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METHOD AND MEANS FOR EXTINGUISHING FIRES

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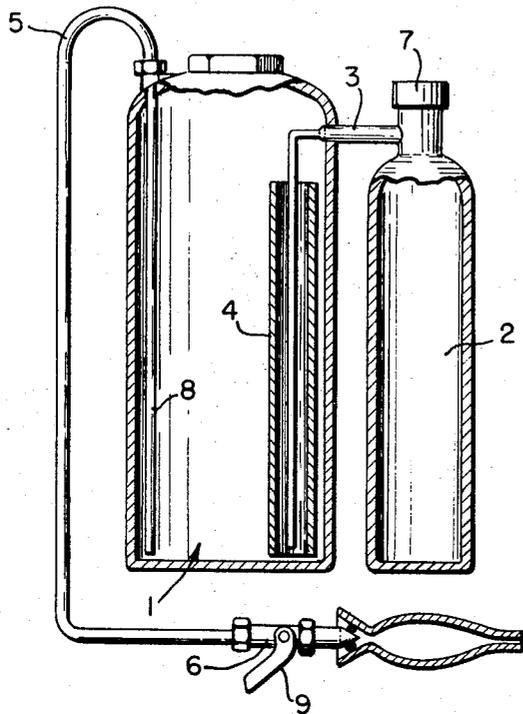


FIG. 1

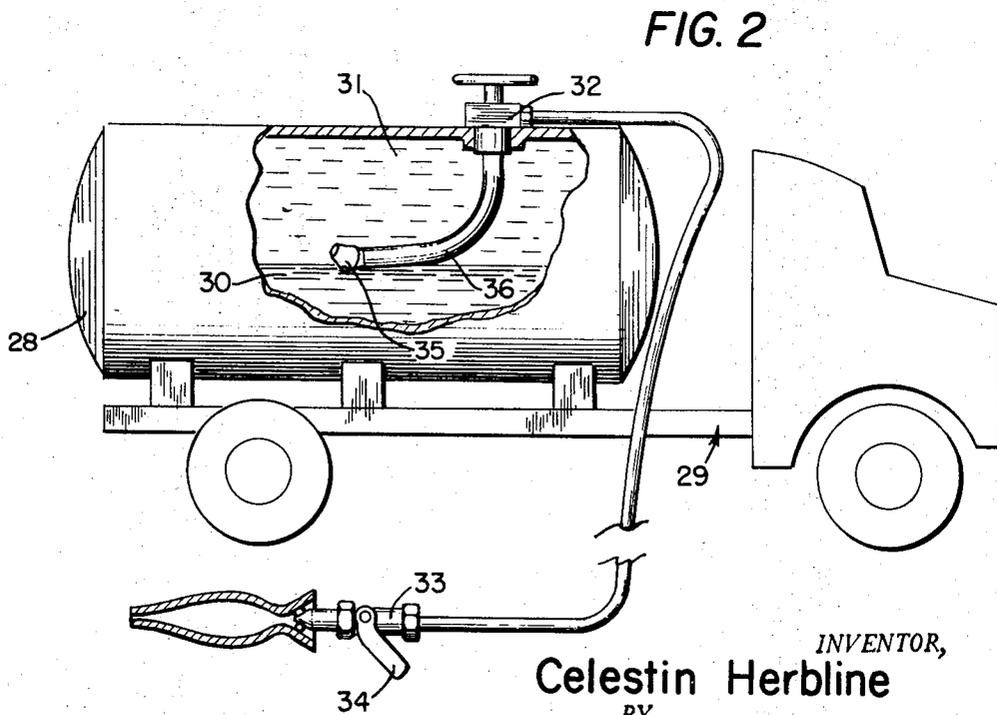


FIG. 2

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**METHOD AND MEANS FOR EXTINGUISHING FIRES**

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Mar. 6, 1967. This application Mar. 3, 1969, Ser.  
No. 803,842

Claims priority, application France, Mar. 10, 1966,  
52,932; Feb. 24, 1967, 96,446  
Int. Cl. A62c 5/16

U.S. Cl. 169—2

8 Claims

**ABSTRACT OF THE DISCLOSURE**

A method and means for extinguishing fires by forming or providing a heavy product in the form of creamy snow in the course of changing into ice and which has a halogenous body contained therein that forms the extinguishing product itself, and wherein when the product contacts a hot surface the gases or materials contained therein are liberated.

**Cross-reference to related application**

This application is a continuation-in-part of patent application Ser. No. 620,894, filed Mar. 6, 1967 now abandoned.

