

G. P. SALISBURY & C. S. WELLS.
 TOOLS FOR HEADING CARTRIDGE SHELLS.

No. 170,772.

Patented Dec. 7, 1875.

Fig. 1.

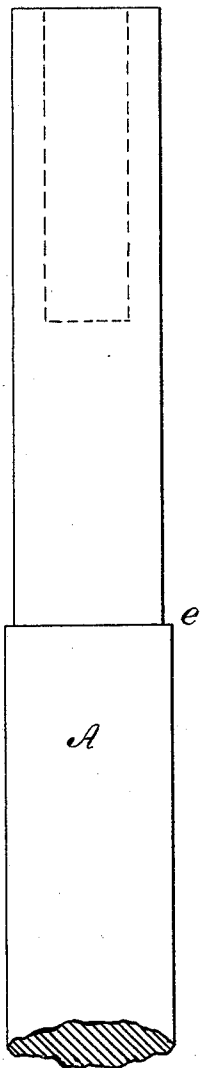


Fig. 2.

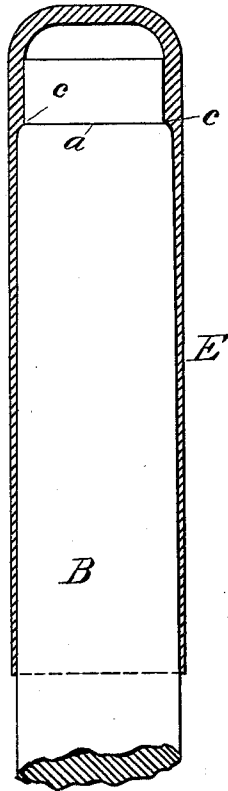


Fig. 3.

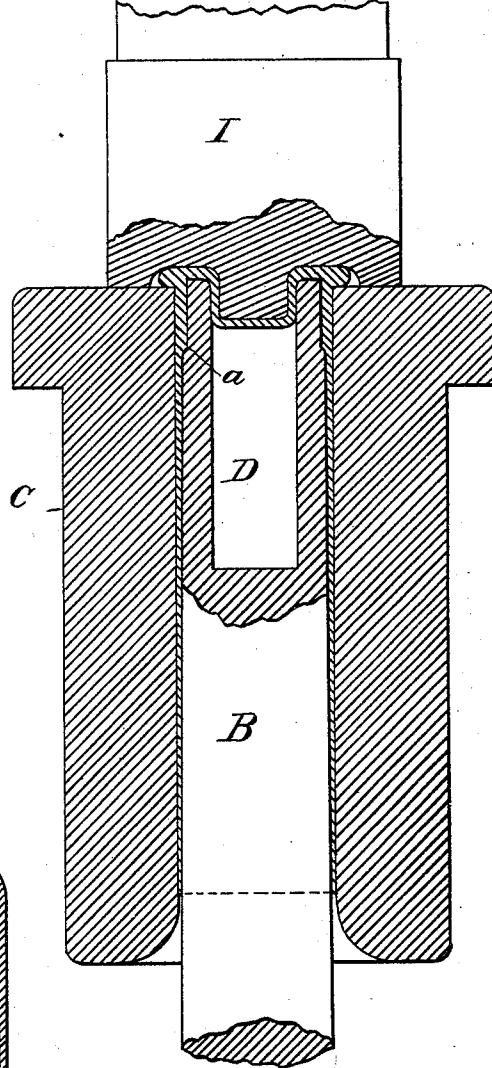
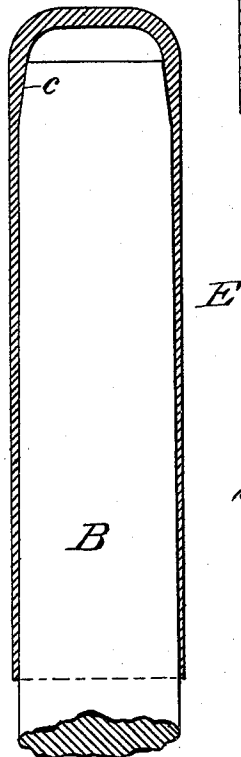


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE P. SALISBURY AND CHARLES S. WELLS, OF NEW HAVEN, CONN.,
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PLACE.

IMPROVEMENT IN TOOLS FOR HEADING CARTRIDGE-SHELLS.

Specification forming part of Letters Patent No. **170,772**, dated December 7, 1875; application filed
September 17, 1875.

