Sept. 30, 1952 C. L. ZABRISKIE 2,612,224

FIRE EXTINGUISHER

Filed Feb. 21, 1948

Fig. 1.

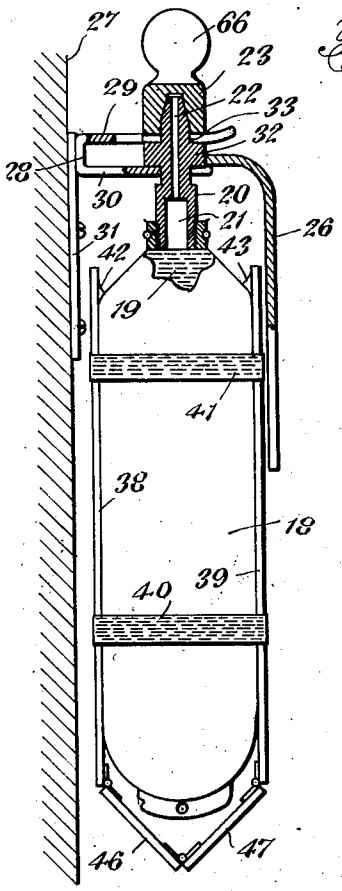


Fig. 3.

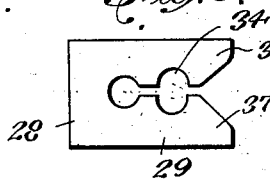


Fig. 4.

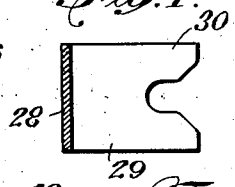


Fig. 6.

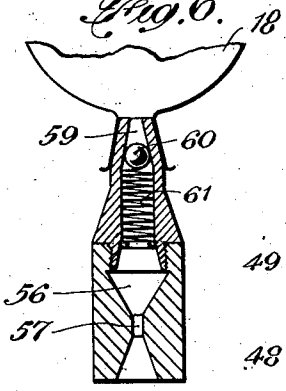


Fig. 5.

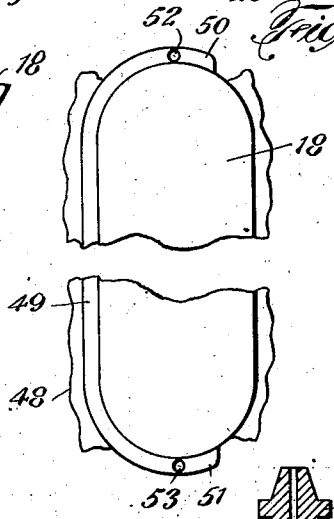


Fig. 7.

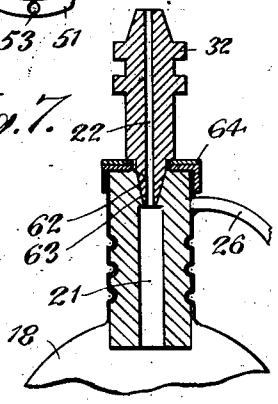
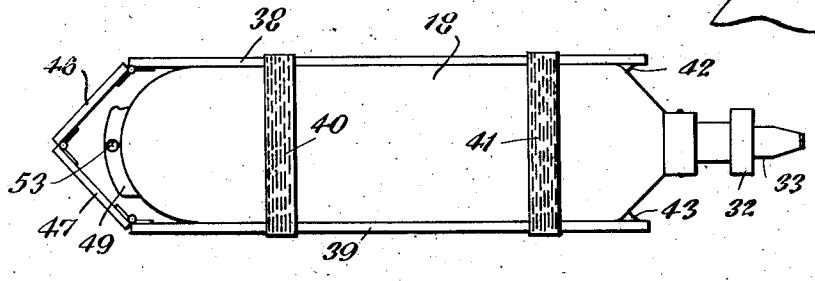


Fig. 2.



