Aug. 16, 1938. P. EVANS 2,127,395

FIRE EXTINGUISHER

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Fig. 9

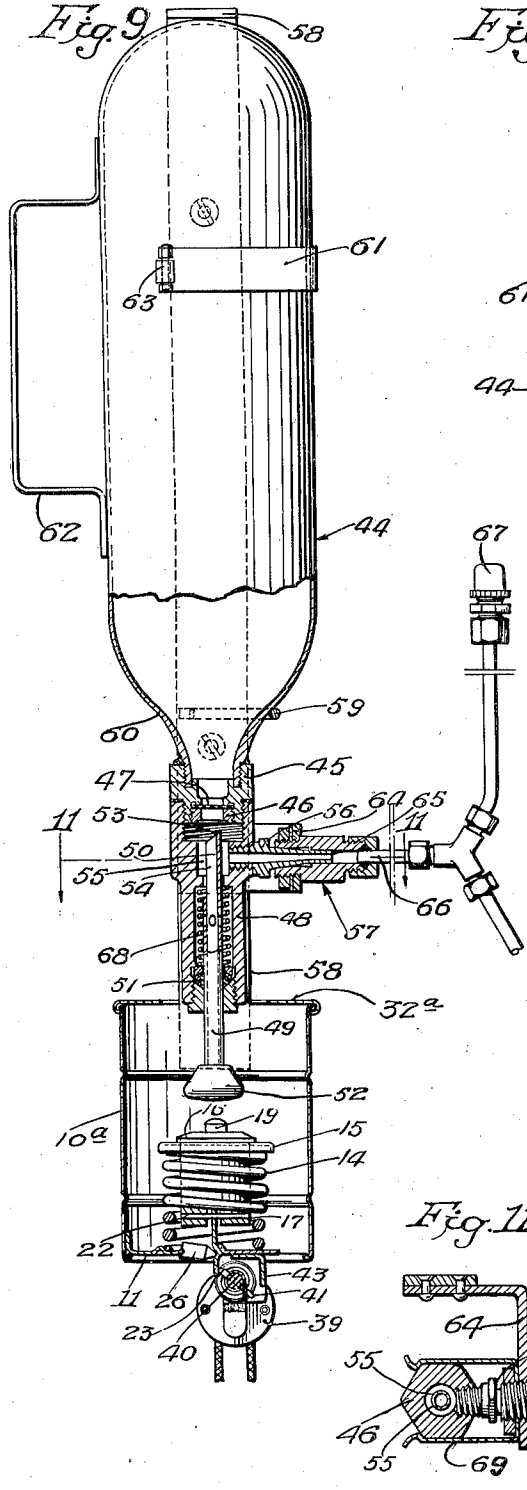


Fig. 10

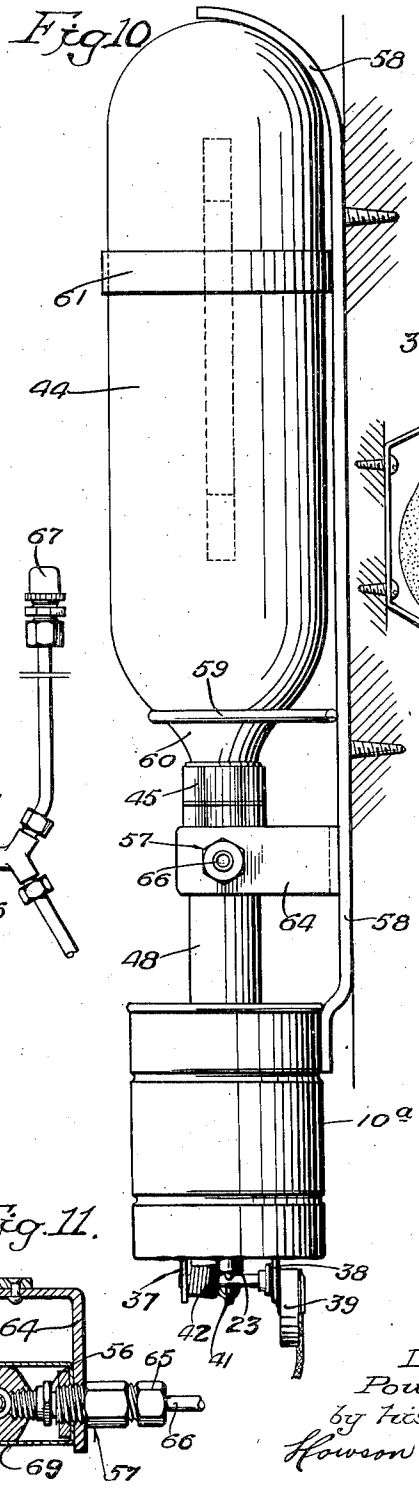


Fig. 1.

