(No Model.)

P. BOCA.

CARTRIDGE SHELL.

No. 297,345. Patented Apr. 22, 1884.

Fig. 1

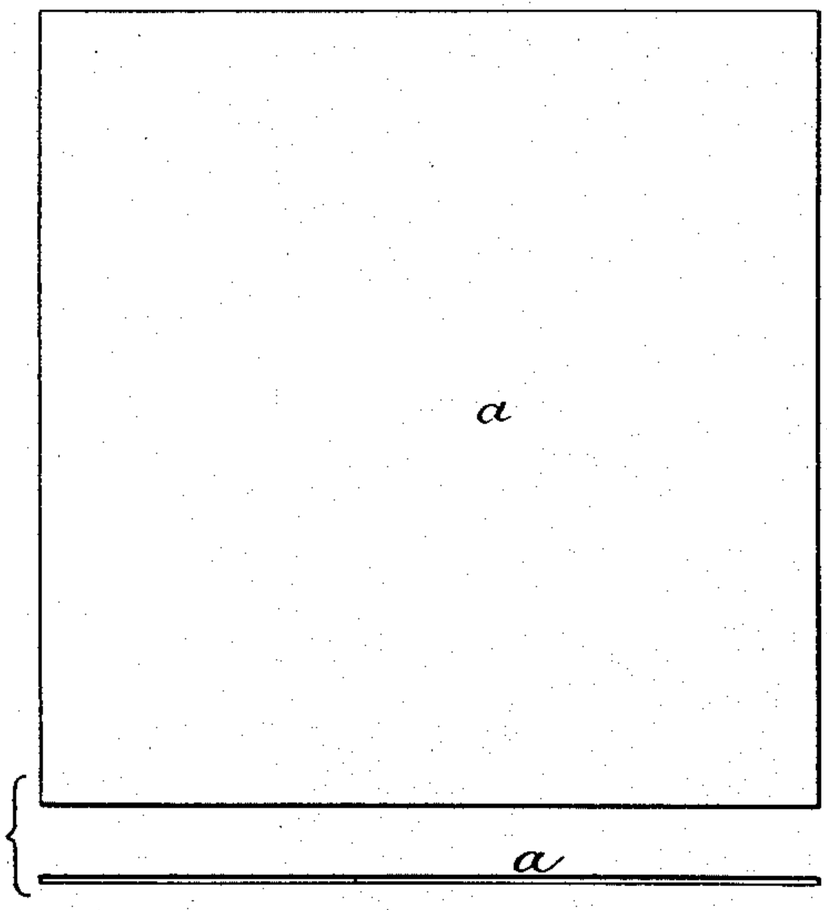


Fig. 2

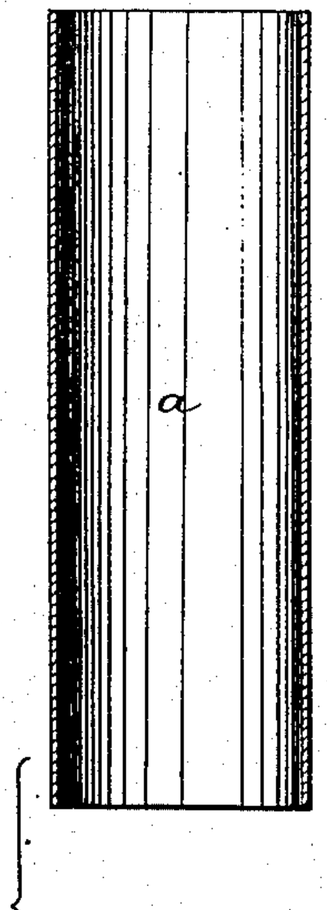


Fig. 3

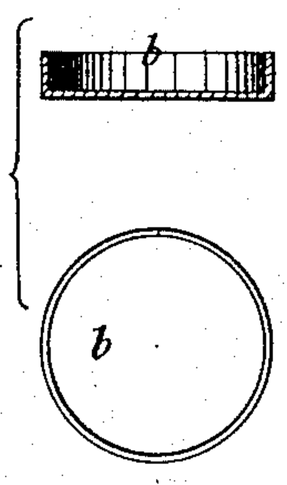


Fig. 4

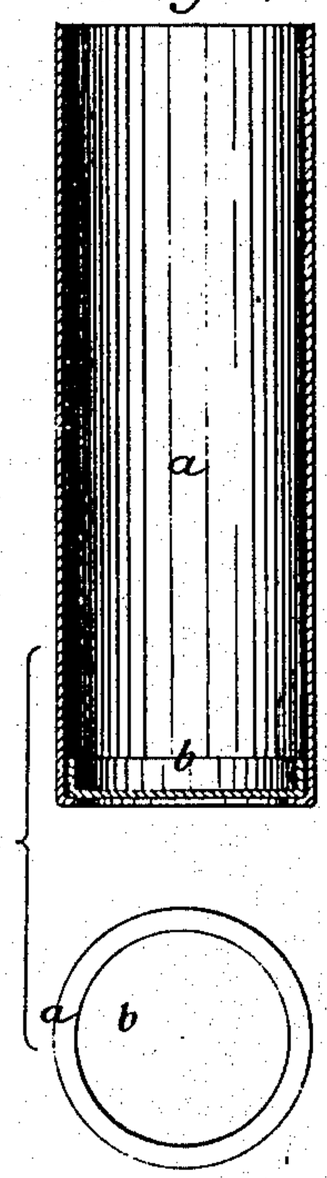


Fig. 5

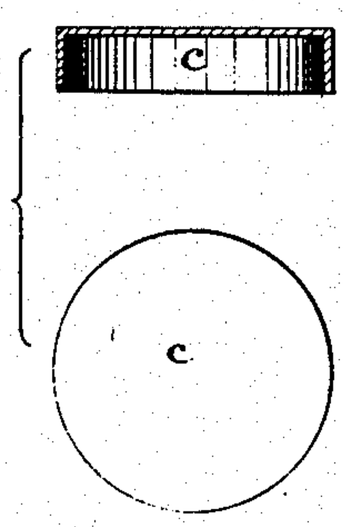


Fig. 6

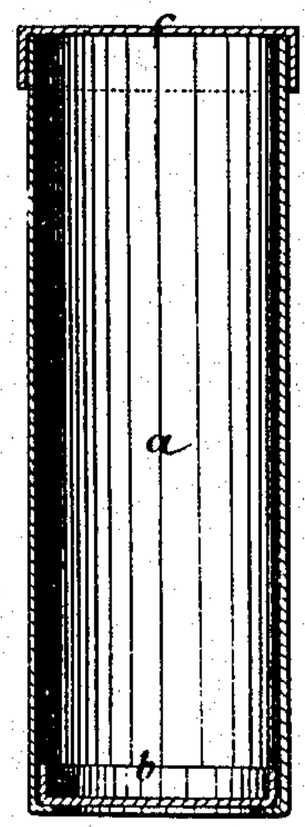
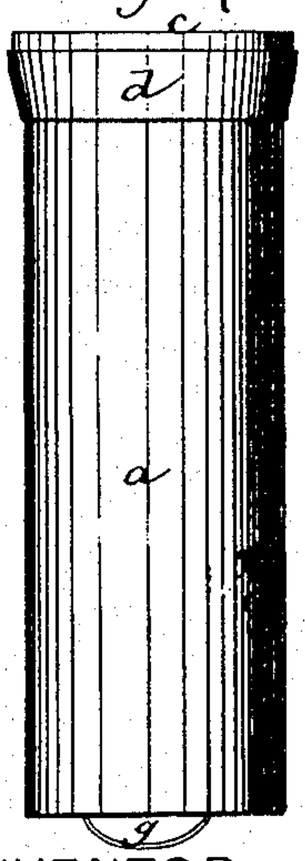


Fig. 7



WITNESSES

E. B. Bolton

Geo. Bainton

INVENTOR:

Paul Boca,

By his Attorneys,

Burke, Fraser & Bonnett

UNITED STATES PATENT OFFICE.

PAUL BOCA, OF PARIS, FRANCE.

CARTRIDGE-SHELL.

SPECIFICATION forming part of Letters Patent No. 297,345, dated April 22, 1884.

Application filed December 22, 1883. (No model.)

To all whom it may concern:

Be it known that I, PAUL BOCA, a citizen of the French Republic, and a resident of Paris, France, have invented certain Improvements in the Manufacture of Cartridges for Ordnance and Fire-Arms, of which the following is a specification.

