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F. I. DU PONT.

EXPLOSIVE CARTRIDGE AND METHOD OF MAKING SAME.

APPLICATION FILED AUG. 31, 1905.

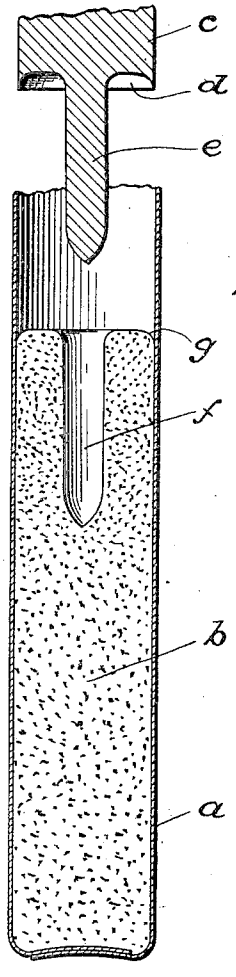


FIG. 1.

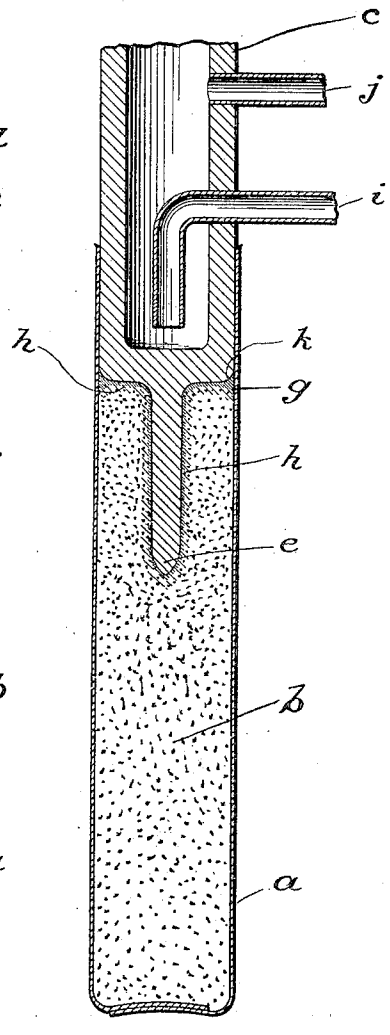


FIG. 2.

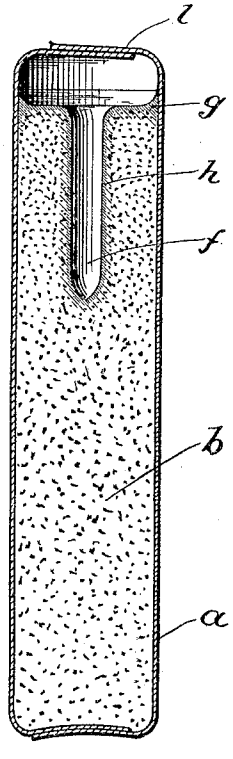


FIG. 3.

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EXPLOSIVE-CARTRIDGE AND METHOD OF MAKING SAME.

No. 837,958. Specification of Letters Patent. Patented Dec. 11, 1906.

Application filed August 31, 1905. Serial No. 276,508.

To all whom it may concern:

Be it known that I, FRANCIS I. DU PONT, a citizen of the United States, residing at Wilmington, county of Newcastle, and State of Delaware, have invented a new and useful Improvement in Explosive-Cartridges and Methods of Making Same, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object the protection of the priming end of the cartridge, so that it will not be affected by water and the explosive may be kept free from water. To that end I cover the wall of the priming-cavity and the upper end of the explosive with paraffin. I preferably incorporate the paraffin into the explosive at such points by first introducing the paraffin and then by means of a heated rammer it is melted into the explosive material at those points.

I will now describe my improved cartridge and its method of manufacture as shown in the accompanying drawings, in which—

Figure 1 is a sectional view of the cartridge in process of manufacture, also showing rammer. Fig. 2 is a sectional view of the cartridge in a further step of its manufacture after the introduction of the melted paraffin, also showing heated rammer. Fig. 3 shows in section the finished cartridge.

I take a cartridge-shell *a*, preferably formed of paper soaked in paraffin, and introduce therein the explosive *b*. I then use the rammer shown in Fig. 1, which has the body *c*, preferably provided with the edge *d* and the depending projecting portion *e*. This rammer is used to pack the explosive and forms the cavity *f* for the introduction of the primer and the depression *g* around the cartridge. I then introduce on the top of the explosive melted paraffin, as shown at *h*, Fig. 2. I then use the rammer shown in Fig. 2, which is similar to that of Fig. 1, except the body *c* is hollow, and into this cavity extends the steam-pipe *i* and the exhaust-pipe *j*. The edge *d* is absent; but the end of the body is cut away at *k*, so as not to interfere with the previously-formed depression *g*. This heated rammer melts the paraffin uniformly into the explosive compound, thereby providing a waterproof cartridge at that point which cannot be well sealed. The thickness of this paraffin coating depends upon the amount of paraffin and the time during which the heated rammer is allowed to remain in contact with the surface of the explosive material and paraffin. The purpose of the edge *d*, forming cavity *g*, Fig. 1, is to leave a slight depression around the cartridge near the paper, so that when the melted paraffin is introduced a little thicker ring of paraffin is left around the outside of the charge than would be the case if this provision had not been made. After the cartridge is thus formed the ends *l* are folded over. The user unfolds the ends, introduces the primer in the cavity *f*, ties his paper around the fuse or wires of the primer, and uses the cartridge in the ordinary way.

