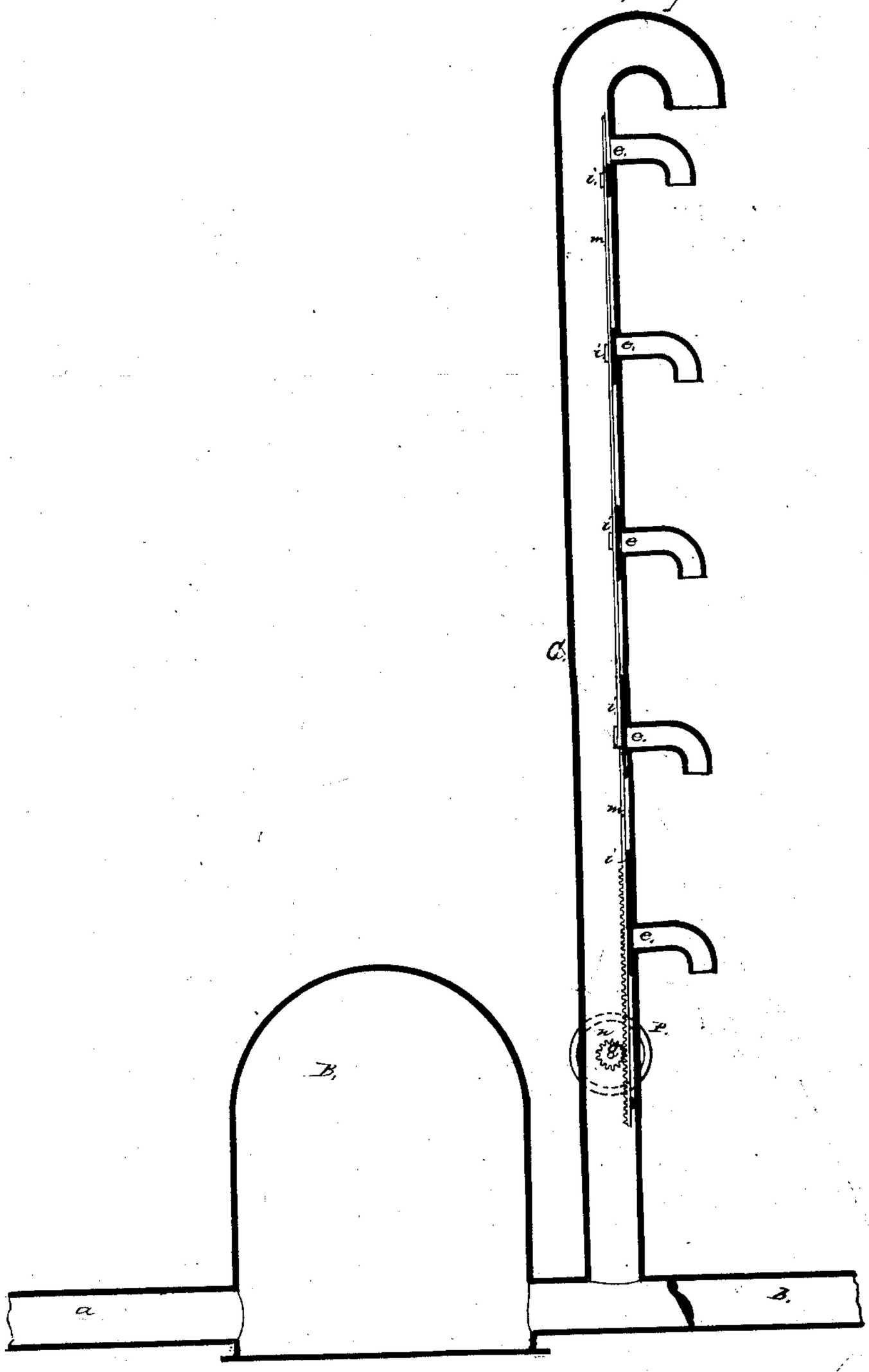
J. W. Middleton,

Water Main Regulator.

No. 11,675. Patented Sep. 12, 1854.



UNITED STATES PATENT OFFICE.

JOHN W. MIDDLETON, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR DISTRIBUTING FLUIDS.

Specification of Letters Patent No. 11,675, dated September 12, 1854.

To all whom it may concern:

Be it known that I, JOHN W. MIDDLETON, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Method of Regulating the Pressure and Supply of Water in a System of Pipes for the Supply of Houses and for the Purposes of Irrigation, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and which represents a vertical section of an air vessel, a vertical pressure-pipe with nozzles at different altitudes, and a section of the horizontal supply and discharge pipes with which they are connected.

