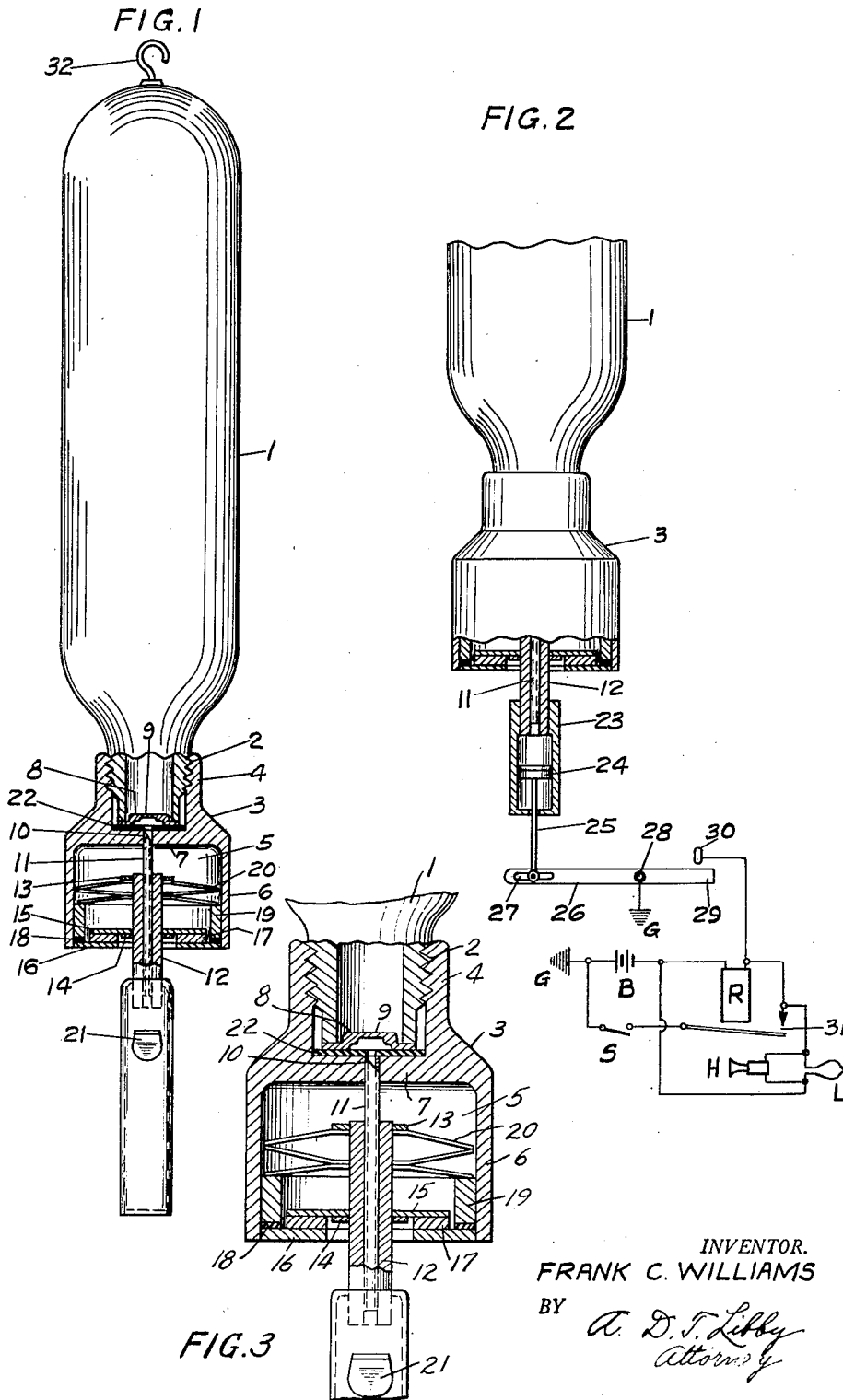


May 9, 1950

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SIGNAL CONTROL STRUCTURE

2,506,983

Filed May 29, 1947



UNITED STATES PATENT OFFICE

2,506,983

SIGNAL CONTROL STRUCTURE

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Application May 29, 1947, Serial No. 751,316

9 Claims. (Cl. 116—106)

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This invention relates to a control structure that is especially adapted for giving a signal, such as for example, a fire alarm.