The present invention relates to a process and means for extinguishing fires.

An object of the present invention is to provide a fire extinguishing process and apparatus wherein a heavy product is formed in the shape of icicles in which a halogenous body is contained which forms the extinguishing product itself, and wherein when the icicles contact a hot surface the gases contained therein will be liberated.

A further object is to provide a fire extinguishing process and means wherein a liquid and gas are imprisoned, and wherein the extinguishing product is in the form of a heavy substance, namely, a snow-like material which is converted into ice, so that there is obtained an extinguishing product that has the appearance of a cold solid body and which kills the fire by three principal actions that occur simultaneously, namely, weight, damping and cold.

These and other objects of the invention will become apparent from a reading of the specification and claims, together with the drawings, wherein like parts are referred to and indicated by like reference characters, and wherein:

FIG. 1 is a view illustrating the present invention, with parts broken away and in section for clarity of illustration.

FIG. 2 is an elevational view illustrating a large capacity mobile extinguishing unit, with parts broken away and in section.

Referring in detail to the drawings, and more particularly to FIG. 1 of the drawings, there is illustrated an apparatus for accomplishing the present invention which includes a receptacle or tank 1 which may have an airtight construction which is adapted to contain a liquid such as water or the like therein. The numeral 2 indicates a receptacle which is adapted to contain a substance such as chlorobromodifluoromethane under pressure, and a duct or conduit 3 is adapted to selectively establish communication between the receptacle 2 and tank 1. A portion of the duct 3 extends into a tubular element 4 which is arranged inside the receptacle 1, and the end of the duct 3 terminates in the vicinity of the bottom of the tubular element 4. In addition, there is provided a discharge duct 5 which includes a portion 8 that extends to the vicinity of the receptacle 1. The discharge duct 5 is provided with a projector 6.

The numeral 7 indicates a valve or cock which can be selectively opened so that the chlorobromodifluoromethane from the receptacle 2 can pass through the conduit 3 and enter the tubular element 4 and mix with the liquid or water in the tank 1. The end 8 of the projector tube of the discharge duct is in the zone wherein the mixing of the halogenated body and the water is effected. When the operator presses on the operating handle 9 of the projector 6, the fire extinguishing product will be discharged from the end of the projector 6.

Referring to FIG. 2 of the drawings, there is illustrated a modification wherein the appliance is in the form of a mobile unit that may be mounted on a motor vehicle 29. The extinguisher itself may consist of an air-tight tank 28 containing the halogenated body 30 which, by its specific weight, occupies a volume or space between the bottom of the tank and the upper level of this liquid. Water or other liquid 31 occupies the space available between the upper level of the halogenated liquid 30 and the top part of the tank 28. In this form of the invention the inner action or formation of the fire extinguishing product occurs in the area between the halogenated liquid and the water 31, when the tank 28 is placed in communication with the air by opening a distributing valve 32, as well as by opening the valve or projector 33 by means of an operating handle 34. A float 35 may be connected to the valve 32 by means of a duct 36 so that the float 35 can fall or move up and down in accordance with the level of the halogenated liquid 30 inside the tank 28.

From the foregoing, it will be seen that there has been provided a method of and means for extinguishing fires, and when using the process and device of FIG. 1 the tank 1 may be filled with a liquid such as water and the receptacle 2 may have a halogenated substance therein such as chlorobromodifluoromethane. For use it is only necessary to open the valve 7 so that the substance from the receptacle 2 can pass through the duct 3 and be discharged in the lower portion of the tubular member 4. Then, by manually actuating the handle 9 the fire extinguishing product will be discharged out through the projector 6.

When using the process and apparatus of FIG. 2, the halogenated body 30 is in the lower portion of the tank 28 on a member such as a movable vehicle 29, and the liquid such as water 31 is above the halogenated body 30. When the valve 32 is opened the fire extinguishing product can flow out through the duct 36 and then by actuating the handle 34 the product can be discharged out through the projector or nozzle 33.

The parts can be made of any suitable material and in different shapes and sizes.

In the present invention there is provided a halogenic heavy product which can be projected a long distance or even poured in such a manner that by its weight it reaches the seat of fire by gravity, and this is to be contrasted to a foam type of fire extinguisher which can never be used in such a way because they are blown about in the wind because of their light weight. While several different apparatus have been illustrated for use in carrying out the present invention, it is to be understood that the invention is not limited to such specific apparatus, but different types can be used in carrying out the process. Thus, various mechanisms can be provided to permit the product to be put into contact with the ambient air, the mixture of halogenic body and liquid which may be water, oil or the like. The primary aspect or feature of the present invention is the process for granular ice that is converted into the ice-like substance which is formed as an extinguishing product. Thus, in accordance with the present invention, a heavy product is formed in the shape of icicles in which the halogenated

body is contained which forms the extinguishing product itself when the icicles come in contact with a hot surface so as to liberate the gases that they contain.

