

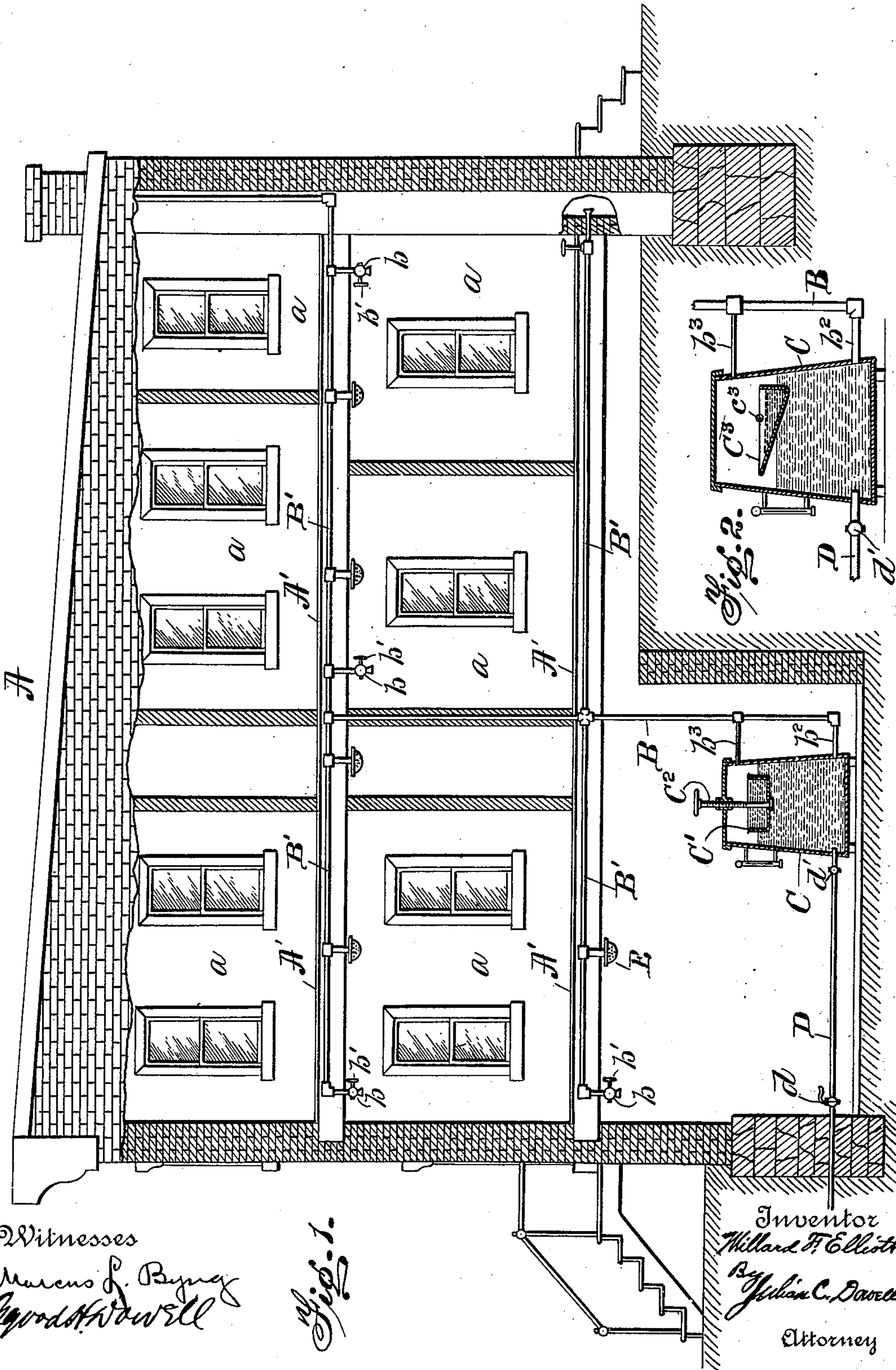
No. 666,604.

Patented Jan. 22, 1901.

M. F. ELLIOTT.
AUTOMATIC FIRE EXTINGUISHER.

(Application filed May 21, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

MILLARD F. ELLIOTT, OF PHILADELPHIA, PENNSYLVANIA.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 666,604, dated January 22, 1901.

