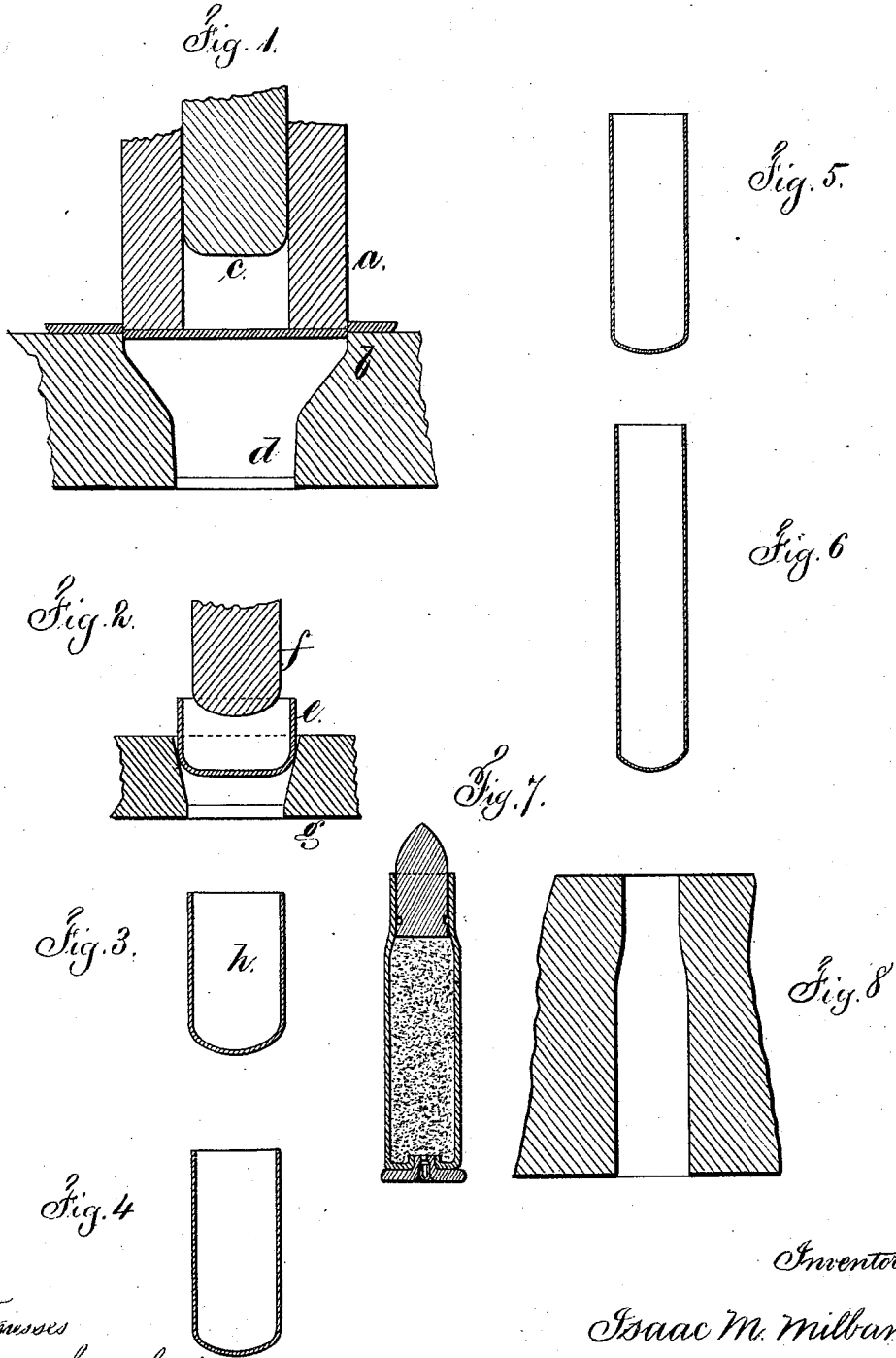


I. M. MILBANK.

PROCESS OF MAKING ZINC CARTRIDGE-CASES.

