H. H. BARNARD.

SHOT-CARTRIDGE.

No. 189,417. Patented April 10, 1877.

Fig. 1.

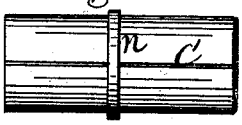


Fig. 2.

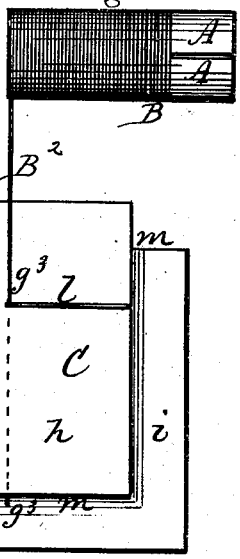


Fig. 3.

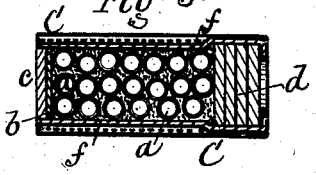


Fig. 4.

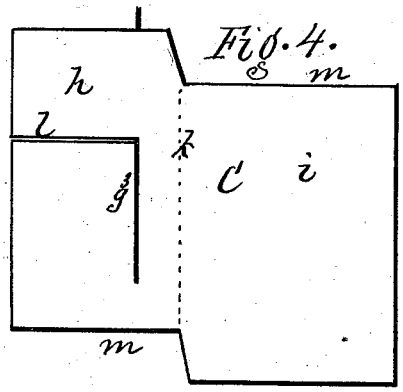


Fig. 5.

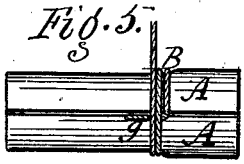


Fig. 7.

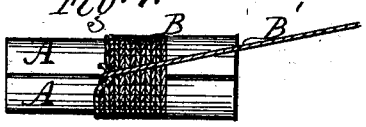


Fig. 6.

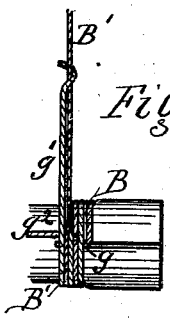


Fig. 8.

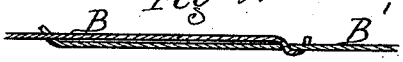
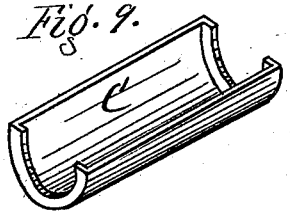


Fig. 9.



Attest.
R. E. White
Jacob Spahr

Inventor:
Henry H. Barnard.
per R. F. Osgood,
atty.

UNITED STATES PATENT OFFICE.

HENRY H. BARNARD, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRY S. MILLER, OF SAME PLACE.

IMPROVEMENT IN SHOT-CARTRIDGES.

Specification forming part of Letters Patent No. **189,417**, dated April 10, 1877; application filed March 10, 1877.

To all whom it may concern:

Be it known that I, HENRY H. BARNARD, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Shot-Cartridges; 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, in which—

Figure 1 is a plan of the cartridge with the paper envelope or covering thereon. Fig. 2 is a similar view, with the paper envelope removed from place, but connected by the winding cord or thread. Fig. 3 is a longitudinal section of the cartridge. Fig. 4 is a plan of the paper envelope in its unfolded form. Fig. 5 is a plan, showing the method of winding the first thread. Fig. 6 is a similar view, showing the method of winding the second and succeeding threads. Figs. 7 and 8 are views showing the method of the unwinding of the threads when the cartridge is projected from the gun. Fig. 9 is a perspective view of one half of the outer paper envelope.

My improvement relates to shot-cartridges composed of half-cases wound with thread, so arranged that when the cartridge is discharged from the gun the thread will unwind, and when the proper range is attained the case will divide, and the shot will scatter to do execution. Such cartridges are well known, but they have heretofore been wound with a single thread of long length, which is liable to many objections.

My cartridge is wound with threads of short lengths, connected in a peculiar way, which is a distinguishing feature; and my invention consists in this and other features, which will be hereinafter more fully described and definitely claimed.

The shell of the cartridge is composed of two halves, A A, of sheet metal, which are counterparts, and, when fitted together, form a cylindrical case that fits the bore of the gun. The front end is loaded with shot *a*, retained by a metallic disk, *b*, and wad *c*, while the rear end, which is of a little larger diameter, is filled with several wads, *d d*, resting in front against the shoulder of the enlargement, and held at the rear by flanges of the case. These wads serve to receive the force of the discharge and prevent the shot from being driven out of the cartridge at the initial movement. They also serve to ballast the cartridge and keep it in proper direction by presenting a lighter body at the rear than in front. The enlargement of the case is so slight that the windings of the cord on the front end produce the same diameter throughout the case.

