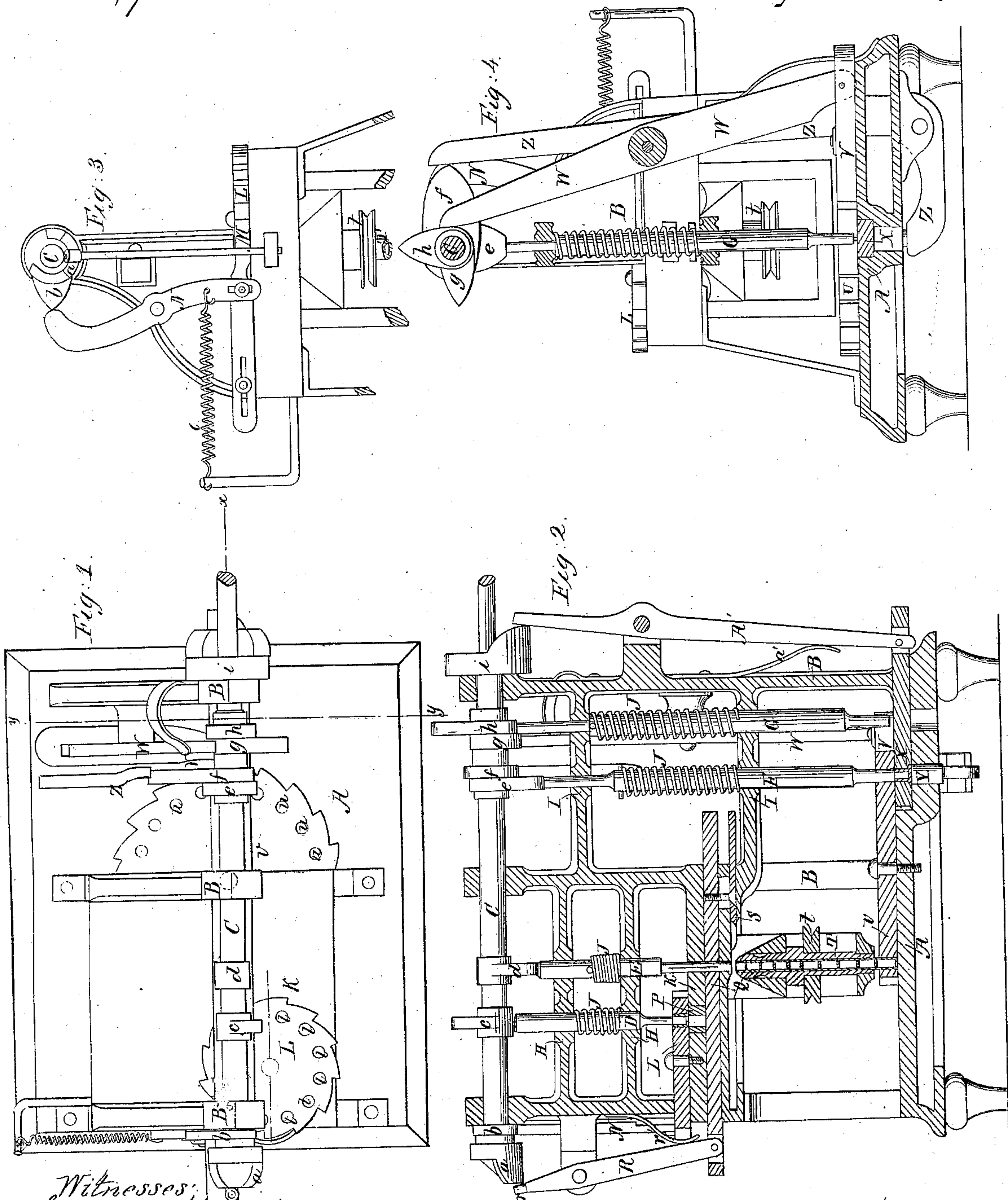


W. A. McIntire,

Making Cartridge Shells,

N<sup>o</sup> 63,915.

Patented Apr. 16, 1867.



Witnesses:  
 Thomas J. Russell  
 John C. Kemmer

Inventor  
 W<sup>m</sup> A. McIntire  
 Per Munroe & Co. Attys



# United States Patent Office

WILLIAM A. McINTIRE, OF SPRINGFIELD, MASSACHUSETTS.

*Letters Patent No. 63,915, dated April 16, 1867.*

## IMPROVEMENT IN MACHINES FOR MAKING CARTRIDGE SHELLS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM A. McINTIRE, of Springfield, in the county of Hampden, and State of Massachusetts, have invented a new and useful Machine for Making Cartridge Shells; and I do hereby declare the following to be a full, clear, and exact description of the same, sufficient to enable one skilled in the art to which the invention appertains to make use of it, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a plan or top view.

