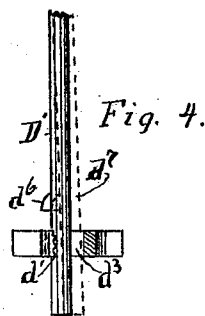
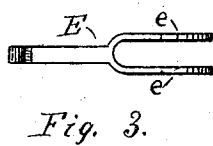
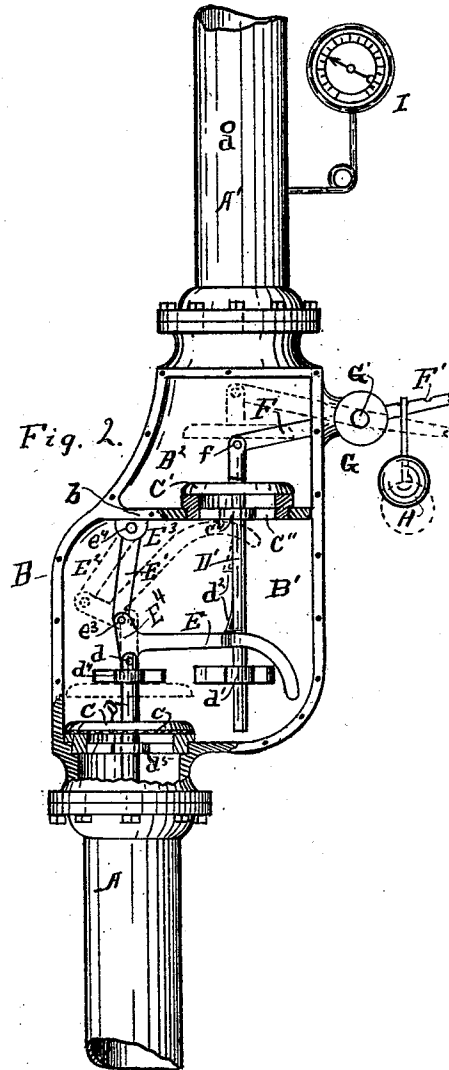
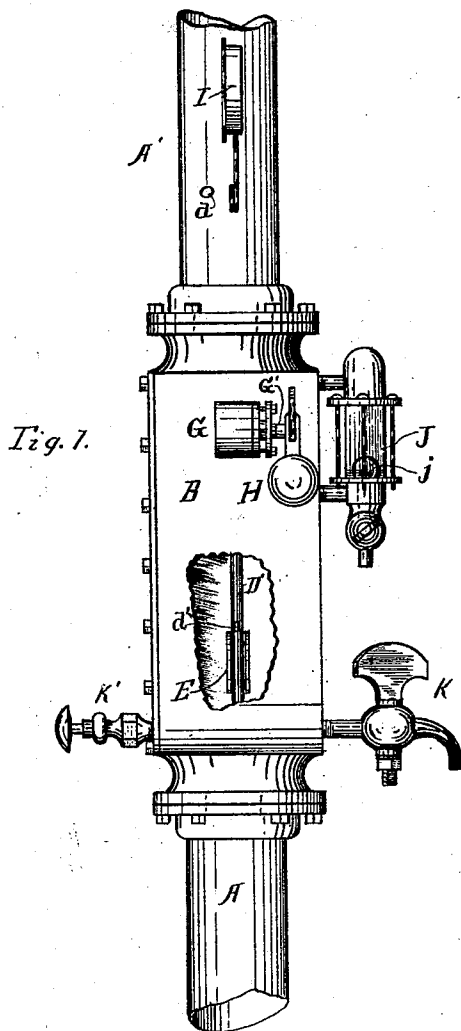


(No Model.)

A. D. LINN.
AUTOMATIC FIRE EXTINGUISHER.

No. 514,833.

Patented Feb. 13, 1894.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALLEN D. LINN, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO
GAIUS W. PERKINS, OF SAME PLACE.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 514,833, dated February 13, 1894.

Application filed December 23, 1892. Serial No. 456,199. (No model.)

To all whom it may concern:

Be it known that I, ALLEN D. LINN, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented a certain new and useful Improvement in Automatic Fire-Extinguishers, of which the following is a specification.

