

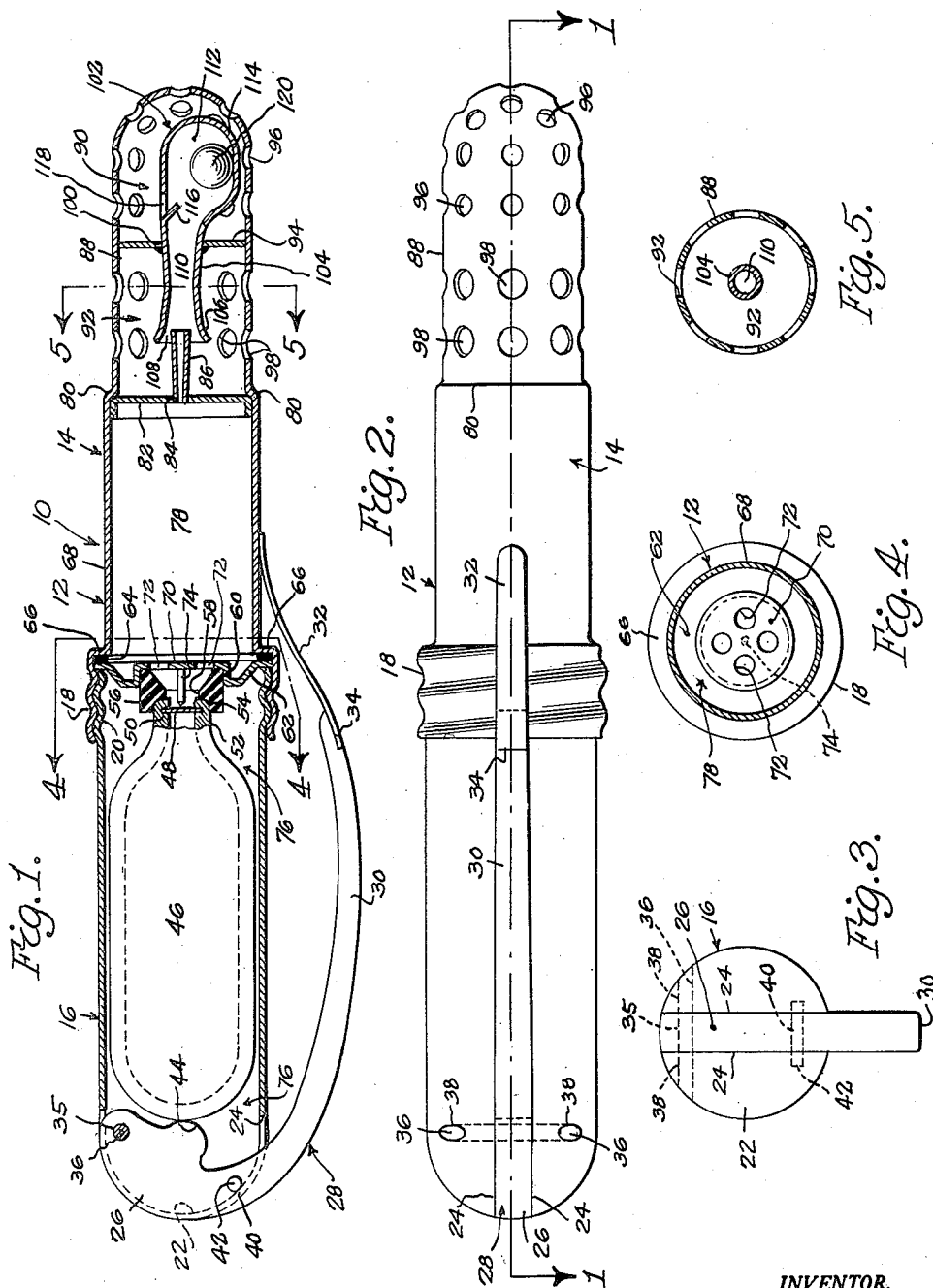
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PORTABLE SELF-CONTAINED AUDIBLE ALARM DEVICE

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PORTABLE SELF-CONTAINED AUDIBLE
ALARM DEVICE

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3 Claims. (Cl. 116—112)

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This invention relates to alarm devices and, in particular, to self-contained alarm devices.

