H. L. GRANT AND G. HADDOW.

ELECTRIC DETONATOR.

APPLICATION FILED MAY 20, 1920.

1,354,100. **Patented Sept. 28, 1920.**

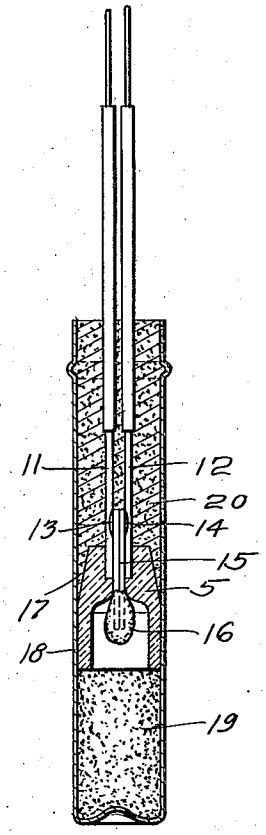


Fig. 1.

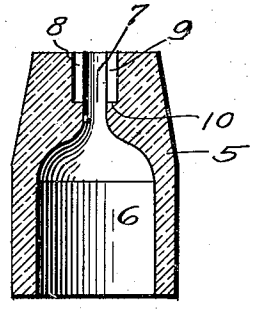


Fig. 2.

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BY

Samuel Herrick, ATTORNEY.

UNITED STATES PATENT OFFICE.

HARRY L. GRANT AND GEORGE HADDOW, OF TAMAQUA, PENNSYLVANIA, ASSIGNORS TO ATLAS POWDER COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF DELAWARE.

ELECTRIC DETONATOR.

1,354,100. Specification of Letters Patent. Patented Sept. 28, 1920.

Application filed May 20, 1920. Serial No. 382,979.

To all whom it may concern:

Be it known that we, HARRY L. GRANT and GEORGE HADDOW, citizens of the United States of America and Great Britain, respectively, residing at Tamaqua, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Electric Detonators, of which the following is a specification.

The object of the present invention is to provide an electric detonator of the character of that shown in United States Patent No. 720,073, but embodying certain improvement features not disclosed by said patent, and hereinafter more particularly pointed out.

Among the objects of the invention is to provide an adapter, within which the fuse wire and a priming element are united in such manner as to thereafter prevent separation of the parts, said adapter acting as an insulator.

A further object of the invention is to provide in a device of this character, an adapter of a nature to be used in place of the usual sulfur plug, ordinarily employed, so that a cavity of much greater size than usual is left in the shell, for the reception of a filling material which renders the assembly entirely waterproof.

Further objects and advantages of the invention will be set forth in the detailed description which now follows.

In the accompanying drawing:

Figure 1 is a longitudinal sectional view of a detonator constructed in accordance with the invention; and

Fig. 2 is an enlarged sectional view of the adapter.

Like numerals designate corresponding parts in both of the figures of the drawing.

In carrying out the invention we provide an adapter consisting of a body portion of inverted cup shape, indicated at 5, said body portion being of a highly dielectric material, such as hard rubber, fiber, or the like. The body 5 is formed with an internal cavity 6, the latter communicating with a passage 7 that leads axially through the adapter. Grooves 8 and 9 located upon opposite sides of the passage 7, communicate with said passage and preferably, though not necessarily, terminate at shoulders 10. The grooves 8 are for the reception of the terminal ends of the fuse wires 11 and 12, said fuse wires being soldered at 13 and 14 to the opposite faces of a strip 15, which passes through the passage 7 and carries at its lower end a globule 16 of a primer composition. This element is similar to that shown and described in the Patent 720,073, above referred to, which element has its opposite faces coated with conductive material so that the primer composition may be fired through the medium of an electric current carried by the wires 11 and 12.

In assembling the parts so far described, the strip 15 is passed through the passage 7, with the globule 16 lying within the cavity 6. The ends of the wires 11 and 12 are then inserted in grooves 8 and 9 and are soldered to the strip as heretofore stated. Thus it will be seen that during the soldering operation, the globule 16 is located in a protected position within the cavity 6 so that danger of ignition of the same is avoided. After the solder has been placed in position, all of the parts will be securely tied together, because the globule 16 is too large to pass through the passage 7 and downward movement of the wires is resisted by the abutment of the lower end thereof against the shoulders 10. However, these shoulders may be omitted if desired and the presence of the drops of solder may be relied upon to prevent downward movement of the wires. The adapter being of insulating material, not only acts to isolate oppositely charged leading wires, but holds the priming element and the wires in assembled relation, during the soldering operation; materially facilitating the latter. The adapter protects the priming composition from being accidentally broken or torn away, and prevents spreading of the fuse wires or the stem of the priming device. The body 5 is beveled as indicated at 17, the purpose of which will be presently stated.

In use the adapter is inserted in the interior of the shell 18 of a detonator its lower end resting upon the detonating composition 19, after which the shell 18 is filled with a sealing composition 20, of a nature to render the entire assembly waterproof. The tapering of the body 5, at 17 permits the waterproofing material to extend down

the sides of the body 5 to a point materially below the level of the top thereof, thereby rendering the waterproofing more perfect.

The provision of the cavity 6 not only serves the useful purposes heretofore set forth but aids in the generation of an effective flash of the primer composition.

It is to be understood that the invention is not limited to the precise construction set forth but that it includes within its purview whatever changes fairly come within either the terms or the spirit of the appended claims.

Having described our invention, what we claim is—

1. In a device of the character described an adapter formed of insulating material and having a central underside cavity therein, an axial opening leading therethrough and in communication with said cavity, grooves upon opposite sides of said passage and communicating therewith, and shoulders at the bottoms of said groove, a strip extending through said passage, fuse wires having their ends located in said grooves with their extremities abutting said shoulders, said wires being united to said strip, and a head of primer composition upon said strip within the underside cavity, of such size as to prevent endwise movement of the strip through said passage.

2. A detonator comprising a shell and a body of detonating material therein, an adapter formed of insulating material of a diameter at its lower portion to substantially fill said shell, said adapter having an underside cavity and being tapered at its upper portion, a primer comprising a strip and a head of primer composition, said head being located within said cavity and said strip extending through an axial opening formed in said adapter, fuse wires connected to the strip above the adapter and a sealing material filling the shell above the adapter and extending downwardly into the shell about the tapered upper portion of the adapter.

In testimony whereof we affix our signatures in the presence of two witnesses.

HARRY L. GRANT.
GEORGE HADDOW.

Witnesses:
SAML. R. BEARD,
HARRY I. LINKER.