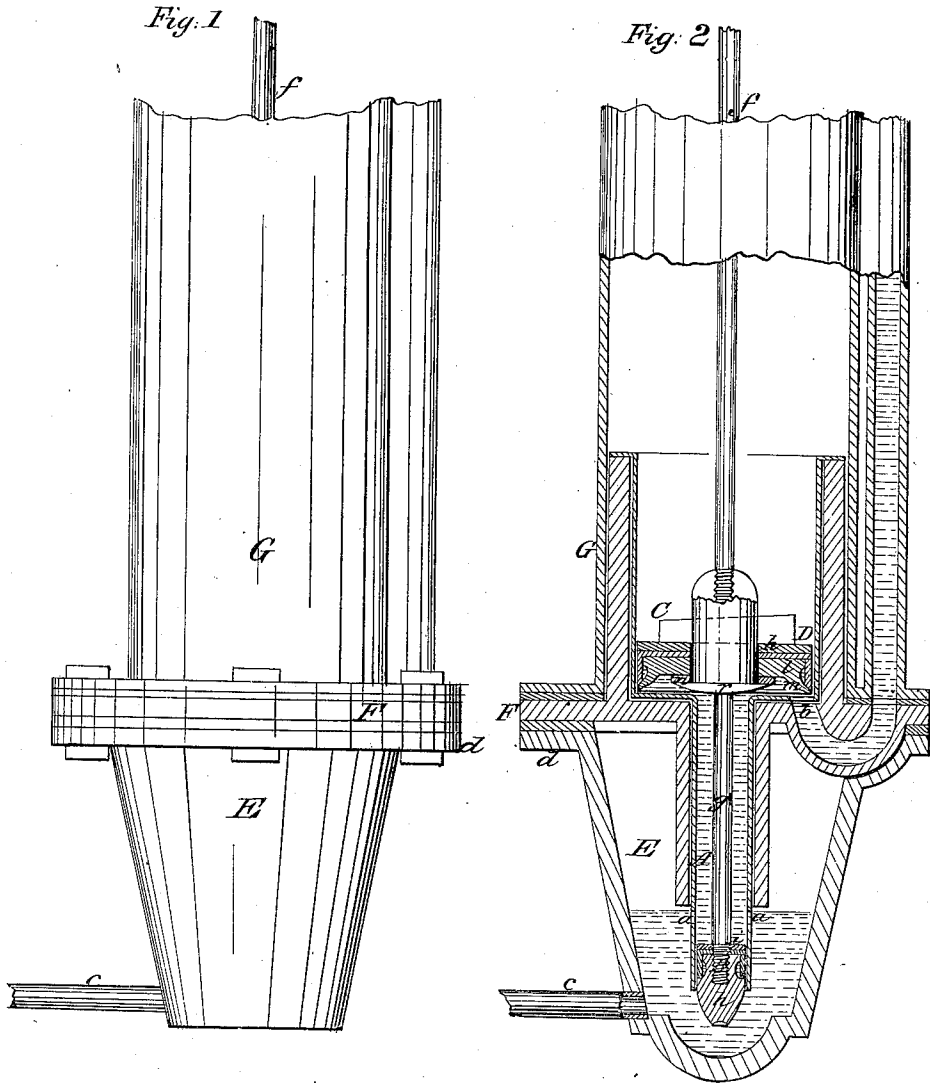


N. B. MARSH.
HYDRANT.

No. 25,660.

Patented Oct. 4, 1859.



Witnesses:
W. J. Adams
W. J. Fenwick

Inventor:
Nathan B. Marsh

UNITED STATES PATENT OFFICE.

NATHAN B. MARSH, OF CINCINNATI, OHIO.

HYDRANT.

Specification of Letters Patent No. 25,660, dated October 4, 1859.

To all whom it may concern:

Be it known that I, NATHAN B. MARSH, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Hydrants; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1, represents a side elevation of the hydrant, and Fig. 2, a vertical section thereof.

Similar letters of reference, in each of the several figures indicate corresponding parts.

Much ingenuity has been displayed in the construction of hydrants, and every day's experience attests the fact that room for improvement still exists.

So far as a principle of action is concerned or general arrangement of operative parts, it would be difficult to strike upon a new or at least improved path, and this my improvement has not that claim in view but bases its claim to novelty and utility on certain adjuncts or peculiarities of details and their construction, practice demonstrating the truth that in hydrants, as in some other things much, to secure efficacy, depends upon advantageous construction.

The hydrant represented in the accompanying drawings is of that class in which an upper large and lower small packed piston or plunger are used to work together in cylinders or valve chambers into which the water is made to enter by holes in the sides of the smaller cylinder, above and below which holes the small piston is made to play while the large piston has its action restricted to play on one side only or above the discharge outlet which may be in the bottom of the large cylinder—that is in open connection or constant water communication with the small cylinder. Those acquainted with hydrants will, from this brief description and inspection of the accompanying drawing, readily understand to what class of hydrants I refer and how the water entering by the inlets *a, a*, to the small cylinder A, when the plunger B, thereof is worked below said openings, fills said cylinder and is passed upward to the large cylinder C, within which the large plunger D, rises simultaneously with the rise of the small plunger over and above the inlets *a, a*, of its cylinder; and how the water is dis-

charged by an outlet *b* below the range of action of the large plunger, the two plungers descending and rising in unison, and the large plunger in rising tending to create a vacuum, and being of larger area than the under piston securing the return of water left in the discharge pipe S, at a high or exposed level where, if allowed to remain, it is liable to freeze and burst the pipe.