One object of this invention is to provide a portable self-contained audible alarm device which can be carried in the pocket or purse and set off by a person who is attacked, such as women, bank messengers or other persons liable to attack, and which cannot be silenced by the attacker, with the result that the sound emitted by the alarm device attracts aid to the person attacked.

Another object is to provide a portable self-contained audible alarm device housed in a casing which holds a cartridge or flask of highly compressed gas, and which also has means actuated by the person attacked for releasing this gas to actuate a noise-making device, such as a whistle.

Another object is to provide a portable self-contained audible alarm device of the foregoing character, which includes means operating by Venturi action to reinforce the effect of the escaping gas by drawing in outside air to assist in actuating the whistle.

Another object is to provide a portable self-contained audible alarm device of the foregoing character wherein a gas expansion chamber is interposed between the gas supply and the whistle to permit the gas to expand from its small volume at high pressure to a much larger volume at low pressure so as to conserve the supply of gas and utilize it most efficiently and effectively.

Another object is to provide a portable self-contained audible alarm device of the foregoing character wherein means is provided for piercing a cartridge or flask of highly compressed gas which actuates a noise-making device, such as a whistle, thereby eliminating the need for using valves or other controls which would be subject to leakage of gas and consequent unreliability of the device.

Other objects and advantages of the invention will become apparent during the course of the following description of the accompanying drawings, wherein:

Figure 1 is a central longitudinal section through a portable self-contained audible alarm device, according to one form of the invention, with the compressed gas cartridge mainly in side elevation;

Figure 2 is a side elevation of the alarm device shown in Figure 1, looking at right angles to the plane of the section of Figure 1;

Figure 3 is a left-hand end elevation of the alarm device shown in Figures 1 and 2;

Figure 4 is a cross-section taken along the line 4—4 in Figure 1; and

Figure 5 is a cross-section taken along the line 5—5 in Figure 1.

Hitherto, persons engaged in hazardous occupations from the viewpoint of attack by other persons, for example, bank messengers, jewelers, pay roll clerks, as well as women who are required to be out at night alone, have often been attacked or threatened with attack without persons in the vicinity being aware thereof. Sometimes circumstances prevent the persons attacked from giving an alarm, as, for example, the suddenness of attack rendering them too terrified to scream or otherwise sound the alarm.

The present invention provides a portable self-contained audible alarm device capable of being carried in the pocket or purse, easy to manipulate, containing its own source of operating energy, and incapable of being shut off by the attacker. Moreover, once the alarm device has been set off, by an action requiring only a sudden squeeze of the hand, it requires no further action on the part of the operator but continues to give a shrill distinctive alarm sound until the supply of gas is exhausted. Even if the alarm device is dropped upon the ground, it continues to operate, with the result that the attacker would be likely to cease the attack and take to flight.

Referring to the drawing in detail, Figure 1 shows a self-contained alarm device, generally designated 10, according to one form of the invention as mounted in a casing, generally designated 12, consisting of forward and rearward tubular sections 14 and 16 secured to one another in any suitable manner, such as by the inter-engaging portions 18 and 20 respectively. The rearward section 16 is provided with a rearward wall 22 which is slotted arcuately as at 24 to receive the arcuate inner end portion 26 of an operating lever 28, the outer portion 30 of which extends along the rearward section 16 of the casing 12 and has a leaf spring 32 attached as at 34 to its forward end, the forward end of the leaf spring 32 engaging the forward section 14 of the casing 12. The rearward portion 26 of the lever 28 is bored as at 35 to receive a pivot pin 36 which at its opposite ends is mounted in aligned bores 38 in the rearward casing section 16 (Figure 3). The rearward portion 26 is also bored as at 40 to receive a stop pin 42 for limiting the rearward travel of the actuating lever 28. The spring 32 serves the double purpose of urging the lever 28 rearwardly so that the stop pin engages the inside of the rearward wall 22 and at the same

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time the spring 32 closes the opening which would otherwise exist between the forward end of the forward portion 30 and the casing 12 so as to prevent the lever catching on the clothing.

