

Aug. 8, 1933.

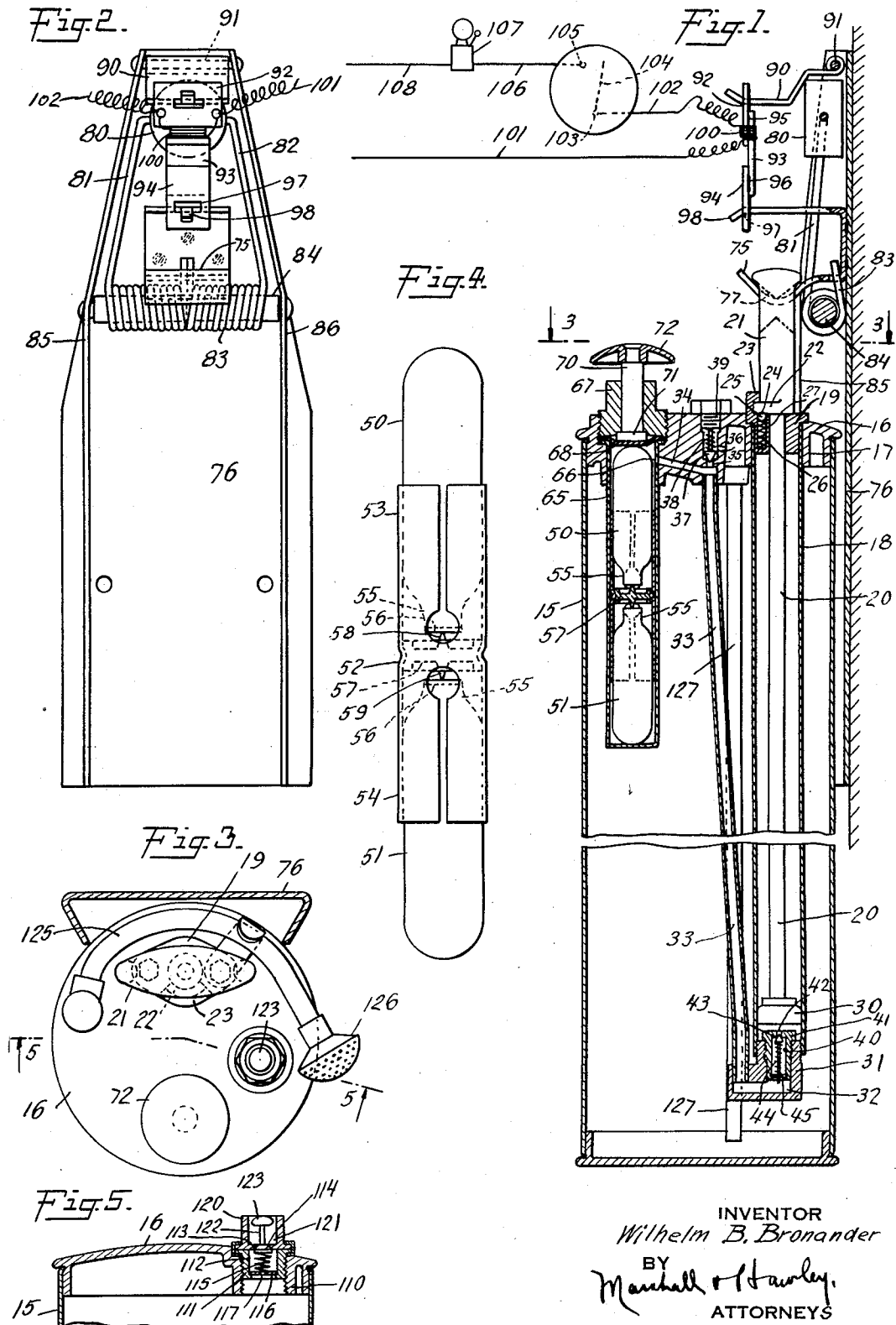
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FIRE EXTINGUISHER