No. 181,356.

Patented Aug. 22, 1876.



Witnesses
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UNITED STATES PATENT OFFICE.

ISAAC M. MILBANK, OF GREENFIELD HILL, CONNECTICUT.

IMPROVEMENT IN THE PROCESSES OF MAKING ZINC CARTRIDGE-CASES.

Specification forming part of Letters Patent No. **181,356**, dated August 22, 1876; application filed December 22, 1874.

To all whom it may concern:

Be it known that I, ISAAC M. MILBANK, of Greenfield Hill, in the county of Fairfield and State of Connecticut, have invented an Improvement in the Manufacture of Cartridge-Cases, of which the following is a specification:

Efforts have been made to manufacture cartridge-cases from sheet zinc, but the same have been attended with so much difficulty that no available mode of manufacture has heretofore been developed.

In making cartridge-cases out of copper and brass it has heretofore been usual to anneal the shells from time to time between the successive drawing operations. This softens the metal sufficiently to prevent the same cracking and breaking.

When sheet-zinc is subjected to the drawing and annealing operation it is weakened and torn or injured in drawing to such an extent as to be either useless or else unreliable when the cartridge is exploded.

My invention relates to an improved method of manufacturing cartridge-cases and similar hollow articles from sheet-zinc.

I select the sheet-zinc free from flaws and imperfections, and with this object in view it is preferable to employ blocks or ingots of spelter that are free from flaws, and coated on one or both sides with a layer of tin, and roll them down to form sheets in the usual manner, care being taken to have the zinc in a compact and hard condition after the last rolling.

The circular blank is cut out by a punch, *a*, and die, *b*, shown in Fig. 1, and this is stamped up into a cup shape by the punch *c* and tapering portion *d* of the die *b*, and the cupped blank *e*, Fig. 2, is reduced in size and lengthened, by the dies *f* and *g*, Fig. 2, into the partially-formed case *h*, Fig. 3.

Similar dies to the dies *f* and *g* are employed to effect the successive reductions in diameter and thickness and increase the length in forming the blanks for the cases shown in Figs. 4, 5, and 6, such punches and dies being of successively smaller sizes.

The cartridge-case is to be finished and primed in any manner to which this character of case is adapted.

I have shown in Fig. 7 a cartridge complete, and when the end of the cartridge that receives the ball is reduced in size it is done by

means of a die similar to that in Fig. 8, which is pressed upon the case, such as shown in Fig. 6.

I have discovered that the drawing operations are, with zinc, performed in the most reliable manner when the zinc is not annealed between one drawing operation and the next, and that the metal so treated remains strong, compact, and perfect.

The cartridge-case is to be annealed slightly in hot water before the last reducing operation, and the last operation, with some cartridge-cases, is to form a taper neck, as seen in Fig. 3.

When the zinc is only coated on one side care is to be taken to have the coated side outwardly of the case, in order that the tin coating may act as a lubricant to facilitate the drawing operation, and in so doing the tin coating is forced into any pores in the zinc, to stiffen and strengthen the same.

During the drawing operation of these tinned-zinc cases soap-suds or pulverized plumbago, or both together, may be employed as a lubricant, as usual.

By this method of manufacturing the sheet-zinc cases the metal retains its full strength, there is not any risk of its cracking or breaking when the cartridge is exploded in the chamber of a gun, and the metal remains of sufficient hardness and elasticity to firmly retain the ball when pressed into the open end of the case.

The zinc cases are not as liable to corrosion as the copper and brass cases heretofore used, and, with zinc that is coated with tin, the surface of the case is not injured by moisture or atmospheric influences.

I claim as my invention—

As an improvement in the art of manufacturing cartridge-cases of sheet-zinc, coating the zinc with tin and then forming the case by the usual mode of stamping or drawing, but without annealing at any time, save just previous to the last drawing operation, when the partly-finished case is annealed by hot water, substantially as described.

Signed by me this 16th day of December, 1874.

I. M. MILBANK.

Witnesses:

GEO. T. PINCKNEY,
CHAS. H. SMITH.