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ALARM DEVICE

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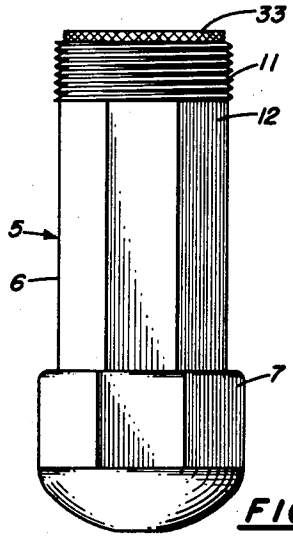


FIG. 1

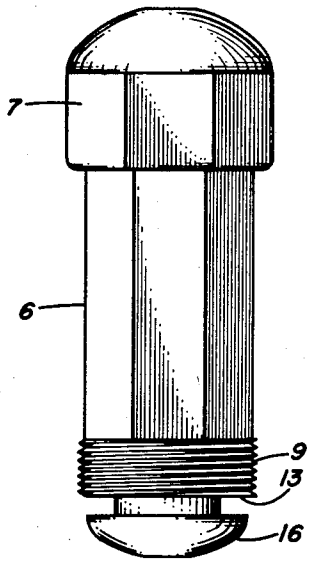


FIG. 2

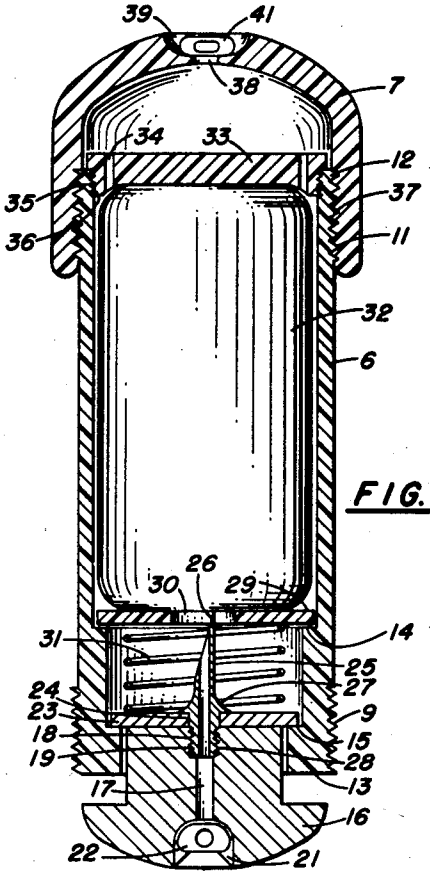


FIG. 3

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ALARM DEVICE

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The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The present invention relates to an alarm device and more particularly to a personal alarm device which is automatically operated.

The primary use of the present invention is as a personal alarm in the event a person is personally attacked. The invention has other uses such as: a fire alarm when suspended by a burnable material; a home protection alarm when connected to doors, windows or the like so as to be dropped upon tampering with such openings, and military personnel can use the device for purposes such as location grenade, attack signals and infiltration signal. Besides emitting a signal for the attention of others when properly charged the device may also emit a fire extinguishing gas; a form of tear gas; a colored gas for location determination, and any form of gas which is compressible to signal requirements or a gas which is formed by liquid reaction to air.

There are known personal alarm devices that can be manually actuated when the attacker places his arm about the victim's throat or mouth thereby leaving the victim's hands free to actuate the alarm. But, when the victim's arms are pinned against his body, his hands are either in a difficult position or are not in a free position to manually actuate the alarm. Thus, the alarm devices of the past have a disadvantage when the victim's arms are pinned down.

In contrast to the known alarm devices, the present invention operates automatically with a minimum of manual assistance on the part of the victim. When the victim is attacked he merely drops the alarm device of the present invention and the device is actuated when it strikes the ground.

A principal object of the present invention is the provision of an alarm device which is actuated automatically with a minimum of manual assistance.

