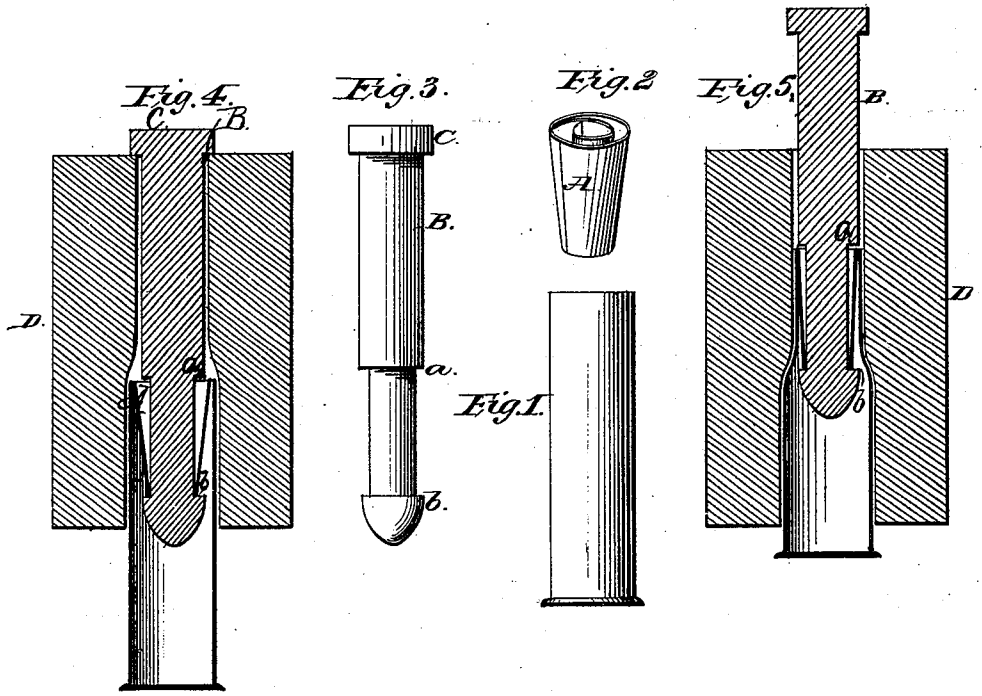
G. P. SALISBURY & C. S. WELLS.

Device for Necking Cartridge-Shells.

No. 167,940 Patented Sept. 21, 1875.



Witnesses:
Roger M. Sherman.
George Terry.

Inventors:
George P. Salisbury
Charles S. Wells.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN DEVICES FOR NECKING CARTRIDGE-SHELLS.

Specification forming part of Letters Patent No. **167,940**, dated September 21, 1875; application filed June 16, 1875.

To all whom it may concern:

Be it known that we, GEORGE P. SALISBURY and CHARLES S. WELLS, of the city and county of New Haven and State of Connecticut, have invented a certain new and Improved Device for Forming Cartridge-Shells; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawing, which forms a part of this specification, in which—

Figure 1 is a perspective view of the cartridge-shell before its open end is reduced in size. Fig. 2 is a view of the frustum-shaped and coiled spring. Fig. 3 is a view of the piece for holding the same, or to which the spring is fastened. Fig. 4 is a vertical and central section of the die, frustum-shaped and coiled spring, the piece to which the above spring is fastened, and the cartridge-shell. Fig. 5 shows a vertical and central section of the same parts as Fig. 4, in a different position relative to each other.

Our invention relates to an improved device operating within the die for reducing the size of the open end of cartridge-shells, has for its object the prevention of the wrinkling or bulging inward of the shell as it is reduced, and consists in a frustum-shaped coiled spring, and a piece for holding the same, as they are hereinafter more fully set forth and claimed.

Fig. 2 shows the frustum-shaped spring A, which is made of sheet-steel and is coiled. The outer end of the spring is gradually reduced in thickness, so much so that the end is nearly to an edge, in order that the outer coil may as closely approximate a circle as possible. The inner end is formed into a small coil, which comes against the shoulders *a* and *b* on the piece B, and is held by them.

Thus constructed the coils can slip on each other, and the spring be diminished in its diameter by pressure, and regain its size on its removal.

The piece B, Fig. 3, has one end rounded, and is turned smaller near the rounded end, forming the shoulders *a* and *b*. The other end has a nut, *c*, screwed onto it, making an enlargement of the end. The end of the piece B, having the nut, and the inner coil of the spring A, are made of such size that, when the nut *c* is removed, the inner coil will spring enough to go over the end of the piece B, and be held between the shoulders *a* and *b*, as shown in the vertical sections, Figs. 4 and 5.

In Fig. 4 a central and vertical section of the cartridge-shell, die D, piece B, and spring A are shown. The die D has a hole through it of the shape of the cartridge-shell when the shell is formed into the desired shape. The exterior of the die may be of any desired form. Into the larger part of the hole in the die the cartridge-shell is represented as inserted as far as the larger part extends, or until the hole begins to diminish. The spring A is of such size that its larger part fills the cartridge-shell, and the remainder of the spring A and the part of the piece B holding the spring pass into the shell. The cartridge-shell and the piece B being held in the same relative position, the forcing down of the die D compresses the shell and makes it conform in shape to the hole in the die.

As the shell is narrowed in diameter it presses upon the spring A, causes the coils of the spring to slip on each other, and the spring to diminish in diameter as the exterior of the shell is reduced to the smaller part of the hole in the die. During this operation the spring A presents a yielding, but firm, pressure against every part of the inner end of the shell, so that it cannot wrinkle or bulge inwardly, and it is found in practice that if the end of the shell is prevented from wrinkling there is no trouble with the remainder.

Fig. 5 shows a vertical and central section of the same parts as Fig. 4, with the die forced down, and the open end of the shell and spring A reduced to the size of the narrow part of the hole in the die. The piece B is now raised and then the die D, when the shell can be removed.

When the die and the above-described device are in use the shell is firmly held by its enlarged end, and the die D and piece B are moved by power.

We claim as our invention—

The frustum-shaped and coiled spring A in combination with the piece B, substantially as and for the purpose described.

GEORGE P. SALISBURY.
CHARLES S. WELLS.

Witnesses:
GEORGE TERRY,
ROGER M. SHERMAN.