The present invention does not use methyl bromide or tetrachloride of carbon which are dangerous and may even be fatal.

There is provided in the present invention an extinguishable product which occurs as a substance having the consistence of melting snow during its conversion into ice. Specifically, there is formed icicles which enclose a halogenous body which is only released when the icicles are in contact with a hot mass. In the present invention both a liquid and gas are imprisoned. The present invention is to be contrasted to those processes or apparatus which have been disadvantageous since the previous products have made extinguishing foams which are always difficult to place into operation and, in addition, which necessitate complex equipment that is not easy to move and generally is not able to be carried by vehicles of all kinds.

It is to be noted that in certain of the prior patents a foam is provided by using a halogenous body such as carbon tetrachloride mentioned in Pat. No. 1,829,714. It will be noted that a foam is a kind of snow forming on the liquid. In the process of the present invention there is provided an extinguishing product which occurs as a heavy product which is like snow during its conversion into ice. Thus, there is obtained an extinguishing product which is in the form of a heavy substance, namely, a snow-like material that is converted into ice, so that there is obtained an extinguishing product that has the appearance of a cold solid body and which kills the fire by three principal actions, namely, weight, damping and cold, and these three actions occur simultaneously when the mixture is placed in contact with ambient air. In addition, this mixture possesses the property of being able to be projected from a considerable distance, or even thrown by hand from a street up to a window of a house in flames. The process of the present invention is very simple and permits the production of a very efficient new fire extinguishing agent. The product is a combination type that places a halogenous body into reaction with a liquid such as water when these two bodies are brought into the presence of air. In addition, the combination of the halogenated body and liquid can be transformed into granular ice upon contact with the air.

With the present invention there is provided or obtained an extinguishing product that occurs in the form of snow being converted into ice which imprisons a halogenous body which boils at less than 0° C. at -4° C. for instance, such as chlorobromodifluoromethane. The product has different physical characteristics from any such products heretofore available.

The present invention thus provides a method and means for producing a fire extinguishing product that can easily be projected over a greater distance of a surface of fire. The present invention possesses advantages over those devices which produce a foam and which are light products of weak density and, consequently, are difficult to project to a great distance. Thus, such extinguishing foams cannot be generally used in the struggle against forest fires in directing them by the aid of special airplanes over the fire surface because these light foams are driven away by winds, dispersed and rarely reach the surface of the fire. The present invention provides a product that is in the form of granular snow, that is to say that it possesses the consistency of creamy snow, of icicles or of hail, that is to say, it is a solid product composed of heavy halogenerated icicles liberating the halogenated body by contact with the heat. Such a product can easily be projected to a great distance with precision on a fire surface because it ejects a heavy product of the proper consistency. When using the same on forest fires for example, due to the mass of the heavy halogenerated icicles, the product can be projected by gravity

so that they can be let loose from an airplane above the spot of the fire wherein the hail-like substance will descend due to the considerable weight upon the selected zone.

Thus, there is provided a method of putting into contact with air a halogenated body previously mixed with liquid so that the action of the air on the mixture induces the evaporation of the halogenated body, engendering the formation of heavy halogenated icicles which liberate the halogenated body by contact with heat. The liquid may be water, oil or the like. The halogenated body may be chlorobromodifluoromethane.

In the device of FIG. 1 there is provided a method and means for producing heavy halogenated icicles and wherein there is provided two air-tight containers, one containing chlorobromodifluoromethane and the other the liquid such as the water or oil, the container of the halogenated body communicating with the container of the liquid by means of a duct, and there is provided a passage for the ejection of the icicles with the process and apparatus.

In FIG. 2 there is illustrated a movable apparatus which may be carried by a vehicle 29 with a container 28 for receiving a halogenated body 30, as well as the liquid 31, the halogenated body 30 remaining at the bottom of the tank. The float 35 maintains itself at the level of the halogenated body as previously stated, and, in addition, there is provided the projector for discharging the fire extinguishing product. The liquid is mixed with the halogenated body and may be water of a suitable type, and may consist of sea water, oil soluble in water or other liquids depending on the type of fire to be extinguished. Specifically, the present invention provides a fire extinguishing product which is in the form of creamy snow in the course of changing into ice. There is provided a substance which can be projected a considerable distance which has a heavy mass having the consistency of carbonated snow and more dense than that which was a mixture of water treated specially and from a halogen.

