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AUTOMATIC FIRE EXTINGUISHER.

APPLICATION FILED MAR. 28, 1902.

NO MODEL.

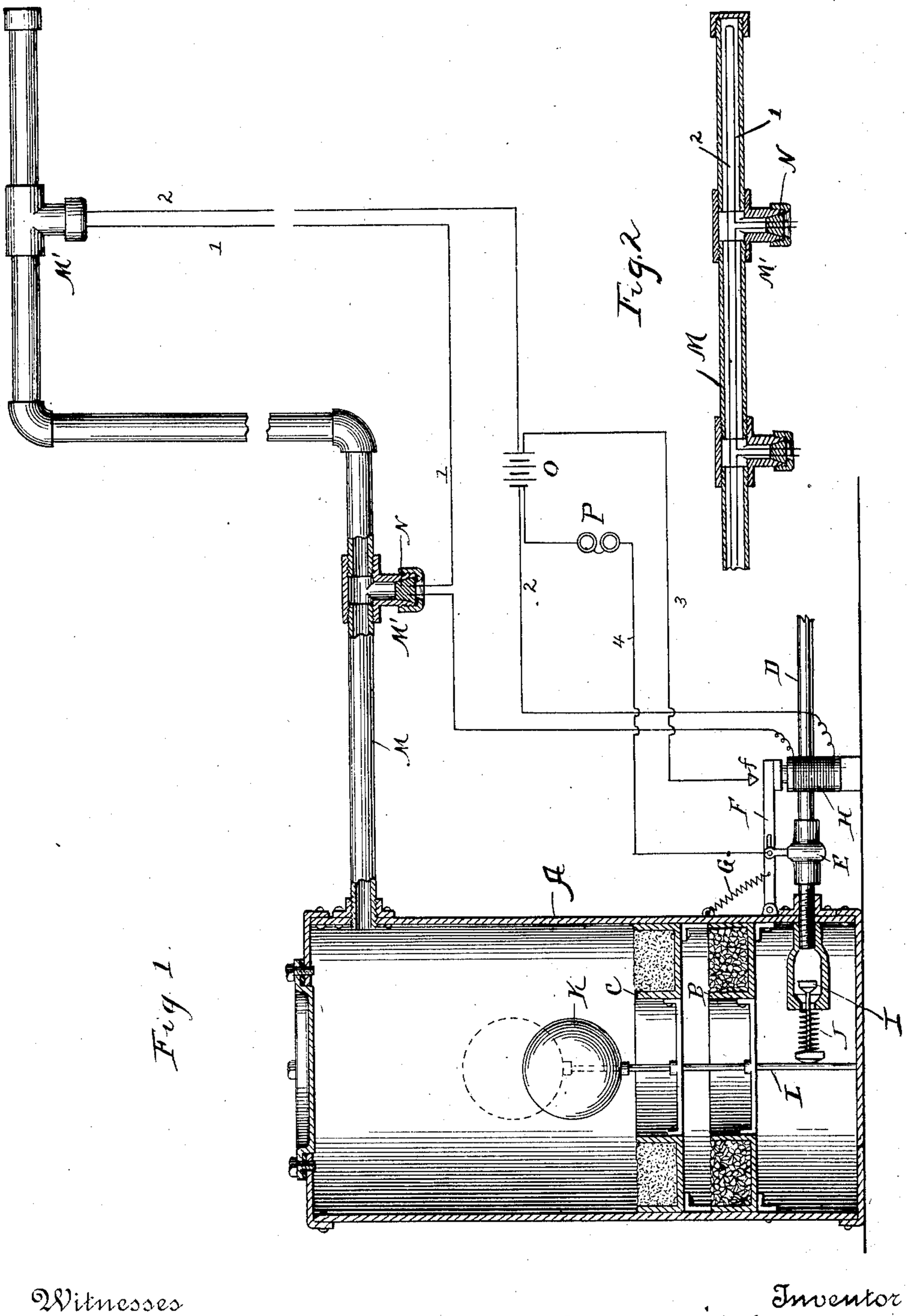

Fig. 1.

Fig. 2.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 737,419, dated August 25, 1903.

Application filed March 28, 1902. Serial No. 100,431. (No model.)

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Automatic Fire-Extinguishers, of which the following is a specification.

My invention relates to an improvement in automatic fire-extinguishers. It belongs to that class of automatic fire-extinguishers wherein a gas is used to extinguish the flame.

The object of my invention is to automatically generate at one central station through a rise in the temperature at a point more or less remote from said station a gas which is incombustible and to carry said gas to the point of conflagration for the purpose of extinguishing the same.

The novel features of this my invention will be hereinafter described, and more fully pointed out in the claims following the specification.

Referring to the drawings, Figure 1 is a vertical longitudinal section of the apparatus and pipes attached thereto. Fig. 2 is a sectional view of a portion of pipe, showing the circuit-wires therein.