Application filed May 21, 1900. Serial No. 17,409. (No model.)

To all whom it may concern:

Be it known that I, MILLARD F. ELLIOTT, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Fire-Extinguishers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for extinguishing fires in buildings, and more particularly to that class of apparatus in which chemicals are employed for generating a gas for utilization in extinguishing the fire.

The primary object of my invention is to provide a simple, inexpensive, and efficient stationary apparatus for extinguishing fire in any part of a building and which may be set in operation by the mere opening of a valve or stop-cock either automatically or by hand in the apartment where the fire may occur, thereby causing the automatic admixture of certain chemical agents adapted to generate a gas and create a pressure sufficient to expel the generated gas and fluid into the desired apartment or apartments for extinguishing the fire without using a pump or other forcing apparatus.

A further object is to provide a practically valveless apparatus with a system of distributing-pipes in communication with a gas-generating tank or reservoir containing a chemical solution in close proximity to but normally separated from another chemical agent which when combined with said solution will generate a gas and create sufficient pressure within the tank or reservoir to expel the gas and fluid therefrom into the room or apartment where a fire may be started, with means for effecting the admixture of the normally-separated chemical agents and setting the apparatus in operation by merely opening a valve or stop-cock in the room or apartment in which the fire may occur, so as to automatically extinguish the fire.

A further object is to provide efficient means for maintaining a chemical solution at a predetermined level in a reservoir or containing vessel by the pressure of a column or body of air confined in said vessel and the distrib-

uting-pipes communicating therewith, so as to normally separate said solution from another chemical agent associated with said vessel for admixture with the solution therein, and thus prevent freezing and bursting of the pipes in cold weather, while at the same time adapting the column or body of confined air to be released by merely opening a simple cock or valve located in the room or apartment where a fire may occur, and thereby effect the admixture of the normally-separated chemical agents which will generate a gas and create sufficient pressure in the generator to expel the gas and fluid therefrom into the room or apartment for extinguishing the fire.

In apparatus of this same general character as heretofore constructed the gas-generating chemicals are usually brought into contact by the use of suitable mechanism for tilting or inverting or breaking one vessel containing one of the chemicals, so as to cause it to spill or empty its contents into the other vessel containing the other chemical in solution, and it is well known that valves and other operating mechanism employed in such apparatus are liable to get out of order and are frequently rendered entirely inoperative and useless at a time when they are sorely needed, but the apparatus is more or less expensive in the first instance by reason of the complexity of the system and the number of parts ordinarily employed therein. My invention is therefore designed to dispense with the use of valves, levers, and other actuating mechanism, so as to overcome the objections incident to the use of fire-extinguishing systems of this same general character as heretofore employed and provide a system that is not liable to get out of order and which consists of the fewest possible number of parts, thus reducing the cost to a minimum.

The invention will first be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and then pointed out in the claims at the end of the description.

In the drawings, in which similar letters of reference are used to denote corresponding parts, Figure 1 represents a sectional side elevation of a building, showing a fire-extinguishing apparatus embodying my invention ap-

plied thereto in such manner as to afford efficient means for readily extinguishing a fire that may be started in any apartment or room of the building; and Fig. 2 is a detail sectional view of a modified form of tank and receptacle therein for containing the chemicals to be utilized in extinguishing a fire.

