E. S. CUNNINGHAM.

DETONATION CAP.

APPLICATION FILED SEPT. 18, 1916.

1,293,354. Patented Feb. 4, 1919.

FIG. I.

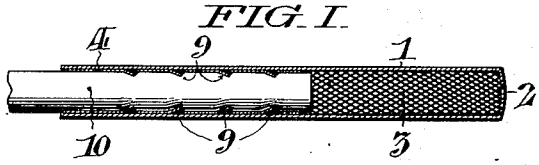


FIG. II.

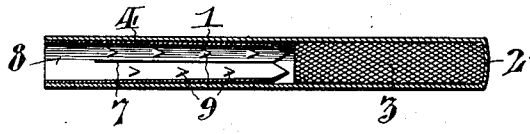


FIG. V.

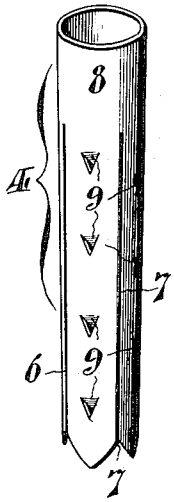


FIG. III.

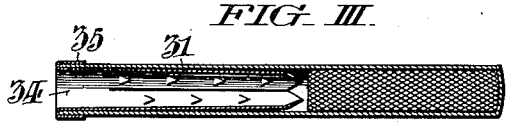


FIG. VI.

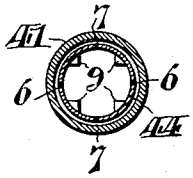


FIG. IV.

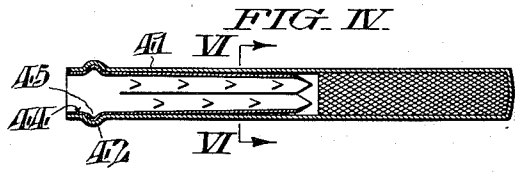


FIG. VII.

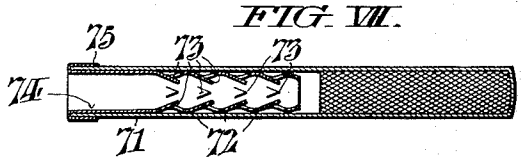
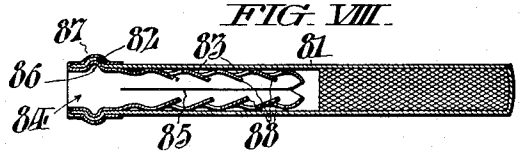


FIG. VIII.



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UNITED STATES PATENT OFFICE.

ECKLEY S. CUNNINGHAM, OF WONDER, NEVADA.

DETONATION-CAP.

1,293,354. Specification of Letters Patent. Patented Feb. 4, 1919.

Application filed September 18, 1916. Serial No. 120,612.

To all whom it may concern:

Be it known that I, ECKLEY S. CUNNINGHAM, of Wonder, in the county of Churchill and State of Nevada, have invented certain new and useful Improvements in Detonation-Caps, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to the caps containing a fulminating compound for detonation of explosive charges in mining, quarrying and the like, and in connection with which a time fuse is employed. The present general practice is to inclose the fulminating compound in a cylindrical copper cap closed at one extremity, and open at the other for insertion of the end portion of the fuse, the metal of the cap being crimped or pinched upon the fuse, after the insertion of the latter, to prevent detachment during handling and the placing of the cap and fuse in the desired relation to the main explosive charge.

Experience has shown that this method of securing the fuse within the cap is objectionable, since the crimping or pinching of the metal is likely to be done hastily, or without proper care, the result frequently being that the cap misses fire, as for instance, through breaking the powder of the fuse of the train before the fulminate is reached, or the powder of the fuse may spit outward and reach the main explosive charge before the fulminate of the cap is caused to detonate, or the fuse may slip out from the cap in handling.

My invention is intended to overcome these difficulties, and provides a means for securing the fuse definitely and with sufficient permanence with relation to the cap, all danger of improper crimping being avoided.

In the accompanying drawings, I have shown several typical embodiments of my invention which are alike in principle, and differ only in detail.

Figure I, is an axial section through a cap embodying my invention in a simple form, and showing the end of the fuse secured in position.

Fig. II, is a similar sectional view, omitting, however, the representation of the fuse, in order to show the internal structure of one of the elements.

