C. H. ALLISON.

EXPLOSIVE CAP PROTECTION.

APPLICATION FILED JUNE 28, 1913.

1,094,692.

Patented Apr. 28, 1914.

Fig. 2.

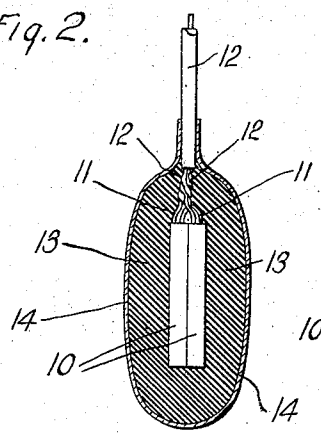


Fig. 1.

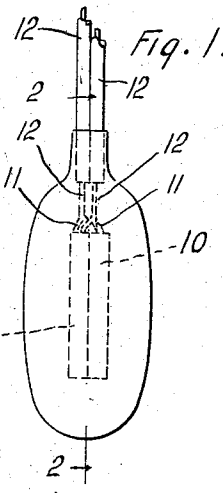


Fig. 3.

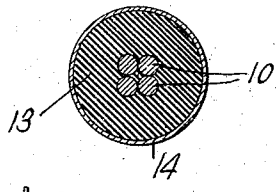


Fig. 4.

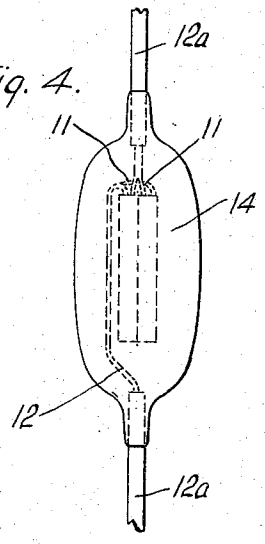
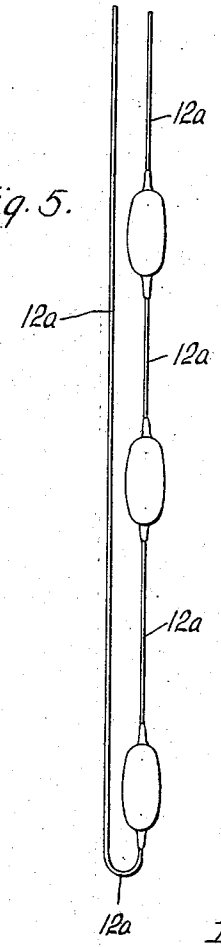


Fig. 5.



Witnesses

Edward H. Parkelew

L. Hoffman.

Inventor:

Charles H. Allison.

by James T. Parkelew

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UNITED STATES PATENT OFFICE.

CHARLES H. ALLISON, OF GLENDALE, CALIFORNIA.

EXPLOSIVE-CAP PROTECTION.

1,094,692. Specification of Letters Patent. **Patented Apr. 28, 1914.**

Application filed June 28, 1913. Serial No. 776,450.

To all whom it may concern:

Be it known that I, CHARLES H. ALLISON, a citizen of the United States, residing at Glendale, in the county of Los Angeles, State of California, have invented new and useful Improvements in Explosive-Cap Protections, of which the following is a specification.

This invention relates particularly to means for protecting explosive caps when subjected to great water pressure or when subjected to any other condition which might injure the cap to prevent its detonation.

Heretofore it has been extremely difficult, if not impossible, to shoot wells in which there is a considerable stand of water, for the reason that the great water pressure at the bottom of such a well is sufficient to entirely destroy the detonating powers of an ordinary cap. In fact, if an ordinary electric cap is simply exposed to moisture its power of detonation is thereby very liable to be lost.

My invention consists in certain means whereby I am enabled to lower a cap or caps into water of great depth and have unfailing explosion when the electric current is properly supplied. In fact, I have been enabled with my invention to explode caps at a submergence of from 4000 to 5000 feet.

Broadly considered, my invention consists in an envelop or covering around the caps of water-proof material of relatively low disruptive strength, the material being carefully worked around the caps so that there are no voids; and I preferably take the envelop with a taping of rubber which is pulled down tightly to form a water-proof binder for the envelop. It is an essential that the material of the envelop does not contain sufficient water to injure the caps; and I therefore make my envelop of a material which does not require water or other liquid to render it plastic. I preferably employ a heavy grade of asphalt, known as "D-grade", this being a material which is ordinarily hard and solid, but which is of sufficient plasticity to be workable when warmed slightly.

The particulars of my invention will appear more fully in the following specification, and I have shown my preferred forms in the accompanying drawings, in which:

Figure 1 is an elevation of a bundle of caps prepared according to my invention. Fig. 2 is a longitudinal section taken as indicated by line 2—2 of Fig. 1. Fig. 3 is a horizontal cross section of the same. Fig. 4 is an elevation illustrating a modified form of arrangement. Fig. 5 is a view showing the use of a form shown in Fig. 4.

