Oct. 11, 1927. 1,645,379

J. B. FLETCHER ET AL

WATERPROOF CAP AND FUSE

Filed Nov. 25, 1925

FIG. 1.

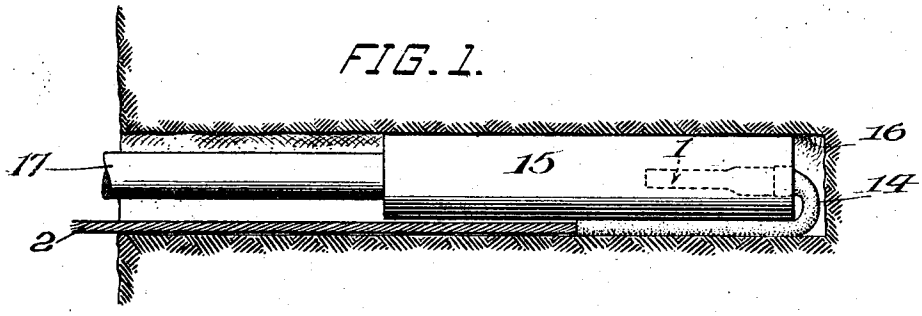


FIG. 2.

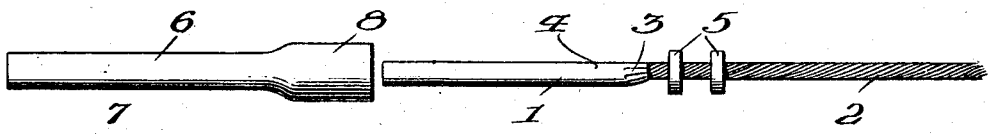


FIG. 3.

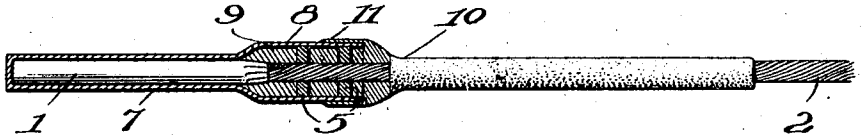


FIG. 4.

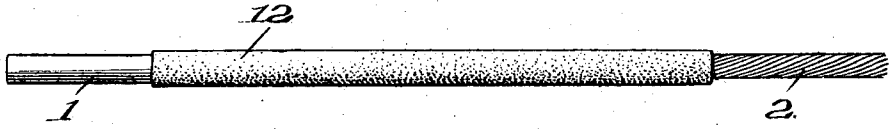
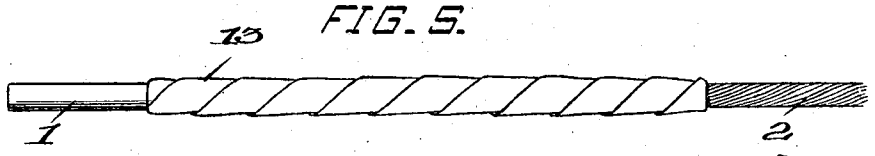


FIG. 5.



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WATERPROOF CAP AND FUSE.

Application filed November 25, 1925. Serial No. 71,371.

This invention relates to waterproof cap and fuse constructions and comprises all improvements over the prior art which are disclosed in this application. Some objects are to provide a way to waterproof caps and fuses so they can be submerged in water for an unusually long time without harm. Also so that the fuse can be given the abrupt bend necessary when the explosive with the attached cap and fuse is loaded into a hole without the bend being liable to be affected by water or to blow out due to cracking, and that these characteristics shall be maintained for a considerable length of time.

The above and other objects which will hereinafter appear, are attained by improvements embodying new and useful features as disclosed in this application. To enable others skilled in the art to fully comprehend the essential features of the improvements, drawings illustrating a preferred form have been annexed as a part of this disclosure.

Fig. 1 is a longitudinal sectional view of a hole in the act of being loaded with explosive containing cap and fuse.

Fig. 2 is a side view of the cap and fuse in position to be inserted into its protective shell.

Fig. 3 is a partial sectional side view showing the cap and fuse inserted in its protective shell and with the rubber cement applied.

Fig. 4 is a side view of a modified construction in which a rubber cement coating is used without any protective covering.

Fig. 5 is a side view of a modified construction in which the protective covering consists of fabric applied over a cement coating.