Filed June 14, 1930

2 Sheets-Sheet 1



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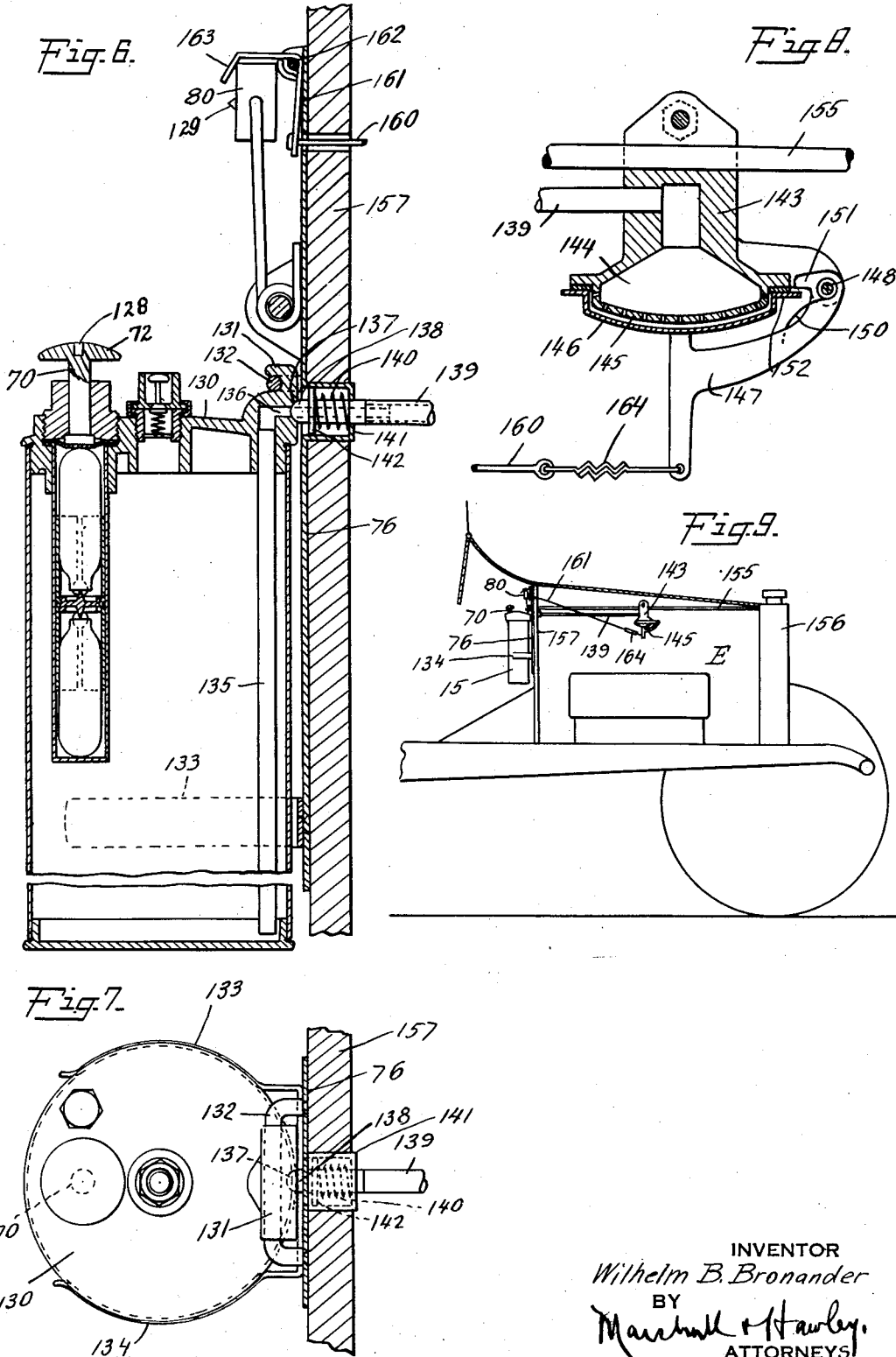
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2 Sheets-Sheet 2



INVENTOR
Wilhelm B. Bronander
 BY
Marshall & Hawley
 ATTORNEYS

UNITED STATES PATENT OFFICE

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FIRE EXTINGUISHER

Wilhelm B. Bronander, Montclair, N. J.

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6 Claims. (Cl. 169—26)

This invention relates to fire extinguishers.

More particularly stated, the invention relates to the type of extinguisher in which fire extinguishing liquid is ejected from the receptacle or container by pressure.

