May 24, 1955

L. T. WARD

2,708,895

FIRE ALARM DEVICE

Filed Aug. 16, 1954

Fig. 1.

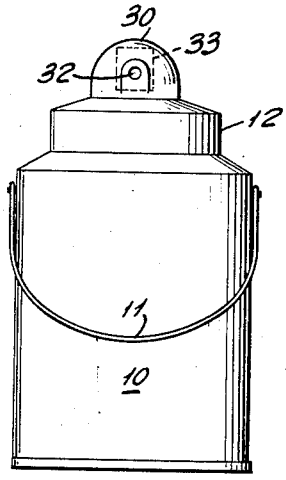


Fig. 2.

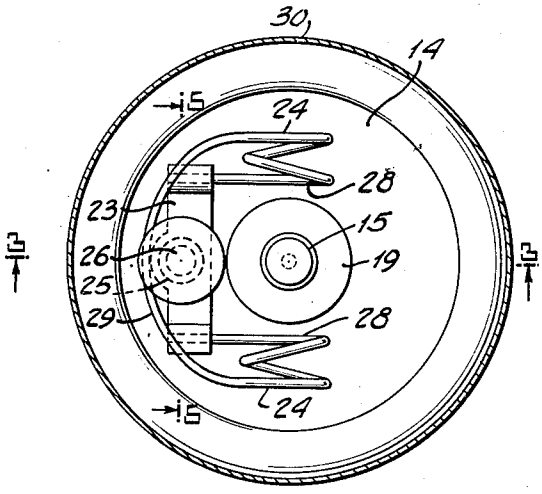


Fig. 4.

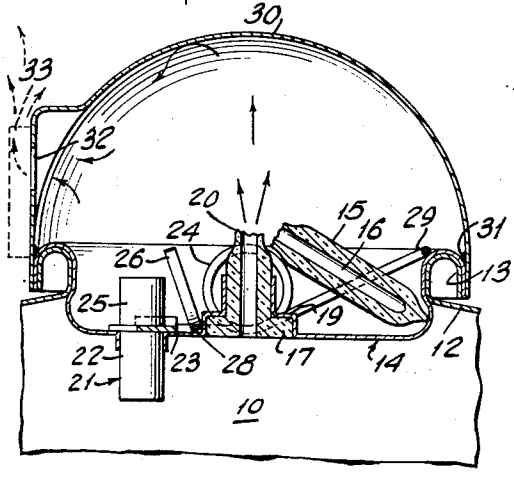


Fig. 3.

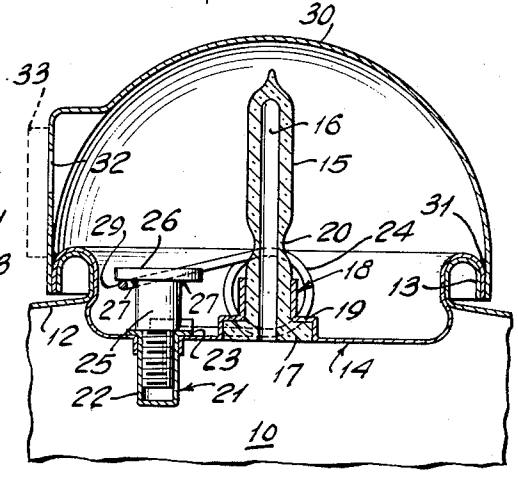
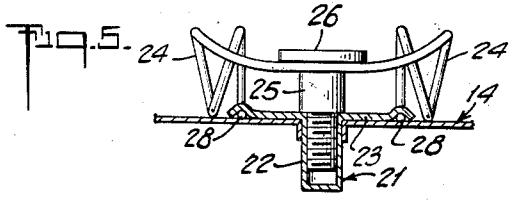


Fig. 5.



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FIRE ALARM DEVICE

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3 Claims. (Cl. 116—106)

This invention relates to a device which emits an audible sound when activated by intense heat and more particularly it relates to an alarm device having a container of gas or vapor under pressure and means for releasing said gas when a critical temperature is attained.

It is an object of this invention to provide a portable fire alarm device.

It is another object of this invention to provide a fire alarm device set off by the melting of a fusible mass.

It is another object of this invention to employ a fusible mass which does not come in contact with gas or vapor being emitted from the container.

It is a further object of this invention to provide an inexpensive portable fire alarm device so that a plurality of such devices may be disposed about a building.

These and other objects and purposes of this invention will become evident upon reading the following descriptive disclosure taken in conjunction with the accompanying drawing in which:

Fig. 1 is a front view of the alarm device,

Fig. 2 is a view taken on line 2—2 of Fig. 1,

Fig. 3 is a view taken on line 3—3 of Fig. 2 and showing the device with an activating spring in a cocked or energized position,

Fig. 4 is a view similar to that of Fig. 3 but showing the device with the activating spring in a de-energized position after fracturing a frangible finger element, and

Fig. 5 is a view taken on line 5—5 of Fig. 2 and showing the manner of maintaining the activating spring in a cocked or energized position.

The major defect of using an aerosol bomb having a fusible plug as a fire alarm device, is that the plug is disposed in an aperture in the container top wall.

The presence of intense heat causes the plug to melt but the rush of gas or vapor under pressure through a crevice of the melting plug causes the plug to cool, so that a plug adapted to melt at a definite or fixed temperature actually does not melt sufficiently at that temperature to operate the alarm due to the herein above disclosed cooling effect caused by expanding gases or vapors.

