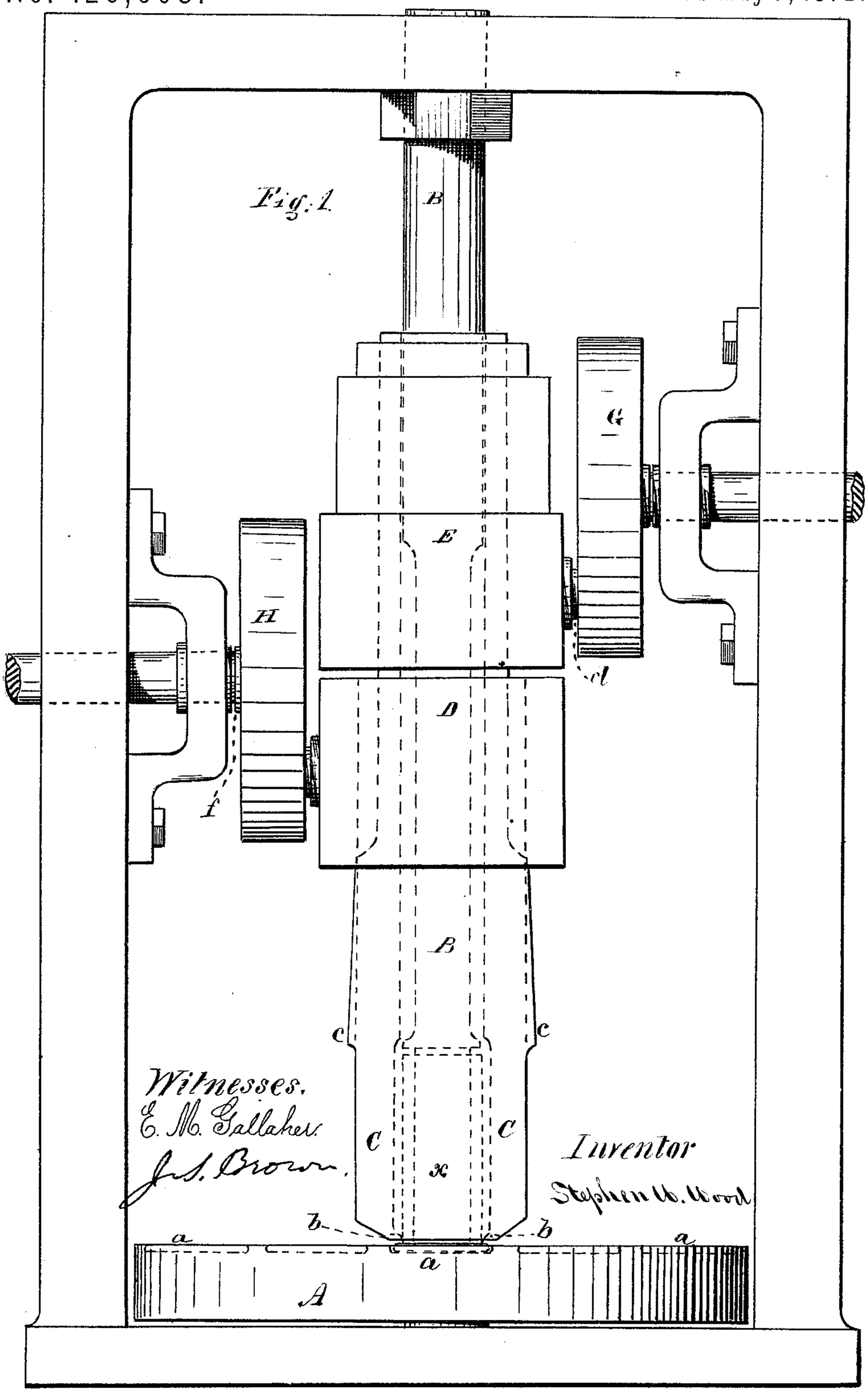
2 Sheets--Sheet 1.

