

Aug. 25, 1953

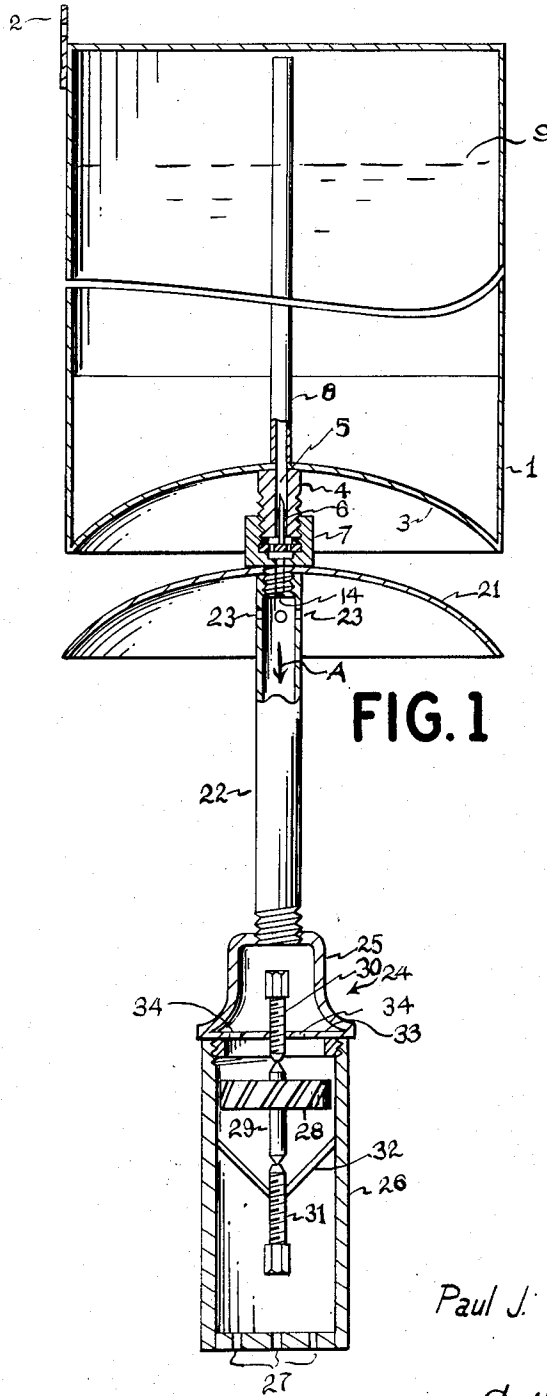
P. J. SHOWSTACK

2,649,752

SELF-CONTAINED FIRE ALARM AND FIRE EXTINGUISHER

Filed Jan. 10, 1952

2 Sheets-Sheet 1



Paul J. Showstack
INVENTOR.

BY *Ezekiel Wolf*
his Attorney

Aug. 25, 1953

P. J. SHOWSTACK

2,649,752

SELF-CONTAINED FIRE ALARM AND FIRE EXTINGUISHER

Filed Jan. 10, 1952

2 Sheets-Sheet 2

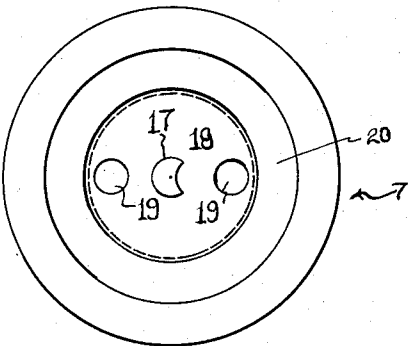


FIG. 3

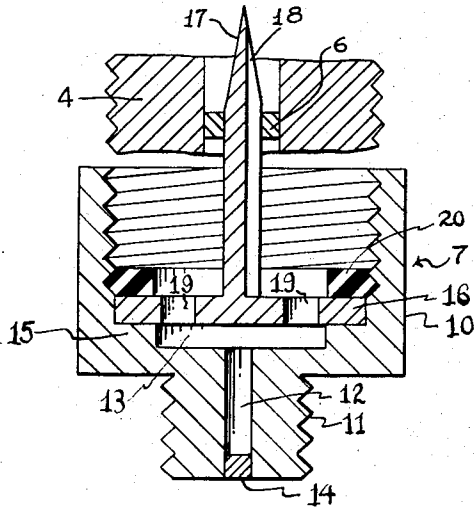


FIG. 2

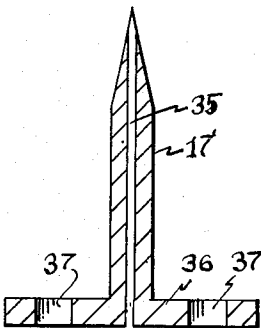


FIG. 4

INVENTOR.
Paul J. Showstack
BY
Ezekiel W. [Signature]
his attorney

UNITED STATES PATENT OFFICE

2,649,752

SELF-CONTAINED FIRE ALARM AND FIRE
EXTINGUISHER

Paul J. Showstack, Dorchester, Mass.

