(No Model.)

L. W. PUFFER.

DRAFT VALVE WITH RELIEF ATTACHMENT FOR FOUNTAINS OR OTHER VESSELS UNDER PRESSURE.

No. 308,576. Patented Nov. 25, 1884.

Fig. 1.

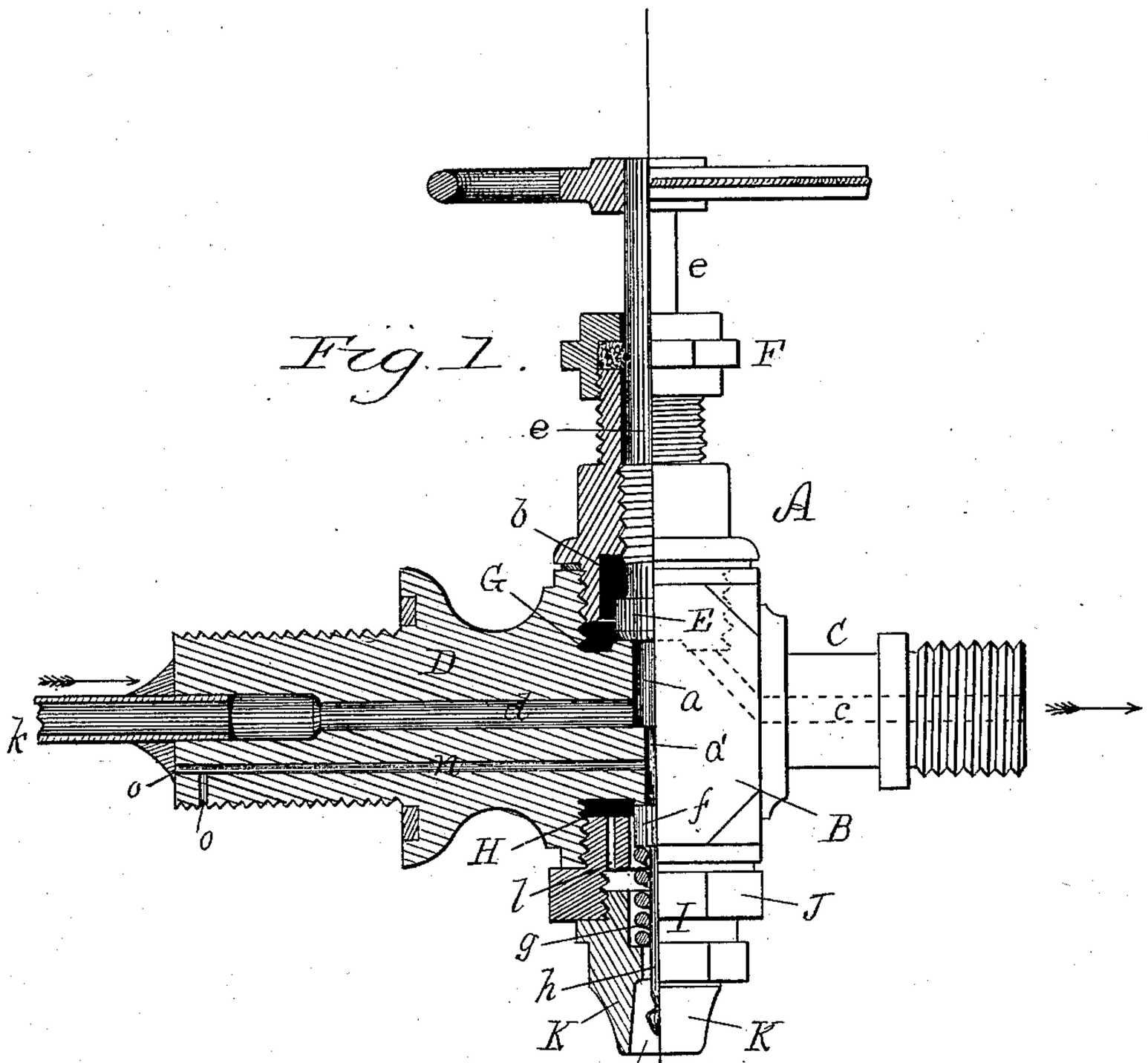
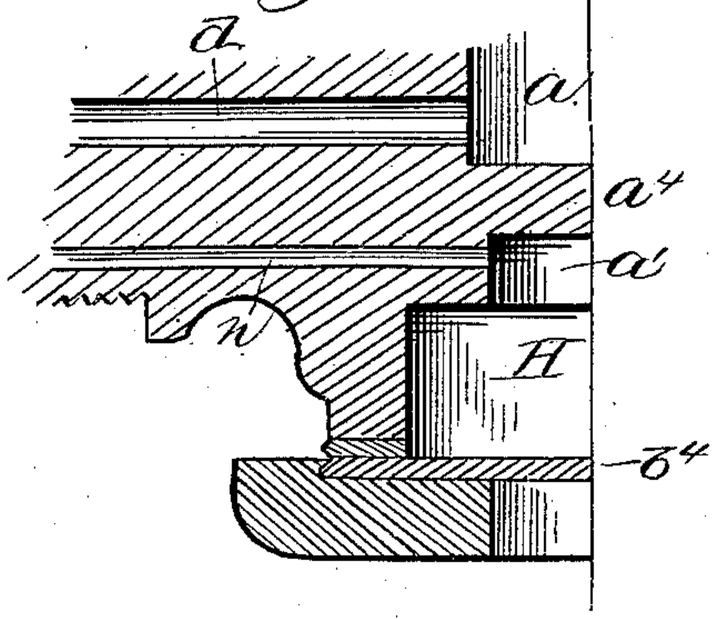