STEPHEN W. WOOD.

Improvement in Machines for Tapering Cartridge-Shells.

No. 126,608. Patented May 7, 1872.

Fig. 1.



Witnesses.
E. M. Gallaher.
Jas. Brown.

Inventor
Stephen W. Wood

2 Sheets--Sheet 2.

STEPHEN W. WOOD.

Improvement in Machines for Tapering Cartridge-Shells.

No. 126,608. Patented May 7, 1872.

Fig. 2.

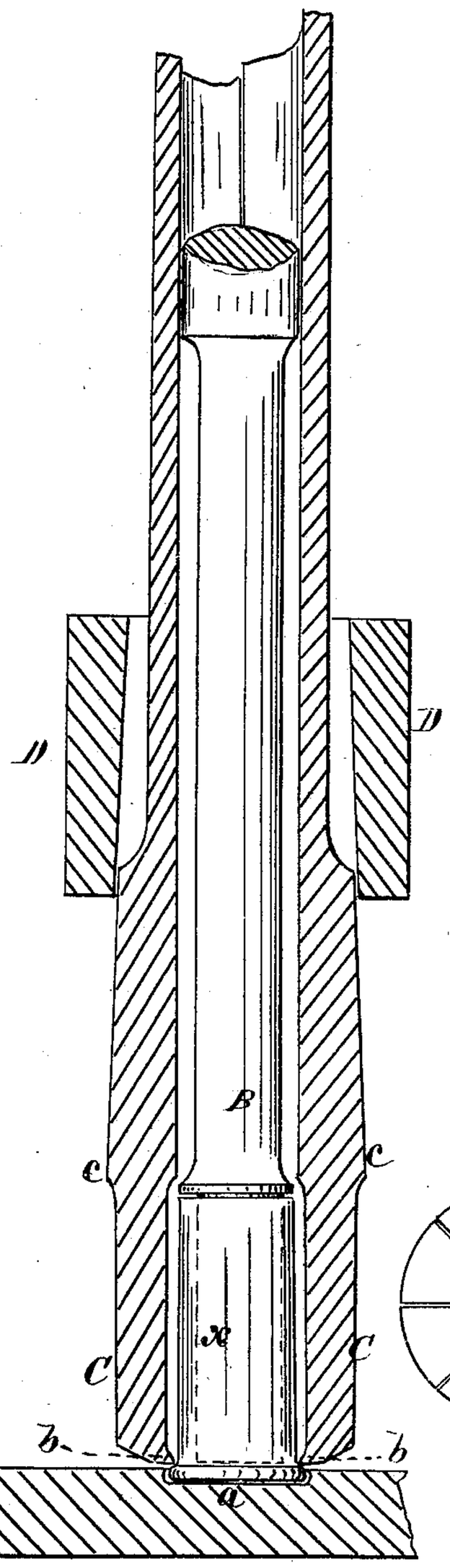


Fig. 3.

