(No Model.) 2 Sheets—Sheet 1.

J. DOWLING & J. LEE, Jr.

SELF CLOSING HYDRANT.

No. 330,776. Patented Nov. 17, 1885.

Fig. 3.

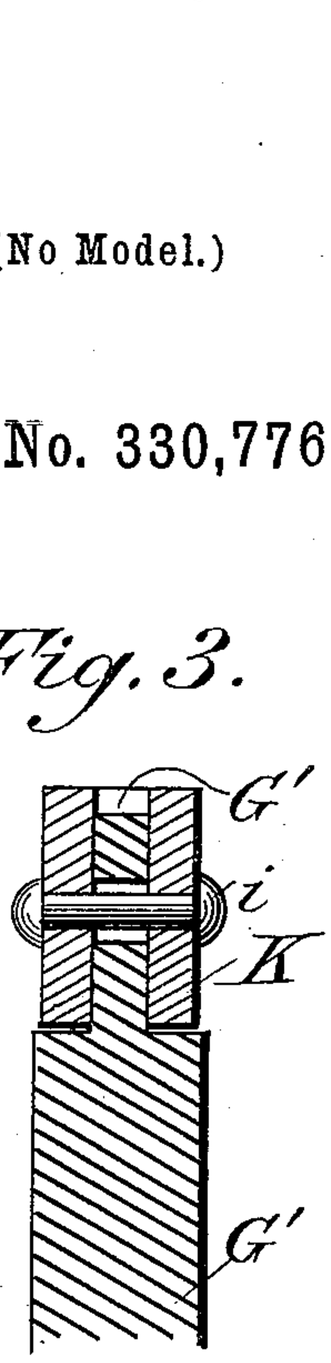
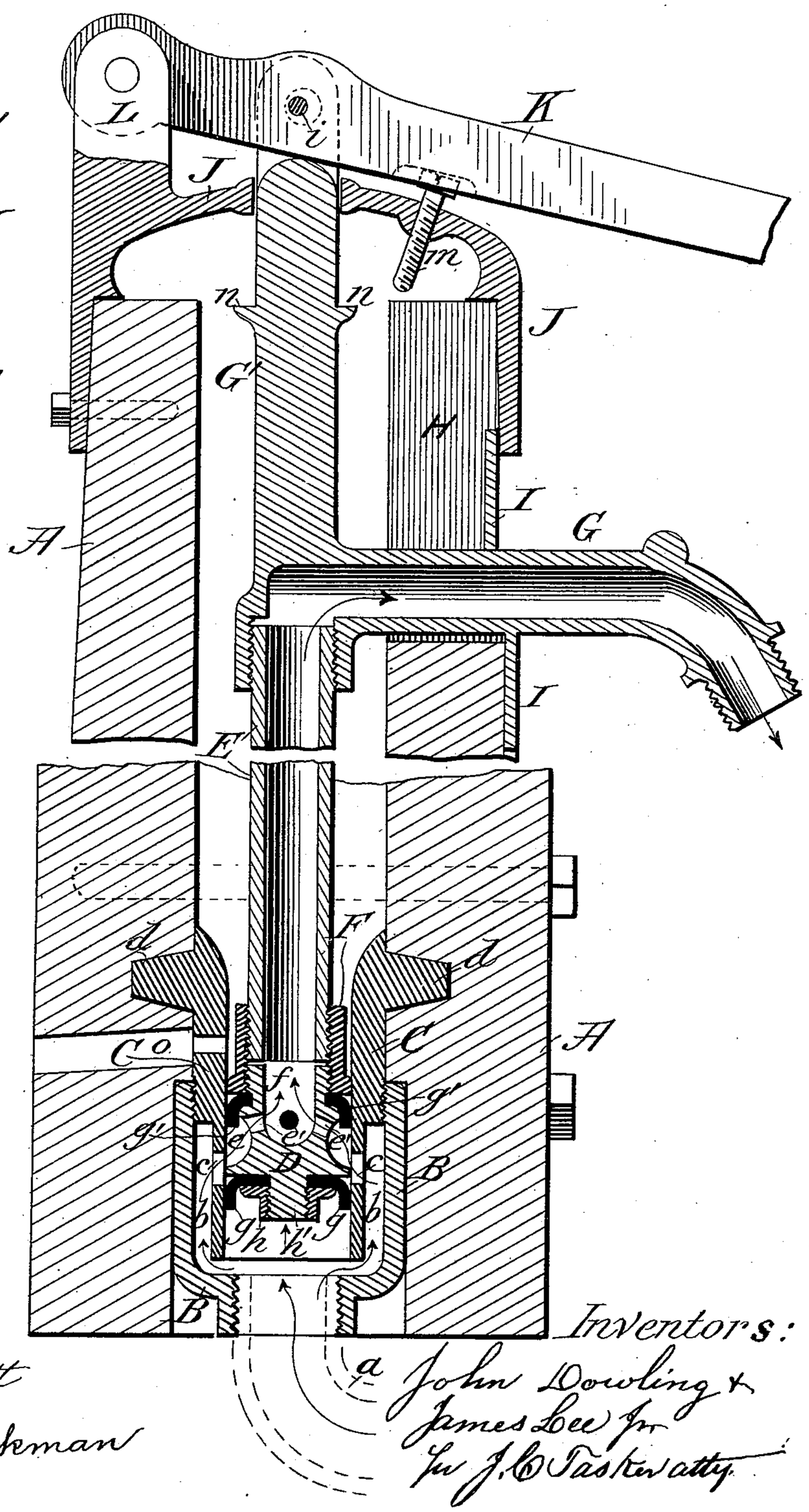


