

J. H. BULLARD.
Metallic Cartridge-Shell.

No. 197,823.

Patented Dec. 4, 1877.

Fig. 1.



Fig. 2.

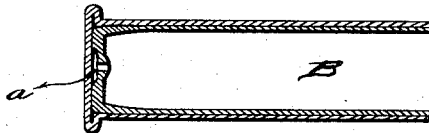
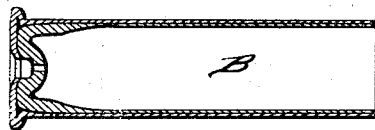


Fig. 3.



WITNESSES

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JAMES H. BULLARD, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN METALLIC CARTRIDGE-SHELLS.

Specification forming part of Letters Patent No. **197,823**, dated December 4, 1877; application filed September 29, 1877.

To all whom it may concern:

Be it known that I, JAMES H. BULLARD, of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and valuable Improvement in Cartridge-Shells and Process of Making; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figures 1, 2, and 3 are longitudinal central sectional views of my cartridge-shell in different stages of construction.

My invention relates to the manufacture of cartridge-shells for small-arms; and the nature of my invention consists, first, in the process of making cartridge-shells with a copper or other metallic lining put in at any time after the first drawing, for the purpose of making a re-enforce to the butt of the shell, and extending the whole length of the shell, for the additional purpose of protecting the outer case from the action of the gunpowder; and, second, in a cartridge-shell made with a copper or other metallic lining, the base of which lining shall have a pocket or recess for the fulminate, all as hereinafter more fully set forth.

The annexed drawing, to which reference is made, fully illustrates my invention.

I first make a cup for the future shell, of brass, for the outside of the shell, and also another cup, of copper, nickel, or other metal that will not be acted upon by gunpowder, this latter cup being just enough smaller than the outside or brass cup to fit into the same. After these cups have been made, they are put together—that is, one within the other—and “drawn” in the usual manner, until the shell is completed.

In Fig. 1, the lining is put in after the third drawing, and makes what is called a “solid head.”

In Fig. 2, I represent a shell with the recess *a* formed for the fulminate, and which is commonly known as an “inside primer,” the lining in this case being put in after the head is formed.

Fig. 3 represents what is called a “folded

head” and an “outside primer,” the head and pocket for the primer being formed at the same time, after the lining is put in the outside case.

By this method of cupping each metal separately, I am enabled to make a lining of equal thickness, or thicker than the outside of the case, and I can also make the rear part of the shell much stronger than can be made of a single piece, for the reason that beyond a given thickness the metal cannot be drawn successfully, as it will tear apart under the press. It is obvious that two pieces drawn separately, as thick as can be in the first place, will be twice as strong as one single piece of half the thickness. This is of great importance in shells used in machine-guns, like the Gardner, Gatling, and other guns of the same class, as the shell remains only for an instant in the chamber of the gun, and if the charge hangs fire from any cause, the shell will not explode until partly withdrawn from the chamber, and, unless the case or shell is unusually strong, it will burst, and inevitably injure and damage the mechanism of the breech, rendering it unserviceable for the time at least. Such accidents have happened in just this way, and, unless a shell is fired the instant the fulminate is struck, are liable to happen at any time with the shells now in use.

Another advantage in having the rear part of the shell thick is the fact that most guns have a recess or slot at the rear end of the chamber, for the purpose of allowing the extractor to engage with the head of the shell, and there is always more or less of a vacant space in the chamber. When a shell is exploded, the force of the explosion drives the shell (as usually made) into this space, rendering it difficult, and in some instances almost impossible, to extract. Neither will the shell be as liable to swell as shells made in the usual way, and stick from that cause.

Another advantage lies in the fact that, by putting this lining in after the head is formed or folded, it completely shuts out the possibility of any gas getting between the folds of the head and causing it to swell when fired, thus making the most perfect re-enforce known; and when this lining is made of copper or other non-corrosive metal, it will thoroughly protect

the brass outside from the action of the powder, making a most perfect shell in every particular.

By my method of making the shells, what is known as an "inside primer" can be used with great advantage, as the pocket or recess *a* can be made in the base of the lining, and the fulminate placed therein, and then said lining put in the outside case or shell A the last thing before the head is formed, or even after, if thought best; or it can be delayed until the time immediately preceding the reducing of the muzzle end of the shell to fit it to the chambers of different guns.

By placing the fulminate in the lining, as described, the piece called a "cup," usually employed for the twofold purpose of holding the fulminate and acting as a re-enforce, is not used, and there is no necessity of pinching or pressing a groove in the sides of the shell to hold it in, thus leaving the outside of the shell smooth and unbroken, and much easier to withdraw from the chamber of the gun, and is also not as liable to break in two as has been the case with shells made in the usual way. Also, by this construction of a cartridge-shell, the outer brass shell is protected from the action of the powder by the inner non-corrosive lining, the latter extending out to the end of the brass outer shell, whereby all liability of the entrance of the gases generated by the explosion of the powder between the shells is prevented, which is liable to occur when the inner lining extends but a short distance from the base. This extension of the inner lining stiffens and strengthens the cartridge-shell, and if there should be, from any cause, a flaw or imperfection in the outer shell or case, the inner lining will prevent any escape of gas into

the mechanism of the gun, thereby doing injury to the fire-arm. If the inner lining should have a flaw or imperfection, the outer case would perform the same duty, thus making a much safer shell than has heretofore been used. The possibility of a flaw in the same place in both cases of metal would be very rare indeed.

I do not broadly claim, in this application, a copper-lined brass cartridge-shell, as that is fully shown and described in my Letters Patent dated July 3, 1877.

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

1. The improvement in the art of manufacturing cartridge-shells, which consists in first forming two separate cups of different metals, one of which is re-enforced at the head by inserting the latter within the outer cup at any time after the first drawing operation, and subsequently completing the same, forming a cartridge-shell with an interior re-enforced casing of different metal from the outer, substantially as and for the purposes set forth.

2. A cartridge-shell consisting of an outer shell, an inner lining of non-corrosive metal, extending to the outer end of the outer shell, said inner lining being re-enforced at the butt, and provided at its base with a pocket or recess for the fulminate, substantially as and for the purposes set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JAMES H. BULLARD.

Witnesses:

I. NELSON,
L. PRESTON.