In the drawings, the numeral 10 may designate any ordinary standard cap, of which I may use any suitable number in one bundle. I have shown in the drawings a bundle of four caps; for certain purposes I utilize more than four. The wires 11 leading out from the caps are electrically connected to wires 12 through which current is supplied to detonate the caps. Wires 12 are preferably rubber covered so as to be entirely water-proof, and I may lead both the wires 12 out from one end of the cap bundle or I may lead one from one end and the other from the other end, as is illustrated in Fig. 4. After the wiring connections have been made a suitable amount of plastic asphalt is worked into a mass around the bundle of caps, the asphalt being carefully worked in between the caps. When finished, an egg-shaped or ball-shaped envelop 13 is formed; the asphalt also being worked carefully about the connecting wires so as to avoid all possibility of entry of liquid where the wires enter the ball. The whole is then taped, as at 14, with a taping of rubber which is drawn out thin and tight so as to form a tightly fitting water-proof binder for the envelop. This tape is wound around the wires where they enter the envelop; and the result is an envelop which is perfectly water-proof and which is bound in by the rubber tape so that it cannot be physically destroyed by the water pressure or by striking any object, or by abrasion.

In using my improved cap protection, I prepare the caps either as shown in Fig. 1 or Fig. 4. Where it is desired only to use one bundle of caps, then the wires 12 are led out as shown in Fig. 1; and either both wires may be led to the surface, or one wire may be connected with the water in which the caps are immersed. In case I wish to use a series of cap bundles, I then prepare each bundle as shown in Fig. 4, with the wires 12^a leading out from each end of each cap bundle, the end wires being the ones leading to the surface. It will be understood that in the usual practice of shooting wells, the cap bundles are placed within sticks of gelatin, and each bundle will per-

haps suffice to detonate two or three feet of gelatin.

My cap protection has proven very successful in actual use on a large scale. As hereinbefore stated, I have been able to cause accurate detonation of from 4000 to 5000 feet of water. The materials which I use are capable of withstanding an extremely heavy compression, the asphalt being practically non-compressible, and the rubber tape preventing disintegration of the asphalt. But in spite of the great compression strength of my protection it has a relatively low disruptive strength; and this is a necessary requisite in order not to damp off the explosive efficiency of the caps.

Having described a preferred form of my invention, I claim:

1. An explosive cap protection, comprising an envelop of solid water-proof material capable of being rendered plastic by heat and of relatively low disruptive strength, and a taping of water-proof binder around the said envelop.

2. An explosive cap protection, comprising an envelop as asphalt, and a binding of rubber tape around the envelop.

3. An explosive cap protection, comprising a solid envelop of asphalt hard at normal temperature, and a binding of rubber tape around the envelop.

4. An explosive cap protection, comprising an envelop of water-proof material kneaded about the cap in a solid mass.

5. An explosive cap protection, comprising an envelop of water-proof material hard at ordinary temperatures kneaded about the cap into a solid mass.

6. An explosive cap protection, comprising an envelop of asphalt hard at ordinary temperatures kneaded into a solid mass about the cap.

7. An explosive cap protection, comprising an envelop of water-proof material kneaded about the cap into a solid mass of substantially uniform thickness over the cap.

8. An explosive cap protection, comprising an envelop of water-proof material kneaded about the cap in a solid mass, and a binding tape wound around the mass.

9. An explosive cap protection, comprising an envelop of water-proof material kneaded about the cap into a solid mass of substantially uniform thickness over the cap, and a binding tape wound around the mass.

10. An explosive cap provided with a protective sheath of asphaltum kneaded thereon at a temperature just sufficient to permit the asphaltum to be plastic, and forming a substantially non-compressible covering for the explosive cap.

11. An explosive cap provided with a protective covering of a material kneaded thereon in a slightly plastic condition and forming a substantially non-compressible protective sheath for said explosive cap.

12. An explosive cap provided with a protective covering of a material kneaded on the cap in a slightly plastic condition and forming a substantially non-compressible protective sheath of substantially uniform thickness on said explosive cap.

13. The process of protecting explosive caps subjected to high hydrostatic pressures, consisting of kneading a mass of material in a plastic condition on the cap and permitting the material to cool to form a hard protective sheath.

14. The process of protecting explosive caps subjected to high hydrostatic pressures, consisting of kneading a mass of material in a plastic condition on the cap, in a body of substantially uniform thickness around the cap, and of allowing the material to cool to form a hard protective sheath.

15. The process of protecting explosive caps subjected to high hydrostatic pressures consisting of kneading asphaltum on the cap to form a covering therefor and allowing the material to harden.

16. The process of protecting explosive caps consisting in kneading a mass of asphaltum on the cap to form a covering of substantially uniform thickness and permitting the kneaded asphaltum to harden before use.

In witness that I claim the foregoing I have hereunto subscribed my name this 19th day of June 1913.

CHARLES H. ALLISON.

Witnesses:

JAMES T. BARKELEW,

ELWOOD H. BARKELEW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

Correction in Letters Patent No. 1,094,692.

It is hereby certified that in Letters Patent No. 1,094,692, granted April 28, 1914, upon the application of Charles H. Allison, of Glendale, California, for an improvement in "Explosive-Cap Protections," an error appears in the printed specification requiring correction as follows: Page 2, line 26, claim 2, for the word "as" read *of;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of June, A. D., 1916.

[SEAL.]

J. T. NEWTON,

Acting Commissioner of Patents.

Correction in Letters Patent No. 1,094,692.

It is hereby certified that in Letters Patent No. 1,094,692, granted April 28, 1914, upon the application of Charles H. Allison, of Glendale, California, for an improvement in "Explosive-Cap Protections," an error appears in the printed specification requiring correction as follows: Page 2, line 26, claim 2, for the word "as" read *of;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

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[SEAL.]

J. T. NEWTON,

Acting Commissioner of Patents.