The invention has for its salient object to provide an extinguisher of the character described, so constructed and arranged that the liquid can be released by pressure obtained by manipulation of a pump or by the release of a compressed charge.

Another object of the invention is to provide an extinguisher of the character described, so constructed and so mounted that the extinguisher will be automatically set in operation in case of fire or can, if desired, be manually operated.

Another object of the invention is to provide a plurality of automatically operable heat controlled mechanisms so constructed and arranged that the extinguisher will be automatically operated in case of fire and an alarm will be sounded.

Another object of the invention is to provide an extinguisher, an automatic control mechanism therefor adapted particularly for installation and operation in motor vehicles, and so constructed, arranged and mounted that the extinguisher can be manually operated when desired or will operate automatically in case of fire.

Further objects of the invention will appear from the following specification taken in connection with the drawings, which form a part of this application, and in which

Fig. 1 is a sectional elevation showing an extinguisher and mounting constructed in accordance with the invention;

Fig. 2 is an elevational view taken at right angles to Fig. 1 and showing the extinguisher supporting plate or bracket and parts carried thereby;

Fig. 3 is a top plan view looking in the direction of the arrows 3—3 of Fig. 1;

Fig. 4 is a detail elevation on an enlarged scale showing the clip for holding the compressed charge cartridges;

Fig. 5 is a sectional elevation taken substantially on line 5—5 of Fig. 3, parts being omitted for the sake of clearness;

Fig. 6 is a sectional elevation similar to Fig. 1 but showing a mounting particularly adapted for motor vehicles;

Fig. 7 is a top plan view, partly in section,

of the mounting for the extinguisher shown in Fig. 6;

Fig. 8 is an enlarged sectional elevation showing the discharge end of the conduit for conducting the extinguishing liquid to a position above the motor of a vehicle; and

Fig. 9 is a diagrammatic sectional elevation showing the arrangement of the extinguisher on the motor vehicle.

The invention briefly described consists of an extinguisher comprising a receptacle or container and a plurality of cartridges having a compressed charge of gas therein adapted upon release to eject the fire extinguishing liquid from the container. Means is provided for releasing the gas from the cartridges by manual operation or automatically in case of fire.

In one embodiment of the invention a pump is mounted in the receptacle or container and can be used to furnish the power required to eject the liquid from the container. In this form of the invention the air pressure from the pump is conducted to a conduit which also communicates with the casing having the compressed charge cartridges therein. Means is also provided for preventing back pressure in the pump upon the release of the charge from the cartridges.

In another form of the invention the mounting for the extinguisher is particularly adapted for use on motor vehicles and means is provided for conducting the fire extinguishing liquid ejected from the receptacle to a position above the motor.

Further details of the invention will appear from the following description.

In the form of the invention illustrated in Figs. 1 to 5 inclusive, the extinguisher comprises a receptacle or container 15 having a head 16 at the upper end thereof. The head 16 has a downwardly extending boss 17 to which is secured a pump cylinder 18 which extends downwardly in the receptacle. A bushing 19 is secured to the upper end of the cylinder and boss and a pump piston rod 20 is slidably mounted in the bushing 19. A handle 21 is secured to the upper end of the rod.

In order to hold the piston rod down when it is not in use, the shank or handle 21 has formed thereon a laterally extending lug 22 and an offset lug 23 is provided on the bushing 19. An indentation or depression 24 is formed on the underside of the lug 22 and is adapted to receive a ball 25 which is pressed upwardly by a spring 26 mounted in a pocket 27 formed in

the bushing 19. The lugs 22 and 23 are arcuate in shape, as shown in Fig. 3, and in order to release the pump piston rod it is merely necessary to rotate the handle and rod to a sufficient extent to release the lug 22 from beneath the lug 23 which overhangs lug 22.

The piston rod 20 has a flexible cup-shaped piston 30 at the lower end thereof which operates in the usual well known manner. A casing 31 is secured to the lower end of the cylinder 18 and is provided with a chamber 32 which receives the air compressed by the pump on its downward stroke and conducts the air to a conduit 33 which extends upwardly and at its upper end communicates with a conduit 34 formed in the head 16. The conduit 34 in turn communicates through a port 35 with a conduit 36 which conducts the compressed charge to the receptacle above the liquid therein. The passage of the compressed charge through the port 35 and to the conduit 36 is controlled by a downwardly seating check valve 37 which is pressed downwardly by a spring 38. The spring 38 seats at its upper end against a plug 39 mounted in the head 16.