A is a reservoir in which B and C are the supports for the chemicals, which supports are preferably in the shape of circular pans.

D is the water-supply pipe, of which E is the valve. This valve is actuated by electromagnetic means—such, for instance, as are illustrated in the drawings, in which F is a lever connected to the valve and normally under the tension of the spring G. This lever also forms the armature for the electromagnet H.

I is the valve controlling the supply of water to the reservoir A and is in the form of a float-valve. I call this valve the "control-valve" in contradistinction to the first valve, which I call the "supply-valve." The stem of this valve butts against the vertical rod L, secured at its upper end to the float K. When the float raises the rod L out of range with the valve-stem of the valve I, the spring J and the pressure of the water together will close the supply.

M is the gas-outlet pipe for conveying the gas capable of extinguishing the fire to the point of conflagration. This pipe extends throughout the building to be protected.

M′ represents the gas-exhaust nozzles, each fitted with the fusible plug N. This plug forms also an electrical connection for the sections of wire forming one part of the circuit in which the magnet H is included.

O is a source of current. This source of current, which is shown in the drawings as a battery, is also connected to the circuit-wires 3 and 4, the wire 3 terminating in the contact *f* and the wire 4 containing a bell or other alarm device P and terminating in the lever F.

1 and 2 are the main-circuit wires.

In Fig. 1 I have to better illustrate the circuit shown the same as being outside of the pipes; but in practice it is best to carry these wires inside of the pipe, so that the same may form a protection for the wire. This form is illustrated in Fig. 2.

The *modus operandi* of practicing my invention and the arrangement for same are as follows: At a center place in the building to be protected, preferably in the cellar, is stationed a tank or reservoir, preferably in a cylindrical form and made preferably of iron, so as to be capable of withstanding the pressure the generated gases may exert. This tank has to be of a capacity so as to be able to furnish the gases necessary for the extinguishing of the fire at not only one but different points in the building. I prefer to use the well-known dioxid of carbon or carbonic anhydrid as the extinguishing agent. This gas is usually generated through the action of sulfuric acid or hydrochloric acid in the presence of water on the carbonate; but I prefer to generate this gas through the action of water on two different chemicals, one chemical containing a carbonate and the other chemical containing an acid radical, both chemicals in their solid form. The best-suited chemicals are a bicarbonate of soda and a bisulfite of sodium or potassium.

I provide the inner space of the reservoir with a series of shelves, and I provide these shelves alternately with a carbonate and acidulous material. It is obvious that the amount of this material controls the amount of gas the device is capable of generating, and if the needed amount is known it is an easy matter to calculate the amount of the two chemicals necessary. If required, the device may be provided with a safety-valve, so as to relieve

the pressure of the gas generated if the same exceeds a predetermined point.

The gas-outlet pipe starts from the inner space of the generator and is carried, as said above, to that part of the building which is designed to be protected. At intervals the pipe is provided with nozzles or outlets, so that the gas generated in the device may escape therefrom, and as this gas has about one and a half times the specific gravity of air it will fall and partially diffuse throughout the space designed to be protected. Normally these outlets are closed up through a material capable of fusing at a predetermined temperature, and if this material consists of a fusible metal then this metal may be used as a contact for one section of the wire and the section following. I am aware that if one line-wire is closed through these plugs this wire is short-circuited throughout; but this fact does not interfere at all with the working of my invention, which broadly consists therein that through the fusing of an outlet-plug a circuit is broken and through the breaking of this circuit the gas is generated and made to escape through the openirg of said outlet. Normally all outlets are closed with the fusible plugs, and normally, therefore, the circuit consisting of the generator O, electromagnet H, wires 1 and 2, and plugs N is closed. The core of the electromagnet H is therefore energized and the armature F is drawn toward that core, thereby closing the valve E of the water-supply pipe D; but as soon as one or the other of the plugs is fused through a rise of temperature, which rise is due to the starting of a fire in the neighborhood of said plug, then the circuit will be broken, the electromagnet H will be deënergized, and the armature F will be drawn by the spring G away from the core of the electromagnet, thereby opening the valve E, and the water of the supply-pipe D will rush into the receptacle and come in contact with the chemicals contained in the spaces of the shelves B and C. The intermingling of the dissolved contents of the chemicals will generate the gas, which, flowing from the reservoir to the pipe, will seek the exit of least resistance and will therefore issue from the exhaust-nozzles, having the plugs N removed through fusing. As soon as the lever F is drawn away from the core of the electromagnet H this lever will come in contact with the contact-point *f*, thereby establishing the circuit, consisting of contact *f*, wire 3, battery O, bell or alarm P, wire 4, and lever F.

The alarm P may be so arranged as to connect with the circuit running to one or the other of the fire-stations, thereby notifying the fire-department of the fire.

