

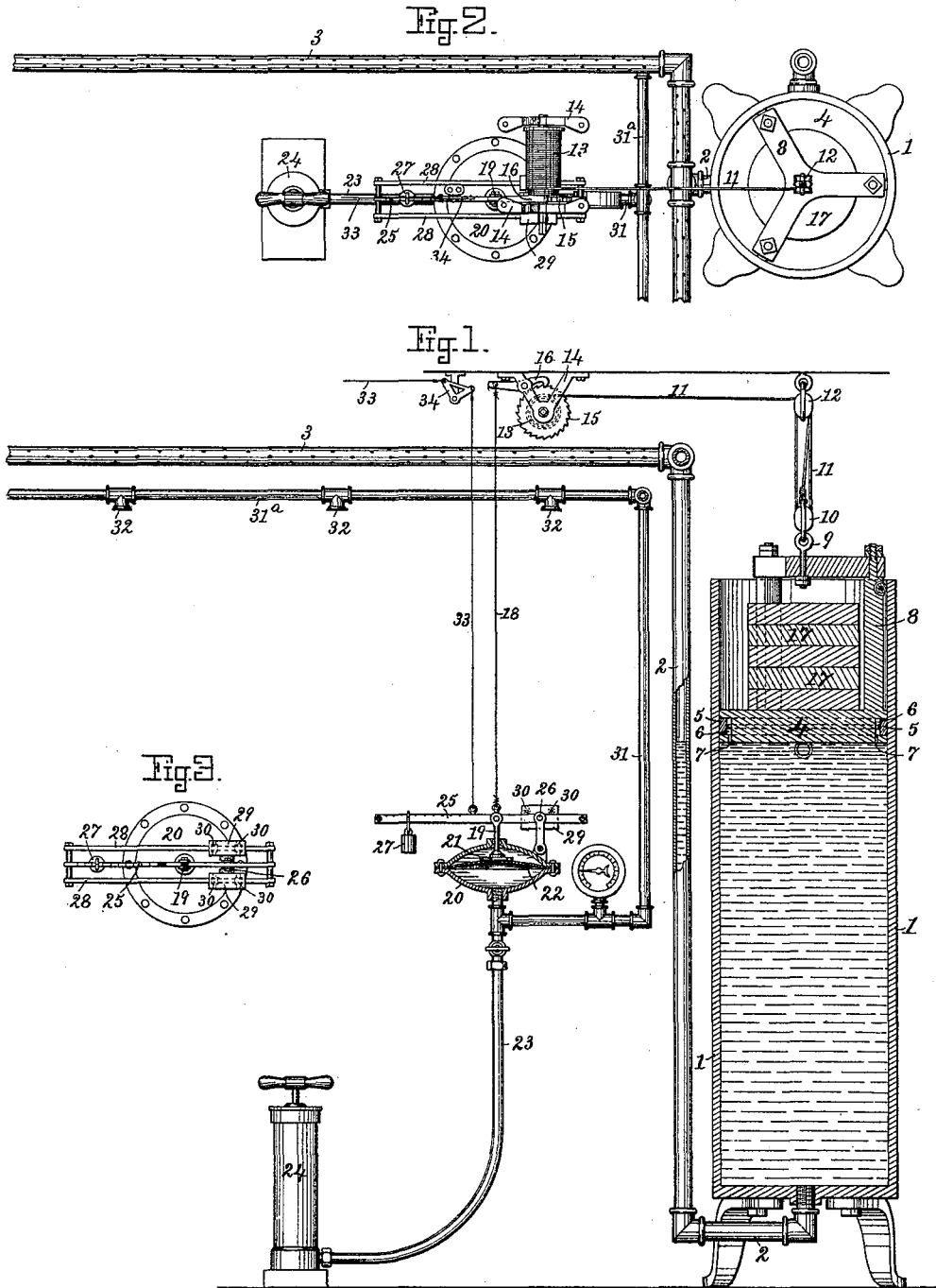
(No Model.)

D. C. STILLSON.

AUTOMATIC FIRE EXTINGUISHING APPARATUS.

No. 326,691.

Patented Sept. 22, 1885.



Witnesses
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UNITED STATES PATENT OFFICE.

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AUTOMATIC FIRE-EXTINGUISHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 326,691, dated September 22, 1885.

Application filed September 24, 1884. (No model.)

To all whom it may concern:

Be it known that I, DANIEL C. STILLSON, a citizen of the United States, residing at Boston, (Somerville,) in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Automatic Fire-Extinguishing Apparatus; and I do hereby declare that the same are fully described in the following specification, and illustrated in the accompanying drawings.

My invention relates to automatic fire-extinguishing apparatus of that class wherein one or more sprinkling-pipes are supplied from a reservoir containing the extinguishing liquid under pressure, communication between the reservoir and the sprinkling-pipe being effected by the melting of a fusible plug or plugs and the admission of air to an auxiliary pipe by which the valve is controlled.

It is the purpose of my invention to simplify this class of apparatus by avoiding the necessity of preserving a constant pressure within the reservoir. The pressure is not exerted until the moment a conflagration breaks out, thereby avoiding the use of valves in the eduction-pipe, which, by long contact, are liable to adhere to the valve-seat and become inoperative. It is also my object to render the mechanism automatic by the employment of an extremely light weight upon the tripping-lever, the necessary force being exerted by an auxiliary weight balanced upon the fulcrum of the lever and brought into operation by the slight inclination of the lever consequent upon the fusion of the air-plug and the sinking of the lever-support.

The invention consists in the several novel features of construction and combinations of parts hereinafter set forth, and definitely pointed out in the claims.

