

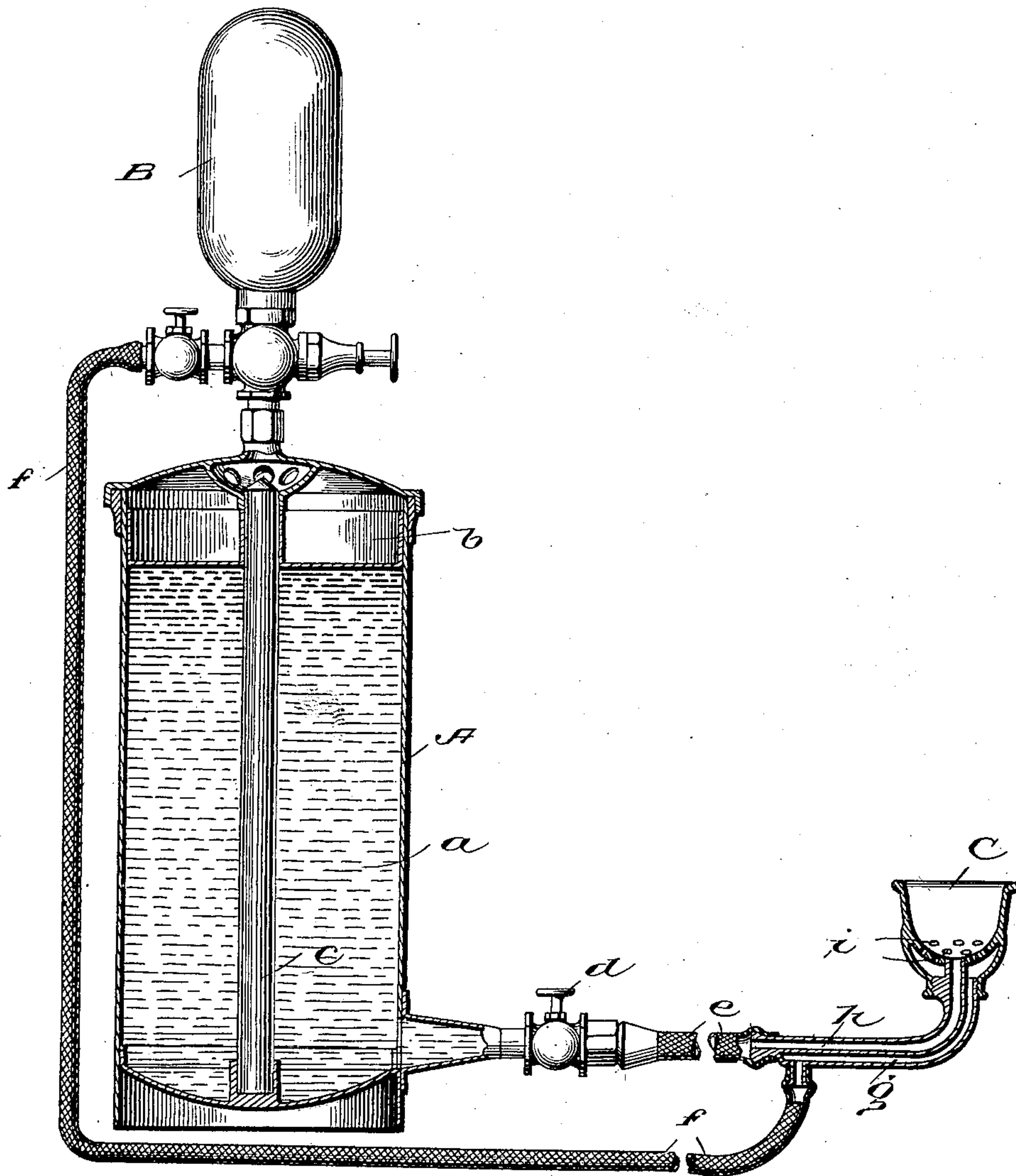
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E. GATES.
METHOD OF EXTINGUISHING FIRES.

APPLICATION FILED MAR. 13, 1903.

NO MODEL.



Witnesses

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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
5 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 sur-
10 face of the emulsion and guided by the cylin-
drical guide-rod *c*, so as to have a free move-
ment up and down in the shell A. At the top
of the receptacle A is a container B for nitro-
gen, ammonia-gas, or carbonic-acid gas un-
15 der pressure, said container being provided
with cut-off valves, as shown, so that when
exhausted it may be removed from the recep-
tacle A and taken away to be refilled.

The receptacle A is provided with an out-
let-pipe having a cut-off *d*, with which con-
20 nects 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,
25 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 com-
munication with the chamber *g* of the nozzle.
30 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 emul-
sion to any desired degree, the purpose being
to keep the cup filled with the emulsion. The
35 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
40 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
45 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
50 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 pre-
vent consequent air-drafts and effectually
check combustion. The combustion is stopped
55 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 60
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-extinguish-
ing gases; substantially as described. 65

2. The method of extinguishing fires, which 70
consists in projecting against burning surfaces
lather-like bubbles containing fire-extinguish-
ing gases, the film of said bubbles consisting
of non-combustible material; substantially as
described. 75

3. The method of extinguishing fires, which
consists in projecting against burning surfaces
lather-like bubbles containing fire-extinguish-
ing gases, the film of said bubbles consisting
of jelly-like emulsion in which is incorporated 80
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-extinguish- 85
ing 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. 90

5. The method of extinguishing fires, which
consists in projecting against burning surfaces
lather-like bubbles containing fire-extinguish-
ing gases, the film of said bubbles consisting of
jelly-like emulsion in which is incorporated 95
salts decomposable by heat, and which leave
non-combustible oxids; substantially as de-
scribed.

6. The method of extinguishing fires in in-
closed rooms or like spaces, which consists in 10
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,
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