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Patented Sept. 30, 1952 2,612,224

UNITED STATES PATENT OFFICE

2,612,224

FIRE EXTINGUISHER

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Application February 21, 1948, Serial No. 9,999

2 Claims. (Cl. 169—30)

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This invention relates to an improved fire extinguisher, and in its smaller forms to be particularly usable in factories, warehouses, homes, and other like places.

The invention herein relates to an improved construction of fire extinguisher which has the fire extinguishing fluid in a flexible container, subject to be squeezed to force a stream of considerable length to a flame.

The invention also provides for an improved construction of flexible container and a nozzle therefor and a handle associated therewith, so that the extinguisher may be operated by one hand for the purpose of specifically directing the extinguishing fluid to the fire and for squeezing the container at the same time so that the fluid will reach a considerable distance from the nozzle, thereby allowing the operator to stand a relatively far distance from the fire. It will be noted that this improved extinguisher is not dependent upon gravity of the fluid to create sufficient force to have the fluid reach a fire of some distance.

The invention further provides for an improved flexible type of fire fighting fluid container, and the nozzle therefor, and as produced the extinguisher may be effectively operated by one hand so that the operator can stand at least an added arm's length from the nozzle of the extinguisher itself, thereby gaining the arm's length distance from the fire as well as exerting squeezing pressure to give an extended length of stream to reach the fire. This arm's length distance is particularly helpful as well as having an apparatus that allows the specific or direct pointing of the nozzle to the bed of the fire or to such other predetermined point of the fire as desired. Such arm's length allows a person to be protected by standing around a corner of a wall and being able to direct the extinguishing fluid to the fire while at the same time saving most of his body from the heat of the fire.

The invention also provides for an improved flexible material for containing the fire fighting fluid. Also, this improved invention provides for a novel type of nozzle by which added length of stream of the fire fighting fluid is obtained.

A further feature of the invention provides for an effective and efficient type of handle preferably associated with the nozzle itself in a manner that allows the nozzle to be specifically and directly aimed or pointed at the fire while at the same time allowing the bag to be squeezed to force the extinguishing fluid from the bag.

Another advantageous feature of the invention

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is the provision of an improved type of nozzle with variations in the diameter of the hole therein to preferably provide a Venturi action, whereby the stream of the extinguishing fluid can be extended in length, thus allowing the operator to stand a further distance from the fire but to have the extinguishing fluid operate to satisfactorily reduce and extinguish the blaze. Further features of the invention have to do with attachments associated with the nozzle and which respond to heat, whereby the extinguishing fluid is kept in the bag until excess heat causes a change to thereby allow the fluid to flow from the bag or container to the fire.

Other features pertaining to a simple, normal type of cap for closing the nozzle and an improved type of support for holding the extinguisher in a desired position in a house, home, factory, or other places, is provided and supports the cap so that when the extinguisher is quickly pulled from the support, the cap is automatically thrown from the nozzle.

Another improved feature of the invention is the protecting of the bag so that it will not have holes punched therein by unauthorized persons but still will be collapsed quickly and easily so that the extinguishing fluid will be forced from the bag.

Other features and advantages of the invention will be apparent from the detailed description given below, when taken in connection with the accompanying drawings. In these drawings,

Fig. 1 is a side view, partially in section, of the improved extinguisher as held in position from a support, here shown as being fastened to a wall, and a handle associated with the nozzle of the extinguisher is also illustrated;

Fig. 2 is a side view of the extinguisher illustrating one form of protector for the flexible bag of the extinguisher;

Fig. 3 illustrates the top view of a portion of support for the extinguisher;

Fig. 4 illustrates a lower portion of the support;

Fig. 5 shows a type of strip or rib holding means for supporting the extinguisher in a desired position;

Fig. 6 illustrates the improved extinguisher with a spring-pressed ball type of construction of nozzle and a Venturi type of opening in a part of the nozzle; and

Fig. 7 illustrates a modified form of nozzle which provides a friction joint which may be forced apart by reason of a thermal element responsive to material increases in temperatures.