I have in the drawings illustrated the reservoir as containing only two shelves filled with chemicals; but it is obvious that the shelves may be duplicated as required. As the bisulfite of sodium is very hydroscopic, it is best to have these chemicals in paper receptacles, or these chemicals may be otherwise provided with means to prevent the moisture of the air from attacking the same as long as the valve E is closed.

I have illustrated and described the control-valve as consisting of a mechanical device, for the reason that should the source of electricity O give out or any other mishap occur to the circuit the flow of water should not be continued long enough to fill the gas-outlet pipes; but it is obvious that the control-valve may be controlled by an electric circuit, and the best way to establish this is to place at the required height two terminals of an electric circuit, and as the liquid is surcharged with chemicals, and therefore a comparatively good conductor, these two terminals will be electrically connected with each other as soon as the liquid has reached their height. In the circuit to which these terminals are connected electromagnetic devices shall be placed adapted to control the control-valve.

I have not illustrated in the drawings the wires as being insulated; but it is obvious that such wires should be insulated with the exception of those parts connected to the fusible plugs.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the class described, a reservoir, solid chemicals contained in said reservoir, a water-supply pipe connected to said reservoir, and a control-valve adapted to close said supply-pipe automatically as soon as the water in said reservoir has reached a predetermined height.

2. In an apparatus of the class described, a reservoir, solid chemicals contained in said reservoir, a water-supply pipe connected to said reservoir, said water-supply pipe provided with a valve controlled by electromagnetic means, and a second valve controlled by the water contained in said reservoir.

3. In an apparatus of the class described, a reservoir, chemicals contained therein, a water-supply pipe connected thereto, said water-supply pipe provided with two valves, a supply-valve and a control-valve, the supply-valve actuated by electromagnetic means, and the control-valve actuated by the height of the liquid in the reservoir.

4. In an apparatus of the class described, a gas-generator, a water-supply pipe connected to said generator, electromagnetic means to control the supply of water to said generator, and means, hydrostatic in their action, to regulate the height of the water in said generator.

5. In an apparatus of the class described, a reservoir containing chemicals adapted to generate gases useful for extinguishing fire, said reservoir operatively connected to a water-supply and operatively connected to a gas-outlet, the water-supply provided with a valve and electromagnetic means to open and close said valve, the gas-outlet provided with means

adapted to be operated by a rise of temperature, said means controlling an electric circuit containing the electromagnetic means for opening and closing said valve, whereby said valve is operated and the water-supply controlled in accordance with the rise of temperature.

6. In a device of the class described, a gas-generator, a water-supply for said generator, a gas-outlet pipe for said generator, said gas-outlet pipe provided with a series of openings normally closed with a conducting material, said conducting material designed to fuse at a predetermined temperature, said conducting material forming part of an electric circuit inclosing means for the controlling of the water-supply.

7. In an apparatus of the class described, a gas-generator, a water-supply pipe for said generator, a gas-outlet pipe for said generator, said gas-outlet pipe containing the wires of an electric circuit, said circuit adapted to regulate, through electromagnetic means inserted therein, a valve with which said water-pipe is provided, said electric circuit also adapted to be made or broken through fusible means normally closing the nozzles with which said gas-outlet pipe is provided.

8. In an apparatus of the class described, a gas-generator, a water-supply pipe for said generator, a gas-outlet pipe provided with a series of outlets normally closed by a material adapted to fuse at a predetermined temperature, an electric circuit adapted to be made or broken through said material, thereby closing or opening the valve of the water-supply pipe, in combination with a circuit adapted to be closed through the opening of said valve, said circuit containing an alarm.

9. In an apparatus of the class described, in combination, a gas-generator containing chemicals in their solid state, a pipe adapted to supply said generator with the necessary water, a second pipe adapted to carry the generated gas to a place more or less remote from said generator, electromagnetic means to control the flow of water in said pipe, hydrostatic means to control the height of water in said generator, an electric circuit, means actuated by the temperature to control said circuit, and means operatively connected with the water-controlling means to open or close a second circuit containing an alarm.

10. In an apparatus to extinguish fire, a gas-supply, a pipe adapted to carry said gas to a place more or less remote from said supply, said pipe provided with a series of outlets normally closed but adapted to be opened through a rise of the temperature to a predetermined point, thereby operating an electric circuit adapted to actuate said gas-supply.

11. An apparatus to extinguish fire provided with means to generate a gas-supply, means to carry said gas to a place more or less remote from the place of generation, means adapted to be operated by a predetermined rise of temperature to open said carrying means and an electric circuit adapted to be operated by said rise of temperature, said electric circuit containing means to operate the means for producing said gas-supply.

In testimony whereof I hereby sign my name, in the presence of two subscribing witnesses, this 27th day of March, A. D. 1902.

ISIDOR KITSEE.

Witnesses:
EDITH R. STILLEY,
CHAS. KRESSENBESCH.