Application January 10, 1952, Serial No. 265,885

10 Claims. (Cl. 116—106)

1

The present invention relates to a fire alarm and fire extinguisher and in particular to the type in which the alarm unit is all self-contained and needs no external power source to bring about its operation.

In order for such a device to be efficient, it should produce an alarm of a substantial intensity and should also continue to operate at such intensity for a considerable time.

A further feature of the device is that it is so inexpensive that a considerable number may be used in a building or residence without great cost. For instance in a residence such an alarm could be used in almost every room and in hall ways and closets so that the fire will operate the alarm while it is still localized and not spread out. A complete home could be equipped with sufficient of these alarms for a sum ranging perhaps from \$25. to \$50. so that no matter where a fire may occur, the alarm will be quickly sounded and warn people in the house and outside of the presence of a fire.

In addition to the device serving as a fire alarm it will also serve as a fire extinguisher without any additional equipment and merely by removing the cover portion of the alarm element.

A further advantage of the present invention is that it may be made to operate on an accurate temperature basis, that is when the temperature in the neighborhood of the alarm has exceeded a definite point. This action is particularly insured because of the relative position of the heat centering means and the fusible bead of metal or other material which is melted away by the action of the heat and permits the alarm to be sounded.

Without further describing the merits and advantages of the present invention, the invention will be more fully described in connection with the drawings illustrating an embodiment of the same, in which:

Figure 1 shows a cross section through the fire alarm device of my invention.

Figure 2 shows an enlarged detail of a portion of the structure shown in Figure 1.

Figure 3 shows a plan view of the structure shown in Figure 2 looking down from the top, and,

Figure 4 shows a modification of a detail of Figure 2.

In the arrangement indicated in Figure 1, 1 is a container which preferably contains an inert gas, which may be a liquid under pressure and may become a gas when released. Various

2

types of gases may be used for this purpose, such as "Freon-12" which is dichlorodifluoromethane or some other such type of gas which is inert, vaporizes on expansion under normal temperatures and may be used for such purposes as herein set forth. In fact other types of Freon gas may be used and some of these are known under the common name of aerosols. The advantage of using such a gas is that a small container may be used to store a tremendous volume. In the case of the gas mentioned, Freon-12, the vapor pressure is 70 lbs. per square inch gauge at 70° F., so that with the gas compressed to a liquid under normal temperature conditions, a tremendous volume of gas will be contained in a container of even a pint or less in volume, sufficient to give a sound blast of considerable intensity for a period of fifteen to twenty minutes, which is more than sufficient as a warning period of a fire.

The container 1 may be provided with an eyelet bracket 2, so that the device may be hung on a wall or in any other suitable place. The bottom face 3 of the container is provided with a nipple 4 which may be threaded as indicated in Figure 1 and serve for the external connections for the attachment of the operating element of the alarm. The nipple 4 normally has a passage 5 which is closed or sealed by a metal seal 6 at its top end which is punctured by applying the connecting cap 7 (Figure 2). A fragmentary section of the nipple 4 is shown in Figure 2 with the seal 6 extending across the passage 5 which is pierced by the pin 17. Normally therefore the container 1 is first filled through the pipe 8 which connects to the passage 5 in the nipple until the container is filled to its desired volume which may be as indicated by the liquid level line 9. The pipe 8 should extend just short of the top of the can as indicated in Figure 1. The cap and connector 7, when screwed in place over the end of the nipple 4, breaks the seal in the container and permits the gas as it evaporates in the position shown in Figure 1, to escape through the passage 5. The construction of the piercing connector 7 is shown more particularly in Figure 2. This comprises a hollow cap element 10 with a threaded neck section 11 through which there is a communicating passage extending from the chamber 13 within the cap through the neck. The end of this passage is however sealed off by a fusible metal plug 14 which may be of Woods metal or any other suitable low melting point metal or alloy which will melt at approximately 100° F. or a little higher.

3

The inside of the cap is provided with a shoulder 15 on which a disc or supporting spider 16 rests which carries a central projecting pin 17 for piercing the seal 6 in the top of the nipple when the cap is screwed over the nipple. This piercing pin 17 is cut out at the side with a key way 18 so that after it has been forced through the seal in the passage 5 the gas will freely flow out through the cut out or key section 18 of the pin. The disc or spider 16 is provided with a number of openings 19, through which the gas may freely flow throughout the chamber 13 and into the passage 12 of the neck section 11 of the cap.