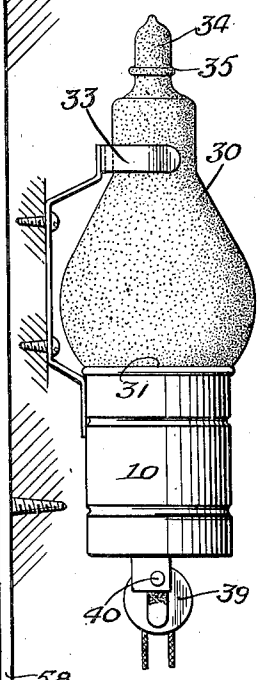


Fig. 11.

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FIRE EXTINGUISHER

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Fig. 6.

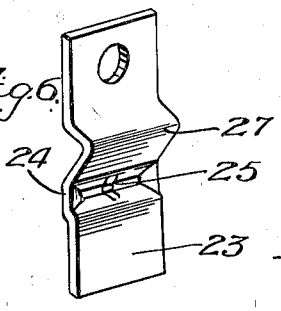


Fig. 5.

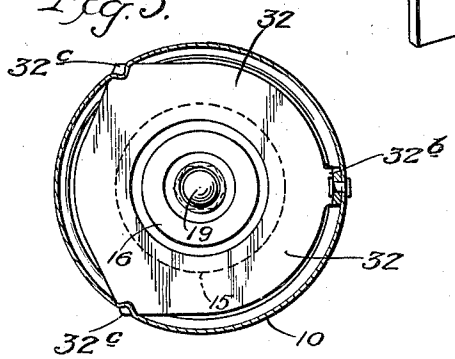


Fig. 4.

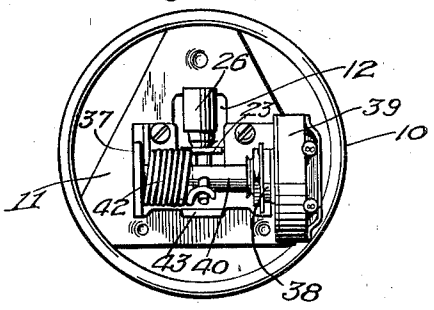


Fig. 2.

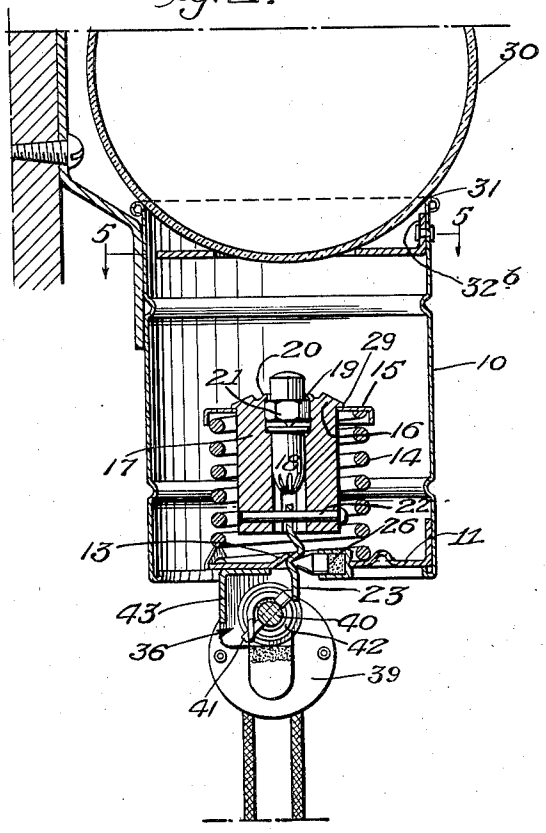
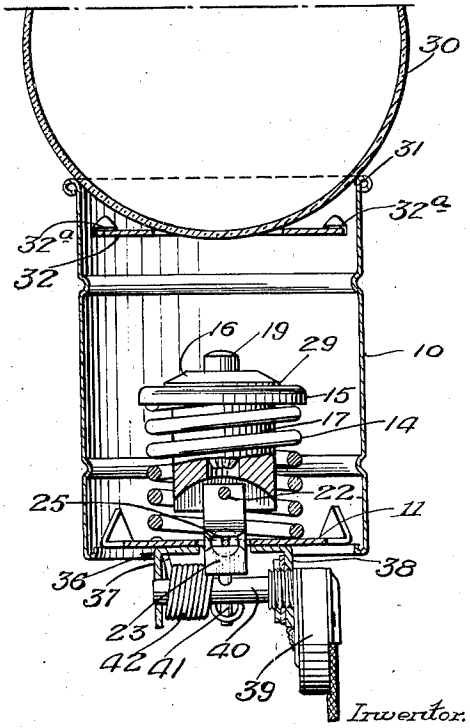