Fig. 1.



Attest:

F. H. Schott

C. J. Stockman

Inventors:

John Dowling &
James Lee Jr.
by J. B. Taskerwatty.

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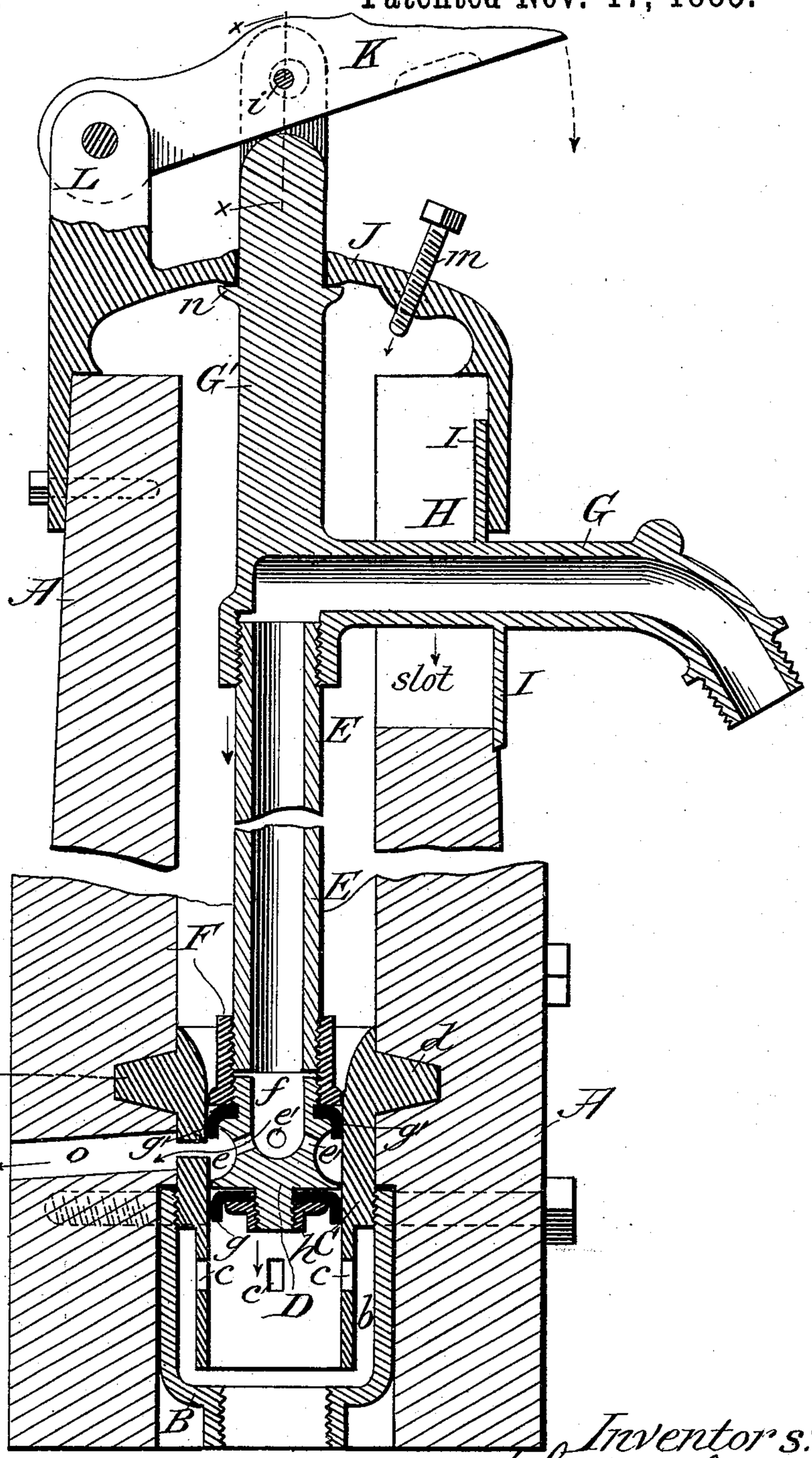

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN DOWLING AND JAMES LEE, JR., OF PLYMOUTH, PENNSYLVANIA.