My invention relates to improvements in that class of fire extinguishers in which a supply of water under pressure is held in check by valves held in place by compressed air, and are unseated by the escape of the air through apertures formed in the air pipe, by the melting of fusible plugs, and its objects are: first, to bring the lever and weight that actuates the lower, or water valve, entirely within the valve chamber; and, second, to provide an automatic fire extinguisher in which the water will flow through the valves with the least possible degree of friction. I attain these results by the mechanism illustrated in the accompanying drawings in which—

Figure 1, is a side elevation of my valve chamber with a portion of the wall cut away to show the relative position of the lower valve lever and the upper valve stem. Fig. 2, is a front elevation of the same with the plate removed to show the position of the valves, and their attachments. Fig. 3, is a plan of the lower valve lever; and Fig. 4, is a modification of the valve stem D' detached.

Similar letters refer to similar parts throughout the several views.

The valve chamber B is divided into two compartments B' and B² separated by a partition b having a valve-way C'. The lower compartment B' is considerably the larger of the two and is closed against the inflow of water from the water pipe A, by a direct acting valve C which is seated directly over the water supply pipe, and is held in place by an angle lever E pivoted by one arm to the upper end of the valve stem D at d, and by another arm to the link E' as at e²; the opposite end of the link being pivoted to the upper wall of the compartment as at e⁴ so that it may swing back to the position indicated by the dotted lines E² when the lever E is raised and the valve is opened. The lever E

projects out at, or nearly at right angles with the line of the valve stem D and the link E' toward, and beyond the stem D' of the upper valve, and is divided at the outer end as shown in Figs. 1 and 3, so that one arm of the division will pass at each side of the valve stem D' and the point of division will stand in position to interlock with the catch or projection d² on the valve stem, and hold the link E' in line to force the valve C, solidly upon its seat and prevent the inflow of water from the water pipe, the valve stem D' being held down to secure the lever E by the pressure of air upon the valve C'. The angle arm E⁴ of the lever stands at a slight incline from the perpendicular when the valve C is seated; thus carrying the lower end of the link E' slightly to one side of the direct line of the valve stem D so that when the lever E is released the pressure of the water upon the lower surface of the valve C will force the link over to the position indicated by the dotted lines E² and the lever to the position indicated by the dotted lines E³, and allow the valve to open, and the water to flow freely into the chamber; the position of the valve and its connection being such that as soon as the water pressure is removed from below, the valve will immediately fall to position upon its seat; the valve stem being held in direct line by the bearings d⁴ and d⁵. To insure the perfect seating of the valve I sometimes insert a rubber face c, upon the valve between its lower surface and its seat.

The catch d² on the valve stem D' may be a spring catch as indicated in Figs. 1 and 2, in which case the weight of the lever E, when falling to position, will spring it back so that the lever can drop below it without the necessity of raising the valve stem, and in this case the lever F F' may be dispensed with, or the catch may be solidly attached to the stem, in which case it is necessary to use the arm F', or I may form a slot d³ in the lower support as shown in Fig. 4 so that the valve stem may swing over as indicated by the dotted line d⁷. The position of the lever F' is designed as a hand piece with which to manipulate the valve C' when desired, and the ball or weight H is designed to hang upon this arm of the lever to hold the valves up

when desired, the lever being pivoted upon the shaft G', in the packing box G, and the inner end of the arm F of the lever is pivoted to the top of the valve stem D' as at f.

5 I place a second valve C', similar in construction to the valve C, in the upper compartment B² upon the upper surface of the partition wall b, which has a long stem D' that passes downward into the lower compartment
10 B' and is held in vertical position by the bearing d' near its lower end and by the arm or link F at the upper end, when this link is used, and when the link is not used, by the bearing c² in the valve-way C''. This valve is
15 held down upon its seat by the pressure of air in the pipe A', said pipe and its connections having apertures at various places, as at d, seated with fusible plugs susceptible of being melted at a very low degree of heat, the melting of any one or more of which will allow the
20 air to escape, in the usual manner; and as the pressure is withdrawn from the top of the valve plate C' the pressure of water below the valve C will force both valves up until the lever E escapes from the catch or projection d²,
25 as hereinbefore described, and the valves opened so that the water under pressure will be free to flow through the chamber and into the air pipe A' and to escape through the apertures d therein, as with ordinary automatic
30 fire extinguishers. The slight incline from the perpendicular, of the short arm E' of the lever, between the upper end of the valve stem at d, and the lower end of the link at c² so adjusts the lever that a slight pressure of
35 air upon the top of the valve C', exerted upon the lever E through the medium of the catch or projection d² will hold the valve C, firmly upon its seat against a high pressure of water, and yet the angle must be sufficient to insure
40 the immediate opening of the valves as soon as the pressure is removed from the chamber B².