Fig. 3.



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FIRE EXTINGUISHER

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Fig. 7.

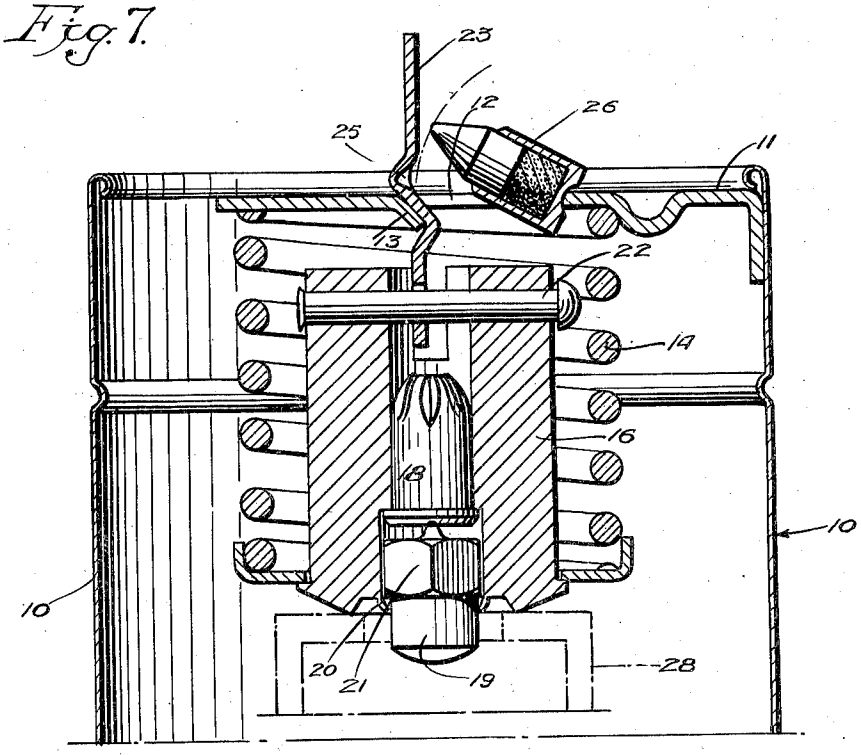
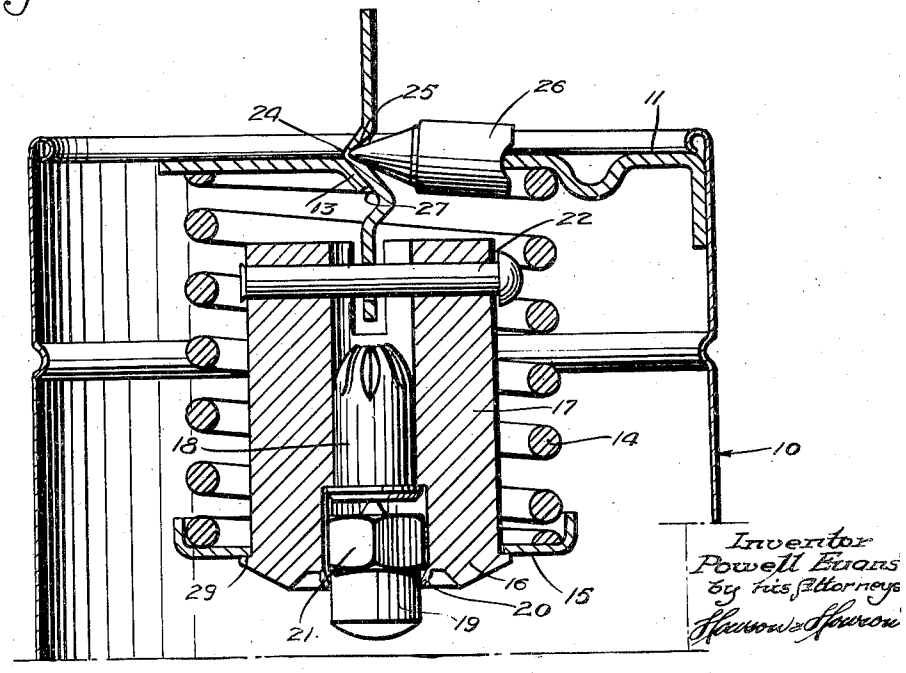


