Aug. 19, 1947. H. B. HUMPHREY 2,425,741

SAFETY PRIMER FOR BLASTING

Filed April 23, 1945

FIG. 1.

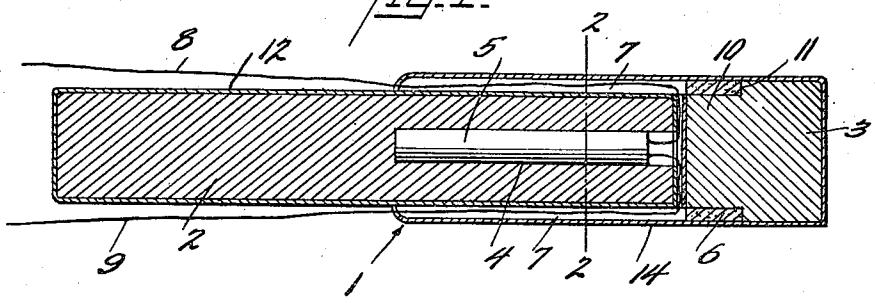



FIG. 2.

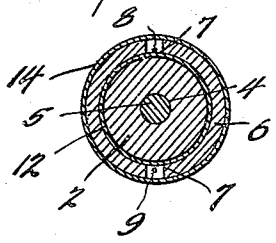



FIG. 3.

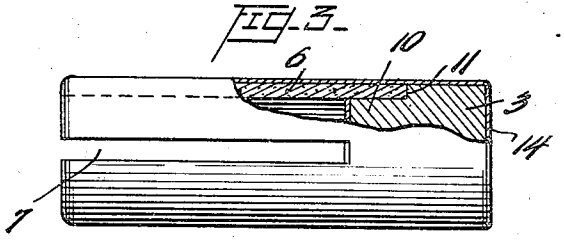



FIG. 4.

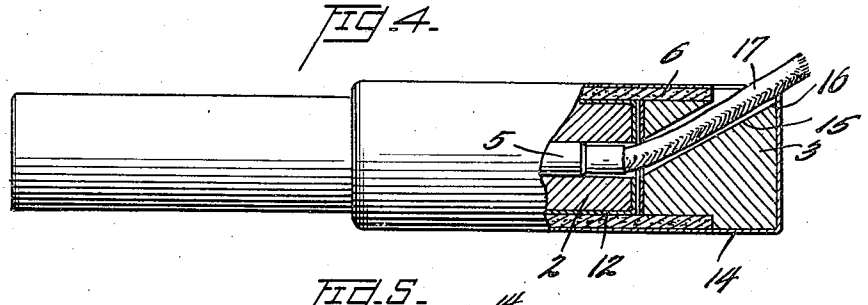
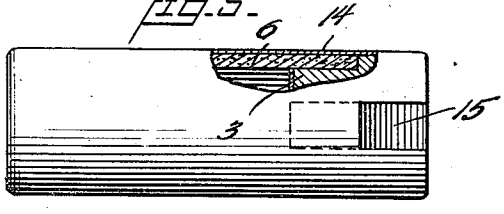



FIG. 5.




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## SAFETY PRIMER FOR BLASTING

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Application April 23, 1945, Serial No. 589,835

1 Claim. (Cl. 102—24)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein may be manufactured and used by or for the Government of the United States for governmental purposes without the payment to me of any royalty thereon in accordance with the provisions of the act of April 30, 1928 (Ch. 460, 45 Stat. L. 467).

This invention relates to the art of blasting, but more particularly to a safety primer for blasting, and has for its object to provide a cartridge which includes provision for protecting the detonator and its attached wires or fuse and in which the detonator will be centered in the most favorable position for maximum detonating effect and to provide a safety primer which can be used anywhere in the charge in the drill hole.

With these objects in view, the invention consists of the novel construction of the molded dynamite cartridge and in the provision of a frangible protecting tubular member, all of which will first be fully described and afterwards specifically pointed out in the appended claim.

Referring to the accompanying drawing:

Fig. 1 is a vertical longitudinal sectional view of a blasting cartridge constructed in accordance with my invention and having an electrically wired detonator.

Fig. 2 is a vertical transverse sectional view through the same taken on line 2—2 of Fig. 1.

Fig. 3 is an elevation partly in vertical section of the frangible protecting tube and its molded dynamite end plug.