Referring to the drawings forming part of this application, Figure 1 is a central vertical section, partly in elevation. Fig. 2 is a plan view. Fig. 3 is a detail plan view of the tripping-lever detached.

In the said drawings, the reference numeral 1 denotes a reservoir in which is contained water or any suitable fire-extinguishing compound. This tank may be of any suitable form; but I prefer a cylindrical shape, the diameter being small relatively to the depth. Leading from the bottom of the reservoir 1 is

a pipe, 2, which supplies a sprinkling-pipe, 3, the latter being arranged in the usual manner. Resting upon the surface of the liquid contained within the tank 1 is a plunger, 4, having an expanding packing-ring, 5, set in a groove, 6, in the periphery of the plunger and bearing against the inner face of the cylinder. Perforations 7 are formed in the lower flange of the groove, opening behind the packing, whereby, upon the forcible descent of the plunger, the liquid will flow in behind the ring and drive it against the cylinder-wall, thereby packing the joint more or less tightly, according to the force exerted upon the plunger. The latter is provided with a frame, 8, which is connected by an eyebolt, 9, to a pulley, 10, having a cord, 11, which passes over a second pulley, 12, and thence to a drum, 13, carried by a shaft journaled in brackets 14 upon the ceiling or other suitable support. A ratchet, 15, is mounted upon the drum-shaft, and a pawl, 16, pivoted on one of the brackets 14, engages with said ratchet and sustains the plunger 4 together with the heavy weights 17 placed thereon. In this manner the liquid in the tank and the eduction-pipe stands at the same height, no pressure being exerted in the reservoir.

Attached to the rear end of the pawl 16 is a cord, wire, or similar connection, 18, which passes down and is connected to the stem 19, which moves vertically in the wall of the air-chamber 20, carrying a disk, 21, which rests upon the expansible diaphragm 22. The chamber 20 is connected by a pipe, 23, with an air-pump, 24, by which air is forced in beneath the diaphragm, forcing it, together with the disk 21 and stem 19, upward, and relaxing the wire 18 to such a degree that the pawl 16 remains in engagement with the ratchet 15. To the stem 19 is attached a lever, 25, pivoted upon a fulcrum, 26, and carrying a weight, 27, upon its outer end. Upon each side of the lever 25 is an auxiliary arm, 28, parallel with it and supported at the ends only. Upon each arm is mounted an auxiliary weight, 29, having friction-rolls 30, which rest upon the arm and permit the weight to move with great ease. These auxiliary weights in use are placed upon the fulcrum 26 in such position that they balance without exerting force upon either side. Tapped into the pipe 23 is an air-pipe,

31, which connects with the pipe 31^a, having at suitable intervals fusible plugs 32, formed of an alloy which melts at a given temperature. The latter pipe is distributed in and about the rooms or buildings, and may have any number of branches, as also may the sprinkling-pipe. Connected to the lever 25, between the fulcrum and the power, is a wire, 33, which, by means of bell-cranks 34, may be conducted to a gong or other signal at any distant point. The parts being in the position shown in the drawings, upon the fusion of any one of the plugs in the pipe 31^a the air will rush from beneath the diaphragm 22, allowing the stem 19 to descend, and giving a sufficient inclination to the lever 25 to start the traveling auxiliary weights 29, which roll to the power end of the lever and trip the pawl 16. The plunger 4 being thus left without support rests with the entire interposed weight upon the liquid in the tank, and the discharge through the sprinkling-pipe begins immediately and continues until it is arrested by the engagement of the pawl 16 with the ratchet, or by the exhaustion of the tank. At the moment the lever 25 is operated in the manner described, it sounds the alarm at the office or any other point by means of the wire 33. The packing-ring 5 is not in operative contact with the cylinder while the plunger is supported, but the moment the supporting-tackle is released it is forced out in the manner described heretofore, and is packed water-tight.

I may employ a different construction from that shown by using any suitable self-setting packing. I may also employ a hollow plunger and fill the same with mercury, sand, or other heavy substance.

By this invention I dispense with valves in the eduction-pipe, which are always liable to stick to the valve-seats with long use. I also avoid the labor and apparatus required to charge the tank with compressed air. By employing a light weight upon the lever 25, also the danger of gradual leakage of air is avoided, and as this construction permits the employ-

ment of auxiliary weights of any size, the operation of the tripping mechanism is rendered certain.

Having thus described my invention, what I claim is—

1. In an automatic fire-extinguishing apparatus, the combination, with the liquid-reservoir, of a suspended weighted plunger actuated by the releasing mechanism supported by an expansible diaphragm, substantially as described.

2. In an automatic fire-extinguishing apparatus, the combination, with a reservoir containing water or other extinguishing-fluid, of a weighted piston or plunger, a tackle by which it is suspended, a pawl holding the drum carrying the rope, a tripping-lever supported by an expansible diaphragm, and an auxiliary weight or weights balanced upon the fulcrum of said lever and carried by side arms attached thereto, substantially as described.

3. In an automatic fire-extinguishing apparatus, the combination, with a tripping-lever, of side arms attached thereto at the ends only and having traveling auxiliary weights mounted thereon, an actuating-weight, and an expansible diaphragm supporting said lever and actuated by the releasing mechanism, substantially as described.

4. In an automatic fire-extinguishing apparatus, the combination, with the reservoir, of the weighted plunger having a self-setting packing-ring, a rope and tackle supporting the same, a drum upon which the rope is wound, a pawl holding said drum, a tripping-lever, an air-chamber having an expansible diaphragm, and a pipe communicating with said chamber and having fusible plugs, substantially as described.

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

DANIEL C. STILLSON.

Witnesses:

HENRY CHADBOURN,
SARAH M. GOODRICH.