Aug. 23, 1927. 1,639,906

N. I. STEERS

SAFETY BLASTING CAP

Filed March 24, 1925

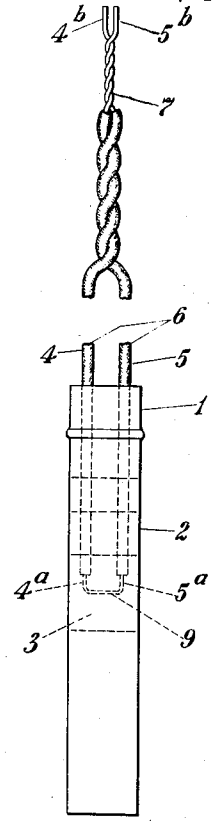


Fig. 1

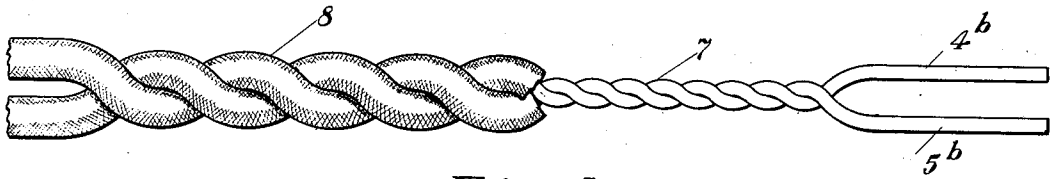


Fig. 2

N.I. Steers, Inventor

By his attorney F.R. Squair

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UNITED STATES PATENT OFFICE.

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SAFETY BLASTING CAP.

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This invention is in the art of explosives and has particular relation to electric blasting caps. As is of course well understood in the art, such caps comprise a suitable shell loaded with a sensitive and violent explosive, for example, fulminate of mercury, with suitable conductors leading into the shell, and permanently connected therewith, for conducting an electric current to the charge to explode the same. In use, the cap is placed in close relation to the blasting charge of high explosive to be detonated, and the exploding of the cap gives the shock and heat necessary to cause detonation of the charge.

The leads of a cap are generally of considerable length, say five or six feet. That is to say, they are so long that when the cap is carried in the hand in the ordinary way the exposed ends of the uncoiled leads are not in the immediate control of the workman, and may come into contact with a charged electric conductor. It is a common practice for the workman to uncoil the leads at some place distant from the point where the cap is to be used and then to carry the cap to that point, with its wires dragging along the ground. There are often stray currents in the ground, or there are charged rails, or what not, and should the leads come in contact therewith, the cap may be exploded, resulting in serious accidents and, indeed, death. There are, of course, many other circumstances under which accidental explosion due to exposed leads may occur. I have devised a cap with its leads so arranged that dangers of the type indicated are eliminated. It is the major object of the invention to provide such a cap. To this end, and also to improve generally upon devices of the character indicated, the invention consists in the various matters hereinafter described and claimed.

Without restricting the invention thereto, it is described with reference to the embodiment thereof illustrated in the accompanying drawing. In the drawing, Figure 1 is an elevational view of a cap with the leads broken out to economize space, and Figure 2 is an enlarged fragmental plan view showing the manner in which the leads are preferably arranged in accordance with the invention. Referring now to the drawing:—

The illustrated cap, designated generally as 1, comprises the shell 2, of any proper material, for example copper, loaded with a suitable explosive 3, and having the leads 4, 5, with their inner ends 4^a, 5^a, connected by the platinum heating element 9 positioned to cause explosion of the charge when the current is passed. The leads are covered with insulation 6 for the greater portion of their lengths outside the shell; but at their free ends are, for a short distance, without insulation so that they may be readily connected with the terminals of a current supplier, this, of course, being the usual practice.

Now, in accordance with the present invention, the leads are "shorted" at their free ends as indicated at 7. With this arrangement, should the shorted ends come into connection with a current, the current will not pass down the leads to explode the charge. Preferably, the shorting is accomplished by twisting the leads together, this being, I have found, much more satisfactory than interposing a bridge between the leads, both from the point of view of making an inexpensive and thorough short and from the point of view of making a short which can be readily broken by the workman when he desires to use the cap. With the illustrated construction, too, the exposed leads can be readily shorted throughout their exposed portions, it only being necessary to closely twist the leads together throughout such portions except for the short tips 4^b, 5^b. Thus, there is no unshorted length between the short 7 and the insulation. Desirably, and as shown more particularly in Figure 2 at 8, the insulation is carried up a short distance beyond the short or, expressed somewhat differently, the twisting is carried along the insulated portions. This makes doubly sure that there shall be no unshorted portion between the short 7 and the insulation. In twisting the leads, it is desirable that care be taken to twist them very closely, thereby to bring them into intimate close contact throughout the twisted length, thus to insure a highly effective short. When the workman wishes to operatively connect the cap with a source of current, he merely has to untwist the leads, thus destroying the short, this operation, of course, not being done until the cap has been placed in position for use.

With this arrangement, even though the workman does bring the exposed leads into

connection with an electric current, as by dragging them across a charged mine-car rail, or what not, no harm will be done, it not being until the short is finally destroyed by the workman that a current can explode the cap. I may say that with suitable leads, of tinned iron or copper, for example, of the diameter commonly used for leads, a short such as indicated will withstand a current of 50 amperes, 550 volts.

I claim:

1. In a blasting cap, an explosive container, and electric leads from said container, said leads having uninsulated portions, with such portions twisted together through a substantial length thereof.

2. In a blasting cap, an explosive container, and electric leads from said container, said leads having insulated and uninsulated portions with the uninsulated portions twisted together through a substantial length thereof, with the twisting extending along the insulated portions.

In testimony whereof I affix my signature.

NEWTON I. STEERS.