B. B. HOTCHKISS.

Primer and Cartridge.

No. 99,899. Patented Feb. 15, 1870.

Fig. 5.

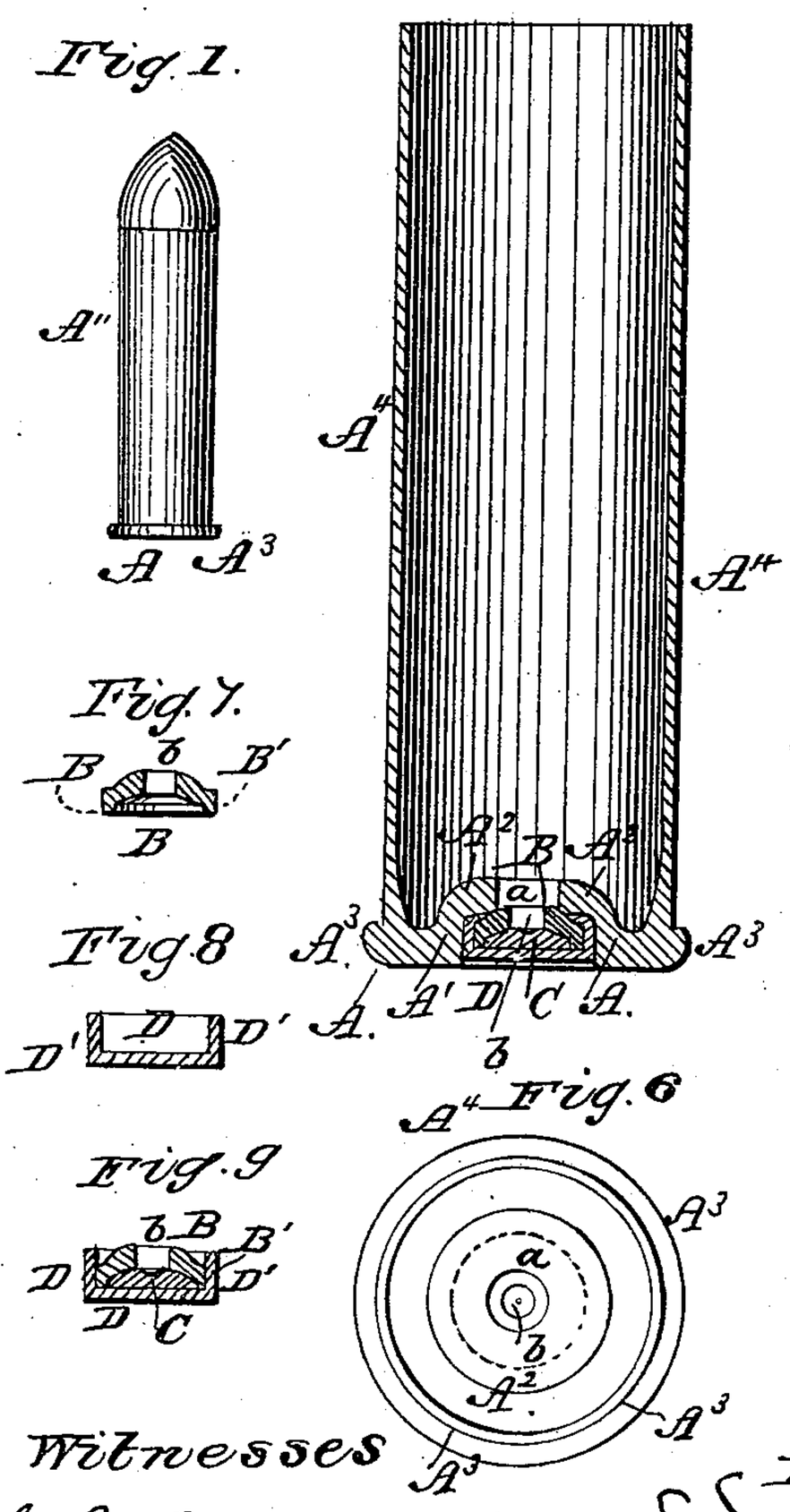


Fig. 1.

Fig. 2.

Fig. 3

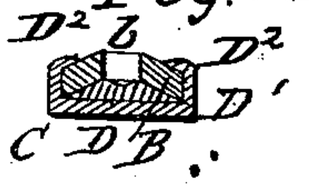
Fig 4

Fig. 7.

