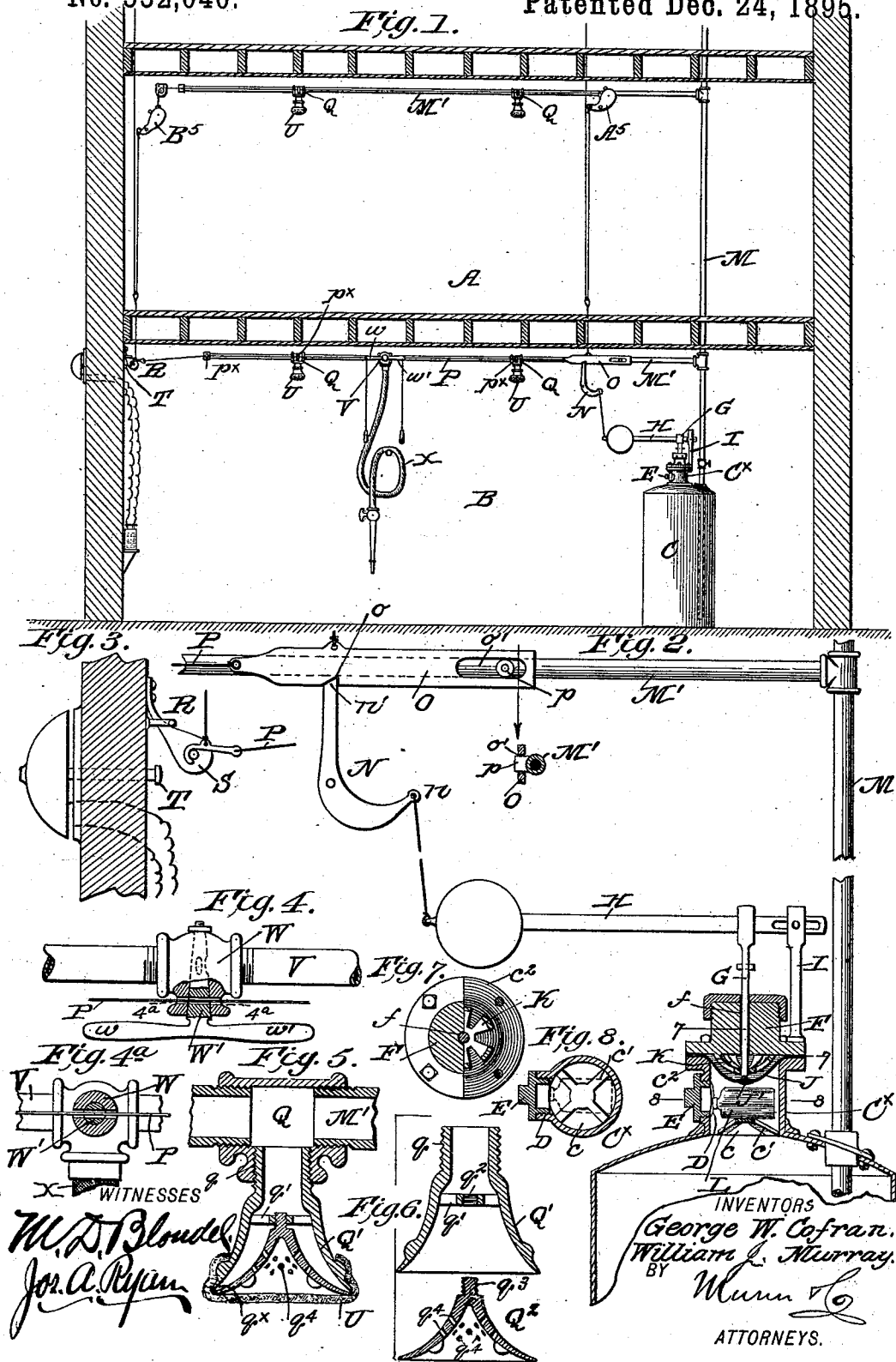


(No Model.)

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AUTOMATIC FIRE EXTINGUISHING MECHANISM.

No. 552,040.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC FIRE-EXTINGUISHING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 552,040, dated December 24, 1895.

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To all whom it may concern:

Be it known that we, GEORGE WASHINGTON COFRAN and WILLIAM JAMES MURRAY, residing in the city of Baltimore, in the State of Maryland, have invented a new and Improved Automatic Fire-Extinguishing Mechanism, of which the following is a specification.

Our invention relates to that class of fire-extinguishers that are brought into action by the rupture of fusible connections; and it primarily has for its object to provide, in combination with the fusible connections and trip devices operated by the severance thereof, fire-extinguishing gas-generating mechanism of a simple and economical structure, and which will effectively and positively operate for the intended purposes.