Another object is an alarm device which can be disarmed simply and effectively, rendering the device harmless for carrying or storing.

A further object of the invention is an alarm device that uses pressurized gas to attract attention or use the same gas for other purposes.

A final object is to provide an alarm device having a positive method of signaling.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Fig. 1 shows an alarm device of the present invention in a disarmed condition.

Fig. 2 illustrates the device in an armed condition.

Fig. 3 is an enlarged sectional view of Fig. 2.

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, there is shown in Fig. 1 an alarm device 5 having a casing 6 and a disarming cap 7 secured at one end thereof. The casing 6 and cap 7 are made of lightweight material such as plastic or aluminum.

In Fig. 3, it can be seen that casing 6 is a hollow cylinder having threads 9 and 11 on the external surface of the ends 12 and 13, respectively. Shoulders 14 and 15 are provided to the internal surface of the end 13 of casing 6. A heavy ram plunger 16, preferably made of case iron or steel, is received in the end 13 of casing 6 and has a central bore 17 connecting an opening 18 having internal threads 19 with an enlarged opening 21. A signal unit 22 is placed in the opening 21 and secured therein by any suitable means.

A retainer ring 23 having a central opening 24 abuts against the shoulder 15 and contacts the inner end of the ram plunger 16, the opening 24 being aligned with opening 18. A hollow firing pin 25 is provided having a sharp point 26 at one end, a protruding shoulder 27 intermediate its ends and an externally threaded end 28; the pin 25 clamps the ring 23 to the inner end of the ram plunger 16 by means of shoulder 27 when the threaded end 28 of the pin 25 engages the threads 19 in the opening 18 located at the inner end of the plunger 16.

A retainer ring 29 having a central opening 30 is spaced from shoulder 14 and retains spring 31 in a compressed position against retainer ring 23.

A gas filled pressure tank 32 is positioned in the casing 6 and abuts against the retainer ring 29 compressing spring 31. The tank 32 is made of a light thin material which is easily penetrated such as plastic or the like. A refill cap 33 having feed holes 34 and external threads 35 locks the tank 32 within the casing 6 and against the retainer ring 29 by engagement of threads 35 with threads 36 provided on the internal surface of the end 12 of the casing 6.

Cap 7 has internal threads shown at 37 and a central opening 38 connecting the interior of the cap with an enlarged opening 39 having a signal unit 41 secured therein by any suitable means.

When the alarm device is not in use, the cap 7 is secured to end 13 of the casing 6 by means of threads 9 and 37 as shown in Fig. 1.

But, when the alarm device is to be placed in an armed condition, as shown in Figs. 2 and 3, the cap 2 is disengaged from end 13, exposing the plunger 16, and secured to end 12 by means of threads 11 and 37. The device is now in condition to be actuated with minimum manual assistance by the person carrying the device. When attacked, the victim need only drop the alarm device to set off the signal.

When dropped the device operates in the following manner: the device will land with an impact force upon the plunger ram 16 due to its being made of a heavy material, which will force the firing pin 25 upward against the tension of spring 31, penetrating the thin gas tank 32. There is an immediate release of gas which flows partially through the hollow firing pin 25 actuating the signal unit 22 and partially up the interior of the casing 6 to the feed holes 34 in cap 33, through the holes and into signal unit 41 by means of central opening 38 in cap 7. Thus, the two signal units 22 and 41 receive pressurized gas and create a signal of intensity, variable pitch if desired, and as controlled by sizes of the feed holes 34.

The signal intensity will diminish as pressure drops but is so designed as to continue for a minimum of three minutes or more. It is nearly impossible to shut off the signal once the gas capsule has been penetrated. Certainly, the attacker will not take time to try to shut the

device off, releasing his victim, with the signal going full blast. Even if the victim may have been rendered unconscious, the reflex action of releasing the device and dropping the same will create a signal.