Fig. 8.



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Patented Aug. 16, 1938

2,127,395

UNITED STATES PATENT OFFICE

2,127,395

FIRE EXTINGUISHER

Powell Evans, Haverford, Pa.

Application January 17, 1936, Serial No. 59,629

11 Claims. (Cl. 169—26)

This invention relates to fire extinguishers of the type employed in small buildings, boats and motor vehicles, and more particularly to that type wherein a container, frangible in whole or in part, or a frangible orifice for a container is mounted upon a support, which support incorporates means for automatically opening the container at a predetermined temperature to dispense the contents thereof automatically and from which support the container is readily removed to permit manual use thereof at a remote point.

In later day developments such fire extinguishers incorporate an alarm device, an explosive cartridge or a cap being so positioned that it is detonated in breaking or opening the container. As the containers are often removed for hand use at some point remote to the container support, and since, in order to insure proper breakage the released hammer or other breaking mechanism must be propelled with considerable force, it is desirable that the breaker or hammer be so disposed that it cannot cause any damage either by too greatly shattering the receptacle or by extension from the holder when it is released following removal of the container. Accordingly, an important object of the invention is the provision of a structure in which positive breakage is provided in event the container be in position in the holder and yet in which it is impossible for the breaker or hammer to too greatly shatter the container or to escape from the holder in event it is operated in absence of the container.

Another object of the invention is the provision of novel and improved means for retaining the breaker in its inoperative position which is readily released upon even a slight movement of the fusible element normally performing the holding operation.

Another object of the invention is the provision in or attached to a structure of this character of an arrangement such that a switch may be readily incorporated in the fire extinguisher to cause operation of a remotely disposed electrically controlled signal.

A further object of the invention is the provision in a structure of this character of an arrangement permitting its use with the methyl bromide type of extinguisher; that is to say, that type of extinguisher wherein the contents of the container comprises ingredients which generate pressure by which they are ejected from the container or are under pressure in the container at all times.

A more specific object of the invention is the provision of an arrangement whereby an extinguisher of this latter type may have the container readily removable for use at a remote point while retaining the feature of automatic dispensing.

These and other objects I attain by the construction shown in the accompanying drawings wherein, for the purpose of illustration, I have shown a preferred embodiment of my invention and wherein:

Fig. 1 is a side elevation of one form of fire extinguisher constructed in accordance with my invention;

Fig. 2 is a vertical sectional view therethrough;

Fig. 3 is a vertical sectional view at right angles to that shown in Fig. 2;

Fig. 4 is a bottom plan view of the support;

Fig. 5 is a section on line 5—5 of Fig. 2;

Fig. 6 is a perspective view of the restraining strip;

Figs. 7 and 8 are detail sectional views illustrating the manner of assembling the unit;

Fig. 9 is a sectional view partially in section through a modified form of extinguisher;

Fig. 10 is a side elevation of the construction shown in Fig. 9; and

Fig. 11 is a sectional view taken on line 11—11 of Fig. 9.