Our invention also has for its object to provide a chemical fire-extinguishing mechanism having, in combination with the fusible holding-wires, the gas generating and distributing devices, and a water-supply having a valve having hand-operated means connected with the fusible connections and so arranged that when turned on such means will also serve to sever the fusible connections at the same time the water is turned, whereby the gas will be generated and permitted to flow into the several sprinkling or distributing nozzles.

Furthermore our invention has for its object to provide suitably-arranged sprinklers or distributing-nozzles having fusible coverings, and also alarm devices connected with the fusible devices by trip mechanism, which when released by the severing of the fusible connections will set in operation the alarm devices.

With other minor objects in view, which hereinafter will appear, the invention consists in such novel features of construction and peculiar combination of parts as will be first described in detail, and then be pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a diagrammatic representation of a portion of a building with our improved fire-extinguishing mechanism shown in the

normal position in elevation. Fig. 2 is an enlarged view of the gas-generator devices and the trip mechanism therefor. Fig. 3 is a detail view illustrating the alarm mechanism and the trip-operating devices therefor. Fig. 4 is a view illustrating the water-supply pipe, the cut-off valve, operating-handles, and the fusible connection joined to the valve-stem; and Fig. 4^a is a section taken on the line 4^a 4^a of Fig. 4. Fig. 5 is a sectional view of one of the sprinklers or distributing-nozzles. Fig. 6 illustrates the parts thereof detached. Fig. 7 is a horizontal section taken on the line 7 7, Fig. 2; and Fig. 8 is a similar view on the line 8 8, Fig. 2.

Referring to the accompanying drawings by letters of reference, A and B represent, for example, the first and second stories of a building, in the lower one B of which at some convenient point are located the gas-generating devices, which comprise a tank or holder C, formed at the upper end with a contracted or neck portion C^x, at the throat *c* of which is held a bridge-piece *c'*, while at one side is an opening D, for a purpose presently described, which is normally held closed air-tight by a suitable plug or hand-hole or plate. The upper end of the neck C^x has a flange *c*², on which is fitted a cap member F, centrally apertured vertically, as at *f*, through which passes a plunger G, the upper end of which is connected with a weighted lever H, which is connected at its weighted end with the trip devices hereinafter described, while the other end is pivotally joined to a standard I projected up from the holder C, as shown.

J indicates a diaphragm clamped at its peripheral edge between the flanges of the neck portion C^x and the cap, and forms an air-tight seal to prevent escape of the gas within the holder through the neck thereof, and such diaphragm is held from being pressed upward by a cage K, against which it seats when forced back after the plunger operates to force it down, such diaphragm having an impact portion J', with which the lower end of the plunger engages when forced downward.

L indicates a bottle in which is to be held the sulphuric acid, (or other elements,) which

is adapted, when the bottle is broken, to mix with the bicarbonate of soda in water (or other elements) held in the holder to form the extinguishing-gas.

5 It will be noticed by reference to Fig. 2, that the plugged opening D, and the bridge-piece *c'* are arranged relatively and the bottle L is of such a size that it can be easily slipped through the opening D and supported on the bridge-
10 piece under the diaphragm.

M indicates the main gas-distributing pipe, which enters the gas-holder to a point near the bottom and extends up through the several stories of the building, it having in each
15 story one or more laterals M', as clearly shown in Fig. 1.

The trip devices before referred to, which serve to operate the plunger G, comprise a bell-crank lever N, connected at one end *n* to the weighted end of the lever H, while its other end forms a lock-pawl *n'*, which normally engages a notch *o* in a lock-bar O, held to slide preferably on a bearing-stud *p*, projected from one of the laterals, its slide movement being
25 limited by the slot *o'*. This bar O is held to its normal or locked position (see Fig. 1) by the fusible wire P, which extends along the distributing-lateral M', and is held in guides *p^x* projected therefrom and the several T-joints
30 Q, and connected at its opposite end to a trip device R, which, when the parts are in their normal position, engages a spring-actuated or gravity drop S, which, when released by the separation of any of the fusible connections
35 within the building, drops and engages a switch member T in the circuit of an alarm-bell, as shown, it being obvious, however, that in practice, instead of the member T serving to operate an electrically-operated gong, it
40 may be in the nature of a tripper for a spring-operated or other gong mechanism.

Throughout the building the several laterals have T-joints Q, to which the sprinklers or distributors are connected, each of which
45 is constructed as shown in detail in Figs. 5 and 6, and comprises a bell-shaped nozzle Q', which has a threaded shank *q*, which enters the T-joints Q and an internal bridge-piece *q'*, which has a central threaded aperture *q²*.