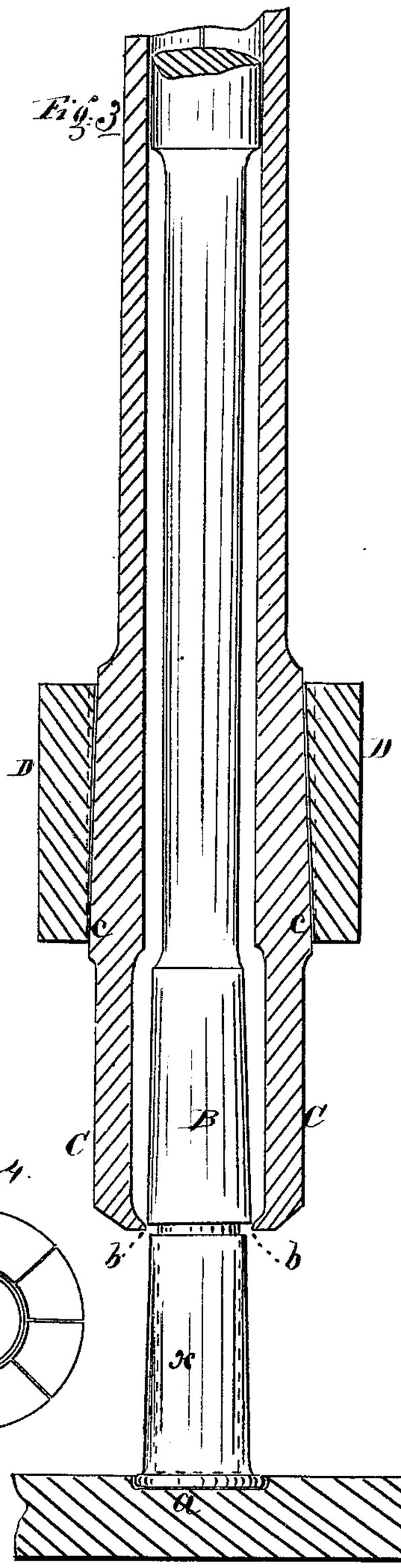
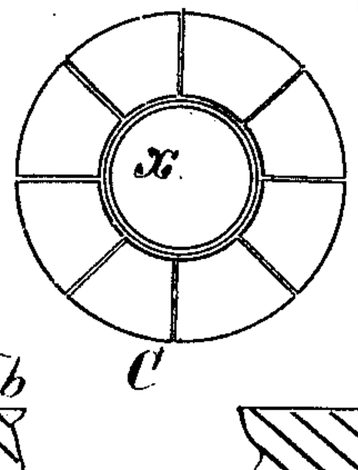


Fig. 4.



Witnesses.

J. S. Brown,

F. C. Lyons

Inventor

Stephen W. Wood

UNITED STATES PATENT OFFICE.

STEPHEN W. WOOD, OF CORNWALL, NEW YORK.

IMPROVEMENT IN MACHINES FOR TAPERING METALLIC CARTRIDGES.

Specification forming part of Letters Patent No. 126,608, dated May 7, 1872.

To all whom it may concern:

Be it known that I, STEPHEN W. WOOD, of Cornwall, county of Orange and State of New York, have invented an Improved Machine for Tapering Metallic Cartridge-Shells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing making part of this specification—

Figure 1 being a view in elevation of the principal parts of the machine; Fig. 2, a central vertical section of the main operative or functional parts of the machine, showing the relative positions of the same in one stage of their operation; Fig. 3, a corresponding section, showing the positions of the parts in another stage of the operation; Fig. 4, a view of the lower or working end of the drawing-tool represented in the preceding figures.

Like letters designate corresponding parts in all of the figures.

In these drawings I represent only the essential parts of the machine, the complete arrangement thereof being shown in Fig. 1, and I describe the movements of the parts to perform the operation of tapering the cartridge-shells, the motions being produced by any suitable and known means.