It is well known that when water is drawn from cocks in the upper part of a building not much below the level of the head of the water which supplies the pipes, and the pipes are small as they usually are, that the water instead of running freely from the cocks in a steady stream will issue with great irregularity, at times barely trickling out of the cock, and then immediately after will run in an enlarged volume, equal to the full capacity of the cock, but if even the circulating pipes be sufficiently large within the house to supply the water in a steady stream, when several cocks are open at a time, still the service pipe which supplies water from the main pipe being small; whenever the aggregate volume of water discharged in a given time, from the cocks, exceeds that received during the same time from the service pipe into the circulating pipes, the discharge will be irregular as in the former case. It also happens that the sudden stoppage of several cocks at the same time, ruptures the pipes and floods the premises, unless the pipe be made unnecessarily strong for ordinary duty at a great increase of expense above what would be required to furnish a house with lighter pipes.

To obviate these difficulties is, among other things, the object of my invention, which is illustrated in one of its applications in the accompanying drawing in which a section of the service pipe *a* enters the lower part of an air chamber and water reservoir (B) of large capacity and which would usually be most conveniently placed in the cellar of a house. A pipe *b* leads from the opposite side of the bottom of the reservoir, for the distribution of the water through the building. At a short distance from the reservoir a vertical pressure gage pipe *c* is erected upon the distributing pipe *b;* this pipe is of such a height that whenever the pressure water shall run over its top the system of pipes with which it is connected are subjected to the maximum strain which they are capable of bearing, which will be greater in thick than in thin pipes, therefore the height of this gage pipe will have to be graduated to the strength of the circulating pipes. Any degree of pressure below the maximum may be produced by opening apertures (*e*) at various heights in the side of the pipe. These apertures are each fitted with a slide valve (*i*); these valves are all attached to a common rod (*m*), by sliding which up or down the apertures will be in succession opened and closed; this renders it necessary to make each succeeding valve from the top one, longer than the one immediately above it by the width of the aperture it is to close. The valve rod (*m*) has a rack attached to its lower extremity to which a pinion (*n*) on a horizontal spindle (*o*) is adapted; so that by turning a hand wheel (P) on the outer end of the spindle in one direction, the valves will be raised and by turning it in the opposite direction the valves will be depressed. This is one of the numerous ways in which a single adjusting apparatus is common to all the valves, but if preferred each aperture might have a valve that could be independently adjusted; or if it is deemed advisable that the waste water from the lower apertures might run into a vessel mounted on a lever connected by suitable devices with the valves so that the waste water itself would close all the valves in succession from the bottom to the top, in this way the waste water generates a power which acts automatically as the agent by which the valves are adjusted according to the pressure and height of the head. The reservoir being of large capacity when once charged the opening of several cocks in the pipes supplied from it would not appreciably lower its head until after some time had elapsed, and even then, by reason of the pressure of the compressed air in the top of the reservoir the discharge of the cocks will be regular. In this way a service pipe of a given size will supply more water than it could do without the reservoir, as small

pipes fill up almost the instant the cocks are shut, on account of the smallness of their capacity. But a reservoir of such large diameter would be in great danger of bursting by the ram so called which is produced by sudden stoppage of the currents of water, if the latter had no means of easy and rapid egress to undo the excess of pressure. The vertical pressure pipe supplies a means for the waste of the water to relieve the reservoir and the system of pipes generally from undue pressure by allowing water to escape through it. This gage pipe it is obvious is applicable to the regulation of the pressure of water, wherever pipes are used to distribute or apply it, and therefore I do not by any means intend to confine its application to the particular case, in connection with which I have described it.

The construction of every part of the apparatus may be varied to suit different circumstances and places and will of necessity have to be greatly varied to adapt them to the multifarious purposes and places to which they are obviously applicable.

What I claim as my invention and desire to secure by Letters Patent is—

1. The arrangement of a water reservoir and air vessel B between the service pipe *a* and the distributing cocks *e*, or near the latter substantially as herein set forth.

2. I also claim the vertical pipe *c*, water and pressure gage, substantiallly as herein set forth, to regulate the flow of fluids through pipes.

In testimony whereof, I have hereunto subscribed my name.

JOHN W. MIDDLETON.

Witnesses:
P. H. WATSON,
PETER HANNAY.