Referring now to these drawings, Fig. 1 illustrates an improved fire extinguisher preferably composed of a flexible bag or container 18, filled with fire extinguishing fluid 19, and a nozzle 20 sealed or held to the bag 18 at a desired point and having an opening therein of larger diameter 21 and a smaller diameter 22 and being provided with a suitable type of cap 23 for closing the free opening in the nozzle. The nozzle 20 is preferably provided with a suitable handle 26 having a relatively long extension portion which is preferred to be positioned to extend along the side of the bag 18 so that it may be gripped with the bag. This handle is provided to preferably function to first pull the extinguisher from a support in a particular manner, later to be described, and secondly, to directly and positively aim the nozzle at a desired part of the fire, and thirdly, to allow the bag to be squeezed against the handle so that the extinguishing fluid 19 will be forced out through the nozzle directly to the fire.

This improved type of extinguisher may be supported in any particular selected position in a home or in a factory or in another place where a fire is liable to start. It is a custom to usually place fire extinguishers near or over stoves, furnaces, or other spots where they are handy to extinguish a fire. These extinguishers may be supported in any satisfactory manner.

In the illustration of Fig. 1, the extinguisher is shown as supported close to a wall 27 by providing a support 28 which, in this instance, has an upper portion 29 and a lower portion 30. This support 28 is held against the wall by a strap 31, or by any other suitable means that will maintain the support in a satisfactory position. For purposes of quick and easy operation, this support 28 has its upper and lower portions 29 and 30 for the purpose of allowing lower portion 30 to engage a larger diameter or collar 32 of the nozzle and thereby take practically all of the weight of the extinguisher, and the upper portion 29 engages a neck part 33 of the nozzle in an opening 34, as indicated in Fig. 3. This upper portion is split so that the legs 36 and 37 (Fig. 3) will expand and allow the neck 33 to pass into the opening 34. It is preferred in one form of the upper portion of support 29 to have the ends of 36 and 37 turned upwardly to a slight extent, as shown in Fig. 1, so that the extinguisher will not slide out of the support, and so that as the extinguisher is quickly pulled from the support 28, the cap 23 will be forced from the nozzle and thereby allow the fluid 19 to be forced from the bag 18 without back pressure. It will be noted that the nozzle is so constructed that when the extinguisher is grasped by the handle 26 and pulled outwardly, the collar 32 will create a leverage that will assist the upper portion 29 of the support 28 in throwing the cap 23 from the nozzle. Other suitable means for supporting the extinguisher and for allowing the cap to be quickly and easily and more or less automatically removed from the extinguisher as the extinguisher is drawn from the support, may be employed as desired.

Referring to Figs. 1 and 2, there is illustrated one form of protector for the bag 18 and in this instance, two relatively flat pieces 38 and 39 are held in contact with the bag by suitable tie elements 40 and 41 which may have rubber construction therein. Also, knobs 42 and 43 are provided so that the flat pieces will not slide from the bag. In the preferred structure here

shown, the lower ends of the flat pieces are provided with short pieces 46 and 47 attached to each other preferably hinged, and to the flat pieces. These flat pieces may be enlarged and may even telescope sidewise with each other to allow the bag 18 to be easily squeezed. The main purpose of the protector is to provide one form of protecting means for the flexible bag 18, and, if desired, to assist in squeezing the bag.

Another form of protecting means for the bag 18 consists of a sleeve or outer bag 48, as shown in Fig. 5. This sleeve or outer bag is flexible and usually extends all around the bag 18. In the event the bag 18 is of material which will not show printing so that instructions may be printed on the side thereof, the protecting sleeve or cover bag 48 will be made of material which will take printing so that the necessary directions may be readily seen and read. In addition, the sleeve 48 may have a luminous strip or part formed thereon or therein so that the position of the extinguisher may be noted during darkness.

Another modified form of supporting the bag 18, is shown in Fig. 5, wherein a suitable type of rib 49 is provided and has free ends 50 and 51 which have holes 52 and 53 therein to allow the bag 18 to be hung either with the nozzle upright or with the nozzle down. This supporting rib 49 is shown in one form but it is to be understood that other extensions from the bag 18 may be employed to hold the extinguisher in predetermined or desired position

In Fig. 1, the nozzle is shown in section and illustrates two diameters of the hole in the nozzle, the larger diameter being preferred to be near the point of attaching or sealing the nozzle to the bag 18. If desired, the same diameter of hole may be made all the way through the nozzle.