The cap however, after the seal 6 has been pierced, retains the gas hermetically sealed in the container because of the sealing gasket 20 which seats itself on the end face of the nipple 4, thus making a hermetical seal for the container which replaces the seal 6 in the passage 5. After the cap 7 has been put in place, the heat covering cone or cup 21 which has a hole in the center sufficient to accommodate the neck 11, is placed over the neck and then the pipe 22 is screwed on to the neck 11 to hold the cup 21 firmly in place. The cup 21 may be made of metal and may be painted black in order to readily absorb heat and retain it. The pipe 22 is preferably provided with a number of vent holes 23 through which air may be sucked by the gas as the gas is propelled downward in the direction of the arrow A as viewed in Figure 1. At the lower end of the tube 22 as viewed in Figure 1, there is attached a sound device 24, which preferably is of the siren type. This comprises an attaching cap section 25 and a cover member 26 with holes 27 at the bottom. The siren device is provided with a small rotor 28 which is supported by a shaft 29 pointed at each end and resting in conical cavities at the end of the adjusted screws 30 and 31. The screw 31 threads into a supporting frame 32 attached to the cap 25 and the screw 30 threads into a disc 33 supported in the cap 25. The disc 33 is perforated by a number of holes 34 to permit the flow of gas against the rotor 28.

The siren indicated in Figure 1 is of a general commercial type, readily available.

The alarm as has been previously stated is usually suspended with the noise element hanging downward. When a fire occurs, the cup 21 accumulates the heat and soon melts the fusible element 14 at the end of the neck 7. This permits the gas to vaporize within the container and the gas is thereupon forced out through the passage 5 which has already been pierced by the pin 17 through the passage 12 and outward with considerable force through the tube 22, the vents 23 serving to draw the air and increase the gas volume flowing downward through the tube 22. The gas will flow through the perforations 34 in the disc 33 against the rotor 28 and spin this at considerable velocity to produce a continuous shrill siren sound.

While other forms of whistles operated by gas blasts may be used, I have found that for this purpose the siren sound has a distinct advantage, both because of its shrill quality and because of the ability of the gas to provide a continuous sound for a considerable period of time.

In Figure 4 there is shown a modification of the piercing tool of Figure 2. The piercing pin 17 in this case is provided with a central passage 35 which may be extended through the supporting spider 36 so that the gas will flow

4

directly into the lower part of the chamber within the cap 7. The supporting spider or disc 36 may also however be provided with holes 37 so that all parts of the chamber within the cap 7 are put under the same pressure.

The device indicated in Figure 7 may also be used as a fire extinguisher. In this case it is preferable to unscrew the sound device by simply unscrewing the cap or bell-like element 25.

When used as a fire extinguisher, the device is turned up side down as viewed in Figure 1, so that the liquid container will be around the open end of the pipe 8 and the gas will be at the end of the container where the nipple connection is. Under these conditions the gas will force the liquid through the pipe 8 and the passage 5 and this will emerge through the pipe 22 or if the pipe 22 is removed, then it will directly flow outward through the passage 12, since of course the fusible metal, under these conditions has been melted away.

It will be noted that the pipe 22 may be unscrewed from the coupling cap 7 without first removing the sound device so that it is a simple matter to see that the liquid will flow directly out of the passage 5 without any interference from the other parts of the mechanism of the alarm device.

Having now described my invention, I claim:

1. A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressures, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a piercing cap connector having a piercing element with a gas escape channel extending longitudinally therein, said piercing element extending through the sealing of the coupling nipple and fitting over said nipple forming a seal for the fluid, said piercing cap connector having a portion providing a passage for said fluid with a seal therein comprising a low melting point fusible metal and means operated by the fluid escaping as a gas when said last seal melts for producing an alarm sound, said means having a conduit coupled to the piercing cap in said portion providing a passage for said fluid.

2. A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressure, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a cap coupling connector fitting over said nipple having a member with a gas escape channel extending longitudinally therein, for piercing said seal of the nipple, said cap having means forming a conduit having a low melting point fusible seal at the end of the conduit, and means for producing an alarm with the fluid escaping as a gas connected to the means forming a conduit.

3. A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressures, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a piercing cap coupling connector comprising an

5

internally threaded cap member having a piercing pin with a gas escape channel extending longitudinally therein, for piercing the seal in the coupling nipple, seated within said cap and a threaded neck element projecting from the face of the cap with a passage extending through the neck element to the inside of the cap, said latter passage having a fusible seal of low melting point, said cap having a sealing gasket positioned to be compressed on the end of said nipple when the piercing cap is put in position on the nipple in piercing the seal on said coupling nipple and means for producing an alarm by the escape of the fluid as a gas secured to the neck of said cap.