Fig. 4 is an elevation partly in vertical section of a blasting cartridge constructed in accordance with my invention and having a fuse igniting detonator, and

Fig. 5 is an elevation partly in vertical section of the frangible protecting tube and its molded dynamite end plug for the fuse type of cartridge shown in Fig. 4.

Like numerals of reference indicate the same parts throughout the several figures, in which:

The primer consists of a molded dynamite cartridge 1, made in two sections 2 and 3 as shown in Fig. 1.

In the main section 2 of the cartridge 1 there is a centered cylindrical chamber 4 to receive a suitable detonator 5.

Formed on the smaller or plug section 3 of the cartridge is a frangible protecting tube 6 made of incombustible material such as finely ground clay, limestone, talc or the like, which is bound together sufficiently to hold its form and shape while being handled and assembled and positioned for use, but sufficiently frangible to break

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and spread apart when firm tamping pressure is applied as is necessary to fill up the bore hole.

In the form of cartridge shown in Figs. 1, 2 and 3, wherein an electric detonator is employed, the frangible shell 6 has two diametrically opposite longitudinally positioned slots 7 to receive the detonator wires 8 and 9, as shown in Figs. 1 and 2, while the plug section 3 of the cartridge is reduced at 10 to form a shoulder 11 to receive the end of the frangible shell 6.

When the detonator 5 is inserted in the central chamber 4 and the wires 8 and 9 are lying along the outside of the main portion 2 of the cartridge, the plug section 3 of the cartridge with its attached frangible shell 6 is slipped over the cartridge section 2 with its inserted detonator 5 so that the wires 8 and 9 lie in the longitudinal slots 7 of the frangible shell 6, as shown in Figs. 1 and 2, and between the abutting end faces of the two cartridge sections 2 and 3.

The main cartridge member 2 may be enveloped in a wrapping of water-proof paper 12, before the parts are assembled, and if desired, the frangible shell 6 and the plug section 3 of the cartridge may likewise be wrapped with paper 14.

In the construction shown in Figs. 4 and 5, the frangible shell 6 is not provided with the longitudinal slots 7 but is cylindrical. In this example, the plug section 3 has a channel 15 which extends from its outer surface 16 on an inclination to the center thereof, as shown in Fig. 4. The fuse 17 for the detonator 5 lies in this inclined channel 15 and thence along the bore hole so that there are no sharp turns or bends in the fuse 17 which would be likely to interfere with or impair its efficiency in operation. The detonator 5 and fuse 17 are passed through this inclined channel 15 before the detonator 5 is inserted in its chamber 4 in the main section 2 of the cartridge. The plug section 3 and attached frangible shell 6 are then slipped over the end of the main cartridge section 2 containing the detonator 5, as shown in Fig. 4.

Having thus described the invention, the cartridge is placed in position by the application of firm tamping pressure. The frangible protective shell 6 resists pressure in line with the axis of the bore hole, but splits when extra pressure is applied so that the shell 6 will be pressed against the walls of the bore hole and the dynamite of the cartridge will be forced in around the detonator to afford it protection. Tendency of the detonator to turn at an angle is obviated, while the frangible shell provides a cushion for the detonator in addition to that provided by the

dynamite. The frangible shell 6 is designed to split and spread under pressure so as to allow compacting the explosive in the bore-hole and to hold the primer in bore-holes that have a steep angle above the horizontal.

Having thus described the invention, I do not wish to be understood as limiting myself to the exact construction shown and described, as various changes may be made therein, and I consider myself clearly entitled to all such changes and modifications as fall within the limit and scope of the appended claim.

I claim:

A safety primer for blasting which includes two sections of molded explosive in abutment with each other, the end of one section which is in abutment with the other having a centrally positioned chamber to receive a detonator, the other abutting section having a portion thereof reduced in diameter, a protective shell of readily frangible incombustible material mounted on the reduced portion of the last mentioned section and against the shoulder thereon and adapted to be passed over the abutting end portion of the other section of molded explosive so as to encompass its said detonator chamber and detonator therein,



the said protective shell of readily frangible material being provided with longitudinal slots to receive wires leading to the detonator, the whole arranged whereby the said protective shell of readily frangible material is sufficiently stable to hold the two abutting sections of molded explosive in proper assembled position during handling and insertion of the primer in a bore hole but upon application of firm tamping pressure exerted on the primer will split and be expanded against the wall of the bore hole to close the bore hole and retain the primer explosive and its detonator in proper position thereon.

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