The advantage of my cartridge is that at all points it is impervious to moisture and can be kept in proper condition under water for any length of time desired without danger. The incorporation of the paraffin with the surface of the powder makes the paraffin protection strong and practically permanent and not liable to disengagement from the explosive. The effect is practical certainty of protection of the explosive from the effects of moisture.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. An improved cartridge in which the upper surface of the explosive is provided with paraffin applied thereto and incorporated therewith.

2. An improved cartridge in which the surface of the explosive at the priming end is provided with parffin applied thereto and incorporated therewith.

3. An improved cartridge having at one end a priming-cavity, in which the surface of the explosive at that end, including the priming-cavity, is provided with paraffin applied thereto and incorporated therewith.

4. An improved cartridge having at one end a circumferential depression in which the explosive in said groove and on the surface of the explosive at said end is coated with paraffin incorporated with the surface thereof.

5. An improved cartridge having at one end a priming-cavity and a circumferential

depression in the explosive in which the explosive at that end, including the cavity and depression, is coated with paraffin incorporated with the surface thereof.

6. An improved cartridge in which the upper surface of the explosive is provided with paraffin, applied thereto and incorporated therewith by heat and pressure.

7. An improved cartridge in which the surface of the explosive at the priming end is provided with paraffin applied thereto and incorporated therewith by heat and pressure.

8. An improved cartridge having at one end a priming-cavity in which the explosive at that end, including the priming-cavity, is provided with paraffin applied thereto and incorporated therewith by heat and pressure.

9. An improved cartridge having at one end a circumferential depression in which the explosive in said depression and on the surface of the explosive at said end is provided with paraffin, incorporated therein.

10. An improved cartridge having at one end a priming-cavity and a circumferential depression in the explosive in which the explosive at that end, including the cavity and depression, is provided with paraffin, incorporated therewith.

11. An improved cartridge comprising a casing formed of paper saturated with paraffin in which the upper surface of the contained explosive is provided with paraffin applied thereto and incorporated therewith.

12. An improved cartridge comprising a casing formed of paper saturated with paraffin, in which the surface of the contained explosive at the priming end is provided with paraffin applied thereto and incorporated therewith.

13. An improved cartridge comprising a casing formed of paper saturated with paraffin, the contained explosive having a priming-cavity in which the explosive at that end, including the priming-cavity, is provided with paraffin applied thereto and incorporated therewith.

14. An improved cartridge comprising a casing formed of paper saturated with paraffin, the contained explosive having at one end a circumferential depression in which the explosive in said depression and on the surface of the explosive at said end, is provided with paraffin applied thereto and incorporated therewith.

15. An improved cartridge comprising a casing formed of paper saturated with paraffin, the contained explosive having at one end a priming-cavity and a circumferential depression in which the explosive at that end, including the cavity and depression, is provided with paraffin applied thereto and incorporated therewith.

16. An improved cartridge comprising a casing formed of paper, saturated with paraffin in which the upper surface of the contained explosive is provided with paraffin applied thereto and incorporated therewith by heat and pressure.

17. An improved cartridge comprising a casing formed of paper saturated with paraffin in which the surface of the contained explosive at the priming end is provided with paraffin applied thereto and incorporated therewith by heat and pressure.

18. An improved cartridge comprising a casing formed of paper saturated with paraffin, the contained explosive having a priming-cavity in which the explosive at that end including the priming-cavity, is provided with paraffin applied thereto and incorporated therewith by heat and pressure.

19. An improved cartridge comprising a casing formed of paper saturated with paraffin, the contained explosive having at one end a circumferential depression in which the explosive in said depression and on the surface of the explosive at said end, is provided with paraffin, incorporated therewith.

20. An improved cartridge comprising a casing formed of paper saturated with paraffin, the contained explosive having at one end a priming-cavity and a circumferential depression in which the explosive at that end including the cavity and depression is provided with paraffin, incorporated therewith.

21. The method of forming an improved cartridge which consists in coating the upper surface of the explosive with paraffin and incorporating said paraffin at the surface by ramming with a heated rammer.

22. The method of forming an improved cartridge containing a priming-cavity which consists in coating the upper surface of the explosive, including the surface of the priming-cavity with paraffin and incorporating said paraffin at the surface by ramming with a heated rammer.

23. The method of forming an improved cartridge which consists in forming a circumferential depression in the surface of the explosive, coating said explosive and the surface of the groove with paraffin and incorporating said paraffin with the explosive at the surface by ramming with a heated rammer.

24. The method of forming an improved cartridge provided with a priming-cavity which consists in forming a circumferential depression in the explosive, coating the surfaces of the explosive including the groove and priming-cavity with paraffin and incorporating said paraffin at the surface by ramming with a heated rammer.

In testimony of which invention I have hereunto set my hand, at Wilmington, on this 18th day of August, 1905.

FRANCIS I. DU PONT.

Witnesses:
IRVING EYER,
LEONARD C. CREWE.