The better to elucidate my improvements on this class of hydrants, and certain peculiarities which I prefer in construction of the parts, I will now proceed to describe certain details, the foregoing being a sufficient reference to general action.

The pipe *c*, which conducts the water from the reservoir to the hydrant; I cause to connect with an air vessel E, at a point below the inlet openings *a, a*, to the small cylinder A, which is situated within said air vessel. The lower end of the small cylinder is also open to the water space in the air vessel. Said air vessel I make of conical or tapering form with a flange *d*, at its upper and larger end to establish its connection by cement and bolts with the stock F. This form is advantageous in point of manufacture as, dispensing with cores, it facilitates molding in forming the casting, and said form facilitates entry of the air vessel in its receiving space when setting up the hydrant, also serves to steady the structure. The air vessel E, forms an important adjunct to the upper cylinder C, and exercises many valuable functions in this class of hydrants. Thus it allows the leather of the lower plunger B, to enter the lower cylinder A, at its top when the water is closed by a cock in the induction pipe *c*; and, under such condition of stoppage of the induction pipe when continuing the descent of the small plunger, relief is given to the effort by the compression which takes place of the air in the air vessel. As water is practically incompressible, no such entry of a leather plunger nor descent of the latter could be made till the cock in the induction pipe was opened. To open this cock at a distant station precisely at the time the plunger was being passed into the cylinder is a nice operation, and requires two sets of hands, one at the cock in the induction pipe, and the other at the plunger. Leakage, or allowing water to run to waste, would facilitate such entry and descent of the plunger, but such are evils and, as far as practicable to be avoided. Repairs

frequently require the plunger to be removed. Nor is much relief afforded to the entry within its cylinder of a cupped leather plunger by the mere opening of the cock in the induction pipe, and in the descent of the plunger much resistance is felt, by reason of the plunger having to force backward the whole column of water under pressure in said pipe; and if dispensing with the air-vessel, this resistance is felt each time the small plunger descends till it passes the inlets in the sides of its cylinder: excessive wear of the leather packing is produced; and the exposed edges of the leather turned back and made to strike the upper end of the small cylinder in entering the plunger; and suddenly closing the cock in the induction pipe occasions injurious concussions. Nor is the advantage of such a vessel trifling as a receptacle for water in case of leakage of the operative parts. Arranged as described and operating in connection with the upper valve chamber or cylinder C, it forms an important adjunct to said cylinder and eases the action of the large plunger therein by the communication which is established between the two by the opening at the top of and side inlets near the bottom of the small cylinder.

The stock F, may be surrounded by an upper shell G, and the cylinder or valve chambers A and C, I form of a thin independent lining of tin or other suitable smooth sheet metal, corresponding in shape to the interior of the stock. By thus constructing the cylinders, all turning or boring of them may be avoided, a certain amount of flexibility or softness is obtained and the two cylinders may readily be formed in one piece which is better, where the two plungers work together, than forming the cylinders separate.

The devices for operating the hydrant may be of any suitable kind, an upper projecting rod *f*, serving to establish the connection, and a lower rod *g*, answering to connect the two plungers B, and D.

The cupped leather of the small plunger is held by means of a conical nut *h*, to secure an easy entry of the plunger in fitting it into its cylinder. This nut is so formed as that it not only becomes a guide to the plunger in its play in the cylinder, but is so shaped at its inner end or base as that while it securely holds the leather in its cupped

form against a back disk *i*, it also protects the exposed or bottom edges of the leather against damage or wear and leaves an open space within the leather cup for water to enter and act on the inside of the leather to secure an easy but tight and effective packing.

The upper plunger D, is thus formed: Its cupped leather which is also backed by a disk *k*, is held on the inside face and upper portion of its inside circumference by a plate *l*, having a lower rim *m*, which is brought to a sharp edge or thereabout at its bottom where it projects in diameter to form a guide to the piston and to protect the lower exposed edge of the leather. The bottom edge of the leather is also beveled on the inside to lap on the beveled projecting rim *m*, and the plate *l*, with its rim *m*, is grooved to receive water to act on the inside of the leather. This construction of packing, or form of packed plunger, secures a tight but easy and durable fit, and to give increased softness and elasticity to it, I cause the plate *l*, to be backed or supported on both faces by leather or its equivalent, to wit: by the leather cup on the one face, and by a leather washer *n*, on the other face, said leather washer *n*, resting below on a valve or stop disk *r*, which, in closing the top end of the small cylinder, or striking it suddenly, breaks shock or jar and lessens the risk of damage to the upper plunger or its packing.

While not claiming the mere use of an air vessel to a hydrant, what I claim as my invention and desire to secure by Letters Patent, is—

The arrangement, in connection with the main casing G, discharge pipe S, and air chamber E, of a hydrant, of the upper and lower plunger or valve chambers A, C, made in one piece F, upper plunger or valve D, when composed of parts *l*, *m*, *n*, *r*, and lower conical guide and stop, plunger, composed of parts B, *h*, *i*, the whole being constructed, arranged and used together in the manner and for the purpose herein described.

NATHAN B. MARSH.

Witnesses:

C. W. AUGUST,
DAVID FISHER.