The passage of the air from the pump cylinder 18 to the chamber 32 takes place through a conduit 40 formed in a plug 41. The air passes from the cylinder 18 into the conduit 40 through a port 42 which is controlled by a valve 43 spring pressed in an upward direction by a spring 44 mounted in the conduit or passage 40. The spring 44 seats at its lower end on a perforated disk 45.

In order to manually operate the extinguisher the pump handle 21 is turned to a sufficient extent to release the piston rod and the pump handle is then reciprocated up and down in the usual manner and on its downward stroke will cause air to be forced through the chamber 32, conduit 33, port 35, and conduit or passage 36 into the receptacle.

In addition to the manually operable ejecting means above described, the extinguisher is provided with a compressed charge of gas and means for releasing the charge. The compressed charge of gas, preferably carbon dioxide, is contained in a pair of cartridges 50 and 51 which are mounted in a clip 52 having oppositely extending resilient cartridge receiving portions 53 and 54. The cartridges 50 and 51 are of the usual construction and are sealed at their reduced ends 55 by diaphragms 56 in the usual manner. The sealed ends of the cartridges are disposed at the inner portions of the clip and a disk 57 is fixedly secured at the central portion of the clip and is provided with oppositely projecting spikes or barbs 58 and 59 which are positioned in alinement with the diaphragms or sealed ends 55 of the cartridges.

The clips and cartridges are housed in a casing 65 which extends downwardly from the head 16. The conduit 34 communicates with the casing 65 through an opening or port 66.

A bushing 67 is threaded into a head 16 above the casing 65 and a sealing disk 68, preferably of lead, is positioned between the bushing and the upper open end of the casing.

A plunger 70 is slidably mounted in the bushing 67 and has a head 71 at the lower end thereof and a handle 72 at the upper end thereof.

If desired, the plunger 70 can be depressed by manual operation and as the plunger is pushed inwardly through the boss 67 the cartridges 50 and 51 will be forced against the puncturing

barbs or spikes 58 and 59, thus releasing the compressed gas therefrom. The gas will pass from the casing 65 through the port 66, conduit 34, port 35 and passage or conduit 36 to the receptacle.

Means is also provided in conjunction with the bracket or supporting plate on which the extinguisher is mounted for automatically depressing the plunger 70 and releasing the compressed charge from the cartridges.

In the form of the invention shown in Figs. 1 and 2, the extinguisher is supported on a bracket 75 which is secured to and extends laterally from a supporting plate 76. The bracket 75 is adapted to extend through an opening 77 formed in the handle 21 of the pump. Thus, when the pump rod is locked in position, the handle is placed over the hook or bracket 75 and the extinguisher will be supported on the bracket.

In order to automatically operate the plunger 70 to release the compressed gas from the cartridges, the hammer 80 is mounted on arms 81 and 82 formed on or secured to a spring 83 carried by a spindle 84 mounted in flanges 85 and 86 formed on the plate 76.

The hammer 80 is so proportioned and the arms 81 and 82 are so mounted that the hammer when released will strike the upper end or handle 72 of the plunger 70 and force the plunger downwardly. The hammer 80 is normally held in inoperative position by means of an arm 90 mounted on a pivot 91 and adapted to extend over the hammer in the manner shown in Fig. 1.

The arm 90 is held against movement on its pivot by means of a fusible link which, in the embodiment of the invention shown in Fig. 1, comprises three members 92, 93 and 94. The members 92 and 93 are connected by a fusible connection 95 and the members 93 and 94 are connected by a fusible connection 96. The lower end of the fusible link has formed therein a slot 97 adapted to receive the outer end of a fixed arm 98 carried by the plate 76. The composite link formed by the members 92, 93 and 94 is thus adapted to connect the pivoted arm 90 to the fixed arm 98 and in this manner hold the pivoted arm against movement upwardly on its pivot in a direction to release the hammer 80.

