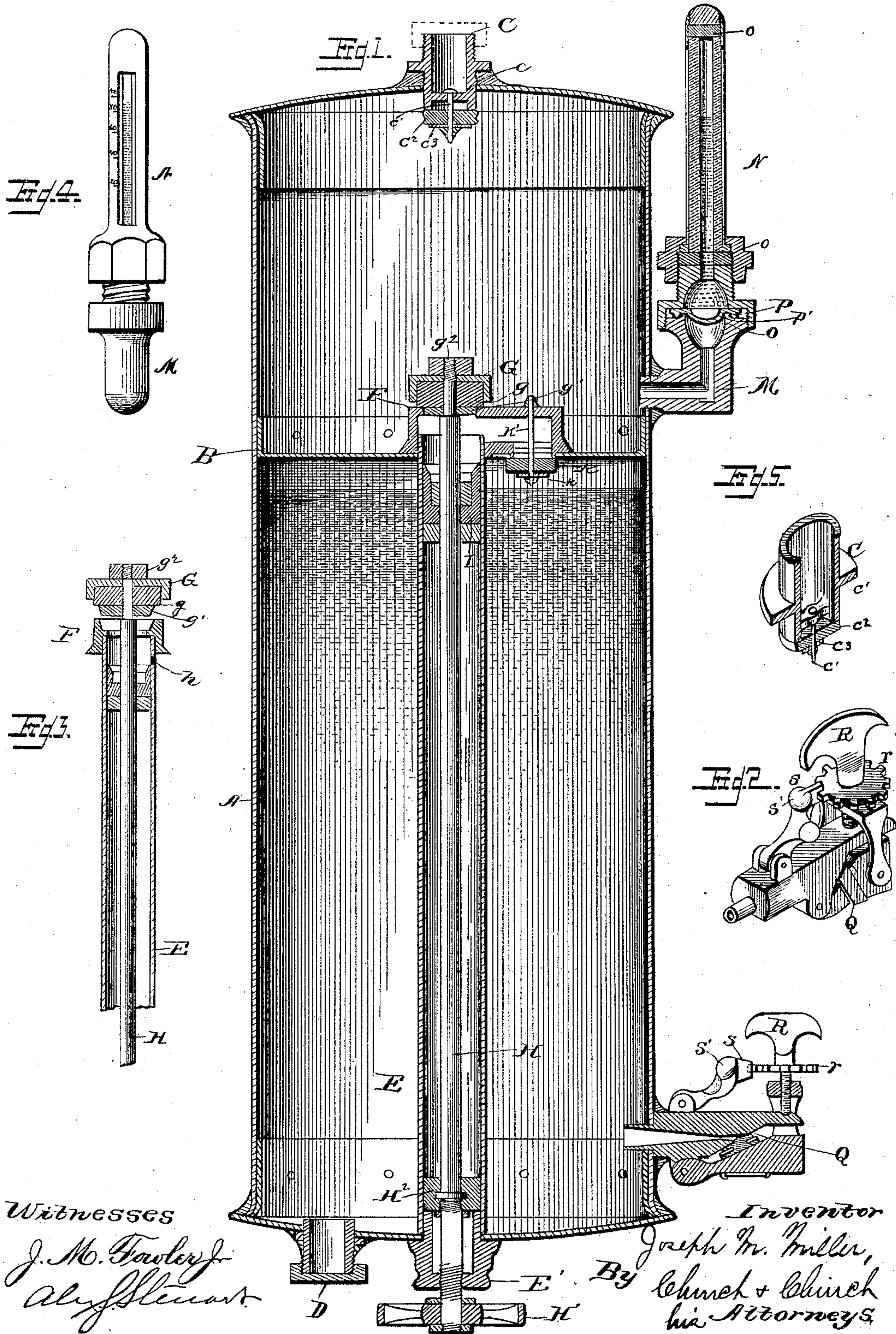


(No Model.)

J. M. MILLER.
FIRE EXTINGUISHER.

No. 483,632.

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UNITED STATES PATENT OFFICE.

JOSEPH M. MILLER, OF CHICAGO, ILLINOIS.

FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 483,632, dated October 4, 1892.

Application filed October 26, 1891. Serial No. 409,878. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. MILLER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Fire-Extinguishers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and
10 to the letters of reference marked thereon.

The present invention relates to that class of fire-extinguishers in which a portable vessel is charged with a fire-extinguishing solution under air or gas pressure and provided
15 with means for discharging such fluid upon a fire by the force of the contained pressure.

The objects of the invention are to overcome certain objections existing in extinguishers of this class as heretofore constructed, particularly incident to those in which a vessel having but a single compartment is employed, although incident in a minor degree to those of other constructions, whereby the pressure in the vessel is reduced in course of time or
25 the walls or other parts of the apparatus are corroded or destroyed, due to chemical or electrical action. These deleterious effects, it is claimed, are much more noticeable where the liquid and the air or gas are allowed to
30 remain in contact, and therefore in the present device I provide separate and independent compartments for the fluid and air or gas with means whereby the air or gas pressure may be quickly communicated to the fluid-
35 apartment and the apparatus thrown into condition for instant use, all without giving the fluid access to the pressure-chamber or parts where its effects could be injurious in the least. To further protect the device
40 against accidental derangement and loss of pressure without the knowledge of the attendant, I provide a visual indicator, which shows at a glance just the degree of pressure within the pressure-chamber, and such indicator being out of reach of the fluid remains practically without deterioration.