There are many places where the ordinary fire alarm would be objectionable, both as to its looks and space taken up by it.

It is therefore, one of the objects of my invention to provide a signal control structure which is not only ornamental in character so that it may be used in any room in a residence, but one that is highly efficient and useful wherever it may be placed.

Another object of my invention is to provide a signal control structure which is relatively cheap to manufacture, and adapted for several uses.

These and other objects will be discerned from a reading of the following specification taken in connection with the annexed drawing, wherein

Figure 1 is a part elevational and part sectional view through the structure when used to blow a whistle.

Figure 2 is a view somewhat like Figure 1, but showing the structure arranged to give either or both visual or audible signals at a distance from the device.

Figure 3 is an enlarged view of the lower end of Figure 1.

In the drawing, 1 is a container preferably made of strong material such as steel, whereby it will withstand the pressure of 500 lbs. per square inch at 70° F., or 6000 lbs. per square inch at 190° F. The container 1 is adapted to receive a gas or liquid such as carbon dioxide, which I have found to be satisfactory for uses to be described.

One end of the container 1 has a reduced threaded end 2 and on this is mounted a cup shaped cap 3, having a sleeve portion 4 threaded to engage the threads on the neck 2 of the container 1. The cup 5, is formed by the shell 6 and has its bottom 7 positioned adjacent a seal 8 which is welded to the end of the neck 2. The Seal 8 has a puncturable portion 9 that is adapted to be struck by the piercing point 10 of a hollow pin 11. The piercing pin 11 is fastened as by welding to a plunger 12, one end of which extends into the cup 5 and has a retaining ring 13 fastened thereto. Also fastened to the plunger 12 is another retaining ring 14, also fastened to the plunger 12 is a disc 15 that is positioned in spaced relation to another disc 16 that is fastened to the rim of the shell 6. Between the discs 15 and 16 is located material 17 that is adapted to fuse at a predetermined point.

Positioned on the disc 16 is a gasket 18 preferably of non-metallic material and on this gasket

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18 rests a ring 19 which supports a spring which in the form shown is made up of a plurality of spring washers 20. The upper one of which is in engagement with the retaining ring 13 so that when the parts are shown in the position in Figure 1, the spring or its members 20 are under considerable tension whereby when the material 17 is fused at a predetermined temperature, the disc 15 is released and the spring will drive the plunger 12 with the piercing pin 11 upwardly so that the cutting edge of the pin will strike the portion 9 of the seal 8 and puncture it, allowing the gas or liquid therein to flow through the hollow pin 11, and to produce a whistle on the member 21 which is attached to the plunger 12. A gasket 22 is utilized between the bottom of the cup 7 and the seal so as to insure that the gas or liquid of the container 1 will pass into the hollow pin 11. The gasket 22 has a hole therein somewhat smaller in diameter than the outer diameter of the pin 11 so as to further insure passage of the gas or liquid into the hollow pin.

By utilizing a cup 5 having considerable area, and springs of considerable diameter, relatively large radiating surfaces are provided so that the spring or springs will not be damaged by the rise of temperature required to fuse the metal 17. Furthermore, the large radiating surface just described insures that the spring will retain its spring function and hold the plunger 12 against the bottom 7 of the cup, while the material inside the container 1 is being extruded through the pin 11.

Since the CO₂ gas expands very quickly and absorbs a large amount of heat, this tends to keep the pin 11 cool and thereby cools the surrounding air in the cup 5, as well as cooling the spring 20.

In Figure 2, the plunger 12 carries a cylinder 23 in which a piston 24 is located. The piston has a rod 25 connected to a lever 26 through a motion pick-up means 27. The lever 26 is pivoted at 28 and its end 29 is adapted to engage a contact 30 connected to a relay R supplied with current from battery B. A lamp L and a horn H are adapted to be operated through the relay contact 31 which contact also serves to lock the relay R in operative position under control of the switch S.

Instead of blowing a whistle or horn or lighting a signal lamp, the structure may be used to inflate a membrane or fabric shell which may serve as a signal in some cases.

