H. BERDAN.

Cartridge.

No. 52,818. Patented Feb. 27, 1866.

Fig. 2.

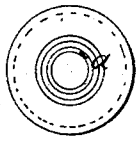


Fig. 1.

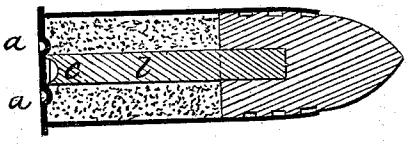


Fig. 3

Fig. 4

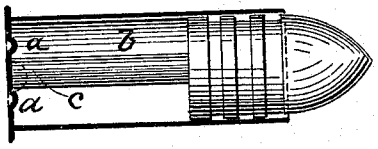
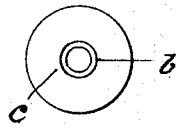


Fig. 5



Witnesses
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UNITED STATES PATENT OFFICE.

HIRAM BERDAN, OF NEW YORK, N. Y.

IMPROVEMENT IN METALLIC CARTRIDGES.

Specification forming part of Letters Patent No. 52,318, dated February 27, 1866.

To all whom it may concern:

Be it known that I, HIRAM BERDAN, of New York city, in the county of New York and State of New York, have invented a new and useful Improvement in Center-Fire Metallic Cartridges for Breech-Loading Arms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section of one of my improved center-fire metallic cartridges complete. Fig. 2 is a view of the rear end of the same. Fig. 3 is a view of the front end of the cartridge. Fig. 4 is a section view of a partly-made metallic cartridge. Fig. 5 is a view of the rear end of the center-pin and ball.

Similar letters of reference in the several figures indicate corresponding parts.

The object of my invention is to protect metallic cartridges against accidental explosion, and also to combine in one cartridge the advantages of a "center-fire" and the taper form in such manner as to render their manufacture less expensive and dangerous.

In the construction of metallic cartridges with a center-fire it has never been deemed practical, on account of the danger of premature explosion, to make the cases of a taper form by the drawing or swaging process after the fulminate, powder, and ball are inserted; that is, at one blow, by means of dies. The premature discharge would occur in the swaging process with other cartridges than mine, on account of the fulminate being placed in the hollow rim of the metallic case or between disks at the center of the head of such a case, and, thus located, is subjected to the force of the blow upon the bullet and powder necessary to give the required taper form to the case and press the bullet to its proper position.

The nature of my invention consists, first, in a cavity or fulminate-chamber in the end of the anvil or centering-rod, in combination with the head of a cartridge-case; second, in a tapering cartridge-case drawn or swaged from sheet metal, with the smallest end forward and with a center fire, the same constituting an improved new article of manufacture.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same.

To make my improved metallic cartridge, I take sheet metal and first bring it into a cylindric form, the cylinder being open at one end. The head of the case is formed in the usual manner, but without a fulminate-chamber; the corrugation *a* in the head is formed by the same die which forms the head. A conic ball, with grooves in its circumference and a cavity in the base of the ball for the anvil or centering-stem *b*, is now brought into use. The stem of this ball has in its rear end a small cavity or chamber, *c*, in which the fulminate is placed so as to be free from the inside of the head of the cartridge-case when the ball and case are put together, as illustrated in Fig. 1 of the drawings. The case, charge of powder, and the ball and stem having all been brought together in the usual mode, the swaging or drawing die is brought down over the ball and case with sufficient force to change the case from the form shown in Fig. 4 into the form shown in Fig. 1. The ball is held true or in center during the swaging or tapering process by means of the stem and the die and the milled ring-shoulder of the cartridge-case head. The same operation that produces the taper form of the case also fastens the ball, stem, and case firmly together, and insures uniformity in the external surface.

It will be observed that the fulminate of the cartridge is entirely isolated from the head of the cartridge, and is so located that it cannot possibly be ignited by a square contact of the head with any object, or vice versa; nor by a contact of the flange with any object, or vice versa. In a word, it is necessary, in order to ignite the fulminate, to indent the head of the cartridge-case directly at the center, and to effect this a very small implement must come in contact with the head at that point.

It is a very important matter to have a strong flange to the cartridge-case, and this I

secure by making the head solid and of thicker metal than can be employed when the fulminate-recess is formed in the head.

It is also important to have the cartridge-case of taper form, in order that it may be readily withdrawn from its seat after it has been exploded in a gun. The taper form also gives a close fit between the cartridge-case and the breech of the barrel, as it enters on the wedge principle.

It is also important to ignite the charge at the center of the cartridge, for reasons well understood.

It is also important to make the taper cartridge-case of sheet metal, as well as unite the pin, ball, and case together at one operation by the swaging or drawing process, as by this means a much firmer anvil to detonate against is formed, and also much time and expense are saved, and, withal, a more uniform external surface is secured.

It is further important to have the fulminate within the compass of the circumference of the pin in order that the swaging or drawing die may be forced down to the flange upon the ball, powder, and case with the necessary power and rapidity without liability of igniting or detonating the fulminate.

And, finally, by combining a taper-form case and a center fire the force of the blow which is necessary to indent the head of the cartridge-case or produce the detonation of the fulminate or agent employed to fire the charge is to a great degree received by the inclined shoulder presented by the taper cartridge to the counter-bore of the gun, and thus any tendency to strip or force back the flange and press the case too far into the gun-barrel or over the ball is overcome.

I believe I am the first one who has ever combined any description of center fire and a swaged or drawn tapering sheet-metal cartridge-case, whether the fulminate is contained in a cavity of the stem or between disks, or in a cap placed on a cone which is in communication with the charge of powder in the cartridge, or with any description of center fire.

What I claim as my invention, and desire to secure by Letters Patent, is—

As a new article of manufacture, a metallic cartridge, having a stem projecting from the base of the bullet with a cavity at the rear end for the fulminate, the case being made with a flange at the rear end and tapering toward the forward end, and drawn down upon the bullet by means of a swage or die, whereby the external surface of the cartridge can be made more uniform, less liable to explode in the act of construction or transportation, and the shell more readily extracted after being fired.

HIRAM BERDAN.

Witnesses:
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