To all whom it may concern:

Be it known that we, GEO. P. SALISBURY and CHARLES S. WELLS, of New Haven, in the county of New Haven and State of Connecticut, have invented certain Improvements in the Art of Heading Cartridge-Shells, and Tools therefor, of which the following is a specification:

Our invention relates to the manufacture of metallic cartridge-shells; and the invention consists in an improved method of forming the heads on such shells, and in the tools used for that purpose. Heretofore in heading metallic cartridge-shells it has been customary to use a mandrel or supporting-punch, constructed as represented in Figure 1, on which there was formed a shoulder, *e*, for the open end of the shell to rest upon, while the pressure was applied at the opposite or closed end of the shell to form the head, the mandrel with the shell on it being inserted within a female die while the head was being formed. It is obvious that with such a tool the entire pressure necessary to form the head was exerted upon the shoulder *e*, and as the shell is always thinnest, and therefore weakest, at its open end, it was apt frequently to crinkle or bend up the metal at various points along the sides of the shell, between its closed and open ends, the pressure obviously being applied to and transmitted through the shell from end to end. By this means many shells were destroyed in the act of heading, and as the heading is preceded by many other operations the loss of a shell at this stage of its manufacture is far more serious than it would be at the earlier stages of its construction. To obviate this difficulty, and enable the shells to be made with greater accuracy, we proceed as follows: In the first place, the shells are drawn in such a manner as to leave the metal much thicker near their closed ends than they are throughout the balance of their length, as represented in Fig. 2, where *E* is the shell. It will be observed that there is an internal shoulder, *c*, at the point where the thicker and thinner portions of the shell unite. We then construct a holding mandrel or punch, *B*, with a corresponding shoulder, *a*,

on it of the exact size to fit the interior of the shell, but stopping a little short of its closed end, as shown in Fig. 2. It will be seen that when the mandrel *B* is inserted within the shell *E*, and both are then shoved within a female die, *C*, as shown in Fig. 3, the shell will be supported entirely upon the shoulder *a* of the mandrel *B*, near its end, and that when the bunter *I* is brought down upon the closed end of the shell to form the head or flange there will be no pressure at all exerted upon any portion of the shell below its shoulder *c*. As a consequence of this manner of supporting the shell during the operation of heading, the body of the shell below the shoulder *c* is left free from any strain or pressure, and therefore retains its form perfectly, thus obviating entirely all tendency to crinkle or become deformed or injured. The cartridge-shells may be formed with the re-enforced or thickened wall made tapering, and without any defined or abrupt shoulder, as shown in Fig. 4, in which case it will be observed that the thickened portion of the shell grows gradually thinner, and finally unites with the parallel walls of the tube, without any shoulder at their point of junction. In such cases, instead of forming the mandrel *B* with a shoulder, *a*, as shown in Fig. 2, it will be formed with a tapered end, corresponding in shape and diameter with the interior of the re-enforced portion of the shell, as shown in Fig. 4, so that when the mandrel, with the shell thereon, is inserted in a female die, which fits snugly around the thickened portion of the shell, the latter will be supported by the tapered portion of the mandrel, thus relieving all of the shell below that point from end pressure, the same as when made with a shoulder, as previously described, the principle or mode of operation being substantially the same in both cases. The tapered form of shell, while it may be more convenient for drawing, is not considered so good for heading, as it will have a greater tendency to wedge in the die. Fig. 4 is intended merely to illustrate the invention as applied in a modified form.

By this method of heading shells all loss or injury arising from end pressure on the shell

is obviated, and a great saving is thereby effected. This improvement is also important from the fact that, with the improved arms of the present day, the shells are required to fit the chamber of the gun with great accuracy; and when headed by the old method they would often be bulged or crinkled so slightly as not to be readily observed in the rapid process of heading, and yet be rendered incapable of that accurate fit which is now required. The process or operation of heading the shells may be in all other respects the same as heretofore, these tools being applied and used in machines the same as formerly.

Having thus described our invention, what we claim is—

1. As an improvement in tools for heading

cartridge-shells re-enforced by a thickened portion at or near their closed ends, a mandrel or anvil, B, provided with a shoulder or equivalent taper to support the shell while being headed by its re-enforced or thick portion only, substantially as described.

2. The combination of a holding or female die, C, a bunter, I, and a mandrel or anvil, B, provided with a shoulder, a, or equivalent taper, all being constructed and arranged to operate substantially as and for the purpose set forth.

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