Referring now to the accompanying drawings, Figure 1 represents a vertical section through the center of an extinguisher constructed in accordance with my present invention. Fig. 2 is a detail perspective of the
50 discharge-cock, showing the lock. Fig. 3 is

a detail section of a modified form of the connection or fitting between the air and liquid apartments. Fig. 4 is front elevation of the
55 indicator. Fig. 5 is a detail sectional perspective of the preferred form of valve.

Like letters of reference in the several figures indicate the same parts.

The form of extinguisher illustrated and
60 about to be described is such as is adapted to be held in racks or hung about an edifice at convenient points and when in use to be carried in the hands or arms of the attendant who controls the flow and direction of the
65 liquid, although it will be understood that the invention is equally applicable to many other styles and sizes of extinguishers.

The containing vessel or casing is lettered A in the drawings and is of usual or preferred
70 construction, and at a suitable point, usually about one-third of the length of the vessel from the top, is provided with a partition or diaphragm B, which divides the vessel into two separate and distinct compartments, the
75 smaller one constituting the pressure-compartment and the lower and larger one the liquid-compartment. Under normal conditions —i. e., when the extinguisher is not being used—there is no communication between
80 the two compartments, and each may be filled or emptied independently of the other, the liquid being injected through a filling-orifice D in the bottom of the vessel, which may be closed by a simple screw-cap, and the air or
85 gas passes in through a filling-orifice C in the top of the vessel, said last-mentioned orifice being of peculiar valved construction to be presently described.

To admit pressure from the pressure-com-
90 partment to the liquid-compartment, I locate a valve in the diaphragm B, where it is entirely out of the way, and said valve and the mechanism by which it is operated, extending to the outside, are preferably protected from
95 the liquid by a second lightly-set automatic check-valve adapted to permit air to pass through into the liquid-compartment, but to prevent the movement of either liquid or air in the opposite direction, as follows: Passing
100 through the vessel from the outside, preferably the bottom, to the diaphragm is a tube E, at the top of which is mounted on the diaphragm a fitting F, constituting a valve-seat

for the valve G, consisting of a metal cap, a rubber gasket *g*, and a metal plate *g'*, held on the end of valve-rod H by a nut *g²* or in any suitable manner. The valve-rod H passes
 5 down through the tube E and out through a guide or packing box E', where it is provided with a hand-wheel H'. The lower end of the rod is screw-threaded to co-operate with a similar thread in the guide-box, and to ease the
 10 movement of the valve the rod is preferably provided with a joint H², which permits the lower portion to rotate independently, while its longitudinal movement is communicated to the upper portion. At a point near the top
 15 of the tube a rubber gasket I is mounted on the valve-rod to prevent any possible escape of pressure or fluid down the tube when the valve is open, said gasket being preferably of cup or thimble shape with the flange up.
 20 Thus any pressure in the upper part of the tube at once causes the flange to spread and close the tube effectually.

In the preferred construction, as stated, the valve and tube are protected from the liquid
 25 by an automatic safety check-valve, although a simple aperture—such as *h*, Fig. 3—is all that is absolutely necessary. The valve referred to is shown in Fig. 1, and consists of a rubber disk K, held in place by a plate *k* and pin *k'*
 30 over an opening formed in the fitting F and communicating with the valve-opening in the pressure-compartment. Thus free access is afforded from the pressure-compartment to the liquid-compartment, but nothing can pass in the opposite direction. The entrance to the
 35 pressure-compartment is formed by a screw-threaded fitting C, secured in the top shell and having within it, and preferably near the lower end, a cross-bar C', through which passes a
 40 headed pin *c'*, carrying at the end the rubber disk *c²*, fitting tightly over the inner end of the fitting and held by a plate *c³*, soldered or otherwise secured to the pin, as shown. In the manufacture of these fittings containing
 45 valves use is preferably made of ordinary brass-wire nails, which are passed through the fitting and receive the rubber disk and plate, which may be forced up as tightly as desired, when a drop of solder holds the whole
 50 firmly in place. The valve-stem does not move in the direction of the disk to open the valve, but the valve is opened by the yielding of the elastic disk.

The pressure within the pressure-chamber
 55 is indicated by an indicator consisting of the fitting M, screwing into or otherwise connected with the chamber and carrying a gage-glass N, containing glycerine or other suitable fluid, with a flexible diaphragm O for
 60 supporting the same, as shown.

In the preferred construction shown in Fig. 4 the gage-glass is held by a case N', which is open at the bottom and screws directly onto the fitting, packings—such as *o o*—being
 65 placed above and below the glass tube, as shown in Fig. 1. Below the glass tube is secured the cup-shaped elastic diaphragm O, having on

its annular flange a bead P, lying outside of a similar bead P' on the fitting, which when the ports are screwed together form a double
 70 seal.