Referring now more particularly to the drawings, the numeral 10 generally designates a cylindrical support, the bottom of which is preferably in the form of a triangular plate 11 having a central opening 12. At one side, this opening is provided with an upwardly and inwardly projecting tang 13. The bottom of the support forms a seat for a spring 14 which engages a flange 15 provided upon the upper end of a breaker head 16. The breaker head 16 is in the form of a chambered block 17 adapted to receive a blank cartridge 18, and above this cartridge to receive a firing pin 19 which is prevented from escape from the upper end of the chamber by swedging the metal thereof inwardly at 20 about an enlargement 21 formed on the firing pin. The lower end of the chambered block has pinned thereto at 22 the upper end of a retainer strip 23. This strip, intermediate its ends, is pressed to form a transverse lug 24 at one surface thereof, and a socket 25 at the opposite surface thereof. The lug is adapted to engage beneath the inclined tang 13 while the socket 25 receives the nose of a fuse 26 the normal length of which is such that it prevents escape of the lug 24 from beneath the tang. The upper surface of the lug is inclined similarly to the inclination of tang 13, and the strip above the lug is offset at 27, the surface of

the offset forming a continuation of the upper surface of the lug.

This feature permits ready assemblage of the structure since the offset surface may be arranged against the tang 13 as shown in Fig. 7 providing enough space to permit the fuse to be seated against the opposite edge of opening 12 from the tang and swung into engagement with the strip 23 at socket 25, following which the breaker head 16, which during this operation is held by means of a jig 28, may be released drawing the strip 23 downwardly and causing it to move toward the fuse due to the engagement between the inclined surfaces of the tang and offset. Transversely widening the lug 24 enables this lug to seat firmly upon the tang so that there will be no tendency to twisting on the part of strip 23.

The flange 15 may be conveniently formed as a collar seating against a shoulder 29 formed upon the upper end of the chambered block. It will be held against this shoulder by the spring 14 and is held from escape over the lower end of the chambered block by pin 22. It will be obvious that when element 26 is fused with the retraction of the nose under the transverse pressure applied through engagement of the tang and lug and created by spring 14, the spring will force the chambered block upwardly for engagement with an anvil surface causing the explosion of the cartridge 18. In Figs. 1 to 6 this anvil is illustrated as a frangible container 30 for a fire extinguishing medium such as carbon tetrachloride which will, of course, be broken simultaneously with operation of the alarm. This container seats upon the upper end of support 10 as at 31 and within the upper end of the container immediately below the upper end thereof a plate 32 is mounted having a central aperture of sufficient diameter to permit ready passage of the chambered block but of less diameter than flange 15. Since the chambered block cannot escape from the flange 15, it will be retained within the support even though operation should take place when the container 30 has been removed.

A convenient method of mounting the plate 32 is illustrated in Fig. 5. As shown in this figure, the walls of the container 10 have openings 32*a* formed therein adapted for the reception of projecting corners formed at spaced points on the periphery of the plate and at one side thereof. At the opposite side of the plate an angular portion 32*b* is provided, which portion, when the corners 32*c* are engaged with the openings, will fit snugly against the wall of the container and may be secured thereto by a rivet or the like.

Container 30 is grasped adjacent its upper end by a spring clip 33, which clip permits the container 30 to be readily removed for use at a remote point. The upper end of this container 30 has a readily removable head 34 connected with the container through a readily frangible portion 35 so that by striking the head 34 against a convenient surface the container is opened to permit ready dispersal of its contents.

The numeral 36 designates a bracket secured to the under surface of the bottom plate 11, this bracket having depending arms 37 and 38, the latter mounting a rotary switch 39 which may be of any usual type. This switch is provided with an elongated stem 40 rotatably engaged in the arm 37. Projecting through the switch stem is a pin 41, and surrounding the stem between the arm 37 and this pin is a coil spring 42 one end of which engages the bracket and the other end of which is hooked about the pin and constantly tends to rotate the switch stem 40 to place the contacts of the switch in operative position. The pin 41 bears against the face of retainer strip 23 opposite from that engaged by the fuse 26 and is held from rotating by the retainer strip as long as the fuse remains intact. When the fuse is released, however, the pin is likewise released and the switch is operated, this operation through the spring being limited by contact of one end of the pin with a third depending arm 43 formed on bracket 36. It will thus be seen that operation of the fuse not only releases the breaker head 16 but likewise causes operation of the switch 39. Switch 39 may be included in a suitable alarm circuit which may be either of the closed or open circuit type.