My invention relates to that class of cartridge-shells which are made of celluloid or other inflammable compound of pyroxyline. My object is to provide a shell to contain the charge of powder that will be stiff and strong, whereby it may be used for the heaviest charges, perfectly water-proof, and capable of standing the official test of two meters of water pressure without injury, perfectly insect-proof, and of such character that the shell entirely disappears when the charge is fired. Such a shell I make from celluloid or other analogous composition containing pyroxyline. By celluloid I characterize a compound of pyroxyline and camphor or a solution of camphor in alcohol. My celluloid shell comprises three elements—namely, a tubular body, a flanged bottom, and a cap. The bottom is cemented in the end of a tubular body, preferably by means of a cement of the same material, and after the charge of powder is inserted the cap is or may be cemented on in the same manner. In order that the fire from the primer or fulminate-cap may be enabled to reach the powder in the shell without fail, the shell may be made thinner at the point where the jet of flame impinges on it; but this I do not consider necessary unless the shell is very large and thick, as the celluloid is very combustible.

In the drawings which serve to illustrate my invention, Figure 1 is a plan and edge view of a sheet of celluloid cut to form the body of the shell. Fig. 2 is a vertical mid-section of the body or tube and an end view of same. Fig. 3 shows the bottom of the shell in transverse section and plan. Fig. 4 is a section of the body of the shell with the bottom in place and bottom or end view of same. Fig. 5 shows the cap of the same in transverse section and plan. Fig. 6 shows the body, bottom, and cap united to form the shell. Fig. 7 shows the charged shell provided with a thin band of celluloid placed over the joint where the cap is attached to the body.

The tube or body *a* may be made with any section desired—as square, polygonal, &c.; but it will usually be cylindrical, as shown, to fit the chamber or bore of the gun. In forming it I take a sheet of celluloid (shown in Fig. 1) of the proper size, thickness, and shape, and bend it around the mandrel or form, cementing the edge with, for example, celluloid softened or dissolved in camphorated alcohol; or I may form the tube without a joint by forcing previously-softened celluloid in mass through a die similar to that employed for lead or clay pipes. The lower extremity of the tube has an inturned flange, and on this rests the flanged bottom *b*. This bottom is formed by subjecting a disk of celluloid to heat and pressure in a die. It is secured in place by the celluloid cement, so as to form a firm damp-proof joint. The cover or cap *c* of the tube is constructed in the same manner as the bottom *b*, and is of the same form, but it takes over the outside of the tube or body. Its flanged margin is made, by preference, a little deeper than that of the bottom. After having introduced the powder into the shell the cap is placed thereon, and either cemented in place once for all or secured by a thin band of celluloid, *d*, as shown in Fig. 7, which is cemented fast, and may be cut in order to remove the powder.

To assist in the removal of the shell from the gun in case the charge is not to be fired, I may, for heavy charges, attach to the bottom *b* a bridle or grip, *g*, of woolen fabric or other suitable material. This may be attached to *b* in any convenient way. In the same manner I may also attach a handle to the cap *c* in order to facilitate the handling of the charged shells.

As before stated, the shell may in the manufacture be made thinner at the point where the fire from the fulminate strikes it than at other points; and I may add that the shell may be readily made to conform in size, shape, and character to the particular gun it is designed to be used in. If designed for guns with percussion-locks, it may have the fulminate arranged in its cap, either at the center or in the rim.

My improved shell has almost unlimited durability, as it is not acted on by air, water, or insects, it protects the powder perfectly against dampness, and it leaves no residue in the gun after the discharge. No pricking need be resorted to in order to insure the discharge, as the fire from the primer will inflame the shell itself.

I find that the use of my shell does not visibly modify the explosive force of the charge, but it slightly increases the initial velocity.

I may, and generally prefer to, employ transparent celluloid for my shell, as this permits one to see the powder inclosed at any and all times and observe its condition; but the transparency of the celluloid has no other advantage. Even with rapid firing little or no traces of the celluloid shells will be found in the gun. Such traces as may be left will be found to be hard and carbonaceous, and not of a character to incrust the bore.

Owing to the extreme rigidity and stiffness of even a thin shell made from celluloid, I am enabled to employ my shell for the heaviest cannon-charges without fear of their being crushed or misshapen by rough handling, and these are especially suited for the use of war-vessels, as they are very light comparatively and perfectly impervious to moisture.

I do not claim, broadly, the use of celluloid for a cartridge-shell, as this has been before proposed.

Having thus described my invention, I claim—

As an improved article of manufacture, a cartridge-shell constructed of a tube, *a*, with an inturned flange, a bottom, *b*, with a flange, and a flanged cap, *c*, the said three parts being made from celluloid or its specified equivalent, and cemented together, substantially as set forth.

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

PAUL BOCA.

Witnesses:

ARMENGAUD, Jeune,

ROBT. M. HOOPER.