In the drawings, which represent one of the simplest forms of embodiment of my invention for both positive and automatic release of the column of air which sets the extinguisher in operation, the letter A may denote a building having several apartments *a a*, in each of which may be located a discharge spout or nozzle *b*, adapted for convenient connection with a hose or spraying device and in communication with a fluid-distributing pipe or pipes B B', leading from a tank or vessel C, which may be located in the cellar or any convenient portion of the building and is in communication with a water-main or other suitable source of supply by a pipe D, having a regulating-cock *d* and a check-valve *d'* therein. The discharge-spouts *b b* may be provided with any suitable valves or stop-cocks *b' b'*, adapted to be manipulated by hand for the purpose of opening the valve or cock to permit the confined air and extinguishing fluid to escape, as will be presently explained. The branch pipes B' B' may be conveniently located below the floor A' or above the ceiling of the building for the purpose of concealing the same as well as excluding cold air therefrom in winter, the discharge spouts or nozzles projecting through suitable apertures conveniently located at any desired point. Any desired arrangement of the pipes may be employed, such as may be found most convenient or desirable, according to the construction of the building and the requirements or desires of the builder. The main or discharge pipe B directly communicating with the vessel C for distributing the extinguishing fluid through the branch pipes B', communicating with the different apartments of the building, is in communication with the interior of said vessel C at or near the bottom thereof by a fluid-duct *b²* and also at or near the upper end thereof by an air-duct *b³*, the connection *b²* being provided for the escape of the extinguishing fluid, while the connection *b³* is provided for the escape of the air, which is normally confined in said vessel compressing the fluid therein until released by the opening of one or more of the stop-cocks *b* or other valves controlling the exits from the distributing-pipes.

Within the tank or vessel C is placed a receptacle C' for sulfuric acid or other suitable chemical to be combined with the solution in said tank for the purpose of generating a gas and creating a pressure in the generator sufficient to expel the gas and fluid therefrom for the purpose of extinguishing the fire. The receptacle C' may consist of a cup-like holder secured to a vertically-ad-

justable rod or spindle C², tapped through an opening in the cover of the tank C or otherwise secured thereto or thereon in such manner as to sustain the acid-receptacle at the desired elevation within the tank, with capacity for vertical adjustment, in order that the chemical contained therein may be separated from the chemical solution and maintained at the desired elevation above the level of the solution until it is desired to effect the admixture thereof with the solution in the tank. This may be automatically effected by releasing the air confined in the distributing-pipes, either automatically, as by the fusing of a fusible plug located in any desired part or parts of the building, or by opening one or more of the stop-cocks *b'* by hand.

In Fig. 2 I have shown a modification of the receptacle for the sulfuric acid or other chemical contained in the receptacle C', such modification consisting of a triangular-shaped cup-like holder C³, secured intermediate the ends thereof to a pivot-rod *c³* in such manner that when the fluid in the vessel or tank C rises the acid-receptacle will be tilted and empty its contents into the fluid contained in the tank. The check-valve *d'* in the pipe D serves to admit water into the tank until the pressure therein is at the desired point, whereupon the valve will close and prevent the further inflow of water and will be kept closed until the pressure in the tank is reduced, so that when the chemicals are mixed for generating gas the increased pressure will only more tightly close the check-valve while the generated gas and fluid is being expelled.

The operation of the invention will be readily understood from the foregoing description taken in connection with the accompanying drawings. All outlets being closed and carbonate of soda or other suitable chemical agent being placed in the tank or vessel C, sufficient water is admitted to form the desired solution, the water rising to near the top of the vessel or receptacle C', which may contain sulfuric, hydrochloric, or other suitable acid, which when combined with the solution in the tank will generate a gas and create a pressure sufficient to expel the gas and fluid from the generator into the room or apartment of the building in which a fire may occur, and the solution in the vessel will be maintained at the desired level, below the surface of the acid or acid-receptacle, by the pressure of the column or body of air confined within the tank and the distributing-pipes communicating therewith until the air is released by opening one or more of the stop-cocks or valves in one or more of the rooms or apartments of the building, whereupon the air will escape and the fluid-pressure within the tank will cause the same to overflow or tilt the acid-receptacle, causing the contents of the two receptacles to combine, thereby generating a gas and creating a pressure within the generator sufficient to expel the gas and fluid therefrom through

the distributing pipe or pipes into the room or apartment for extinguishing the fire.

In order to render the device entirely automatic, I also preferably provide in each room or apartment a discharge spout or nozzle with a spraying device E thereon and containing a valve, which is held normally closed by a fusible plug of any approved construction, such as are in common use, so that when the temperature of the room rises above a predetermined point the plug will be fused and permit the pressure of the air within the distributing-pipe to unseat the valve therein, thus permitting the air to escape and setting the generator in operation so as to automatically effect the generation of the gas and the discharge of the fire-extinguishing fluid.