Fig. 10

Fig. 8

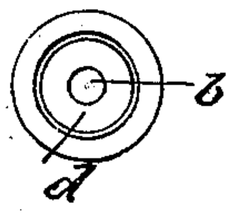
Fig. 11



A4 Fig. 6

Fig. 9

Fig. 12.



Witnesses

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UNITED STATES PATENT OFFICE.

B. B. HOTCHKISS, OF NEW YORK, N. Y.

IMPROVEMENT IN PRIMERS FOR CARTRIDGES.

Specification forming part of Letters Patent No. **99,899**, dated February 15, 1870.

To all whom it may concern:

Be it known that I, B. B. HOTCHKISS, of New York city, in the State of New York, temporarily residing in Vienna, Austria, have invented certain new and useful Improvements in Percussion Primers and Cartridges; and I do hereby declare that the following is a full and exact description thereof.

My invention relates to the means of exploding the contents of a cartridge adapted for breech-loading arms. I form a recess in the rear of the cartridge, and introduce a peculiar primer to be exploded by a blow from the rear.

My cartridge is intended mainly for target practice and sporting. It allows the cartridge shell or case to be reprimed and used many times over. I have used the same shell fifty times. It fulfills all the conditions required for such use more perfectly than any previously known to me.

I will first describe what I consider the best means of carrying out my invention, and will afterward designate the points which I believe to be new therein.

The accompanying drawings form a part of this specification.

Figure 1 is a side elevation of the entire cartridge. Fig. 2 is a side elevation of the primer. Fig. 3 is a front view of the primer, and Fig. 4 is a rear view thereof. Fig. 5 is a central longitudinal section through the shell of the cartridge and through the primer, on a more magnified scale. Fig. 6 is a view looking from the front rearward into the interior of the shell. Fig. 7 represents one of the details in section. Fig. 8 represents another detail. Fig. 9 represents the parts of the primer as loosely put together, previous to their being permanently united.

Similar letters of reference indicate corresponding parts in all the figures, 1 to 9, inclusive.

The remaining figures show a modification of the form of the part which I have termed the "internal piece" B, being less hollow, and being capable of containing a smaller quantity of the fulminate.

Fig. 10 represents the internal piece in section. Fig. 11 represents the entire primer in section, and Fig. 12 represents the front view of the entire primer.

A is the rear face of a copper shell, provided with a flange, A^3, at the periphery, and with a long cylindrical casing, A^1, secured to the ball or shot at the other end in any approved manner.

The central portion of the rear of the cartridge is perforated and forced inward, to form a receptacle into which my primer may be forced from the rear, and will be firmly held with its exterior nearly flush with the general rear face of the cartridge, but a little sunk within the cartridge. There is a hole, *a*, through which the fire from the primer flows to the interior of the cartridge.

The cylindrical portion of the indentation in the rear of the cartridge is marked A^1. The contraction at the front of the indentation, which prevents the entire primer from being pressed inward too far into the cartridge, is marked A^2.

I will now describe my primer particularly. It is in two parts, (or in three, counting the fulminate as a part.) The fulminate is attached to the inner and rear face of an internal piece, B, as indicated by C. This internal piece B, after receiving a sufficient quantity of the fulminate, is placed within a larger piece, in the position represented in Fig. 9, and then the edge of this outer piece is bent inward or drawn together and pressed down upon the inner one, so as to hold the parts permanently and tightly together.

The forming and putting together of the pieces is accomplished by properly-adapted dies, and will offer no difficulty to mechanics accustomed to striking up copper and analogous soft material.

I will now describe particularly the arrangement of the primer in the cartridge. There is a hole through the inner piece B, as indicated by *b*. The hole *b* is placed in line with and directly against the hole *a* in the cartridge-shell. When the hammer strikes, either directly or through the aid of a firing-pin or analogous device, it acts, not directly against the rear of the cartridge, but on the rear face of the outer piece D of the primer, and, indenting it inward, explodes the fulmi-

nate, the flame from which finds a direct and easy exit through the holes *b a* to the powder which is in the cartridge.

I prefer to construct the inner piece B in the form represented, so that there is a flange projecting from its edge rearward.

In drawing together the front or edge of the outer piece D, I use such dies that the inner piece B is not crushed, but is simply inclosed within the outer piece.

