

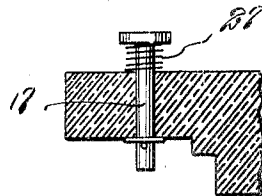
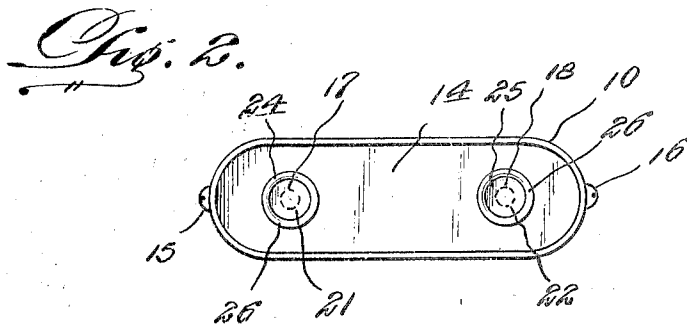
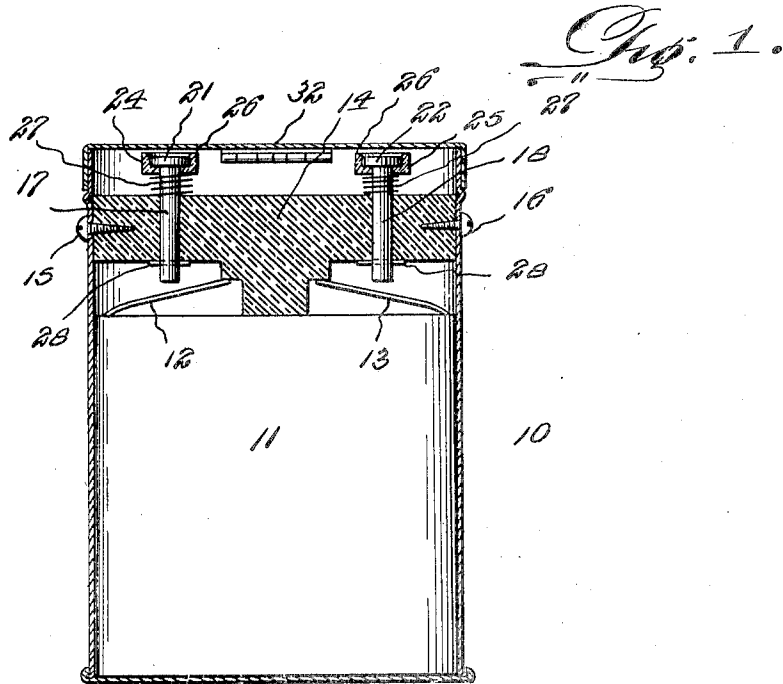
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H. NEAL

SHOT FIRING DEVICE

Filed Feb. 25, 1922



H. L. Soy.

WITNESSES:

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HENRY NEAL, OF YUKON, PENNSYLVANIA.

SHOT-FIRING DEVICE.

Application filed February 25, 1922. Serial No. 539,282.

To all whom it may concern:

Be it known that I, HENRY NEAL, a citizen of the United States, residing at Yukon, in the county of Westmoreland and State of Pennsylvania, have invented new and useful Improvements in Shot-Firing Devices, of which the following is a specification.

This invention relates to a shot firing device for use in mines, and under similar conditions, in firing the charge, and the object is to provide a particular type of safety appliance, including a dry cell, or battery, a casing therefor, and contact making devices mounted in a certain novel manner herein-
after disclosed.

A further object is to provide an element serving to retain the battery in position and serving to mount the contact devices, so that they will be normally in alignment with the terminals of the cell or battery but out of contact therewith.

A still further object is to provide spring held contact devices, normally out of engagement with the terminals and to provide the heads of these devices with insulating guard means, so that the wires forming the circuit leading to the cap to be exploded, when merely held against the contact pins will not complete the circuit until the contact pins are pressed and the wires are also forced by the pressure of the fingers beyond the guard of insulation, thus affording a maximum degree of protection from premature firing.

With the foregoing and other objects in view, the invention consists in the novel construction and arrangement of elements described, and claimed, it being understood that modifications may be made within the scope of the claims without departing from the spirit of invention.

In the drawings, Figure 1 shows the device in vertical section, and Figure 2 is a top plan view, the cover being removed; Figure 3 is a detail view of a modified form of pin mounting.

The battery case is designated 10, and is of suitable size for receiving a dry battery of some commercial make and supplying the required voltage.

The battery 11 includes the terminals 12 and 13, and the battery is retained in position in the case by means of an element 14, of insulating material, and proportioned to snugly fit the casing. This element 14 is readily inserted or removed, and is posi-

tively secured by means of screws passing into the casing from the sides thereof, these screws being designated 15 and 16.

The contact buttons or pins, are designated 17 and 18, and the shank portions thereof pass through apertures provided in the block at points corresponding in position with the location of the battery terminals. The pins are formed of metal and include heads 21 and 22. The heads may be countersunk within insulating disks 24 and 25, these disks each including an outer flange 26, projecting beyond the surface of the head of each pin.

The shank of each pin is surrounded by a coil spring 27, the spring bearing against the element 14, and serving to move the pin in a position to prevent contact with the corresponding battery terminal until pressure is applied. The outward movement of the pin under the action of the spring may be limited by any suitable device, such as a transverse pin 28.

In the use of the device, the wires of the circuit leading to the charge to be exploded are placed respectively across the heads of the pins forming the contact devices, no circuit being completed until sufficient pressure is applied, both to overcome the action of the coil spring and also to press the wires inwardly toward the heads of the pins,—the wires being normally retained out of contact with the pins by reason of the insulated guard members previously referred to. It will be observed that while the pressure required to overcome the small coil spring would be comparatively slight, somewhat greater pressure may be required for making contact at the heads of the pins, owing to the position of the insulating guard members, thus affording double precaution against premature firing. It will further be noted that the block 14 is countersunk within the casing, and although the casing is provided with a metallic cap 32, no electrical contact with the metal cap is possible because of the insulated guard members, even though the pins should move slightly under shock due to rough handling.

In Figure 3 I have shown a contact pin mounted in a similar insulating member and held under the action of a spring, the insulating guard member being omitted.

Having thus described the invention, I claim:

1. In a device of the class described, a cas-

ing, a battery including terminal members received by said casing, an element of insulating material received by the casing and proportioned to fit snugly for retaining the latter in position, said member of insulation being apertured at points opposite the battery terminals, spring held pins mounted in the apertures and normally positioned out of contact with the terminals, and guard members of insulating material including flanged portions, projecting beyond the ends of the pins.

2. In a device of the class described, a casing, a battery including terminals received by the casing, an element for retaining the battery in position, said element being countersunk in the casing at one end, providing

a chamber between the end of the casing and said element, the element so countersunk being apertured at points opposite the terminals of the battery, spring held contact devices mounted within the apertures, a cap for the casing, and insulating guard members surrounding and projecting beyond the outer ends of the contact devices for preventing electrical contact with the cap of the casing, and retaining a straight conducting element laid across the contact devices out of electrical contact therewith until pressure is applied to said conductor for depressing the latter into engagement with the contact devices.

In testimony whereof I affix my signature.
HENRY NEAL.