The rearward portion 26 of the lever 28 is provided with a forwardly-projecting rounded contact portion 44 which engages the rearward end of a flask or cartridge 46 containing a highly compressed gas. Such flasks or cartridges are available on the open market for actuating beverage siphons, inflatable life jackets, life rafts and the like, as well as propelling mechanical toys. The flask or cartridge 46 is sealed as at 48 in any suitable way after being filled with a highly compressed gas, such as carbon dioxide, the sealing means 48 shown being a puncturable diaphragm mounted as at 50 in the nose portion 52 of the flask 46.

The nose portion 52 of the flask 46 is seated in a recess 54 within an annular resilient abutment or cushion 56 having an aperture 58 therein for the passage of the gas when the diaphragm 48 is punctured. The forward end of the annular abutment 56 is seated in a correspondingly shaped socket or recess 50 in a perforated disc 62 (Figure 4) having its periphery engaging an annular gasket 64 and held between the forward end of the rearward casing section 16 and the annular shoulder 66 lying between the threaded portion 18 and the intermediate portion 68 of the forward casing section 16 and the annular shoulder 66 lying between the threaded portion 18 and the intermediate portion 68 of the forward casing section 16 (Figure 1). The annular abutment 54 and gasket 64 are preferably of elastic deformable material, such as natural or synthetic rubber or synthetic plastic. The disc 62 is provided with a central portion 70 around which are apertures 72 for the escape of the gas. Mounted on the central portion 70 and projecting rearwardly therefrom is a sharp pointed pin 74 for puncturing the diaphragm 48 when the actuating lever 28 is operated by the person attacked, as explained in connection with the operation. The disc 62 and annular resilient abutment 56 thus serve to close the forward end of the chamber 76 within the rearward casing section 16 containing the compressed gas cartridge or flask 46.

The intermediate portion 68 of the forward casing section 14 contains a gas expansion chamber 78, the forward part of which is provided with an annular shoulder 80 against which a flanged closure disc 82 is seated and secured in any suitable way, as by spot welding or by a press fit. The flanged disc 82 is provided with a central hole 84 from which a gas tube or nozzle 86 extends forwardly into the forward portion 98 of the forward casing section 14. The latter is divided into forward and rearward chambers 90 and 92 respectively (Figure 1) by a partition disc 94. The walls of the chambers 90 and 92 are provided with multiple holes 96 and 98 for the escape of gas and intake of air respectively. The partition disc 94 is also secured in position by spot welding or a press fit or in any other suitable manner, and is provided with a central hole 100 in which is mounted a noise-making instrument 102, which is in the form of a whistle.

The whistle 102 consists of a tubular portion 104 mounted in the hole 100, as by welding or soldering, and having a bell-mouthed rearward end 106 into which the forward end of the nozzle 86 projects so as to provide a venturi action or aspirator effect whereby air is sucked into the flared entrance 108 to the gas inlet passageway

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110. The inlet passageway 110 opens into the chamber 112 within the bulbous head 114 of the whistle 102, and is separated from it by an inwardly bent tongue or lip 116 adjacent the aperture 118 for the escape of the sound produced by the whistle 102. A ball 120 or other loose object is optionally mounted within the chamber 112 to render the sound intermittent in the manner of a trill. The whistle 102 is of any suitable design or type, and its design is such that it will give the maximum length of sustained sound for a given supply of gas. Ordinarily, such whistles operate at relatively low pressures, hence it is advisable to permit the gas to expand in the expansion chamber 78 before entering the whistle 102.