In packing large shot in the case the interstices between the shot are filled by fine sand *f* or by some equivalent heavy material. This is for the purpose of producing a solid body and preventing compression.

B B^1 B^2 are the several threads or cords which are wound upon the case. The first one is wound next to the enlargement, as shown in Fig. 5. The end *g* is laid longitudinally upon the case, and the coils are wound over it at right angles any desired number of times. Before this thread is fully wound up the end g^2 of the second thread B^1 is laid longitudinally under the winding end g^1 of the first thread, as shown in Fig. 6, and the two ends of the two threads are then turned and wound together at right angles, the short end of the first thread standing outside and winding over the laid end g^2 of the second. When the two ends are wound up together a suitable length the end g^1 of the first thread is turned over the top of the second thread, and then under it, forming a loop, as shown at the top in Fig. 6. The second thread is then wound in the same manner as the first, and the third thread is spliced with the second in the same manner, and so on till the full covering is made.

By this means it will be seen that the several threads are wound so that their ends are confined by the overwinding, and yet the splices are loose and disconnected, so that in the projection of the cartridge the several threads will free from each other without tangling or catching. Furthermore, it will be seen that in unwinding the end of the thread that is being unwound will raise the end of the next thread, so that it gets the action of the air, thereby insuring the proper starting of such thread and preventing any possibility of the thread sticking, so that it will not unwind. This is illustrated in Figs. 7 and 8, the former figure showing the thread B^1 as just

leaving the cartridge and raising the end of thread B, and the latter figure showing the two ends of the threads stretched out, the first being entirely free of the cartridge while the other has commenced to unwind. The winding of the threads, as before described, leaves the end of the first thread under the second, and the second under the third, &c., so that each thread as it leaves the cartridge will lift the end of the next thread and leave it free to the action of the air. The connection or splice is also such that the parts readily separate.

By making the thread in several lengths, as above described, a longer range can be obtained than where a single length is used, since, with the escape of such thread, there is an interval of time before the next thread gets in active motion unwinding. The threads are also surer in unwinding in short lengths than in a long one, and there is less danger of the deflection of the cartridge from its true course by the catching of the cord on twigs, bushes, &c. The range of the cartridge may be accurately gaged by the length of the cords and the number used, which may be varied as desired.

The end g^3 of the last thread which is wound upon the cartridge, is connected with the paper envelope C, so that as soon as the cartridge leaves the gun, the paper will fly off and start the unwinding.

The envelope may be made of different forms; but I prefer that shown in Figs. 2 and 4. In this case the envelope is made with two flaps, *h i*, which fold one over the other at the line *k*. The part *h* has a slit, *l*, through which the thread is passed, beneath the part *h*, when folded. The envelope is also preferably notched, as shown at *m m*, so that when folded the edges of each of the two thicknesses will just meet around the cartridge without overlapping, thus producing a uniform exterior surface.

In addition to serving as an attachment to start the unwinding of the thread, the envelope also serves to protect the threads from becoming gummed in passing through the barrel, and protects the barrel itself from the contact of the exposed end of the metallic cartridge.

Fig. 9 shows an envelope made in two halves, of paper stamped up in form to apply around the cartridge, and it may be used either around the envelope before described, or alone. The envelope is held to the cartridge by an elastic loop, *n*, which may be removed when the cartridge is applied in the gun-barrel. The end of the cartridge opposite the enlargement may have small lugs or beads struck out, of the same diameter as the enlargement, to present a true bearing to the bore of the barrel at both ends.

After the cartridge is wound it is dipped into pulverized plumbago or soap-stone in the dry state, which coats the threads and makes them impervious to water, obviating any tendency to cling or stick in unwinding.

Having thus described my invention, I do not claim, broadly, a shot-cartridge having a divided case wound with cord or thread; but

I claim—

1. In a shot-cartridge, the combination, with the divided case A A, of the several threads B B′, wound one after another upon the case, the ends of the threads looping around each other, as described, so that, in unwinding, one thread will raise the end of the next, as and for the purpose specified.

2. In a shot-cartridge, the combination, with the case A A and the threads B B′, of a paper envelope, C, covering the cartridge, and connected with the threads in such a manner as to start the unwinding of the thread as the cartridge leaves the gun, as herein shown and described.

3. The envelope C, constructed with the two flaps *h i*, arranged for folding one over the other, a slit, *k*, for the insertion of the thread, and the notches *m m*, for producing even wrapping of the envelope around the cartridge, as herein shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HENRY H. BARNARD.

Witnesses:
R. F. OSGOOD,
JACOB SPAHN.