I have marked the flange on the rear of the inner cap B by the letter B′, and the greater cylindrical part of the front flange of the outer part D by the letter D^1. The contraction at the front of the outer piece, which clinches or holds it upon and around the inner piece, is marked D^2.

In the act of being fired, the blow received on the rear face of the outer piece D is resisted, not alone by the inertia of the part B in the front of the primer, but also by the part A^2 of the cartridge-shell, and this being stoutly connected by the part A^1 to the main body of the cartridge-shell at the rear, it follows that the entire base A A^1 A^2 of the cartridge-shell serves in effect as an anvil against which to explode the fulminate C.

I can, if preferred, make the inner cap B considerably thicker than is here represented, and can give it simply a conical shape, omitting the cylindrical projection rearward. The thickness given to this internal piece B of the primer may vary within wide limits. If it is thick and hard, it will more strongly contribute by its inertia and hardness to the explosion of the fulminate, without subjecting the parts A^2 and A^1 to any appreciable strain from the blow; but I have succeeded very perfectly in experiments when the internal piece is made very thin and light.

It will be observed that my construction receives the great force due to the explosion of the fulminate entirely within the walls or casing of my compound primer, and that it directs the jet of flame through the holes *b* and *a* into the interior of the cartridge, without subjecting the cartridge-shell to any action thereof. It follows that the cartridge-shell is not bent, cut, or abraded in the least by the action of the fulminate.

In withstanding the explosion it is only required to resist the slower and more gentle action of the powder, and this latter, being exerted in a direction tending to compress rather than distend the metal A^1 A^2, does not seriously affect it during a great number of firings.

My primer and cartridge combined form the most complete gas-check known to me. At the period when the fulminate is burned, the parts of the primer are distended, so as to fit more tightly than usual against the parts A^1 A^2 of the cartridge-shell.

The construction allows the primer to be very readily inserted by any suitable tool, and allows it to be easily removed after the firing by the introduction of a wire or the like from the front to act through the hole *a*.

My primer may be manufactured and transported independently. It is more sure to fire, and is more compact, strong, and convenient than any device for the purpose previously known to me.

My primer will bear a very considerable pressure in the pocket or otherwise without distortion, because there is no thin edge left unsupported.

I can allow and clinch down much more of the material of the outer cap upon the inner than is here represented; but it is important to leave an opening which shall coincide with the hole *b* in the inner piece B. The hole or space thus left may be as small as the hole B, or even smaller; but it is important that it shall be so arranged relatively thereto, and also to the hole *a* in the cartridge-shell, as to leave a clear space for the flame to pass, and that sufficient metal shall be clinched over to hold the parts B and D properly together.

I can apply any ordinary means of making my primer water-proof. I can face each cap with a thin coating of metal, as tin-foil or the like, or with thin oiled or otherwise prepared paper, or I can close the hole *b* and cover the entire front of the primer with a solution of shellac and alcohol, or of analogous material having such consistence as will leave a weak film across the hole sufficient to exclude water, but so weak as to be readily broken by the flame, and to offer no appreciable resistance thereto when the primer is exploded.

I can coat the whole primer with shellac or analogous waterproofing material, if desired; but in such case it may be well to produce the primer of a little less size, to allow for the coating of water-proof material on the outside.

It will be observed that the construction and arrangement of the parts are adapted to direct all the flame from the fulminate directly from the front of the primer, through the center hole in the base of the cartridge, and to effectually protect the material of the cartridge case or shell from destructive action of the fulminate.

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

1. The within-described primer for cartridges, having an internal piece, B, and an external piece, D, permanently combined, with the fulminate between, and having a hole, *b*, adapted to direct all the flame in line with a central hole in the cartridge, and to protect the material of the shell from destructive action of the fulminate, all substantially as and for the purposes herein set forth.

2. The within-described combination and

arrangement of the cartridge with the compound primer B C D, having a hole, *b*, in line with the hole *a* in the cartridge-shell, the whole being adapted to serve relatively to the firing-pin or analogous exploding means, and to the contents of the cartridge, as herein set forth.

In testimony whereof I have hereunto set my name in presence of two subscribing witnesses.

B. B. HOTCHKISS.

Witnesses:

KATHARINA MANHART,

HARRIET A. HALL.