SELF-CLOSING HYDRANT.

SPECIFICATION forming part of Letters Patent No. 330,776, dated November 17, 1885.

Application filed August 18, 1885. Serial No. 174,707. (No model.)

To all whom it may concern:

Be it known that we, JOHN DOWLING and JAMES LEE, Jr., citizens of the United States, residing at Plymouth, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Self-closing Hydrants; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in that class of hydrants employed to furnish water for domestic and other uses, in connection with the ordinary supply of cities or other places where the system of water-distribution is under pressure. A difficulty has been heretofore experienced in the construction and operation of these hydrants, owing to the necessity of employing a spring, screw, or some other equivalent mechanical device to shut off the water after its flow was no longer required. If these devices were intended to act automatically, a spring was usually employed, acting against the pressure of the water to close the valve. This spring, however, by constant use would lose its elasticity and fail to perfectly close the valve, thus resulting in a leaky hydrant; or the spring would get broken, causing the flow of water to be constant until a new spring was supplied, or other means taken to stop the flow. When the screw or equivalent means are employed to effect the closing of the valve, it is frequently left open, through carelessness, thereby entailing a waste of water, and it soon wears out through the constant use to which a device of this kind is subject.

The object of our invention is to obviate these difficulties by constructing the operative parts of the hydrant in such a manner that the automatic closing of the valve is produced by the pressure of the water in the mains without the intervention of springs or other equivalent devices, thus simplifying the construction, reducing the cost of repairs, and rendering the apparatus certain in its action; and the invention consists in the construction and arrangement of the several parts of the valve and the devices by which it is operated, as will be hereinafter fully set forth.

In the accompanying drawing, Figure 1 is a vertical longitudinal section through the stock and the operative devices, showing the parts in the position they occupy when the valve is open and water flowing from the hydrant. Fig. 2 is a vertical section showing the valve closed. Fig. 3 is a detail view showing the connection of the operating-lever with the stem of the discharge-pipe.

The stock A is preferably of wood, as it is cheaper than metal and forms a better non-conducting jacket for the discharge-pipe, consequently reducing the chance of injury to the operative parts of the apparatus by frost; although it will be understood that a metal stock may be substituted for the wooden one, if desired, without departing from the spirit of our invention. Into the lower end of this stock comes a service-pipe, *a*, to which is connected, by a screw or other suitable joint, the thimble B. This thimble is enlarged above the point of its connection with the service-pipe, and provided at its upper end with an internal screw-thread, which receives a similar thread formed upon the hollow cylinder C. This cylinder forms the working-barrel, within which is placed the piston-valve D. That portion of the cylinder beneath its junction with the thimble is of less diameter than the internal diameter of the thimble, thus leaving a channel, *b*, between them, which opens freely at its lower end to the service-pipe, thus allowing a circulation of water both inside and out of the lower end of the cylinder. A series of openings, *c c*, are made through this part of the cylinder, and serve to admit water through the valve D to the discharge-pipe E when the valve is brought into a proper position.

When the stock is of wood, it becomes necessary to provide the cylinder with some means by which it can be secured in its proper position in the stock and firmly retained therein. This we accomplish by providing the upper end of the cylinder with a series of tapering radial projections, *d d*, which enter suitably-formed mortises in the stock, and, in connection with the screw-bolts which keep the two halves of the stock together, hold the cyl-

inder, with its attached thimble B, securely in position. The piston-valve D is provided with a peripheral groove, *e*, which encircles it and is connected with the chamber *f*, formed in the middle of the valve by a series of holes, *e'*. An elastic cup-washer, *g*, is secured to the lower end of the valve by a flanged nut, *h*, which screws on a stud, *h'*, projecting from the lower side of the valve. Above the peripheral groove *e* is secured another cup-washer, *g'*. This washer is held in place by the coupling E, which is provided with a flange at its lower end, that, when the coupling is screwed down upon the upper end of the valve, bears upon the washer *g'* and retains it firmly in position. Into the upper end of this coupling is screwed the lower end of the discharge-pipe E, which also forms a part of the connection between the operating-lever and the valve.

