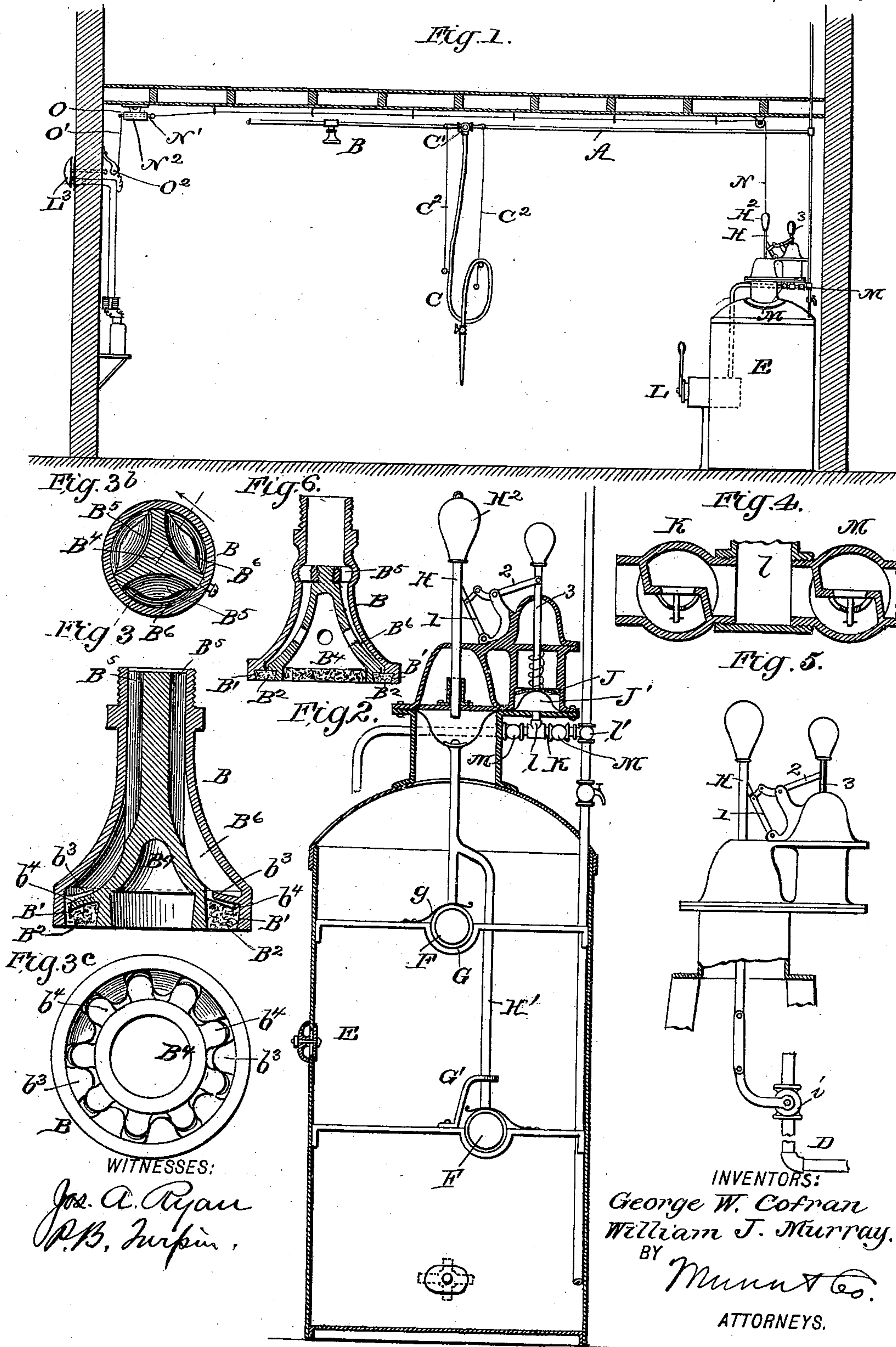


(No Model.)

G. W. COFRAN & W. J. MURRAY.  
FIRE EXTINGUISHER.

No. 556,305.

Patented Mar. 10, 1896.





