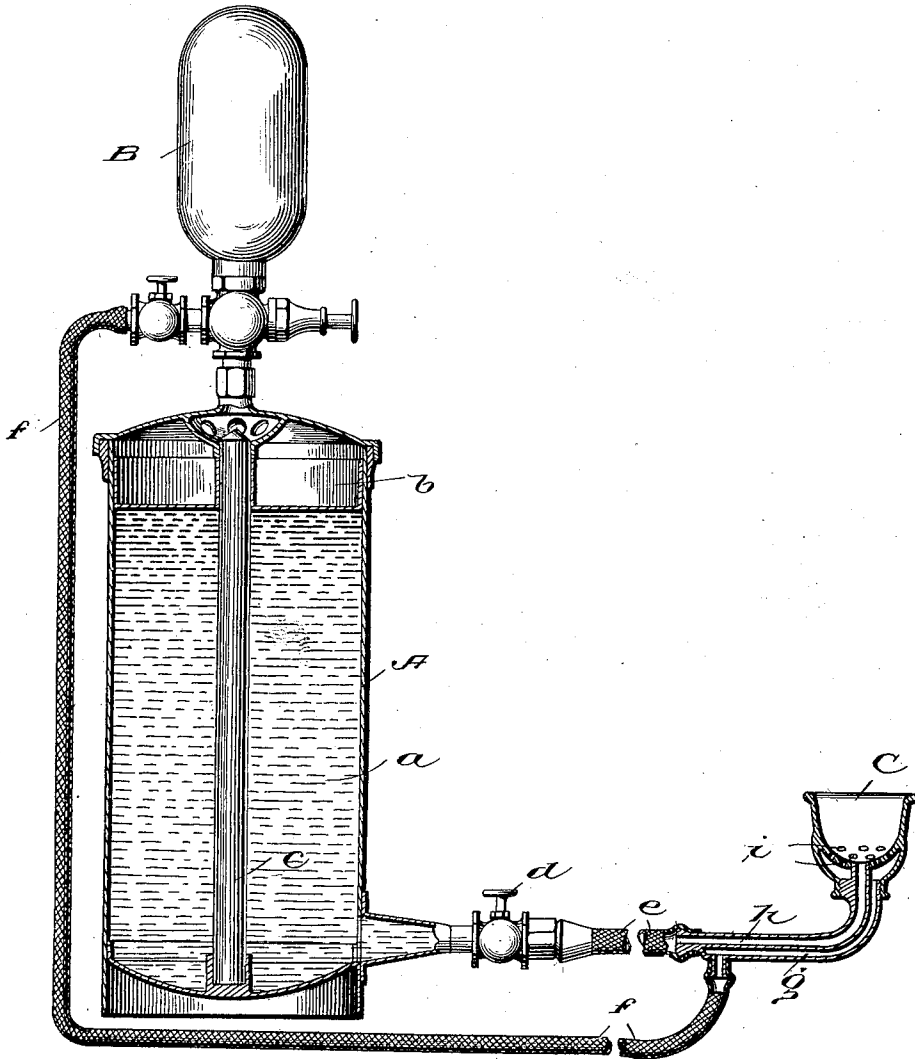


No. 749,374.

PATENTED JAN. 12, 1904.

E. GATES.
METHOD OF EXTINGUISHING FIRES.
APPLICATION FILED MAR. 13, 1903.

NO MODEL.



Witnesses

Wm. J. ...
...

Inventor

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UNITED STATES PATENT OFFICE.

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METHOD OF EXTINGUISHING FIRES.

SPECIFICATION forming part of Letters Patent No. 749,374, dated January 12, 1904.

Application filed March 13, 1903. Serial No. 147,686. (No model.)

To all whom it may concern:

Be it known that I, ELMER GATES, a citizen of the United States, residing at Chevy Chase, in the county of Montgomery and State of Maryland, have invented certain new and useful Improvements in Methods of Extinguishing Fires; 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.

In another application for Letters Patent of the United States, filed July 12, 1900, Serial No. 23,361, I have described and claimed the application of a jelly-like mucilaginous emulsion to the extinguishment of fires, said emulsion preferably containing salts which are either not affected by the heat and are themselves non-combustible or which in addition to being non-combustible are decomposable by heat, so as to leave non-combustible residues and to give off fire-extinguishing gases, such as carbonic-acid gas, ammonia, or the like. By the employment of emulsions of this general character I am enabled to make use in admixture therewith of much larger relative proportions of fire-extinguishing salts than are possible in fire-extinguishing liquids.

My present invention relates to a method of extinguishing fires in which thick, tough, mucilaginous emulsions of the character specified are of particular advantage.

It consists in projecting against a burning wall or other surface or into a room or building a quantity of bubbles containing appropriate fire-extinguishing gases, such as carbonic-acid gas, ammonia-gas, or nitrogen, or any mixture thereof. I prefer to employ as the film substances for these bubbles the jelly-like emulsion specified, so as to not only apply the fire-extinguishing gases contained in the bubbles to greater advantage, but for the further purpose of thereby distributing the emulsion itself throughout the room or building and fully utilizing its capacity for the development of additional fire-extinguishing gases and for depositing upon the burning surfaces its non-combustible salts.