A bed-plate or table, A, is employed, on which to place the cartridge-shells to be tapered, and this table may revolve and be provided with cavities or recesses *a a* for receiving the heads or bases of the shells, all arranged in a circle concentric with the center of revolution, so as to present the shells successively to the operation of the parts by which the tapering is effected. Each cartridge-shell *x* when brought into position is centrally under or opposite to a mandrel or holder, B, which holds the shell in place while the operation of tapering is being performed. The tool C, by which the tapering is directly effected, is tubular or hollow, and the mandrel or holder B, as represented, works inside thereof. After the cartridge-shell has been brought into position the tapering-tool C is brought down over it, (or, equivalently, the shell may be moved up into the same,) as indicated in Figs. 1 and 2. In this position a lip or working edge, *b*, of the tool C closely surrounds the periphery of the shell. The tool is then drawn up or back over the surface of the shell to its open end or to the termination of the part to be tapered, and is gradually contracted in diameter while performing the movement, so as to produce the required taper on the shell. The position of the tool then is indicated in Fig. 3, allowing room for the withdrawal of the tapered shell, and the introduction of the next shell to be tapered. The mandrel or holder is then raised or withdrawn from the shell. In order to allow the drawing-tool thus to contract in diameter to effect the tapering, and again to expand, it is divided into sections, so as to be capable of opening and closing to the required extent. In Fig. 4 it is represented as divided longitudinally and radially into eight sections, so that the spaces between them are so very narrow as not to produce irregularities on the surface of the cartridge-shells. More or fewer sections than represented may be employed, and the sections may be made so as to overlap one another; or any other equivalent and practical construction of the tool to effect the purpose may be adopted. The sections of the tool may spring out or into their outermost or innermost limit; or the radial movement, which is very slight, may be allowed by the pivoting of the upper ends thereof, if they are so rigid as not to bend. The radial contracting action of the tool to effect the tapering of the shells, as above set forth, is properly produced by a wedge-force. Thus, in the drawing there is represented a slightly-tapering surface, *c*, on the outside of the tool, having just the degree of taper required to produce the effect; and this surface plays within a hollow collar or counter-guide, D, which has, or may have, an interior surface of the same degree of taper. An arrangement of the drawing-tool and collar or guide to produce the movements for tapering the shells is represented in Fig. 1. A guide-block E, sliding in the frame of the machine, is attached to the drawing-tool, and is situated above the cam D. A wrist-pin, *d*, projecting therefrom, plays in a cam-groove in the face of a revolving disk or plate, G. This cam-groove not only imparts the required extent of reciprocating movement to the drawing-tool C, but any desired intermittent or variable motion thereto. The collar D also has a wrist-pin, *f*, which plays in a cam-groove in the face of another revolving plate or disk, H, whereby its

own reciprocating movement, variable or otherwise, is produced. This collar D also slides in guides of the frame.

The relative movements of the drawing-tool C and collar D, to produce the tapering of the shells, are as follows: A cartridge-shell, *x*, having been brought into position, and the mandrel or holder B caused to descend by any suitable means inside thereof, till it rests or bears on the inside of the head or closed end of the shell, (being small enough in diameter to enter therein and be withdrawn again freely,) at that moment both the drawing-tool C and collar D should be at the upper extremity of their respective movements, and the taper surface *c* of the drawing-tool out of and below the cam, so that the tool is open sufficiently to pass freely over the shell in its descent, which is the first succeeding movement that takes place. The tool descends till its lip *b* reaches the flange of the shell, as represented in Figs. 1 and 2, or as far down the sides of the cartridge-shell as the taper is to be formed thereon. The collar D then descends till its lower side reaches the upper end of the tapering surface *c* on the drawing-tool, as represented in the same figures. The drawing-tool then ascends, while the collar D remains stationary, so that the taper-surface *c* is forced up into the collar, thereby contracting the lip *b* of the tool gradually around the shell, and drawing it to the taper required. The position of the parts then is shown in Fig. 3. Then the collar D ascends to the top of its movement, thereby opening the tool ready for the repetition of the operation upon the succeeding shell. The mandrel or holder B is then withdrawn to allow the shell to be removed and the next shell to be brought into position. There may be a shoulder or enlargement, *g*, on the holder B above the open end of the shell to shield the same from being struck by the tool in the descent of the same. This shoulder should be a little distance away from the end of the shell, leaving a space between them to allow for the lengthening of the shell caused by the drawing action of the tool.

The positions of the parts herein described may be changed from vertical to horizontal, or may be completely inverted, in which case the bed-plate A may be dispensed with.

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

The combination of the sectional expanding and contracting tool C, the mandrel or holder B, and sleeve D, substantially as and for the purpose herein specified.

STEPHEN W. WOOD.

Witnesses:

J. C. LYONS,

J. S. BROWN