Figure 2 is a vertical longitudinal section on the line *x x*, fig. 1.

Figure 3 is an end elevation.

Figure 4 is a vertical transverse section on the line *y y*, fig. 1.

The machine is adapted for drawing, trimming, and heading the cartridge shells by a series of automatic and consecutive operations.

In the ordinary mode of making a metallic cartridge capsule it is first cut out of a sheet; the blank thus obtained being a circular disk, is subsequently, by means of die and punch, swaged into the form of a tube with the bottom end closed; this has to be repeated several times, and the metal annealed between each drawing operation. I take the cartridge shell after the last annealing and draw it the last time, trim and head it by successive automatic operations. The shell is put into the upper disk L, which conveys it to the first punch D, which forces it through the die K, into the slide Q, whose motion carries it under the punch E, which forces it into the trimming die. As the slide Q goes back after another shell the knife S advances and trims the edge of the shell, which is forced down by the succeeding shell as the punch E makes another stroke. At each stroke of the punch E the bottom shell is forced out of the hollow mandrel T into a hole in the disk V, which conveys it to the heading device, where the third punch F forces it into the second slide X. Both the other punches (D and E) force the shells by pressure against the bottom or closed end of the shells, but the punch F expels the shell from the slide V by pressure upon its edge, as the shoulder on the punch rests on the edge of the shell, the latter being longer than the portion of the punch which is introduced into it, leaving a space between the end of the punch and the inside bottom of the shell. The shell being held in this position, the punch Y is raised by the lever Z, and spreading the closed end of the shell and forming the flanged rim around the base or closed end. The slide X is now retracted, and the shell discharged therefrom by the descending punch G. The shells are carried from place to place automatically and consecutively, no special manipulation being required.

In the drawings, A is the base, and B B B standards of the frame; in the latter is journaled the main shaft C, from which nearly all the motions of the machine are derived. On this shaft are nine cams, which are indicated in the drawings by the letters *a, b, c, d, e, f, g, h, i*. Four of these operate the plungers D, E, F, G; other four operate the feeding devices, and one is the header which upsets the closed end of shell and makes the flanged head. The plungers D E slide in sockets in the cross-pieces H H, and the plungers F G in the cross-pieces I I. In each case the downward or effective movement of the plunger is due to its cam on the shaft above, and its return movement or retraction is performed by a spring, J. Upon the table K is centred a wheel, L, which has pockets *l*, adapted to receive the copper tubes which are to be drawn, trimmed, and headed; this wheel is revolved by a pawl, M, which has a horizontal movement imparted by the cam *b*, through the intervention of the arm N, which is pivoted to the frame, and retracted after its effective stroke by the spring O. The blank having arrived under the plunger D, is driven by the descent of the latter through the die P, in the table K, and into a pocket of the slide Q, which is then moved by the lever R and cam *a* till the drawn tube is brought under the plunger E. The cam *a* is a face cam, and at its point of contact with the lever R the latter is furnished with a friction-roller, *r*. The plunger E now descends and drives the tube out of the slide Q. *r'* is a spring to retract the slide Q after its effective motion produced by the cam *a*. As the slide Q is retracted it brings with it the knife S, which trims off the end of the tube as it is revolved by the spindle into which it was pushed by the plunger E. The spindle T is revolved by a cord on the pulley *t*, and the column of shells therein falls consecutively into the pockets *u u* of the wheel U, which is centred upon the bed-plate of the machine, and revolves by means of the pawl V, which is actuated by the lever W and cam *g*. By this revolution of the wheel U, the tube reaches a position under the plunger F which is operated by the cam *e*, and whose lower end agrees with the

desired inside dimensions of the completed shell. The latter, as the plunger F descends, slips upon it and is longer than its socket as the trimmed end of the shell rests against the shoulder on the plunger. The plunger F descends and carries the shell out of the pocket in the wheel U and into a die in the slide X, where it is held while the header Y ascends and upsets it, as shown in fig. 2, forming the flanged head. The header is operated by the lever Z from the cam *f*. The plunger F is now raised, leaving the complete shell in the slide X, which is then retracted until the shell comes under the plunger G, which descends and expels it from the machine. The slide X is operated by the pivoted lever A', which is moved in one direction by the cam *i*, and in the other by the spring *a'*. The machine may be made to operate under a change of position; the plungers moving horizontally and the pieces being fed from place to place by troughs instead of disks.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the plunger and die for drawing the shell, the slide or equivalent for delivery of the same, and the trimming device for the purpose described.
2. In combination with the above, I claim the rotating disk U, and heading device, arranged substantially as described.

To the above specification of my improved machine for making cartridge shells I have signed my hand this 13th day of October, 1866.

WM. A. McINTIRE.

Witnesses:

SOLON C. KEMON,  
EDWARD H. KNIGHT.