My invention is based upon the observation that when a mass of bubbles is thrown upon

burning materials the flame is more effectually extinguished than by throwing an equal amount of the liquid constituting the film of the bubbles upon the same amount of flame. The explanation of this phenomenon is that an ounce, for instance, of bubble-making liquid thrown directly upon burning materials will cover much less area at a much less depth than if the same quantity of liquid were first converted into a lather of minute bubbles. In fact, the mass of lather procurable from any given quantity of bubble-making liquid will be several times larger at least than that of the liquid from which it is made and will thus more effectually screen the air from the surface upon which it is thrown and at the same time will just as effectually dampen and smother flame as does the liquid itself. Moreover, if the bubbles contain, instead of air, some gas which is a non-supporter of combustion—as, for instance, ammonia, nitrogen, or carbonic acid—the fire will be still more effectually extinguished, because as the bubbles break free inert gas will be released and mingle with the air in that vicinity, thus reducing its capacity for supporting combustion. Furthermore, the mass of bubbles will in that event cover the combustible surface with which they contact with a layer of non-combustible gas.

By using a non-combustible gas in connection with a bubble-making liquid an enormous quantity of bubble-like lather can be created very quickly, and it can be thrown against the walls and floors and ceilings of a building, so as to protect its surfaces, and for this purpose the bubble-like lather should contain inorganic salts which decompose on being heated and give off incombustible gases. In practice I may use to advantage a thick solution of ammonium soap containing, for instance, dissolved borax or ammonium sulfate. This solution may be contained within a suitable receptacle, such as a portable tank, adapted to be carried by hand or drawn by horses and having a nozzle for the ejection of the contents of the tank by means of pressure produced by non-combustible gas taken directly from a gas-reservoir.

In the accompanying drawing I have illus-

trated, partly in section and partly in elevation, a form of apparatus adapted for the practice of the invention.

Referring to the drawing, A indicates a stout metallic receptacle adapted to resist a strong internal pressure and containing the bubble-making emulsion *a*. This receptacle contains a cup-shaped piston *b*, resting upon the surface of the emulsion and guided by the cylindrical guide-rod *c*, so as to have a free movement up and down in the shell A. At the top of the receptacle A is a container B for nitrogen, ammonia-gas, or carbonic-acid gas under pressure, said container being provided with cut-off valves, as shown, so that when exhausted it may be removed from the receptacle A and taken away to be refilled.

The receptacle A is provided with an outlet-pipe having a cut-off *d*, with which connects a flexible pipe or tube *e*, leading to the delivery-nozzle. Another flexible pipe *f* leads from the compressed gas-container B to the delivery-nozzle and discharges into a chamber *g* adjacent to the chamber *h* of said nozzle, which latter chamber forms a continuation of the flexible tube *e*. The chamber *h* opens into a cup-like holder C, provided at its bottom with a number of holes or apertures *i* in communication with the chamber *g* of the nozzle. The flow of the emulsion into the cup C may thus be expedited by pressure of the gas upon the piston *b*, communicated thence to the emulsion to any desired degree, the purpose being to keep the cup filled with the emulsion. The gas passing through the tube *f* and thence through the chamber *g* of the nozzle and the apertures *i* will pass upwardly through the emulsion in the cup and will create a great quantity of bubbles which will be projected in a stream into the building or against the walls which are to be protected.

In the case of more serious fires threatening a valuable building the receptacle A may be of a size and the gas of a pressure and the emulsion of an amount capable of filling an entire room or series of rooms with a solid mass of bubbles. In this event the nozzle is to be thrust into an open window or door and the stream of bubbles created in such quantity as to fill the room, thereby driving out the air. When the air is driven off, the presence of the bubbles in the room will prevent consequent air-drafts and effectually check combustion. The combustion is stopped for two principal reasons, first, the room will

be deprived of air, which is the supporter of combustion, and, secondly, it will be filled with an inert gas. The bubbles will also have the effect of dampening the fires, because of the substance from which they are preferably made. In order to increase the toughness of the bubble-films, I may add glycerin to the emulsion.

Having thus described my invention, what I claim is—

1. The method of extinguishing fires, which consists in projecting against burning surfaces lather-like bubbles containing fire-extinguishing gases; substantially as described.

2. The method of extinguishing fires, which consists in projecting against burning surfaces lather-like bubbles containing fire-extinguishing gases, the film of said bubbles consisting of non-combustible material; substantially as described.

3. The method of extinguishing fires, which consists in projecting against burning surfaces lather-like bubbles containing fire-extinguishing gases, the film of said bubbles consisting of jelly-like emulsion in which is incorporated salts decomposable by heat; substantially as described.

4. The method of extinguishing fires, which consists in projecting against burning surfaces lather-like bubbles containing fire-extinguishing gases, the film of said bubbles consisting of jelly-like emulsion in which is incorporated salts decomposable by heat, and which on being decomposed give off non-combustible gases; substantially as described.

5. The method of extinguishing fires, which consists in projecting against burning surfaces lather-like bubbles containing fire-extinguishing gases, the film of said bubbles consisting of jelly-like emulsion in which is incorporated salts decomposable by heat, and which leave non-combustible oxids; substantially as described.

6. The method of extinguishing fires in enclosed rooms or like spaces, which consists in filling the room or other space with lather-like bubbles containing fire-extinguishing gases; substantially as described.

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

ELMER GATES.

Witnesses:

REEVE LEWIS,
C. W. DRAPER.