In the operation of the invention, the user who is open to the possibility of attack preferably carries the device 10 in his or her hand when passing through a neighborhood where such an attack is likely to occur. In the event of an attack, the person attacked merely squeezes the forward portion 30 of the hand lever 28 against the rearward casing portion 16, causing the rounded projecting portion 44 thereof to push the flask or cartridge 46 of compressed gas forwardly so that the diaphragm 48 engages the pointed pin 74 and is punctured as the annular resilient abutment 56 yields momentarily to permit such motion. The hand lever 28 is released instantly and the device may be dropped upon the ground without impairing its effectiveness.

The puncturing of the diaphragm 48 causes the gas within the flask or cartridge 46 to rush out through the hole therein and the gas cannot escape rearwardly into the cartridge chamber 76 because of the sealing effect of the resilient abutment 56. Accordingly, the stream of gas rushes through the holes 72 of the disc 62 into the expansion chamber 78 and thence through the nozzle 86 and passageway 110 past the tongue 106 into the resonance chamber 112, escaping out through the aperture 118 and sounding the alarm. As the gas rushes out of the nozzle 86, and through the passageway 110 it creates a suction in the bell-mouthed inlet 108 through venturi action, drawing in air through the holes 96 and inlet 106 to amplify the volume of the gas traversing the passageway 110. In this manner, the effect of the gas in the flask 103 in producing a whistling sound is increased and assisted by the incoming air through the flared entrance 108. The ball or loose object 120 converts the sustained or steady tone into a warbling or trill tone.

What I claim is:

1. A portable self-contained audible alarm device for actuation by the flow of gas from the outlet of a compressed gas cartridge contained therein, said device comprising a hollow casing having a gas cartridge receiving chamber therein, a cartridge opening element disposed in said casing adjacent said outlet of said cartridge, a gas-operated noise-making instrument disposed in said casing and having an operating gas inlet communicating with said outlet of said cartridge, said casing having an outside air intake opening disposed in communication with said instrument inlet, a Venturi device disposed adjacent said instrument inlet communicating with said air intake opening, said Venturi device operating on the induction principle to draw outside air into said instrument inlet in response to the flow of gas from said cartridge outlet through said instrument inlet, and mechanism for moving said

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cartridge outlet and said cartridge opening element relatively to one another into opening engagement.

2. A portable self-contained audible alarm device for actuation by the flow of gas from the outlet of a compressed gas cartridge contained therein, said device comprising a hollow casing having a gas cartridge receiving chamber therein, a cartridge opening element disposed in said casing adjacent said outlet of said cartridge, a gas-operated noise-making instrument disposed in said casing and having an operating gas inlet communicating with said outlet of said cartridge, a gas expansion chamber disposed between said cartridge outlet and said instrument inlet, said casing having an outside air intake opening disposed in communication with said instrument inlet, a Venturi device disposed adjacent said instrument inlet communicating with said air intake opening, said Venturi device operating on the induction principle to draw outside air into said instrument inlet in response to the flow of gas from said cartridge outlet through said instrument inlet, and mechanism for moving said cartridge outlet and said cartridge opening element relatively to one another into opening engagement.

3. A portable self-contained audible alarm device for actuation by the flow of gas from the out-

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let of a compressed gas cartridge contained therein, said device comprising a hollow casing having a gas cartridge receiving chamber therein, a cartridge opening element disposed in said casing adjacent said outlet of said cartridge, a gas-operated noise-making instrument disposed in said casing and having an operating gas inlet communicating with said outlet of said cartridge, a gas expansion chamber disposed between said cartridge outlet and said instrument inlet, a gas nozzle opening out of said expansion chamber into said instrument inlet and spaced apart therefrom to provide a Venturi passageway therebetween, said casing having an outside air intake opening disposed in communication with said passageway, and mechanism for moving said cartridge outlet and said cartridge opening element relatively to one another into opening engagement.

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