4. A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressures, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a piercing cap coupling connector comprising an internally threaded cap member having a piercing pin with a gas escape channel extending longitudinally therein, for piercing the seal in the coupling nipple seated within said cap and a threaded neck element projecting from the face of the cap with a passage extending through the neck element to the inside of the cap, said latter passage having a fusible seal of low melting point, said cap having a sealing gasket positioned to be compressed on the end of said nipple when the piercing cap is put in the position on the nipple in piercing the seal on said coupling nipple, means for producing an alarm by the escape of the fluid as a gas secured to the neck of said cap and a heat collecting shield secured around said neck and surrounding said fusible seal of low melting point.

5. A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressures, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a piercing cap coupling connector comprising an internally threaded cap member having a piercing pin with a gas escape channel extending longitudinally therein, for piercing the seal in the coupling nipple, seated within said cap and a threaded neck element projecting from the face of the cap with a passage extending through the neck element to the inside of the cap, said latter passage having a fusible seal of low melting point positioned in the outer end of the passage near the end surface of said neck, a heat collecting shield having a central hole fitting over said neck, a pipe fitting said neck clamping said shield in place on said neck and an alarm producing means operative by the escape of the fluid as a gas, secured to said pipe.

6. A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressures, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a piercing cap coupling connector comprising an internally threaded cap member having a piercing pin with a gas escape channel extending

6

longitudinally therein, for piercing the seal in the coupling nipple, seated within said cap and a threaded neck element projecting from the face of the cap with a passage extending through the neck element to the inside of the cap, said latter passage having a fusible seal of low melting point positioned in the outer end of the passage near the end surface of said neck, a heat collecting shield having a central hole fitting over said neck, a pipe fitting said neck clamping said shield in place on said neck and an alarm producing means operative by the escape of the fluid as a gas, secured to said pipe, said fusible seal having a position corresponding to the focus of said heat collecting shield.

7. A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressures, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a piercing cap coupling connector comprising an internally threaded cap member having a piercing pin with a gas escape channel extending longitudinally therein, for piercing the seal in the coupling nipple, seated within said cap and a threaded neck element projecting from the face of the cap with a passage extending through the neck element to the inside of the cap, said latter passage having a fusible seal of low melting point positioned in the outer end of the passage near the end surface of said neck, a heat collecting shield having a central hole fitting over said neck, a pipe fitting said neck clamping said shield in place on said neck and an alarm producing means operative by the escape of the fluid as a gas, secured to said pipe, said pipe having a vent adjacent the end of said neck.

8. A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressures, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a piercing cap coupling connector comprising an internally threaded cap member having a piercing pin with a channel extending longitudinally therein, for piercing the seal in the coupling nipple, seated within said cap and a threaded neck element projecting from the face of the cap with a passage extending through the neck element to the inside of the cap, said latter passage having a fusible seal of low melting point, said cap having a sealing gasket positioned to be compressed on the end of said nipple when the piercing cap is put in position on the nipple in piercing the seal on said coupling nipple and means for producing an alarm by the escape of the fluid as a gas secured to the neck of said cap.

9. A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressures, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a cap coupling connector fitting over said nipple having a member with a gas escape channel extending longitudinally therein, for piercing said seal of the nipple, said cap having means forming

a conduit from the nipple with said conduit at its other end, having a low melting point fusible seal, and means for producing an alarm with the fluid escaping as a gas connected to the means forming a conduit, comprising a gas siren.

10 A self-contained fire alarm signal comprising a container having an inert fluid contained therein, self-convertible from liquid to gas when escaping from higher than atmospheric to atmospheric pressures, said container having an external sealing coupling nipple on the bottom of the container connected to a pipe extending within the container to a point near the top thereof, a cap coupling connector fitting over said nipple having a member with a gas escape channel extending longitudinally therein, for piercing said seal of the nipple, said cap having means forming

a conduit having a low melting point fusible seal at the end of the conduit, and means for producing an alarm with the fluid escaping as a gas connected to the means forming a conduit, said fluid comprising dichlorodifluoromethane.

PAUL J. SHOWSTACK.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
856,075	Lorig	June 4, 1907
1,019,571	West	Mar. 5, 1912
1,324,784	Barr	Dec. 16, 1919
2,410,310	Smith	Oct. 29, 1946
2,483,657	Messick	Oct. 4, 1949
2,506,983	Williams	May 9, 1950