While in the preceding I have described the structure as one for initiating a signal for alarm purposes, the gas and liquid coming from the

container 1 may be utilized to remove heat from or freeze some material, by voluntarily fusing the metal 17.

In Figure 1, I have shown a hook 32 which may be utilized for hanging the device on a suitable support. The hook 32 may be of the open type or in the form of an eye.

From what has been said, it will be readily understood that certain of the details entering into the construction of my device may be varied without departing from the spirit of my invention and the scope of the depending claims.

Having thus described my invention, what I claim is:

1. A signal control structure comprising a single element container closed at one end by a puncturable seal and containing gas or liquid under pressure, a cup shaped cap having a sleeve portion with means for attaching it over the end of the container having the seal, a plunger having at least one end extending into the cup part of the cap, retaining rings fastened to the plunger in spaced relation, a support plate fastened to the rim of said cup part, a disc fastened to the plunger adjacent the outer of said retaining rings and spaced a short distance from said support plate, fusible metal normally anchored to both the support plate and said disc, a hollow piercing pin carried by the plunger and extending into a guide hole in the bottom of the cup to a point adjacent said seal and spring means located within the cup and acting on the inner of said retaining rings to force the plunger and pin rapidly toward the seal and cause the pin to puncture the seal when the fusible metal is fused.

2. A signal control structure as defined in claim 1 further characterized in that said piercing pin spring and plunger are so co-related that the pin will puncture the seal before the end of the plunger will hit the bottom of the cup while the spring will have sufficient tension to hold the plunger against the bottom of the cup after said seal has been broken.

3. A signal control structure as defined in claim 1 further characterized in that a ring for supporting the spring is positioned on the inner wall of the cup adjacent said support plate but preferably separated therefrom by a heat resisting gasket.

4. A signal control structure as defined in claim 1 further characterized in that a suitable non-metallic gasket is positioned within the sleeve against the opposite side of the cup bottom, the gasket having a hole therein slightly smaller than the outside diameter of the piercing pin for the purpose described.

5. A signal control structure comprising a single element container having an integral much reduced end, closed at said end by a non-shatterable but puncturable seal and containing gas or liquid under pressure, means attachable to the reduced end of the container having the seal and carrying a device for puncturing the seal and directing the flow of the gas or liquid therefrom, fusible means for normally holding said puncturing device in non-puncturing position but responsive to a predetermined temperature for releasing said puncturing device spring

and means for then moving said puncturing device into puncturing position.

6. A signal control structure comprising a single element container closed at one end by a non-shatterable but puncturable seal and containing gas or liquid under pressure, an attachment fastened to the end of the container said attachment directly carrying, a hollow guide plunger and a hollow puncture pin carried partially within the hollow plunger, a spring directly connected to the plunger for driving the plunger and pin into puncturing position to release said gas or liquid through said hollow pin and means including a readily meltable element for holding the plunger pin and spring under restraint until a predetermined temperature is reached.

7. A signal control structure comprising a single element container closed at one end by a seal that will withstand a high pressure but having a predetermined puncturable portion and containing gas or liquid under pressure, means including a readily meltable element for holding a puncturing pin which is hollow uniformly throughout its length adjacent said seal until a predetermined temperature is reached and then releasing it and spring means alone acting solely and directly on the plunger for moving said pin when released by said meltable element and causing it to strike the seal so as to surely puncture it and direct the quantity and the flow of the contents of the container from the puncture end of the pin through its entire length thereof and out at its opposite end for the purpose described.

8. A signal control structure as defined in claim 5 further characterized in that said attachable means is a cup shaped member while said pin moving means is a plurality of individual spring washers radially spaced a considerable distance from the pin to also act as radiating surfaces for the purpose described.

9. A signal control structure which may be subjected to high temperature, comprising a single element container for carrying a material which will expand rapidly when released, a seal at one end of the container, means directly fastened to the container at the seal end for carrying a hollow pin for puncturing the seal at a predetermined temperature, said last mentioned means including a plural part spring and disposed so they will be kept sufficiently cool, by said material in the container when it is released on puncture of the seal, by flow through said pin to insure that said spring parts will function properly until the material is all used up.

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