The basis for operation of the present invention is in making the halogenated body pass from its initial position at the heart of the container to its final position in the atmosphere. Thus, the halogenated body being relieved of its initial pressure and from the liquid state to the atmospheric pressure and to the gaseous state, warms itself in absorbing calories disengaged from the bodies in contact with it, thus cooling these bodies. Also, the halogenated body in the presence of a liquid such as water cools down until its point of congelation and the halogenated body escaping from the dispensing apparatus will be enclosed at the midst of the mass which will appear then under the form of icicles in the course of formation. Also, when fighting hydrocarbon fires it operates in a manner that is entirely different from the previous devices, mainly due to its high specific gravity which makes it penetrate to the midst of the fire so that the same will be extinguished as the result of the intense cooling of the upper layer of the fuel which tends to reduce the temperature below the point of inflammation. Also, there is evaporation of the halogen body which penetrates in the form of icicles into the fuel where its action as a negative catalyst takes place. Further, there is a penetration of a cold mass into the volume of fire, and this penetration and the spouting provoked by the dis-engagement of the halogen body creates turbulence removing the hot layers from the surface so as to cool the latter.

The present invention produces an apparatus utilizing the application of thermodynamics of extinguishing fires. The halogen body is adapted to be mixed with liquid at the moment of use and putting into contact with the air in order to obtain the fire extinguishing effect.

What is claimed is:

1. A method of producing and projecting a product in the nature of creamy snow in the course of transformation to ice for extinguishing fires, comprising the steps of

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placing in contact with air a halogen body, such as chlorobromodifluoromethane previously mixed with liquid and imprisoned in the liquid so that the action of the air on the mixture induces the evaporation of the halogenated body, to cause the production and formation of heavy halogenated icicles, and wherein the halogenated body will be liberated when contacting a hot surface or area.

2. The method as defined in claim 1, wherein the liquid is water.

3. The method as defined in claim 1, wherein the liquid is oil.

4. The method as defined in claim 1, wherein the fire extinguishing product has the consistency of melting snow during its conversion into ice, and wherein the extinguishing product has the appearance of a very cold solid body which kills a fire due to its weight, damping action and coldness, the extinguishing product that occurs in the form of snow being converted into ice which has imprisoned therein a halogenated body that boils at less than 0 degrees C.

5. In a device for producing and projecting icicles having a halogenated body imprisoned therein for extinguishing fires, a pair of air-tight containers, one of which contains a halogenated body such as chlorobromodifluoromethane and the other containing a liquid such as water or oil, means selectively establishing communication between the air-tight containers, and wherein heavy halogenated icicles are adapted to be formed in the interior of the container with the liquid, and passage means for discharge and evaporation of said fire extinguishing product which is in the form of a heavy mass having the consistency of snow.

6. In a device for producing a heavy fire extinguishing substance having a halogenated body, such as chlorobromodifluoromethane imprisoned therein, a movable assembly adapted to be mounted on a vehicle, a container on the vehicle for receiving a halogenated body and a liquid, the halogenated body having a tendency to remain at the bottom of the container due to its specific gravity, a float maintaining itself at the upper level of the halogenated body, means for selectively mixing the halogenated body with the liquid so as to form a heavy mass

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having the consistency of creamy snow in the course of being transformed to ice and conduit means for selectively establishing communication between the product and the outside area.

7. In a device for producing a fire extinguishing product, a means for holding a liquid and a halogenated body such as chlorobromodifluoromethane, means for selectively mixing the halogenated body with the liquid so as to form a heavy mass having the consistency of creamy snow in the course of being transformed to ice, the halogenated body being imprisoned therein, and means for selectively discharging the product into the atmosphere.

8. A method of extinguishing fires comprising the steps of imprisoning a halogenated body such as chlorobromodifluoromethane in a liquid, causing the halogenated body that is imprisoned in the liquid to pass from its initial position in a container to a final position in the atmosphere, and wherein the halogenated body is relieved of its initial pressure and passes from a liquid state to a gaseous state at atmospheric pressure so as to warm itself by absorbing calories disengaged from bodies in contact with the same so as to cool said bodies, the halogenated body in the presence of a liquid cooling down to its point of congelation, and the halogen body being enclosed in a mass which appears in the form of creamy snow in the course of being transformed to icicles.

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