In Figures 9 to 11, I have illustrated this structure as adapted to the support of a pressure type extinguisher 44 as, for example, an extinguisher containing methyl bromide. This container has at its discharge end a fitting 45 mounting through a clamping ring 46 a sealing diaphragm 47. A tubular extension 48 is connected to this fitting and mounts a plunger 49 having a hollow stem 50 which extends through a packing gland 51 and is equipped at its outer end with a head 52 which closes the end of the tube. The upper end of this tube has a sharpened point 53 for perforating diaphragm 47 and has its side wall cut away as at 54 so that when the diaphragm 47 is perforated the contents of the container can escape to a chamber 55 surrounding the piercing stem 49. This chamber communicates with a nozzle 56 which forms one member of a tapered slip joint 57.

The container 10*a* with the complement of switch, breaker head and retainer construction described in connection with the remaining figures, has a bracket 58 extending upwardly therefrom, this bracket having a supporting ring 59 adapted to engage the reduced neck 60 of the container and having adjacent its upper end a spring clip 61 to embrace the container and from which the container may be readily disengaged by grasping the handle 62 thereof. The free end of clip 61 is preferably provided with a roller 63 to facilitate engagement and disengagement of the container 44. The bracket 58 has an arm provided with an angular portion 64 mounting the second member 65 of the tapered slip joint, this member 65 being in communication through conduit 66 with nozzles 67 arranged at strategic points. The angular portion 64 of the arm is provided with a spring clip 69 embracing the tubular portion 48 to maintain the slip joint in its proper position and to further assist in holding the container in position. The plunger 49 is normally held in depressed position through a light spring 68, but when engaged by the breaker head driven by the powerful spring thereof it is forcibly projected through the sealing diaphragm 47 to release the contents of the container. When it is desired to use the container 44 at a remote point, it is readily removed by reason of use of the slip joint connection illustrated. It will be noted that the head 52 of the plunger is made of such size that it may pass through the opening of the restraining plate 32 while the breaker head may not pass therethrough.

Since the constructions described are obviously capable of considerable modification without departing in any way from the spirit of my inven-

tion, I do not wish to be understood as limiting myself thereto except as hereinafter claimed.

What I claim is:

1. In apparatus of the type described, a spring pressed head, an objective into engagement with which the spring urges the head, an explosive carried by the head and detonated upon engagement of the head with the objective, a switch including a movable contact, a strip secured to said spring pressed head for controlling said movable contact and said head, and a single fusible element engaging said strip and maintaining said strip in a position restraining said head against movement by its spring and preventing movement of said movable contact.

2. In apparatus of the type described, a container, a spring pressed head therein, an objective mounted on said container and into engagement with which the spring urges said head, an explosive carried by the head and detonated upon engagement of the head with said objective, a pressed up tang adjacent an opening in the bottom of said container, a socketed strip having a lug pressed therein secured to said spring pressed head, and a fusible element arranged to engage the socket in said strip to maintain the lug in engagement with the tang and restrain said head against movement by its spring.

3. In apparatus of the type described, a container, a spring pressed head therein, an objective mounted on said container and into engagement with which the spring urges said head, an explosive carried by the head and detonated upon engagement of the head with said objective, a pressed up tang adjacent an opening in the bottom of said container, a socketed strip having a lug pressed therein secured to said spring pressed head, a fusible element arranged to engage the socket in said strip to maintain the lug in engagement with the tang and restrain said head against movement by its spring, and means positively limiting movement of the head if the objective is removed.