It will be observed that when the valve is in the position shown in Fig. 1 the water following the course of the arrows passes from the service-pipe *a* into the channel *v*, surrounding the cylinder; thence through the openings *c c* in the same into the peripheral grooves *e* of the valve, and from this groove through the openings *e' e'* into the chamber *f*, and thence upward through the discharge-pipe E to the nozzle G, which screws on the top of the discharge-pipe and passes out through the mortise or slot H in the side of the stock. A flange, I, is formed upon the nozzle, and serves to close the slot H on the outside, as well as to hold the nozzle in place, as the lower part of the flange is upon the outside of the stock, while the upper part passes under the downwardly-projecting rim of the cap J, which covers and is secured, by bolts or otherwise, to the top of the stock, thus preventing any lateral movement of the nozzle or discharge-pipe, but allowing a free vertical motion within certain limits. A vertical extension, G', of the nozzle passes upward through an orifice in the cap J, which orifice serves also as a guide for the same, and has formed upon its upper end a tenon which enters a mortise in the operating-lever K, and is secured therein by a pin, *i'*, which passes horizontally through the lever and an enlarged orifice formed in the tenon. By this means the lateral movement of the pin *i'*, as the lever is raised and lowered, is not imparted to the extension G', and consequently does not affect the true vertical movement of the same, together with the discharge-pipe E. One end of the lever K is pivoted to the lug L, which projects upward from one side of the cap and forms a part of the same. Diametrically opposite this lug is placed an adjusting-screw, *m*, by means of which the downward movement of the lever K is limited, its upward movement, together with that of the discharge-pipe and its connections, being governed by the collar *n*, formed upon the nozzle-extension G', which, when the said extension reaches a certain predetermined height, strikes the under side of the cap J, which prevents any further upward movement.

As heretofore described, the movable parts have been in the position shown in Fig. 1— that is, with the valve open and water issuing from the nozzle. In order to retain the parts in this position, sufficient pressure must be exerted upon the lever K to overcome that of the water in the service-pipe upon the under side of the valve. When the pressure upon the lever is removed, the valve rises automatically from the pressure beneath it until the projection *n* strikes the under side of the cap J. The parts are then in the position shown in Fig. 2. The valve having risen above the openings *c c* in the cylinder, of course no water can enter the discharge-pipe through the same; but this movement of the valve brings the peripheral groove *e* of the valve in connection with the waste-opening *o*, through the side of the cylinder and stock; consequently all the water which may have been retained in the discharge-pipe will pass out through this waste-opening, thus preventing all danger from freezing during cold weather.

The construction of the apparatus having been described, its operation would be apparent to those skilled in the art; but to make it perfectly clear we will recapitulate and explain its operation.

By referring to Fig. 2 of the drawings it will be noticed that the valve D is above the inlet-openings in the cylinder, and that the hand-lever K is thrown upward, thus showing the valve closed, but the waste *o* open. It will be apparent that when the parts are in this position and it is desired to open the valve a downward pressure upon the lever will cause the valve to descend, first closing the waste-opening, and then bringing the inlet-passages *c c* of the cylinder into communication with the openings *e' e'* in the valve, thereby allowing the water to pass freely from the service-pipe *a* to the discharge-pipe. On releasing the lever K the reserve pressure below the valve acts to close the same, this result being attained without the aid of springs or other actuating devices, but simply by the force of the water.

If it should be desired that the hydrant remain open for a length of time—as in supplying water for sprinkling—it is accomplished by turning down the adjusting-screw *m*, so as to allow a greater downward movement to the hand-lever, and consequently of the valve, thus enlarging the space in the elongated inlet-openings *c c* for the passage of water until its flow is so free as to relieve the pressure below the valve and increase it above until it is so nearly equalized that the weight of the hand-lever and its attachments shall be sufficient to retain the valve in position.

When an iron stock is used in place of the wooden one hereinbefore described, it is provided with internally-threaded chambers near its lower end to receive the thimble and cylinder, which have corresponding screw-threads

formed upon their outer sides, and are retained in their proper position in the stock by simply screwing them into place.

Having thus described our invention, we claim as new and desire to secure by Letters Patent the following:

1. In a hydrant, the combination of the stock A, cap J, provided with adjustable set-screw *m* and projection L, lever K, pivoted into said projection, spout G, having extension G′, fashioned with lugs *n*, passing through a perforation in cap J and secured pivotally to the lever K, the pipe E, and the valve D, all constructed, arranged, and operating substantially as shown and described.

2. As an improvement in hydrants, the automatically-closing valve herein described, in combination with devices consisting of a hand-lever and adjusting-screw adapted to so regulate the valve as to relieve it of all or any desired portion of the closing-pressure and remain stationary, as hereinbefore specified.

3. In a hydrant, the nozzle G, having extension G′, provided with projection *n*, in combination with the hand-lever K, cap J, and adjusting-screw *m*, all arranged and operating as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN DOWLING.
JAMES LEE, JR.

Witnesses:
TERANCE HORA,
THOMAS O'KEEFFE.