50 Q² indicates a detachable cone-like member formed with a screw-shank *q³*, the top of which is adapted to enter the aperture *q²* in the bridge-piece. As shown in Fig. 5, it will be noticed that the lower edges of the member Q²
55 are so flared outward that when it is connected with the bridge-piece such edges can be adjustably fitted to form a narrow annular escape-slit *q^x*, the body portion of such member having also jet-openings *q⁴*.

60 In practice a fusible covering U is fitted over the bottom of each nozzle, and such fusible material is so arranged as to withstand a heat greater than that required to sever the fusible connections before referred to, so as
65 to permit the use of a hand-hose at the incipency of the fire, if desired. For this purpose in the lower story or all of the stories is

disposed a water-pipe V, which has a three-way cock W formed with oppositely-projecting members, to which are connected pendent
70 handles *w w'*, by which the water can be turned on or off.

X indicates a hose-section connected with the valve-cock W.

By referring to Figs. 4 and 4^a it will be seen
75 that the fusible wire passes through corresponding holes in the neck of the valve W and the valve-stem W' in such a manner that as the handle *w'* is pulled down to open the valve to turn on the water such wire will be cut, which
80 will set in operation the gas-generating means. By thus connecting with the fusible connections and extinguishing mechanism a water-supply, should a fire break out, say, during the
85 day, the water-hose can be used, which, when set in operation, will also set the gas-extinguishing means ready for operation, so that in case the fire could not be controlled by the hose the extinguishing means will be auto-
90 matically brought into action.

It will be readily understood from Fig. 1, should the fusible wire be severed, the weighted lever will be released and drop, and thereby cause the plunger to break the bottle under it.

In the upper stories the fusible wires are
95 connected with and held taut by the weighted levers A⁵, which at one end connect with the sliding lock member N, and at the other they have weighted levers B⁵, which are connected by any suitably-arranged bell-crank-lever
100 mechanism with the fusible wire in the lower story, the several levers A⁵ and B⁵ being so arranged as to keep all of the fusible wires normally to a taut position. By such construction it will be manifestly clear that should a
105 fusible wire in any part of the building become severed the trip-lever H will be dropped. It will also be obvious that by providing the several sprinklers or distributors with fusible coverings only such sprinklers as are in the
110 room or portion of the room burning will be set in operation.

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

1. A chemical fire extinguishing mechanism comprising a gas generating means, having distributing pipes, provided with sprinklers or nozzles, having fusible coverings to normally hold them closed, trip devices for holding the gas generating means from operation, and fusible wires for holding the trip-
120 devices to their normal or locked position, said fusible wires and the coverings for the sprinklers being constructed substantially as described whereby the wires are adapted
125 to separate at a less degree of heat than the said coverings as specified.

2. The combination with a gas generating mechanism, a trip device for holding the gas
130 generating mechanism normally from operation and the gas distributing pipe, of a water supply pipe, having a hand operated valve, a hose section connected therewith, and a

connection between the valve and the trip devices arranged substantially as shown whereby when the valve is turned to open the water, it (the connection) will free the trip devices and set in operation the gas generating mechanism, substantially as shown and described.

3. In a chemical fire extinguishing mechanism, in combination with a tripping mechanism and fusible means for normally holding them to a locked position, of a gas holder having a plugged or hand hole opening in the top, and an internal supporting member, a fluid holding vessel adapted to be inserted through the opening and adapted to rest on the support, a plunger held to engage the vessel and break it when forced down, and a weighted lever connected to the plunger and the tripping mechanism, all arranged substantially as shown and described.

4. The combination, in a fire extinguishing mechanism as described with the tripping devices and the fusible means for holding them to a locked position, of a gas holder having a contracted or neck portion, having a plugged or hand hole opening at one side, and an internal bridge piece, a glass or similar vessel adapted to be inserted through such opening, an apertured cap member fitted on the upper end of the neck of the holder, a diaphragm or analogous seal interposed be-

tween such cap and neck, a plunger movable in the cap adapted to engage the diaphragm and bottle, and a weighted lever connected with such plunger and the tripping mechanism, all arranged substantially as shown and described.

5. In a fire extinguishing mechanism, the combination with the gas holder proper, the top cap member F and the vessel L held in the holder, of the plunger G, the diaphragm held between the bottle and the plunger and the cage K held between the cap F and the diaphragm, said cage and cap being apertured for the passage of the plunger, substantially as shown and for the purposes described.

6. The combination with the gas generating means including the plunger, and the weighted lever, of the bell crank tripper, the lock member N, movable endwise and to swing vertically and having a lock notch adapted to engage the upper end of the tripper, a connection between the lower end of such tripper and the weighted lever and the fusible connection between the end and top of such member N all arranged substantially as shown and described.

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Witnesses:

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