Fig. 2.



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UNITED STATES PATENT OFFICE.

LUTHER WINTHROP PUFFER, OF MEDFORD, MASSACHUSETTS.

DRAFT-VALVE WITH RELIEF ATTACHMENT FOR FOUNTAINS OR OTHER VESSELS UNDER PRESSURE.

SPECIFICATION forming part of Letters Patent No. 308,576, dated November 25, 1884.

Application filed March 3, 1884. (No model.)

To all whom it may concern:

Be it known that I, LUTHER WINTHROP PUFFER, a citizen of the United States, residing at Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Draft-Valves with Relief Attachments for Fountains or other Vessels Under Pressure; and I do hereby 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 letters or figures of reference marked thereon, which form a part of this specification.

Hitherto it has been customary to supply vessels to which this invention is to be especially adapted with ordinary draft fountain valves or cocks; but it is obvious that this combination-valve embodied in this invention can readily be attached to any vessel or structure under pressure. Now, it will be readily understood that fountains or receivers for aerated waters are always charged under a very heavy pressure, and there are no means for ascertaining whether said pressure has been increased, which frequently happens from various external causes, after being so charged, to a dangerous degree. It is for this reason that I have formed a combination-valve which will not only effect the opening or closing of the port to supply the draft-fountain, but will act also as a relief or safety gage to permit of escape of either gas or water to produce a diminution of the pressure, when the latter exceeds a certain amount, and thereby confine it within the bounds of safety.

In the drawings accompanying this specification, Figure 1 represents a sectional elevation of a combination-valve embodying my invention, and Fig. 2 represents a vertical sectional detail view of a part of said valve, illustrating a modification adapted to allow escape of gas only through the relief-outlet, and embodying the substitution of a brittle plate for the relief-valve.

In these drawings, A represents the valve as an entirety and to be permanently attached to any vessel under pressure. In this case I will suppose a fountain or receiver. The body is shown at B, and contains a central opening or bore, *a a'*, extending through it. This body is prolonged into two short cylindrical screw-threaded arms, C D, the male screw on D uniting with a female screw turned upon the bung of a soda-fountain, and the whole adapted to become a fixture thereof. The portion D is centrally perforated with an opening, *d*, leading into the central bore, *a*. Similarly C is peripherally screw-threaded to be united to the draft-fountain. The bore *a* leads into the chamber *b* in the upper portion of the body B, which is further provided with a circular opening, G, the latter being adapted to receive an ordinary valve, E, and valve-rod *e*, and furnished with the usual stuffing-box, F. This valve serves to maintain the bore *a* closed against the pressure from the charged vessel, to which the valve A may be united, except when a supply is required for the draft-fountain. When it is so desired the valve is raised from its seat and the aerated liquid under pressure passes in the direction of the arrow, as shown, through the bore *d* into *a*, thence upward around the valve E, to the chamber *b*, whence it passes into the bore *c* in C, onward into the vessel to be supplied. I have previously mentioned the opening G, formed upon the upper portion of the body B of the valve A. Similarly I have provided a corresponding opening, H, to receive a relief or safety valve, I, adapted to maintain the bore *a'* closed at its lower end so long as the pressure in the vessel charged does not exceed a certain fixed amount previously ascertained as being within the bounds of safety. As I before premised, these vessels are charged under a high pressure and in a cool place; hence, if taken out and exposed to a warmer temperature, as often occurs in transportation, the pressure is increased very much, and heretofore there has been nothing to indicate what pressure existed within, instances occurring in which the pressure after charging was so increased as to burst the vessel. I have therefore formed a compound valve, one portion of which acts as a supply, and the other a safety or relief valve, and by this means no matter where the vessel may be placed, it is always secured against an excessive increase of pressure. This relief-valve I is composed of a short cylindrical rod, *f*, actuated by the coiled spring *g*, which is retained in place by the rod *h*. This