# UNITED STATES PATENT OFFICE.

GEORGE W. COFRAN AND WILLIAM J. MURRAY, OF BALTIMORE, MARYLAND; SAID COFRAN ASSIGNOR OF ONE-FIFTH TO JOHN A. ADDISON, OF SAME PLACE.

## FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 556,305, dated March 10, 1896.

Application filed May 9, 1895. Serial No. 548,717. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE W. COFRAN and WILLIAM J. MURRAY, of Baltimore city, in the State of Maryland, have invented a new and useful Improvement in Fire-Extinguishers, of which the following is a specification.

This invention is an improvement in automatic fire-extinguishers, and especially in that class of such devices in which a fusible closure is provided upon the nozzles or outlets, and the present invention has for an object to provide simple means by which a reduction of air-pressure in the pipe system will effect a flow through such pipe system of the gas, water or other medium by which to extinguish the fire.

The invention has for further objects other improvements; and it consists in certain novel constructions, combinations, and arrangements of parts, as will be described and claimed.

In the drawings, Figure 1 is a sectional view of a part of a house provided with our improvement. Fig 2 is a perspective view of the tank and parts immediately connected therewith. Figs. 3, 3<sup>b</sup>, and 3<sup>c</sup> are detail views of the nozzle. Fig. 4 is a longitudinal section of one of the pipes. Fig. 5 shows the construction for connection with the water-main, and Fig. 6 shows a somewhat different construction of nozzle.

The pipes A of the system may be disposed in any suitable or desired arrangement in the building or structure and is provided at intervals with the nozzles B of a special construction, more fully described hereinafter. This system also has one or more hand-hose C connected by a coupling C' having a three-way valve and hand-cords C<sup>2</sup> for manipulating the same, so that communication may be established between the pipe A and the hand-hose to release the pressure in the pipe A by the watchman or other person whenever it is desired to use the extinguishing devices before the fusible nozzles are released. The pipes A connect with the supply of extinguishing material, it may be a water-main D, as shown in Fig. 5, or, as is preferred, a gas-tank E, as shown in Fig. 1.

The tank E contains elements of the gas,

such as bicarbonate of soda and water, and sulphuric acid is supplied to such elements by breaking a bottle F containing such acid within the tank. To this end we provide in the tank a seat G for the bottle F and a clasp g to secure the bottle in such seat. It is preferred to provide two of such bottle-holders, one above the other, so the sulphuric acid may be more evenly distributed within the tank to secure a better generation of gas. These bottle-holders also have guides G' for the bottle-breaking rod of the plunger H. This plunger H constitutes the device for releasing the fire-extinguishing medium and is preferably arranged to break the bottles of sulphuric acid, but may within the broad principles of our invention be arranged to open a valve i in a water-main I suitably connected with the circulating-pipe A, as shown in Fig. 5, so water may be used instead of the gas to extinguish the flames, but we prefer the construction by which gas is generated, as shown in Fig. 1.

The plunger H is weighted at H<sup>2</sup> so it will drop quickly and forcibly, and is secured by a latch including a pivoted strut-bar l movable at its swinging end into and out of position to support the plunger H and connected by lever 2 with the weighted rod 3 in such manner that when the rod 3 falls the latch will be moved to release the plunger so the latter may fall, strike the breaking-rod, and release the extinguishing agent. This latch is supported by a diaphragm J bearing beneath the rod 3, and such diaphragm is operated by pressure from the circulating-pipe, such pressure being preferably air-pressure, and secured in the manner which we will now describe. A pipe K from a suitable air pump or compressor L (the construction of which it is not necessary to describe) connects at l' with the chamber J' below the diaphragm, and also connects at l'' with the circulating-pipe A. This pipe K is provided between the pipe A and the diaphragm and between such diaphragm and the pump with check-valves M, both opening in the same direction, as shown.