In case of fire the fusible connection 96 will melt, thus releasing the arm 90 for movement on its pivot and in this manner releasing the hammer 80 which, under the action of the spring 83, will be swung about the pivot 84 and will strike the plunger 70, forcing the plunger inwardly and causing the cartridges to be punctured and the compressed gas charges therein to be released.

The fusible connection 95 between the members 92 and 93 is controlled by a winding 100 of high resistance wire. One end 101 of the winding 100 is connected to one side of a power circuit. The other end 102 is connected to a contact 103 of a thermostatically controlled detector having an arm 104 of thermostatic metal adapted under the action of heat to engage a contact 105. A conduit 106 is connected to the contact 105 and is also connected to an alarm bell 107. The other contact of the bell 107 is connected to a conduit 108, which in turn is connected to the other side of the power circuit. In case of fire the thermostatic detector or switch arm 104 will close the circuit through the alarm bell and through the high resistance heating coil 100, thus causing the fusible connection 95 to melt. From the above description,

it will be seen that the hammer 80 may be released by the melting of the fusible connection 95 or of the fusible connection 96. When the composite link which holds the arm 90 gives way, the hammer will be released, thereby, in the manner above described, causing the compressed charges of gas to be released from the cartridges.

In order to prevent the pressure within the receptacle caused by the release of the charge of gas in the cartridge from bursting the receptacle, means is provided for insuring an air space above the liquid. This is accomplished in the manner illustrated particularly in Fig. 5, wherein there is shown a downwardly extending sleeve 110 formed on the head 16. The sleeve forms the filling opening for the receptacle and since it extends downwardly into the receptacle an appreciable extent, it will be obvious that the receptacle cannot be filled above the level of the lower end of the sleeve.

The filling opening is closed by a plug 111 which is threaded into the sleeve and has formed therein a chamber 112. The upper end of the chamber 112 has a port 113 normally closed by a valve 114 which is pressed against the port by a spring 115 disposed in the chamber 112. The spring 115 seats at its lower end against a disk 116 having an opening 117 therethrough. The port 113 is formed in a nut 120 which is recessed, as shown at 121. A valve stem 122 is connected to the valve 114 and has a button 123 at the upper end thereof. When the liquid has been discharged from the extinguisher any remaining pressure can be released by depressing the valve 114.

The liquid may be discharged from the extinguisher in any suitable manner and in Fig. 3 there is shown a discharge hose 125 having a spray nozzle 126 on the end thereof. The liquid is conducted to the hose 125 from the receptacle by means of a discharge pipe 127 which is carried by the head and extends downwardly to a position adjacent the bottom thereof.

In the embodiment of the invention illustrated in Figs. 6 to 9 inclusive, the pump has been omitted but the cartridge mounting and the means for operating the plunger by means of which the cartridges are punctured are the same as the corresponding parts shown in Figs. 1 to 5 inclusive. The handle 72 in this case is provided with a fulminate cap 128 adapted for engagement by a projection 129 on the hammer 80 whereby an alarm will be given.

In this form of the invention the head 130 of the receptacle is provided with a hook 131 which is adapted to engage beneath a U-shaped bracket 132 carried by the back plate 76. The back plate also has connected thereto a pair of spring clamping arms 133 and 134 adapted to embrace the receptacle.

A discharge pipe 135 is carried by the head 130 and extends downwardly to a position adjacent the bottom of the receptacle. At its upper end the pipe 135 communicates with a conduit 136 formed in the head and having a spherical discharge orifice 137. When the receptacle is mounted on the supporting plate 76, the discharge orifice 137 is disposed in engagement with a spherical inlet end 138 of a conduit 139. The end 138 of the conduit is held in seating position on the discharge orifice by a spring 140 positioned in a housing 141 and engaging a collar 142 secured to the conduit.