rod plays loosely in the piece J, which screws into and is attached to the body B. Furthermore, to set up the spring to any desired pressure against the valve I upon the lower relief-opening, *a'*, I have attached the secondary adjustable piece, K, which screws into J.

The operation of this relief-valve is twofold, viz., to relieve the pressure by either discharging water or gas, as may be desired and provided for, as herein shown, according as constructed.

When it is desired to relieve the pressure by discharging water, I have arranged the flow as follows: It being understood that the valve E is closed and the pipe *k* extends, as usual in fountains or receivers, to which this device is in this case supposed to be applied, almost to the bottom, and the end is always submerged in water, hence when the pressure within becomes excessive the water is forced into the pipe *k*, passes through *d* and bore *a'* downward, the valve E preventing its escape upward, and then exerts its undue force against *f*, compressing the spring *g*, which yields, and *f* moving down allows the escape of water into the chamber H, and by means of the holes *l l*, &c., down and round the spring *g*, out through the orifice *m* in K, whence it runs to waste until the excessive pressure is overcome, when the spring *g* exerts its normal function, the valve closes, and water ceases to flow.

In case it is desired to reduce the pressure by discharging gas, the orifice *a'* is separated from *a*, as shown in Fig. 2, by not boring through the metal and uniting the passages *a a'*, but leaving an intervening wall or partition, a^4. By this means the water-passage *d a* is entirely separate from the gas-passage, which lies contiguous thereto, as shown at *n*. The outlet-orifice of the latter leads into the passage *a'*, while its inlet-orifices *o o*, being at the top of the vessel, are always surrounded by gas and permit only the latter to escape. Thus when the pressure from within becomes from any cause excessive beyond the usual normal charge, the same action is exerted by the gas upon the valve *f*, and shown above as accomplished by the water, to permit the escape of gas through H, *l*, and *m* to the exterior of the vessel. This relief-valve may be essentially varied from the one herein described, and a thin plate or diaphragm, b^4, (shown in Fig. 2,) substituted therefor, capable of supporting the requisite normal pressure, but will break if subjected to any higher. This I consider a mechanical equivalent, as the same object of my combination-valve will be accomplished—viz., a relief-valve for reducing any undue pressure arising from external causes, combined with an ordinary stop-valve—and this without effecting any change in the general construction. The lower extremity of the pin *h* attached to the valve *f* is formed with a neck, as shown, and capable of operation by an attendant, if desired—that is, the neck may be grasped by a proper tool and the valve *f* released from its seat in order to ascertain whether the valve is open and free to relieve any undue pressure or is obstructed. In the latter case the obstruction, of whatsoever nature, may readily be removed.

The subject-matter illustrated in Fig. 2—*i. e.*, the construction for allowing the exit of gas only through the relief-opening, and also the substitution of a thin brittle plate for a relief-valve—will form the subject-matter of a separate application.

I claim—

The valve-body B, provided with a limb, D, which contains the independent inlet-passages for gas and water, and the limb C, containing the main outlet-passage, in combination with the main outlet E, arranged at the top of said body, and controlling communication between the said inlet and outlet passages, and the supplemental automatic valve *f*, which normally closes an outlet-valve at the bottom of said body, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LUTHER WINTHROP PUFFER.

Witnesses:
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