The particular embodiment of the invention which is herein disclosed for illustrative purposes is applied to a standard cap 1 of copper which contains the detonating material, and a powder fuse 2 secured within the cap 1 at 3. A priming coat of cement is preferably applied beginning at a point 4 on the cap 1 extending along fuse 2 for a distance of several inches or more. A protector is provided in the form of a slip over shell 6 preferably of thin copper. The part 7 of the shell is just large enough to freely slip over cap 1. With washers 5 preferably of rubber in position as shown in Fig. 2, the cap 1 is dipped in rubber cement adapted to form a protective coating, and some of this rubber cement is also put in shell 6. Then cap 1 is inserted into shell 6 whereupon the major portion of the cement in part 7 is forced back into enlarged extension 8 as indicated at 9 in Fig. 3. Additional protective cement is applied beginning at a point 11 on enlargement 8 and extending along fuse 2 for a distance of several inches or more to form a protective coat 10. Mica dust or other suitable material is applied to cement 10 after drying to render it non-sticky. Washers 5 engage between the enlargement 8 and fuse 2 to prevent the fuse having too much lateral movement which would be liable to break the cement where the outer end of enlargement 8 joins coating 10. Washers 5 also aid to make it certain that water will not reach to where the cap and fuse are connected together.

Fig. 4 illustrates a modified construction in which the protection is obtained by a heavy coating of rubber cement 12 rendered non-sticky by mica dust or the like.

Fig. 5 is a modified construction in which a protective cement coating is covered with a winding of fabric or tape 13.

The priming coat preferably consists of materials proportioned as follows: 5 ozs. balata gum dissolved in 1 gal. naphtha to which is added ¾ lb. powdered rosin (preferably pale for its quality). To this is added 5 ozs. gutta percha dissolved in ½ gal. carbon bisulphide. This results in a very quick drying non-penetrating cement which is very desirable as a first or priming coat, since other cements sometimes penetrate the asphaltum compounds used in the fuse, sufficiently to cause a delayed fire which is frequently as disastrous as a missed fire since a round of holes must be timed correctly.

The main protective coat may consist of vulcanizing rubber cement or 1 lb. of unvulcanized rubber dissolved in 1 qt. of benzine or benzol. Where excessively strong acids in water such as arsenic sulphuric and others are to be encountered, we preferably incorporate in the main protective cement, 1½ drams sulphur chloride, 1 pt. carbon bisulphide, and 3 drams hydrochloric acid. The primary feature that must be possessed by the main protective coat is that it shall readily bend and stretch in a manner sufficiently similar to rubber that when the fuse is given an abrupt bend as at 14 in Fig. 1 the coat will not crack so that the fuse will not blow

out or be affected by water. Fig. 1 illustrates dynamite cartridge 15, cap 1 and fuse 2 placed in hole 16 by means of loading stick 17.

Caps and fuses treated as herein disclosed by us, remain in perfect condition for a year or more and remain absolutely water proof while submerged in water for 48 hours or more.

Such variations as employ the generic or specific essentials of the herein disclosed improvements over the prior art, are intended to be comprehended within the meaning and range of equivalency of the following claims.

We claim:

1. A waterproof cap and fuse comprising, a cap and fuse connected together and having a covering at, and extending in both directions beyond, the cap and fuse connection, said covering comprising a closely adhering coating of rubber cement, and a substantial length of said covering being free to be given an abrupt bend.

2. The device set forth in claim 1 in which the cement coating extends along the fuse for a distance of several inches from the cap and fuse connection.

3. A waterproof cap and fuse comprising, a cap and fuse connected together and having a covering at, and extending in both directions beyond, the cap and fuse connection, said covering comprising a closely adhering coating of rubber cement, and a protective covering applied over the cement at and adjacent both sides of said cap and fuse connection, said protective covering comprising a slip over shell with an enlarged extension near the region of said cap and fuse connection and with one or more washers within said enlarged extension and surrounding said fuse.

4. The method of making a waterproof cap and fuse comprising, applying a non-penetrative priming coat of cement at and for a distance in both directions beyond, the cap and fuse connection, and subsequently applying a main protective coat of rubber cement over said priming coat.

5. A waterproof cap and fuse comprising a hydrochloric acid and sulphur chloride containing rubber cement at and for a distance beyond the cap and fuse connection.

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