4. In apparatus of the type described, a container, a spring pressed head therein, an objective mounted on said container and into engagement with which the spring urges said head, an explosive carried by the head and detonated upon engagement of the head with said objective, a pressed up tang adjacent an opening in the bottom of said container, a socketed strip having a lug pressed therein secured to said spring pressed head, a fusible element arranged to engage the socket in said strip to maintain the lug in engagement with the tang and restrain said head against movement by its spring, and a plate interposed between the objective and head having an opening through which the head may not bodily pass and through which the head may project sufficiently to engage the explosive with the objective.

5. In apparatus of the type described, a container, a spring pressed head therein, an objective carried by said container and into engagement with which the spring urges said head, an explosive carried by the head and detonated upon engagement of the head with said objective, a pressed up tang adjacent an opening in the bottom of the container, a switch including a movable contact, a socketed strip secured to said spring pressed head and extending through the opening in the bottom of the container for controlling said movable contact, and a single fusible element engaging the socket in said strip to maintain the movable contact in inoperative position and restrain said head against movement by its spring.

6. In apparatus of the type described, a container, a spring pressed head therein, an objective carried by said container and into engagement with which the spring urges said head, an explosive carried by the head and detonated upon engagement of the head with said objective, a pressed up tang adjacent an opening in the bottom of the container, a switch including a movable contact, a socketed strip including a lug secured to said spring pressed head and extending through the opening in the bottom of the container for controlling said movable contact, a single fusible element engaging the socket in said strip to maintain the said switch contact in inoperative position and restrain said head against movement by its spring, and means positively limiting movement of the head if the objective is removed.

7. In apparatus of the type described, a container, a spring pressed head therein, an objective carried by said container and into engagement with which the spring urges said head, an explosive carried by the head and detonated upon engagement of the head with said objective, a pressed up tang adjacent an opening in the bottom of the container, a switch including a movable contact, a socketed strip having a lug pressed therein secured to said spring pressed head and extending through the opening in the bottom of the container for controlling said movable contact, a single fusible element engaging the socket in said strip to maintain the said switch contact in inoperative position and restrain said head against movement by its spring, and a plate interposed between the objective and head having an opening through which the head may not bodily pass and through which the head may project sufficiently to engage the explosive with the objective.

8. In apparatus of the type described, a plate, a spring abutting one side of said plate, a head actuable by said spring, a pressed up tang adjacent an opening in said plate, a fusible element, a socketed strip secured to said head and extending through said opening in the plate, a lug formed in the said strip for contact with said tang, the portion of the strip below the lug being offset to provide sufficient clearance between the wall of the plate opening opposite the tang and the strip to permit insertion of said fusible element in said socket, and the tension of said spring on said strip exerting said lug on said tang and maintaining said fusible element firmly engaged between said opposite wall and said socket.

9. In apparatus of the type described, a plate, a spring abutting one side of said plate, a head actuable by said spring, a pressed up tang adjacent an opening in said plate, a fusible element, a socketed strip secured to said head and extending through said opening in the plate, a lug having an angular surface formed in the said strip for wedging contact with said tang, the portion of the strip below the lug being offset to provide sufficient clearance between the wall of the plate opening opposite the tang and the strip to permit insertion of said fusible element in said socket, and the tension of said spring on said strip exerting a wedging action on said tang by said lug and maintaining said fusible element firmly engaged between said opposite wall and said socket.

10. In apparatus of the type described, a spring pressed head, an objective into engagement with which the spring urges the head, a switch includ-

ing a movable contact, a spring constantly tending to shift the contact and a member connected to said head and in one position thereof operatively maintaining said switch contact against movement under the influence of the spring and restraining said head from movement under the influence of its spring and a fusible element engaging said member to maintain the same in said position.

11. In apparatus of the type described, a spring pressed head, an objective into engagement with which the spring urges said head, a strip secured to said spring pressed head, a support for the head including an opening through which the strip may extend, a wall of the opening and said strip being mutually constructed and arranged to provide angular shouldered engagement therebetween whereby the strip is moved toward the opposite wall of the opening as the head moves under the influence of its spring, a fusible element preventing movement of the strip toward the last-named wall of the opening whereby to restrain said head from movement under influence of its spring, a rotatable switch, means constantly urging rotation of the switch and a stop associated with the switch and engaged with said strip whereby to prevent rotation of the switch until the head is moved under the influence of its spring.

POWELL EVANS.