T. M. DANIELS.

WATERPROOF FUSE CAP.

APPLICATION FILED DEC. 14, 1909.

964,219. Patented July 12, 1910.

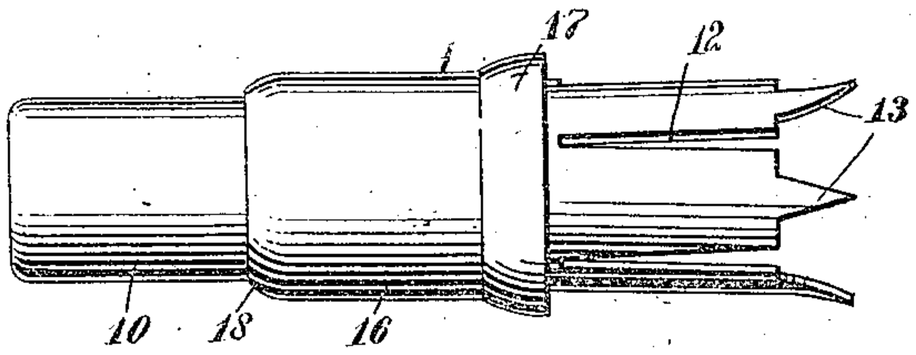

Fig. 1

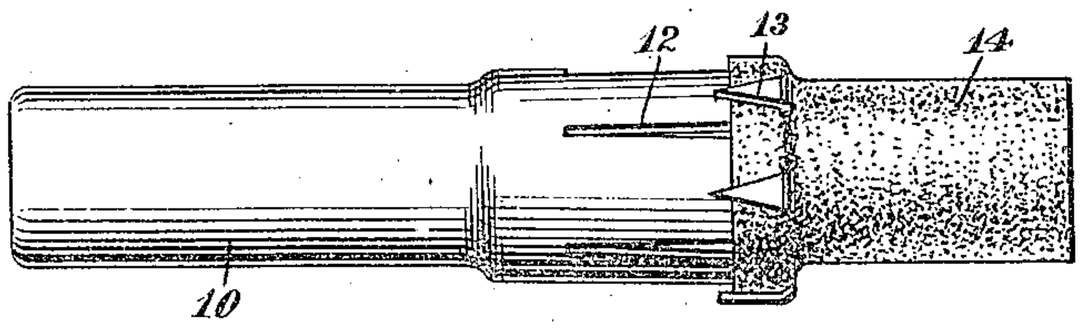

Fig. 2

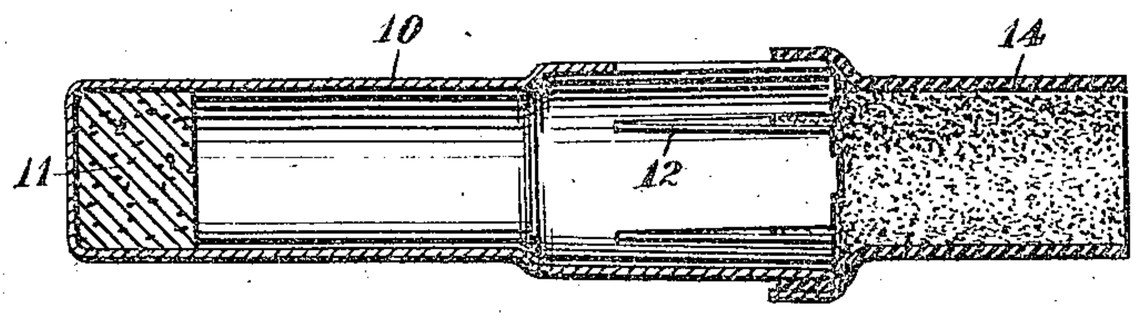

Fig. 3

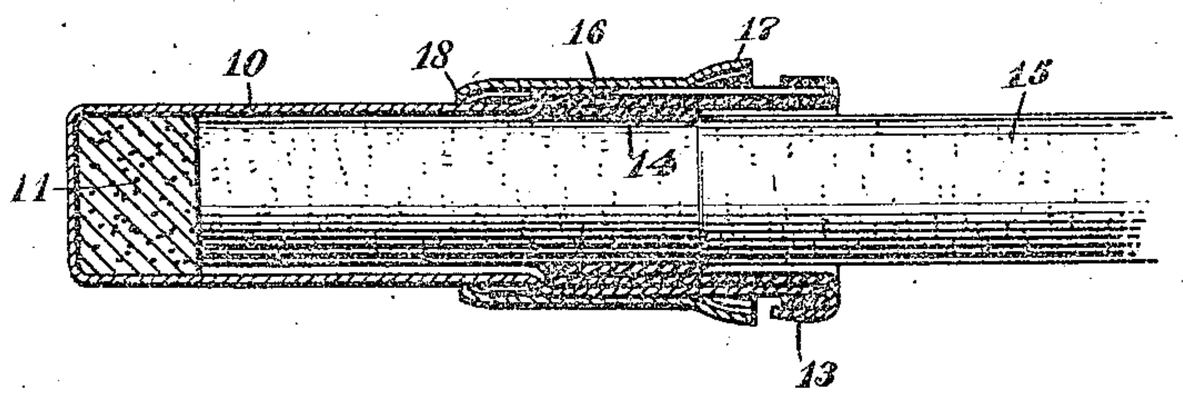

Fig. 4

WITNESSES

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WATERPROOF FUSE-CAP.