After the gas in tank **32** has been spent, a renewable tank containing pressurized gas can easily be inserted into casing **6** by removing the refill cap **33** from end **12** of the casing **6**.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. An alarm device comprising a hollow casing, a tank adapted to hold fluid under pressure within said casing, means mounted at one end of the casing to penetrate said tank, means slidably mounting said tank-penetrating means within said casing, a signal unit positioned at said one end of said casing for receiving the compressed gas, and a weighted mass fixed to said tank-penetrating means at the outer end thereof operative to position the device vertically with the weight downward whereby, on release of said device for free fall and on impact with an underlying fixed surface, the tank is penetrated and said signal unit will automatically be activated by the compressed gas

2. An alarm device comprising a hollow casing, a tank adapted to hold compressed gas within said casing, means on one end of said casing retaining said tank within said casing, said tank retaining means on said one end of the casing having at least one opening therethrough, weighted means partially received in the other end of said casing to penetrate said tank, means slidably mounting said weighted means within said casing, a signal unit positioned on the weighted means end of the casing for receiving said compressed gas when released from said tank, a cap secured to the one end of the casing, said cap having another signal unit attached thereto and associated with the openings in said retaining means, whereby both mentioned signal units will automatically be actuated by the compressed gas when the device is dropped, landing on the weighted means which penetrates the tank.

3. An alarm device comprising a hollow casing, a weighted plunger partially received in one end of said casing, means slidably mounting said plunger within said casing, a compressed gas tank within said casing, pin means connected to the end of the plunger within said casing and in operative position to penetrate said tank, a signal unit positioned on the plunger end of the casing for receiving the compressed gas, and means for retaining said tank within said casing, said tank retaining means having openings therethrough, a cap having another signal unit attached thereto secured to the end of the casing remote from said plunger, said other signal unit being in communication with the openings in said retaining means whereby the device will land on the heavy plunger when dropped forcing the pin to penetrate the tank and releasing the gas to pass through both of said signal units.

4. An alarm device comprising a hollow casing, a weighted plunger received in one end of said casing and partially protruding therefrom, said plunger having a central bore therethrough, a signal unit associated with said bore, a hollow pin connected to the end of the plunger within said casing and communicating with said bore, means for slidably mounting said plunger within said casing, a compressed gas tank secured within said casing and in position to be penetrated by said pin, a cap having another signal unit attached thereto, means on each end of the casing to secure said cap to the casing, whereby said cap can be secured to the end of the casing receiving the plunger and the device is in a disarmed condition or said cap can be secured to the end of the casing remote from the plunger and the device is in an armed condition and further provides another signal unit to be actuated whereby both signal units will automatically be actuated by the compressed gas when the device is dropped, landing on the weighted plunger and forcing the pin to penetrate the tank.

5. An alarm device comprising a hollow casing having a shoulder protruding from the internal surface of one end of the casing, a first retainer ring abutting said shoulder, a second retainer ring within said casing, a spring under compression between said first and second rings, each of said rings having openings in alignment with each other, a weighted plunger partially received in said one end of said casing and engaging said first ring, said plunger having a central bore therethrough in alignment with said openings in said rings, a signal unit attached to said plunger and associated with said central bore, a hollow pin having protruding shoulders, said pin passing through the opening in said first ring and secured within the plunger bore, said shoulders on the pin holding the first ring to the plunger, a compressed gas tank within said casing and forcing the second ring against the second shoulder, a refill cap fastened to the other end of said casing and forcing said tank against said second ring, said refill cap having at least one opening therethrough, a cap having another signal unit attached thereto and associated with the openings in said refill cap, means on each end of said casing for securing said cap thereto, whereby said cap can be secured to the one end of the casing and the device is in a disarmed condition or said cap can be secured to the other end of said casing and the device is in an armed condition and further provides another signal unit to be attached, whereby the device will land on the heavy plunger automatically forcing the pin to penetrate the tank, releasing the compressed gas to actuate both of said signals.

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