D. F. LUSE.
Hydrant.

No. 235,790. Patented Dec. 21, 1880.

Fig. 1.

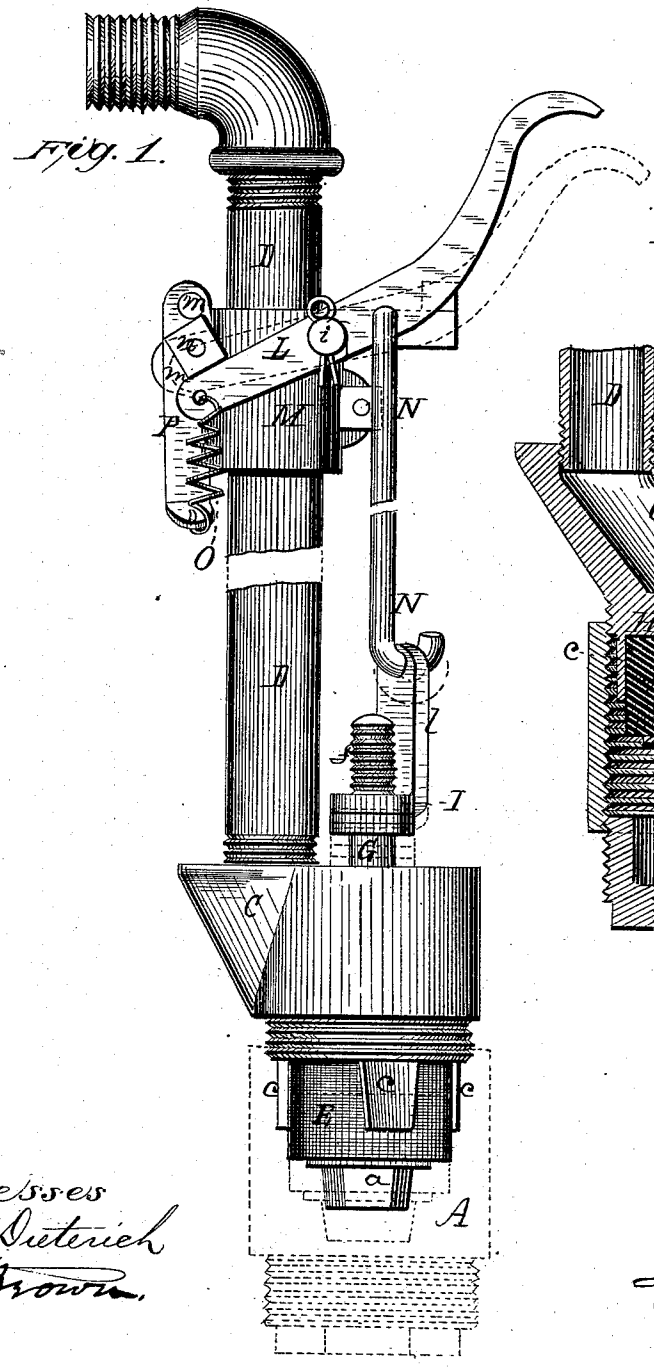
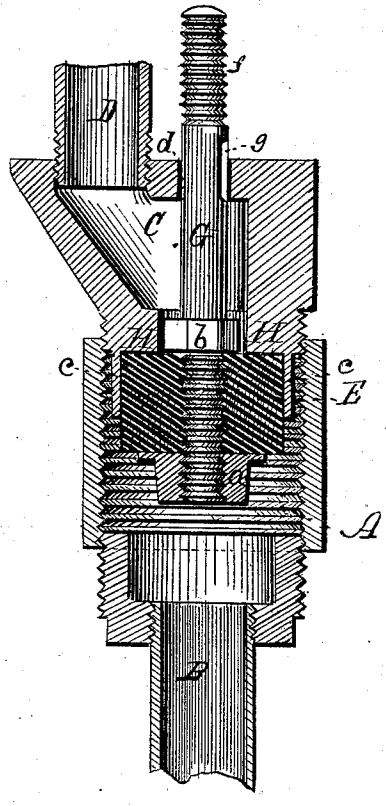


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

DANIEL F. LUSE, OF CENTRE HALL, PENNSYLVANIA.

HYDRANT.

SPECIFICATION forming part of Letters Patent No. 235,790, dated December 21, 1880.

Application filed July 26, 1879.

To all whom it may concern:

Be it known that I, DANIEL F. LUSE, of Centre Hall, in the county of Centre and State of Pennsylvania, have invented an Improved Hydrant; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a side view of the hydrant; Fig. 2, a central vertical section of the main part of the hydrant.

Like letters designate corresponding parts in both figures.

The main feature of my invention consists in a hydrant-valve formed of a thick cylinder or block of india-rubber or equivalent compressible or yielding elastic material, constructed to fit against a flat valve-seat, the thickness of the block being sufficient to produce the requisite compression or yielding and adaptation to the surface of the valve-seat to produce a perfectly-tight joint, while it possesses sufficient firmness and rigidity to resist any pressure to which it may be subjected.