964,219. Specification of Letters Patent. Patented July 12, 1910.

Application filed December 14, 1909. Serial No. 532,995.

To all whom it may concern:

Be it known that I, THOMAS M. DANIELS, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Waterproof Fuse Cap, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in water-proof fuse caps for use in blasting, and relates more particularly to that type of cap disclosed in my prior Patent, No. 900,670, issued October 6, 1908.

The object of my present invention is to simplify the construction of the cap and the means for securing the sleeve of water-proof material in place.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which—

Figure 1 is a side elevation of the tube and the clamping ring; Fig. 2 is a side elevation of the tube with the water-proof sleeve secured thereto; Fig. 3 is a longitudinal section through the construction illustrated in Fig. 2; and Fig. 4 is a longitudinal section through the cap with the fuse attached thereto.

In the specific form illustrated I employ a tube or cylinder 10, preferably of thin metal and closed at one end to receive the detonating charge 11. The opposite end of the tube or cylinder is open and enlarged to very slightly greater diameter. The enlarged portion is provided with a series of slits or cuts 12 extending longitudinally of the tube, so as to permit the open end to be expanded or contracted during the attachment of the fuse. Intermediate each slit or opening 12, the edge of the tube is provided with outwardly-extending pointed flanges or extensions 13, by means of which the water-proof sleeve is secured in place. This water-proof sleeve 14 is preferably of thin rubber, and when in operative position, is disposed within the tube adjacent the slits 12.

In securing the sleeve to the tube the flanges or extensions 13 are left in substantial alinement with the tube or only slightly bent outwardly, as illustrated in Fig. 1. The sleeve is then slipped over the extensions and the latter are bent outwardly, so as to pierce the sleeve at a short distance from the end of the latter. These flanges or extensions are then bent back against the outer surface of the sleeve, so as to firmly secure the sleeve to the tube substantially in alinement therewith as illustrated in Fig. 2. The fuse 15 is then extended into the end of the sleeve and forced inwardly into engagement with the detonating charge 11, so that the sleeve will lie within the enlarged portion of the tube, and cover that portion of the inner surface of the tube having the slits. The sleeve will lie between the tube and the fuse, and will be under slight compression, so as to effectively seal the inner end of the tube against the admission of moisture.

Outside of the tube I provide a clamping ring 16, having an expanded end 17 and a slightly contracted end 18. This clamping ring loosely fits the outer surface of the lower portion of the tube, but tightly engages with the outer surface of the enlarged portion of the tube. After the fuse and sleeve have been moved into position, the clamping ring is placed on the lower end of the tube and moved upwardly to the limiting position. When it reaches this limiting position, the contracted end 18 of the clamping ring will come adjacent the lower end of the expanded portion of the tube and the enlarged end 17 will receive and protect the flanges 13 and the outer end portion of the water-proof sleeve 14. The clamping ring operates to force inwardly the separate portions of the outer end of the tube, so that they will bind against the water-proof sleeve 14 and bind the latter against the fuse. The clamping ring is held in place by friction, and prevents any accidental outward bending of the flanges 13. Moisture is prevented from entering the tube or coming in contact with the detonating charge, and the tube or cylinder is prevented from becoming detached from the fuse.

Various changes may be made in the specific construction illustrated and within the scope of the appended claims, without departing from the spirit of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A fuse cap having a tubular shell closed at one end and open at the other and adapted to receive an explosive charge, the

open end having longitudinally-disposed slits dividing the adjacent portion of the shell into sections, a fuse extending into said shell, and a water-proof sleeve intermediate said shell and said fuse, said shell at its open end having outwardly-extending flanges integral therewith for clamping the sleeve to the shell.

2. A fuse cap having a tubular shell closed at one end and open at the other and adapted to receive an explosive charge, the open end having longitudinally-disposed slits dividing the adjacent portion of the shell into sections, a fuse extending into said shell, and a water-proof sleeve intermediate said shell and said fuse, said shell having a plurality of pointed flanges at its open end extending outwardly through the sleeve and bent back against the shell for securing said sleeve to said shell.

3. A fuse cap having a tubular shell open at one end and having a plurality of pointed outwardly-extending flanges integral therewith at the open end, a sleeve of water-proof material inclosing the walls of the open end of said shell and having apertures for receiving said flanges, a fuse extending into said shell through said sleeve, and a clamping ring encircling said shell and adapted to protect said flanges.

4. A fuse cap having a tubular shell closed at one end and open at the other, the portion of the shell adjacent the open end being of greater diameter than the portion adjacent the closed end and connected thereto by an annular shoulder, a fuse extending into said shell, a water-proof sleeve intermediate the enlarged portion of the shell and the fuse, and an outer sleeve encircling the shell and movable lengthwise thereof to contract the enlarged portion and grip the fuse, said last-mentioned sleeve having a contracted terminal portion for engaging with said shoulder to limit the relative longitudinal movement of the shell and last-mentioned sleeve.

5. A fuse cap having a tubular shell open at one end and of greater diameter adjacent the said open end than adjacent the opposite end, said enlarged portion being slit lengthwise to provide a plurality of fingers, a fuse extending into said open end, a packing intermediate said fingers and said fuse, and an outer sleeve movable lengthwise of said shell for pressing said fingers inwardly toward said fuse, said sleeve having a contracted portion for limiting the lengthwise movement of the sleeve in respect to the shell.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS M. DANIELS.

Witnesses:

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K. M. MAYER.