Figs. III, IV, VII, and VIII, are similar sectional views, each indicating a different arrangement of details, the representation of the fuse itself being omitted.

Fig. V, is a view in perspective on an enlarged scale, of the form of securing device shown in Figs. I, and II.

Fig. VI is a transverse section on the line VI, VI, of Fig. IV.

In Figs. I, and II, 1 represents the elongated cylindrical cap, usually of copper, and having the extremity 2, closed, the fulminating compound indicated by the cross-hatched lines at 3, being placed within the closed extremity.

A metal thimble 4, shown in perspective in Fig. V, and having an approximately cylindrical form, is adapted to be slid within the open end of the cap 1. The metal of said thimble is slit for a considerable distance longitudinally at a plurality of points, as indicated at 6, and 7, of Fig. V, preferably arranged in quadrant relation, the unslit rear extremity 8, being of such external diameter as to fit with substantial friction within the open extremity of the cap 1.

The tongues formed by the longitudinal slits are provided with a plurality of inwardly projecting prongs 9, having sharp points, which form barbs adapted to penetrate and engage in the covering of the fuse 10, as shown in Fig. I, said barbs pointing away from the rear portion 8, of the thimble.

In use the thimble is slipped over the end portion of the fuse, whose extremity should barely protrude beyond the front end of the thimble. When thus inserted the fuse is engaged by the barbs and cannot be withdrawn rearwardly from the thimble.

The thimble with its contained portion of the fuse is then pushed into the end of the cap, the thimble being held with substantial firmness by friction engagement of the rear portion 8, within the wall of the cap. It will thus be seen that since the length of the thimble is known, it serves as a gage for insuring the insertion of the fuse to the proper extent, so that it shall be neither too tightly pressed against the fulminate, nor leave too large a gap. When once inserted, the fuse and thimble cannot be withdrawn without substantial effort, and the attachment of the fuse to the cap effected without any perforation of the metal of the cap itself, which would be highly objectionable.

The arrangement shown in Fig. III, dif-

fers from that just described simply in the fact that the outer extremity of the thimble 34, is provided with a flange 35, returned upon itself, and frictionally engaging upon the outer surface of the cap 31.

In the arrangement shown in Fig. IV, the cap 41, is provided with an externally projecting annular bead 42, and the thimble 44, is provided with a similar projecting bead 45, adapted by compression of the metal of the thimble to slip into the annular hollow of the bead 42, and engage therewith.

In Fig. VII, the thimble 74, is represented as lacking the longitudinal slits, but is provided with peripheral corrugations, as shown at 72, the barbs 73, being formed in longitudinal lines and at the region of greatest inward projection of the corrugations. Said thimble is also shown as provided with a returned external flange 75, for engagement with the extremity of the cap 71.

In the form shown in Fig. VIII, the cap 81, is provided with an externally projecting bead 82. The thimble 84, is corrugated as indicated at 83, and provided with longitudinal slits 84, and barbs 88. The unslit extremity of the thimble is provided at 86, with a bead adapted to engage in the concavity of the bead 82, and the metal of the thimble is also returned in a beaded flange 87, adapted to engage upon the exterior of the bead 82, upon the cap.

I have described the above embodiments of my invention as typical of some modifications which I contemplate, but do not restrict my broader claims to these particular organizations.

Having thus described my invention, I claim:

1. The combination, with a cylindrical cap adapted to contain a detonating compound, of a longitudinally slit thimble adapted to slide within the open end of said cap and engage frictionally therewith, said thimble being provided with inwardly projecting barbs adapted to engage the end portion of an inserted fuse.

2. The combination, with cylindrical cap adapted to contain a detonating compound; of a thimble adapted to slide within the open end of said cap, a portion of said thimble being provided with inwardly projecting barbs adapted to engage the end portion of an inserted fuse, the unbarbed portion of said thimble being inwardly compressible at the portion immediately adjacent to its extremity, and being provided with means for frictionally engaging the proximate portion of the cap.

3. The combination, with a cylindrical cap adapted to contain a detonating compound, of a corrugated slit thimble adapted to slide within the open end of said cap and engage frictionally therewith, said thimble being provided with inwardly projecting barbs adapted to engage the end portion of an inserted fuse.

In testimony whereof, I have hereunto signed my name at Wonder, Nevada, this 8th day of September, 1916.

ECKLEY S. CUNNINGHAM.

Witnesses:
ROBT. G. DAVIES,
E. E. CARPENTER.