I have found by experiment and trial that while a mere elastic packing or gasket, even when of considerable thickness, upon a metallic or unyielding body, will not answer to make a perfectly-tight packing that will endure and continue to adapt itself to the valve-seat, yet that a thick block of india-rubber composing the whole or the main part of the valve-body will, by its full extent of compressibility and yielding, adapt itself to the valve-seat, equalize its pressure thereon, and retain its firmness and form for a great length of time, even in hydrants subject to continual and frequent use, as in large cities. The thickness or depth of this valve-block may, of course, vary, and I do not intend to confine myself to any exact limits in its dimensions; but I find that an inch in thickness, or thereabout, is preferable. With such a thickness the valve will retain its form and firmness for an unlimited time. Instead of india-rubber, sole-leather in several thicknesses, or any other substance of similar qualities, may be used; but I prefer india-rubber. The block may be of cylindrical, polygonal, or any other convenient form. This valve is intended to close against and not into a valve-seat, so that it may have a lateral self-adapting movement. Yet the valve-seat may vary somewhat from a plane form, either concavely or convexly, and still have the valve close against it. By thus shutting against a flat face, and not wedging into a seat, the valve of india-rubber becomes practicable and capable of exercising its superior elastic qualities, so that it will shut tightly against the valve-seat even when gravel of considerable size intervenes or the valve-seat is quite irregular from wearing away, while the indentations of the valve itself thereby do not materially injure the same, and it does not wear unevenly. It therefore does not get out of order, even under long and often repeated use, whereas an india-rubber valve fitting into a seat and subjected to pressure therein is entirely impracticable, because it wedges powerfully into its seat, as I have proved by repeated experiment and trial.

The accompanying drawings represent this and my other improvements applied to a hydrant which closes the valve by the upward pressure of the water.

A represents the valve-chamber connected with the service-pipe B, and C the exhaust or overflow chamber connected with the delivery-pipe D.

The valve E is formed of a thick block of india-rubber or equivalent compressible or yielding material, and it is secured upon the lower end of the stem G by nuts *a* and *b* at the bottom and top thereof, or by any equivalent and suitable means, so that the whole body of the block is free to yield and adapt itself to the valve-seat H, against which it closes upward. The valve is kept in its proper position by suitable guides in the valve-chamber, so as to allow a free passage around the valve and not interfere with the flow of the water. As an improved construction, I cast downward projections *c c* on the exhaust-box outside of or around the valve-seat, to serve as such guides, between which the valve loosely or freely moves.

The valve-stem G extends straight upward through the exhaust or overflow chamber C, and through an opening, *d*, in the top of the case thereof, and it terminates with a screw-

thread, *f*, a little above the case or box, to receive a nut, I, adjustable in position thereon. Under this nut a packing of india-rubber or other suitable material is applied to close down upon the top of the case as a seat and shut the opening *d* therein water-tight when the valve is opened, but to allow the water in the delivery-pipe to escape and prevent freezing as soon as the valve is again closed. This aperture *d* is made a little larger than the valve-stem, so that there may be no wear or friction of the parts in the use of the hydrant; but to insure sufficient space around the valve-stem to empty the delivery-pipe quickly, especially in freezing weather, I form a cut or passage, *g*, in the side of the valve-stem, which opens a space in the aperture *d* when the valve is closed, but may not when the valve is opened. The valve is operated by a lever, L, as shown in the drawings, or by any other suitable and desired means.

With the lever device as herein represented I have some features of improvement. I mount the lever on a pivot, *i*, which is cast or formed on one part of a divided collar, M, which is clamped by screws around the delivery-pipe D. This lever is connected with the valve-stem by a connecting-rod, N, which I connect with the said valve-stem in a peculiar manner, as represented. I form an ear or upward projection, *l*, on one side of the nut I and hook the connecting-rod into it. By this means not only is the proper connection formed between the connecting-rod and the valve-stem, but the connecting-rod serves as a nut-lock to prevent the turning and displacement of the nut, and enables me to adjust the packing under the nut in relation to the seat below by first disconnecting the connecting-rod from the lever or with the lever from its mounting, then turning the nut till the adjustment is effected, and then again mounting the lever or connecting the connecting-rod therewith. Thus, if the pressure of water in the hydrant is great, the nut and packing may be adjusted downward, so as to make the movement of the valve comparatively small; or if the pressure of water in the hydrant is light, then a greater movement of the valve is desirable to adjust the flow of water thereto.

A suitable counter-spring, O, is connected with the lever L, to counterbalance its handle, the connecting-rod N, and the valve and its stem. I provide a simple and convenient means of adjusting the force of this spring. Its lower end is connected with a strip, P, which is provided with a slot or number of holes, *m m*, to mount it on the bolt *n*, by which the collar M at one side is secured on the delivery-pipe. By this means the strip itself is adjusted up or down, and consequently the spring varied in its tension and force.

I disclaim a valve of india-rubber the periphery of which shuts into a valve-seat of corresponding form, such valves being entirely inoperative under pressure on account of the close wedging thereof into its seat. I also disclaim a solid india-rubber valve playing to and from the valve-seat freely upon a valve stem or guide, the material (india-rubber) performing no special function in such a construction.

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

1. A hydrant-valve composed, essentially, of a cylinder or block of india-rubber, or equivalent yielding elastic material, attached to the valve-stem, and having a flat end or face abutting against, but not entering, a flat valve-seat, substantially as and for the purpose herein specified.

2. The valve-guides *c c*, projecting from the exhaust-box, in combination with the valve E, substantially as and for the purpose herein specified.

3. In a hydrant, a valve-stem having a cut or passage in one side, where it passes through the upper wall of the case, in combination with the exhaust-chamber C, substantially as and for the purpose herein specified.

4. The combination of the adjustable nut I, holding the packing on the valve-stem G, lever L, and the connecting-rod N, substantially as and for the purpose herein specified.

5. The lever L, mounted on the delivery-pipe D by means of a clamp-collar, M, bearing the lever-pivot *i*, and adjusting-strip P, substantially as and for the purpose herein specified.

6. The adjusting-strip P, in combination with the spring O on the lever L, substantially as and for the purpose herein specified.

The foregoing specification signed by me this 15th day of July, 1879.

D. F. LUSE.

Witnesses:
PETER HOFFER,
FRED KURTZ.