The conduit 139 is connected at its opposite end to the casing 143 of a spray nozzle 144 hav-

ing a perforated sprinkler head 145 thereon. The perforated sprinkler head 145 is normally protected against dust and dirt by means of a cover 146 which is held in position by an arm 147 mounted on a pivot 148 formed on the casing 143. A spring 150 engages the arm 147 and tends to swing the arm in an anti-clockwise direction, viewing Fig. 8, or in a direction to release the cover 146. A lug 151 is formed on the arm 147 and is normally positioned above the outer peripheral portion of a flange 152 formed on the cover. Thus, when the arm 147 is released and is swung by the spring on its pivot, the lug 151 will positively eject the cover 146 from its operative position over the discharge or spray head 145. The casing 143 may be mounted in any suitable position but is shown in Figs. 8 and 9 as clamped to the tie rod 155 which connects the radiator 156 to the dash of an automobile. The casing, as shown in Fig. 9, is positioned above the automobile engine E.

The arm 147 is held in position by means of a wire or rod 160 which is connected at its opposite end to an arm 161 mounted on a pivot 162 carried by the plate 76 and having an angularly disposed portion 163 adapted to extend over the hammer 80 and to hold the hammer from operation. A fusible link 164 connects the rod 160 to the arm 147.

The extinguisher shown in Figs. 6 to 9 inclusive operates in the following manner: In case of fire the extinguisher can be manually grasped and removed from its support by swinging the extinguisher outwardly about the U-shaped bracket 132 until the hook 131 on the extinguisher head is released therefrom. A blow on the plunger 70 will then cause the gas to be released from the cartridges and the liquid in the extinguisher will be ejected by gas pressure through the conduit 136.

The extinguisher will furthermore be automatically operated in case of fire when the fusible link 164 gives way at a predetermined temperature, thus releasing the cover 146 from the discharge nozzle or sprinkler head and also releasing the hammer 80 which will then engage the plunger and cause the cartridges to be punctured and the gas to be released therefrom. The gas pressure on the liquid in the extinguisher will then eject the liquid through the conduit 136, conduit 139 and discharge head 145.

From the foregoing description it will be evident that a simple, practical and efficient fire extinguishing device has been designed and that the extinguisher will operate effectively and can be operated automatically or manually. With the form of the invention illustrated in Figs. 1 to 5, the fire extinguishing liquid can be ejected from the extinguisher by means of the pump, by a manual operation of the plunger causing the release of the gas from the cartridges, or by the heat controlled automatic operation of the plunger. Furthermore, in the form of the invention illustrated in Figs. 6 to 9 inclusive, the extinguisher may be manually manipulated or will operate automatically in case of fire to cause the fire extinguishing liquid to be discharged therefrom.

Although certain specific embodiments of the invention have been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of

the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What I claim is:

- 5 1. In a fire extinguisher, a filter unit comprising a cage having oppositely extending resilient portions adapted to receive a pair of oppositely disposed cartridges in said cage, and means intermediate the ends of the cage for
10 puncturing said cartridges.
2. In a fire extinguisher, a cage having oppositely extending resilient portions adapted to receive a pair of oppositely disposed cartridges in said cage, and fixed means intermediate the ends
15 of the cage for puncturing said cartridges.
3. In a fire extinguisher, a filter unit comprising a cage having oppositely extending resilient portions adapted to receive a pair of oppositely disposed cartridges in said cage, means intermediate the ends of the cage for
20 puncturing said cartridges, and means for forcing said cartridges into puncturing engagement with said puncturing means.
4. In a fire extinguisher, a filter unit comprising a cage having oppositely extending resilient portions adapted to receive a pair of oppositely disposed cartridges in said cage, means intermediate the ends of the cage for
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puncturing said cartridges, and heat controlled means for forcing said cartridges into puncturing engagement with said puncturing means.

5. In combination, a fire extinguisher comprising a receptacle, a pump carried thereby, said pump including a piston and a piston rod therefor extending through the top of the receptacle and a handle on said rod, a support having a bracket engaging said handle, a casing in said receptacle having a pressure cartridge therein, means including a plunger for puncturing said cartridge, a spring actuated hammer mounted on said support and arranged to engage and actuate said plunger, and heat controlled means for holding said hammer against
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6. In a fire extinguisher, a receptacle, a casing therein, a compressed charge cartridge in the casing, a discharge port in the casing communicating with the receptacle, an opening through the top of the casing for receiving the cartridge, a sealing member of ductile material over said opening, said seal being disposed above the discharge port, and a plunger over the seal for depressing but not breaking the seal and causing the cartridge to be punctured.

WILHELM B. BRONANDER.

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