The liquid is discharged from the nozzle Q of a form now in extensive use, and needs no further explanation than to state that in the present instance the set-screw R, which closes
 75 the nozzle, is provided with a notched collar or flange *r*, with which the pivoted locking-dog *s* is adapted to engage to prevent accidental release of the screw. The locking-dog
 80 may be thrown back of its center by the knob *s'* when it is desired to open the nozzle and forms no impediment to the quick and free operation of the extinguisher, while it prevents any accidental release, even though the
 85 device be subjected to very rough usage. The end of the locking-dog engaging the collar, it will be noted, is elongated in the direction of the longitudinal movement of the screw. Hence the adjustment of the screw does not
 90 affect its operativeness.

In filling or charging the vessel the liquid is simply poured into the opening D until the liquid-compartment is full, when the aperture is closed by a cap or otherwise, and the air-pump or other source of pressure is connected
 95 with the orifice *c* and the air-chamber charged to the required degree, when the usual cap (shown in dotted lines) is put in position. It is understood, of course, that the valve G and nozzles have been previously closed. Now
 100 when it is desired to operate the extinguisher the hand-wheel H' is turned to open the valve G slightly and the nozzle opened in the usual manner, the stream of liquid being then directed upon the fire. By cutting off the pressure the flow can be stopped without getting
 105 the hands into the liquid, and the pressure can be ascertained at any time by an inspection of the indicator, as hereinbefore explained.

I claim—

1. In a fire-extinguisher, the combination, with an inclosing vessel or casing and a diaphragm separating the interior of the vessel into pressure and liquid chambers, said diaphragm having an opening or passage for establishing communication between the pressure and liquid chambers, of a valve controlling said passage in the diaphragm and valve-operating devices on the exterior of the vessel, substantially as described.

2. In a fire-extinguisher, the combination, with an inclosing vessel or casing and a diaphragm separating the interior of the vessel into pressure and liquid chambers, said diaphragm having an opening or passage for establishing communication between the pressure and liquid chambers, of a valve controlling said passage in the diaphragm and a valve-stem controlling the valve passing through the liquid-chamber to the exterior of the vessel, substantially as described.

3. In a fire-extinguisher, the combination, with the vessel, the diaphragm dividing the same into two compartments, and the valve

located in said diaphragm, of the tube passing through one of the compartments to the valve and the valve-rod passing through said tube, substantially as described.

5 4. In a fire-extinguisher, the combination, with the vessel, the diaphragm dividing the same into two compartments, and the valve located in said diaphragm, of the tube passing through the lower compartment, the valve-rod passing through the tube, and the packing or gasket surrounding the valve-stem and fitting in the upper end of the tube, whereby the escape of pressure or liquid through the tube is prevented, substantially as described.

15 5. In a fire-extinguisher, the combination, with the vessel, the diaphragm dividing the same into two compartments, and the valve located in said diaphragm and opening into the air-compartment, of the check-valve opening into the liquid-compartment, substantially as described.

25 6. In a fire-extinguisher, the combination, with the vessel, the diaphragm dividing the vessel into two compartments, the valve located in said diaphragm and opening into the air-compartment, and the valve-stem controlling said valve passing to the outside, of the check-valve opening into the liquid-compartment for preventing access of the liquid to the first-mentioned valve, substantially as described.

35 7. In a fire-extinguisher, the combination, with the vessel, the diaphragm dividing the vessel into two compartments, the valve located in the diaphragm and opening into the air-compartment, the valve-stem, and the tube surrounding said stem passing through the liquid-compartment, of the check-valve controlling the opening from the first-mentioned

valve to the liquid-compartment, substantially as described.

8. In a fire-extinguisher, the combination, with the vessel and the diaphragm dividing the same into two compartments, of the fitting secured on the diaphragm and having 45 openings to the respective compartments, oppositely-arranged valves located in said openings, and a valve-stem for opening the valve in the pressure-compartment, substantially as described.

9. In a fire-extinguisher, the combination, with the vessel provided with two compartments for the air and liquid, respectively, of the fitting forming the communication between said compartments, the check-valve for 55 preventing the entrance of liquid to said fitting, and the valve controlling the passage of air through the fitting, substantially as described.

10. In a fire-extinguisher, the combination, 60 with the vessel, of the valve-fitting having the cross-piece, the elastic disk covering the opening in the fitting, the plate overlying the disk, and the pin passing through the cross-piece disk and plate and held by the cross-piece 65 against movement in the direction of the elastic disk, substantially as described.

11. In a fire-extinguisher, the combination, with the vessel, of the valve formed by the fitting, the elastic disk covering the opening 70 therein, the plate overlying the disk, and the pin secured to the plate and fitting and passing through and holding the disk compressed against the fitting, substantially as described.

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Witnesses:

A. MONTGOMERY WARD,
CHAS. H. THORNE.