In this type of extinguisher, which is capable of being squeezed to force the fire extinguishing fluid therefrom, it is desired to obtain the longest stream possible. One form of providing this advantage is to form the hole in the nozzle in different Venturi sizes of diameters. With this improved nozzle to gain a longer stream, it is desired that the opening nearest the bag 18 shall have a maximum diameter of five units at position 56 and to then taper to the smallest diameter 57, which is of one unit diameter, and then the hole bells outwardly to form a final diameter of three units. These units of diameter and relationship with each other have been found to be very satisfactory to gain a good advantage herein, i. e. exceptionally long stream. Changes may be made but they must be such that the length of the stream will be increased.

Another modified form of opening in the nozzle is also shown in Fig. 6, wherein the neck 59 of the nozzle is shown preferably tapered for receiving a ball 60 biased into position by a suitable spring 61 forming a ball spring unloading structure. Normally, the ball 60 closes the tapered portion 59 so that the extinguishing fluid 19 will not pass from the bag except as the bag is squeezed or that the fluid 19 has become expanded by reason of excessive heat or from some other reason. Thus, the extinguishing material is usually maintained in the bag without dimunition for a long period of time without requiring changing.

A still further modified form of nozzle is shown in Fig. 7 where there is shown a lower part of the nozzle extending into the bag 18 and is provided with a friction surface joint 62 and the cooperating portion of the friction joint is illustrated at 63. This friction joint is held together very

firmly and in such a manner that it will support the lower portion of the extinguisher when held in support 28. Just above the collar portion 63 of the nozzle structure, there is provided a thermal responsive element associated with this joint and operating to force the joint apart when the thermal element becomes heated to a large extent and gives way. In Fig. 7, this thermal element is shown as a bi-metallic element 64 which in expanding by reason of heat, will force the friction joint apart and allow the bag 18 to drop onto the fire. The diameter 21 of the hole in the nozzle is larger at the lower part of the friction joint and when the bag drops, the fluid will flow quickly and easily out of the bag onto the fire. Fig. 7 also shows the smaller diameter hole 22 in the nozzle. The collar 32 and the handle 26 are also shown in this figure.

It will be understood that when the fire extinguisher is supported by the eyelet 53, with the nozzle pointed downwardly and when the thermo-couple is then expanded and forces the separation of the parts of the nozzle at the friction joint, the extinguishing fluid will immediately fall onto the fire or in the neighborhood of the fire in such a manner as to extinguish it.

In many instances it is desirable to have a fire extinguisher handy without its being supported in a particular place, as for instance, by placing the extinguisher in a desk or dresser drawer, but at some place where it may be grasped easily and pointed at a fire. In such an instance, it is desirable to be able to remove the cap and the enlarged end 66 of the cap 23, as shown in Fig. 1, makes it easy to remove this cap.

It is also a feature of this invention that while the cap 23 fits very tightly onto the nozzle, it is desirable that this cap shall, in many instances, remove itself automatically so that the extinguishing fluid may flow to the fire. In such a case where the fire extinguisher is held with the nozzle downwardly, the material composing the cap 23 should be of a different material than the nozzle 20. By making the cap 23 of material which expands much more rapidly than the material of nozzle 20, the cap will automatically fall from the nozzle when it has been heated to a high temperature and thus drop off of the nozzle. Such an arrangement of different materials whereby the cap material expands faster than the material of the nozzle may be constituted of two metals such as used in a bi-metallic element as noted at 64 in Fig. 7.

It will be seen from the foregoing description that it is preferred to provide a fire extinguisher having a flexible bag that may be squeezed by one hand, or in some instances by two hands, or in instances, which are known in prior patents, between alligator jaws or other like structures. It is preferred that the bag be transparent or at least shall be translucent so that the amount of extinguishing material in the bag may be noted at any time.