When the pressure of the water below the
45 valve C is slight I sometimes find it necessary to place the weight H upon the arm F' to counterbalance the weight of the valves and assist to start them open, but ordinarily this is not necessary.

50 I provide for preventing the water from accumulating in the lower compartment by the use of an ordinary back pressure water-cock K', which will allow the water to drip out until pressure is admitted, when it will close in
55 the usual way; and for drawing water out after the pressure has been removed, by an ordinary pet-cock K, or by pressing upon the valve stem of the water cock. The construction and action of both of these classes of
60 cocks is so well known that I do not deem it necessary to enter into a detailed description of either of them.

I provide for the escape of water from the compartment B² by the use of an ordinary
65 glass water gage J, having a float valve j that is held firmly upon its seat by the pressure of the air from the chamber B², but floats as

soon as sufficient water enters the chamber, and, opening the valve allows the water to flow or drip out until it is so far exhausted as
70 to allow the valve to be resealed and prevent the escape of air.

When resetting my device after having been used, it is necessary: first, to seat the valves properly, then introduce air, under
75 pressure, into the air chamber until sufficient pressure is attained, which may be ascertained by the use of an ordinary steam gage I, when the water under pressure may be introduced into the water pipe A below the valve C. I
80 prefer that when my appliance is set, the water cock K' be left open, by pushing its valve stem in, for the purpose, first, of sustaining normal atmospheric pressure in the chamber; and, second, of allowing any water that may
85 collect in the chamber to drip out.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination in an automatic fire
90 extinguisher of a valve chamber divided into two compartments by a partition provided with a valve seated upon its upper surface, said valve having a stem extending down to
95 near the bottom of the lower compartment and held in position by a bearing d', and having a projection at one side in position to engage with, and hold the arm E, and the upper end provided with a guide, as the pivoted
100 link F, a valve in the lower compartment, the stem of said valve guided by a bearing d⁴ and pivoted to an angle lever, an angle lever pivoted at one side to the valve stem, at the other side to an oscillating link the longer arm of
105 the lever extending out and engaging with the projection on the valve stem D' substantially as, and for the purpose set forth.

2. In an automatic fire extinguisher a valve chamber divided into two compartments connected by a valve, a direct acting valve in the
110 lower compartment, an angle lever held in place by the stem of the upper valve and pivoted between said lower valve and an oscillating link, an oscillating link pivoted to said
115 angle lever and the upper wall of the chamber, a valve above whose stem projects down and engages with said angle lever, a spring projection upon said valve stem to engage
120 said angle lever, and an oscillating link pivoted to said valve stem above the valve, and to the wall of the valve chamber substantially as specified, and for the purpose set forth.

3. The combination in an automatic fire
125 extinguisher of a valve chamber divided into an upper and a lower compartment connected by a valved opening as at C'', a valve in the lower compartment, an oscillating link, an angle lever between said valve and link and having an arm that engages with the upper
130 valve stem, an upper valve adapted to automatically control the lower valve by the degree of air pressure in the upper chamber, an arm and a manipulating lever pivoted to

the wall of the upper chamber and to the valve stem, and automatic drip cocks for drawing water from the chambers, substantially as and for the purpose set forth.

- 5 4. The combination in an automatic fire extinguisher of a lower valve, an angle arm and an oscillating link, an upper valve having a long downwardly projecting stem supported at its lower end by a bearing, a projection upon the side of said stem, a link pivoted to the top of said stem and to the wall of the chamber, and an arm connected with said link and projecting out from said chamber substantially as specified.
- 10 5. The combination, in an automatic fire
- 15

extinguisher, of a valve chamber having two compartments; with a water valve, an oscillating link, an angle lever pivoted between said valve and said link and engaging with the air valve stem, and an air valve having a long stem supported and arranged to lock, and unlock said angle lever automatically, substantially as and for the purpose set forth.

Signed at Grand Rapids, Michigan, this 19th day of December, 1892.

ALLEN D. LINN.

In presence of—

GEORGE H. WHITE,
I. J. CILLEY.