In applicant's device the fusible material does not come in contact with the gas or vapors being emitted under pressure, so that the device always operates at a fixed temperature, for example, 140° F., which is the melting point of the fusible mass.

Turning now to the drawing and particularly to Fig. 1, a container **10** preferably of a cylindrical configuration is preferably provided with a handle **11**. The top of the container may be provided with tiered set-back closure element **12** having an orifice circumscribed by an inverted U-shaped rim **13** (Figs. 3 and 4).

A container cap **14** also having an inverted U-shaped rim **13***x* is disposed within the top container orifice so that rim **13***x* is disposed upon rim **13**. Preferably some organic adhesive sealing compound is disposed between rims **13***x* and **13** to effect a gastight seal therebetween.

The cap **14** is provided with a frangible finger element

15 preferably made of glass and having a tubular cavity **16** centrally disposed therein. The finger element **15** is provided with a circular base or rim **17** adapted to engage a protuberant cylindrical wall **18** disposed centrally in said cap **14**. The wall **18** is provided with a ledge **19** adapted to engage the top surface of rim **17** between the engaging surface of which some sealing compound is preferably disposed. Other conventional means of effecting a gastight seal between finger **15** and wall **18** are operable.

The finger **15** is preferably provided with a constricted section **20** where the thickness of the glass constituting the finger wall is relatively thin.

This constricted section **20**, being weak compared to the remainder of finger element **15**, is fractured when that portion of the finger disposed thereabove is given a sharp blow.

The cap **14** is further provided with a second aperture into which a holder strip **21** is sealingly secured by press fitting, preferably with the aid of conventional sealing compound, to produce a gas tight seal. The holder strip is provided with a screw threaded well portion **22** and a pair of wing portions **23** each having a depending recess adapted to hold a spring foot therein (Fig. 5). The strip **21** may be spot welded to the cap **14**, if desired.

A swingable energizing spring **24** having a pair of spaced apart feet and of a strength suitable to fracture the finger element **15** is secured within the recesses of the wing portions **23** of holder strip **21**. A screw threaded cylindrical pillar **25** is threaded into the well of the strip **21**. A circular plate **26** is secured to the top of pillar **25** by means of fusible metal **27** (Figs. 2 and 3) circularly disposed in the angle formed between plate **26** and pillar **25**.

The spring **24** is preferably made of wire having a pair of spaced apart feet **28** adapted to be secured within the recesses of wing portions **23**. A single coil is disposed adjacent each foot **28** and an arcuate bridge section **29** (Fig. 2) joins the spaced apart coils.

A dome **30** is press fitted and preferably sealed, by means of conventional sealing and securing substance **31**, to rim **15**. The dome is of such a height as to conventionly enclose finger element **15** in an upright position. The dome **30** is provided with an outlet opening **32** to which a whistle, or horn, or other conventional gas operated alarm **33** is secured.

The device may be set upon the floor but preferably it is hung from suitable brackets near the ceiling by means of handle **11**, since the heat of a fire is most intense near the ceiling.

In operating the device, the depressed or cocked spring bridge **29** engages the underside of plate **26** away from finger element **15** (Fig. 3). The intense heat of a fire causes the fusible material **27** to melt, thereby in turn causing spring bridge **29** to dislodge plate **26** and to sharply strike the glass finger **15** above the constricted section **20** causing the finger to break at this point (Fig. 4).

The released gas or vapor from the container then rushes into the cavity of dome **30** and outwardly through opening **32** causing the alarm horn or whistle to operate, giving a warning that a fire has started.

This invention has been described by means of an illustrative embodiment but clearly other embodiments fall within its generic scope. Thus the pillar **25** need not be screw-threaded into a well of strip **21** since it could be secured by being welded directly to cap **14**. Other non-inventive modifications will also occur to those skilled in the art, but all these modifications are intended to be embraced within the scope of the claims herein. Thus also the alarm could be made to operate as a fire extinguisher,

if carbon tetrachloride is added with Freon as the volatile gas disposed in the container.

I claim:

1. A fire alarm device comprising, a pressure resistant container for confining fluid and provided with a flat top wall, a frangible tubular element secured to said top wall and having an opening connecting with the interior of the container to provide an outlet flow for the contained fluid, an energized spring secured to said top wall to one side of and adapted to fracture said frangible element upon de-energization thereof, means for securing said spring to said top wall, a well having internal threads secured in said top wall between said energized spring and said frangible element, a threaded pillar threadingly disposed in said well, a plate disposed upon said pillar, means for fusibly securing said plate to said pillar adapted to melt at a fixed temperature means whereby said plate holds the spring in energized condition, a gas tight dome disposed over said container top wall hermetically sealed to said container and provided with an outlet opening, and whistle means secured in said dome outlet opening.

2. The apparatus of claim 1 wherein said spring consists of a pair of spaced-apart coil elements joined by an integral bridge piece, each of said coils having an integral longitudinal foot, and wherein said means for securing said spring is a holder strip having spaced-apart channels therein adapted to engage said longitudinal foot of each of said coil elements.

3. The apparatus of claim 2 comprising a handle swingably secured to the container and adapted to be hung from a ceiling for positioning said fire alarm near the ceiling where the heat of a fire accumulates, said frangible tubular element being provided with a weakened annular wall section of diminished thickness and adapted to fracture easily, and said coils of said spring being disposed on opposed sides of said tubular element to facilitate fracture of the tubular frangible element at its weakened annular wall section.

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