It will be understood, of course, that various changes may be made in the details of construction and arrangement of parts without departing from the spirit and scope of my invention. Any suitable tank or reservoir may be employed and may be located at any desired portion of the building, connected or not with a water-main, so long as sufficient pressure is available to cause the fluid in the tank to rise and overflow or tilt or otherwise actuate the acid-containing receptacle to effect the admixture of the chemicals for generating the gas and expelling the fire-extinguishing gas and fluid. Instead of the simple contrivance shown for holding the acid any of the common forms of acid-containing receptacles may be employed in association with the tank containing the liquid solution.

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

1. An apparatus for extinguishing fires, comprising a tank or vessel containing an aqueous solution, a receptacle associated therewith containing sulfuric acid or other chemical agent adapted to combine with said solution and generate a gas, a discharge and distributing pipe or pipes communicating with the interior of said tank by an air-duct in the upper portion thereof and a water-duct below the same; said distributing pipe or pipes having discharge spouts or nozzles communicating with one or more apartments of the building, and means for normally closing the discharge-ports, thus confining a column or body of air in said distributing pipe or pipes and partly in said tank to maintain the aqueous solution at a predetermined level below the level of the acid in said receptacle, and means for opening said discharge-ports, whereby the air is permitted to escape causing the contents of said vessel and receptacle to automatically combine and generate a gas creating a pressure within the tank for expelling the gas and fluid therefrom through the open discharge port or ports; substantially as described.

2. In combination with the tank containing an aqueous solution, the discharge-pipe com-

municating therewith by a liquid-duct below and an air-duct above the solution therein, an acid-receptacle in said vessel, and one or more distributing-pipes communicating with said discharge-pipe having a valve-controlled discharge port or nozzle, a body of air confined in said tank and pipes for maintaining the solution in said tank below the level of the acid-receptacle, and means for opening said valve to permit the escape of the confined air through said air-duct and distributing-pipes, whereby when the air escapes the contents of said vessel and receptacle will combine and generate a gas creating a pressure within the vessel for forcing the generated gas and fluid therefrom into the apartment for extinguishing the fire; substantially as described.

3. In a fire-extinguishing apparatus, the combination with a tank or vessel having an aqueous salt solution therein, and a receptacle for sulfuric acid or the like above said solution, conduits leading from said tank into one or more apartments of the building, and means for normally closing the discharge ports or outlets from said conduits; said conduits and the upper part of said tank being filled with air adapted to maintain the aqueous solution in said tank below the level of the acid in said receptacle, whereby when the air in said conduits is released by the opening of one or more of said discharge-ports, the aqueous solution will rise, causing the acid to mix and combine therewith, thereby generating a gas and creating a pressure within the tank for expelling the gas and fluid therefrom to extinguish the fire; substantially as described.

4. A fire-extinguishing apparatus, consisting of a suitable tank or vessel having a supply-pipe with check-valve therein for supplying liquid thereto to provide an aqueous solution therein, a discharge-pipe communicating with said vessel by an air-duct above and a water-duct below the level of the solution and having a series of distributing pipes or branches leading therefrom into different apartments of the building; said pipes and the upper part of said vessel containing a volume of air for maintaining a fixed level of the solution in the tank; valve-controlled discharge ports or spouts for said distributing-pipes, and a receptacle for sulfuric acid or the like supported within said tank with means for adjusting the same and securing it at different elevations within the tank; substantially as described.

5. A fire-extinguishing apparatus consisting of a suitable tank or vessel having a supply-pipe with check-valve therein, for supplying liquid thereto, a discharge-pipe communicating with said vessel by an air-duct above and a water-duct below the level of the liquid therein, and a body of air for maintaining a fixed level of the liquid; said discharge-pipe having a series of branches leading therefrom into different apartments of

the building, and said branches provided with discharge - spouts having stop - cocks and adapted for the attachment of a hose, together with valve-controlled nozzles having fusible
5 plugs therein for keeping the valves normally seated until released by the fusing of the plug, whereby said body of air may be allowed to escape by automatic action, or by hand,

for setting the apparatus in operation; substantially as described. 10

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

MILLARD F. ELLIOTT.

Witnesses:

WM. C. STURGES,

C. L. MILLIGAN.