Now, in operation, if pressure be supplied to the pipe A the diaphragm J will be distended and the latch be supported in position



to secure the releasing-rod elevated, but if such pressure be released the diaphragm will fall and the latch will free the plunger and the extinguishing fluid will be released and  
 5 circulate up through the pipe A and be discharged. The check-valve between the diaphragm J and the pipe A avoids the passage of any of the extinguishing medium to the diaphragm, as will be readily seen. The  
 10 plunger H is connected by a wire N with a bolt N' sliding in a keeper N<sup>2</sup> and receiving a loop or eye O on a connection O' with a circuit-closer O<sup>2</sup>, so arranged that when the plunger H drops the bolt will be withdrawn  
 15 from the connection O' to permit the circuit-closer to fall and complete the circuit of an electric bell L, so the latter will be sounded in case the pressure in pipe A is released. Pressure in the pipe A may be released by  
 20 opening the valve leading to the hand-hose, as before described, but the nozzles B are constructed to automatically open in case of a rise of temperature to a certain point by the fusing of a fusible closure in said nozzles, and  
 25 a special feature of such nozzle is its construction so a small portion of fusible material will efficiently close it. To this end we form the outlet of such nozzle as an undercut channel B' to receive the fusible material B<sup>2</sup>, such  
 30 channel serving to readily receive and retain the material B<sup>2</sup>, and yet permit its easy discharge when it softens by the rise of temperature, so that pressure may be released in the pipe A. This nozzle is formed with an outer  
 35 casing, a shell B<sup>3</sup>, and an inner shell B<sup>4</sup>, separated at the discharge end of the nozzle and having one wall of the undercut channel B' formed in each of such shells, the inner shell B<sup>4</sup> communicating with the pipe A, and an  
 40 opening or openings B<sup>5</sup> being formed through such inner shell into the space B<sup>6</sup> between the shells.

The shells B<sup>3</sup> B<sup>4</sup> are provided at their discharge ends with alternating lips or projections b<sup>3</sup> b<sup>4</sup>, the lips b<sup>3</sup> curving slightly upward  
 45 and the lips b<sup>4</sup> slightly downward and serving to thoroughly diffuse and distribute the escaping fluid, as will be understood from the drawings.

50 In the nozzle shown in Fig. 6 the outlet-opening is continuous and annular, and we also provide within it a central outlet, which, like the annular outlet, is controlled by an undercut outlet in which the fusible material may be inserted, the circular outlets on  
 55 the inner portion of the distributor communicating with the said central outlet, as shown.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—  
 60

1. The combination with the plunger of the latch having a portion engaging such plunger

and a plunger portion the diaphragm supporting such plunger portion, the circulating-pipe, an air-pump a pipe extending from such air-  
 65 pump to the circulating-pipe and communicating with the diaphragm and check-valves between the diaphragm and the pump and between the diaphragm and the circulating-pipe substantially as and for the purposes  
 70 set forth.

2. The combination with the plunger by which to release the extinguishing medium of the bell and its circuit-closer, a bolt by which  
 75 to hold such closer retracted and a connection between the plunger and bolt by which to positively withdraw such bolt when the plunger falls substantially as set forth.

3. In an apparatus substantially as described a nozzle having at its outlet inner  
 80 and outer shells provided with alternating projections whereby to secure a diffusion of the fluid discharged substantially as set forth.

4. In an apparatus substantially as described a nozzle having inner and outer shells  
 85 and provided at its outlet with an undercut channel one wall of which is formed in one shell and the other wall in the other shell such shells being formed with alternately-arranged lips or projections substantially as set  
 90 forth.

5. In an apparatus substantially as described the nozzle having an annular outlet-channel the walls of which taper or converge  
 95 toward the discharge and provided within said channel with a downwardly-facing abutment for the plug and the annular fusible plug substantially as shown and described.

6. The combination of the gas-tank, the circulating-pipe, the latch-supporting diaphragm and its case, the air-pump, a pipe  
 100 extending from such pump past the diaphragm-case connected therewith and with the circulating-pipe, and check-valves arranged in said connecting-pipe between the diaphragm  
 105 and pump and between the diaphragm and circulating-pipe such valves both opening in the same direction substantially as set forth.

7. The combination in an apparatus substantially as described of the breaking-plunger,  
 110 a strut-bar pivoted at one end and movable at its other end into and out of engagement with the breaking-plunger, the latch-plunger arranged alongside the breaking-plunger, means controlling the said latch-plunger and a lever connected at one end with  
 115 the latch-plunger and at its other end with the strut-bar all substantially as and for the purposes set forth.

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 WILLIAM J. MURRAY.

Witnesses:

JOHN A. ADDISON,  
 ALBERT A. MURRAY.