J. P. PIERI.

CARTRIDGE-SHELLS.

No. 181,977. Patented Sept. 5, 1876.

Fig. 1.

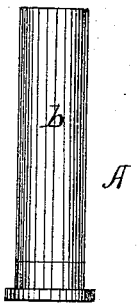


Fig 2.

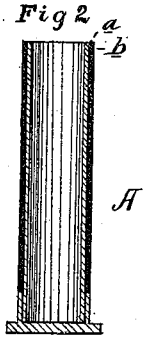


Fig. 3.

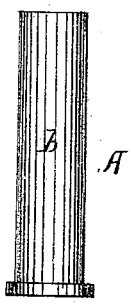


Fig. 4.

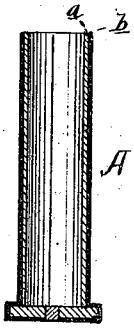
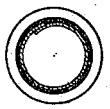


Fig. 5.



Witnesses:
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Atty.

UNITED STATES PATENT OFFICE.

JACQUES PHILIPPE PIERI, OF GHISONI, CORSICA, ASSIGNOR TO WILLIAM SMITH, OF LONDON, ENGLAND.

IMPROVEMENT IN CARTRIDGE-SHELLS.

Specification forming part of Letters Patent No. 181,977, dated September 5, 1876; application filed May 14, 1875.

To all whom it may concern:

Be it known that I, JACQUES PHILIPPE PIERI, of Ghisoni, Corsica, have invented Improvements in the Manufacture of Cartridges for Breech-Loading Fire-Arms and Ordnance, of which the following is a specification:

My said invention relates to the manufacture of cartridges for breech-loading fire-arms and ordnance; and consists in the construction of the cartridges with shells or cases formed of metal foil and caoutchouc or gutta-percha, or a compound thereof combined and vulcanized, as hereinafter specified.

Cartridges constructed according my invention offer the following advantages, namely: The shell or case being composed partly of caoutchouc, or india-rubber, or gutta-percha, or any suitable compound of these materials, which are bad conductors of heat, the cartridge-chamber of the fire-arm or cannon will keep comparatively cool. The material composing the case or shell being elastic, the same will not bind in or adhere to the said chamber after its explosion, and, therefore, its extraction will be easy and certain. The said cartridges, being elastic, cannot be broken or otherwise injured during transport, or have their shape destroyed by a blow. Each cartridge case or shell may be used many times. The said cartridges will not be affected by changes of temperature or climate, and, consequently, may be used in any part of the world. They will not be broken by the action of the gases generated by explosion, and they are impervious to water or moisture.

The case or shell of the said cartridges is composed of a piece of foil rolled up into the form of a tube or cylinder, and with an envelope of caoutchouc, india-rubber, or gutta-percha, or a compound thereof. I prefer to use the variety of caoutchouc known as Para caoutchouc, mixed with chalk or whiting and gravel, and provided with sandarach gum or resin, for the purposes hereinafter specified.

The base or end, which is formed or fitted with a receptacle or cavity for the striker and detonating-cap, may be an iron disk, placed and secured on the end of the tube or cylinder, or a cup-shaped piece, formed of copper or other suitable metal, in which the end of the said tube is inserted and secured; or the said shell or case may be combined with any other suitable base or end.

To enable others skilled in the art to manufacture my device, I now describe the same in connection with the drawings, in which—

Figure 1 is a side elevation of my cartridge; Fig. 2, a central longitudinal section of same; Fig. 3, a side elevation of another style of cartridge, showing the elastic material as covering the base of the shell; Fig. 4, a central longitudinal section of same, and Fig. 5 a cross-section on the line *x x* in Figs. 2 and 4.

Like letters denote corresponding parts in each figure.

A represents the entire cartridge-shell; *a*, the metal foil, and *b* the vulcanized elastic material.

In the manufacture of cartridges according to my invention, I proceed as follows: I take raw or unprepared caoutchouc, india-rubber, or gutta-percha, or a compound of either, and amalgamate the same with fine gravel or argilaceous earth and talc, giving the mass so produced a sheet-form. Then it is mixed with the chalk or whiting or other suitable substance, to diminish the elasticity of the caoutchouc, or india-rubber, or gutta-percha, or compound, and prevent its softening under the influence of a high temperature of the atmosphere. The proportions of these various ingredients should be about as follows, namely: Caoutchouc or other soft substance, as above specified, three parts; talc, one part; gravel or earth, one part; chalk or whiting, one part. It is then passed between parallel rollers, to reduce it to a very thin sheet. After this operation, it is spread upon a slab or plate and a coating or covering of sandarach, talc, or other suitable powdered material is applied. Then the sheet is cut into pieces of the required size. Each of these pieces is rolled up with one of the aforesaid pieces of foil upon a steel rod or mandrel. This rod or mandrel, with the foil and caoutchouc thus coiled upon it, is introduced into a steel cylinder or mold and subjected to a process of vulcanization for about one hour or one hour and a quarter. The sandarach or other pow-

dered material facilitates the molding; or I may dispense with the mold, by binding the cartridge with a piece of cloth or paper, which is removed after the vulcanization. When this operation is finished, the shell or case is withdrawn from the said mold or freed from its binding, and dipped quickly in cold water and then in oil. After vulcanization, the caoutchouc, india-rubber, or gutta-percha, or compound of either of these materials, will be so closely united to the foil as to form one body with the same. Then the base is secured in place by the aid of the apparatus or machine commonly used for this purpose in the manufacture of cartridges.

I claim as my invention—

A cartridge case or shell composed of india-rubber or gutta-percha, or a compound of either of these materials, and metal foil, substantially as described.

P. PIERI.

Witnesses:
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