The extinguishing fluid employed may be of any type for different purposes. For general purposes and for the preferred purpose herein, it is desired to use carbon tetrachloride. The bag 18 may be made of any suitable material for the purpose, and may be exemplified by polyethylene, nylon, vynol rubber, and other like materials which in part at least may be squeezed. It will be noted also that means for protecting the bag may be of any desired form for the purpose, so long as they allow the bag to be squeezed.

It will also be noted that several types and modifications of means for supporting the extinguisher may be provided but it will be particularly noted that one form is desired which will force the cap from the nozzle as the extinguisher is quickly pulled from the support. This type of improved support includes two extensions. Other means may be provided so that there will be a lever action between the directing handle 26 and the support for the purpose of forcing the cap from the nozzle. It will also be noted that a preferred type of handle is herein shown for grasping the extinguisher and for specifically directly pointing the nozzle at the fire. Another feature of the handle is that it allows the bag to be squeezed against it and thereby increase the pressure on the fluid within the bag to obtain a longer stream of the fluid to the fire and to direct the nozzle at the same time.

It will further be noted that there are several preferred types of nozzles so that the extinguisher may be used in different places and for different purposes and so that the maximum velocity and ejector throw of the fluid will be obtained. These features are obtained by various diameters of holes in the nozzle. In addition, the nozzle may be constructed so that it will be responsive to thermal operating pieces to allow the bag to be separated from a portion of the nozzle so that the extinguishing material may be dropped on to the fire and the bag punctured by the heat of the fire and the fluid allow to flow therefrom as well as flowing out of the nozzle. These thermal elements may be ones which melt and allow the extinguisher to drop to the fire, but they also may be thermo-couples which function to exert energy and will separate various parts of the extinguisher from the support provided to hold the extinguisher in a preferred position.

It will also be noted that the bag 18 in its preferred construction will be provided with a suitable holding means at the end opposite the nozzle so that the fire extinguisher may be supported from that end rather than from the nozzle end as shown in Fig. 1.

It will further be noted that the nozzle may be attached, fastened or sealed to the bag at any particular place so that the nozzle may be pointed in any desired direction. Also the hole in the nozzle may have a varied contour and have an exit in the side of the nozzle, if desired. It is, however, preferred that the hole be straight through the nozzle and that any modification of diameters of the hole may be provided that will give a longer length of stream of the fluid to a fire. It may be optional to include the ball spring unloading structure but in many uses, this type of element is preferred.

It will be understood that various modifications and changes may be made in the preferred form of the invention herein, and such modifications and changes are to be understood as part of this invention, as outlined in the following claims.

The invention claimed is:

1. In a fire extinguisher the combination of a flexible bag for holding fire extinguishing material in fluid form, a nozzle attached to one point of said bag for having said fluid pass through said nozzle when said bag is squeezed, and a cap for engaging said nozzle to prevent said fluid from flowing from said body until said cap is removed, said cap being made of a material which expands much more rapidly than the material of which the nozzle is made, whereby it will automatically drop off the nozzle at high temperatures.

2. In a fire extinguisher the combination of a flexible bag for holding fire extinguishing material in fluid form, a nozzle provided with an orifice of relatively large diameter opening at one end into the bag and at the other end into an orifice of smaller diameter, for having said fluid pass through said nozzle when said bag is squeezed, said nozzle being firmly affixed in an opening in said bag, a cap for engaging said nozzle to prevent said fluid from flowing from said body until said cap is removed, said cap being composed of material that responds expansively to heat quicker than the material of said nozzle, and a handle firmly affixed to said nozzle and extending therefrom along the side of said bag as filled with fire extinguishing fluid and being of sufficient length to allow one hand to grasp said handle and said bag and to squeeze the bag to force the extinguishing fluid from said bag, said handle acting to directly aim said nozzle to predetermined points of the fire.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,057,538	Gammeter	Apr. 1, 1913
1,510,848	Hubbard	Oct. 7, 1924
1,592,379	Merle	July 3, 1926
1,793,077	Frich	Feb. 17, 1931
1,850,008	Gore	Mar. 15, 1932
1,918,848	Levinson	July 25, 1933
2,222,267	Schnabel	Nov. 19, 1940