2 Sheets—Sheet 1.

A. SESSIONS.

Cartridge-Trimming Machine.

No. ~~203,655~~.

Patented ~~May 14~~, 1878.

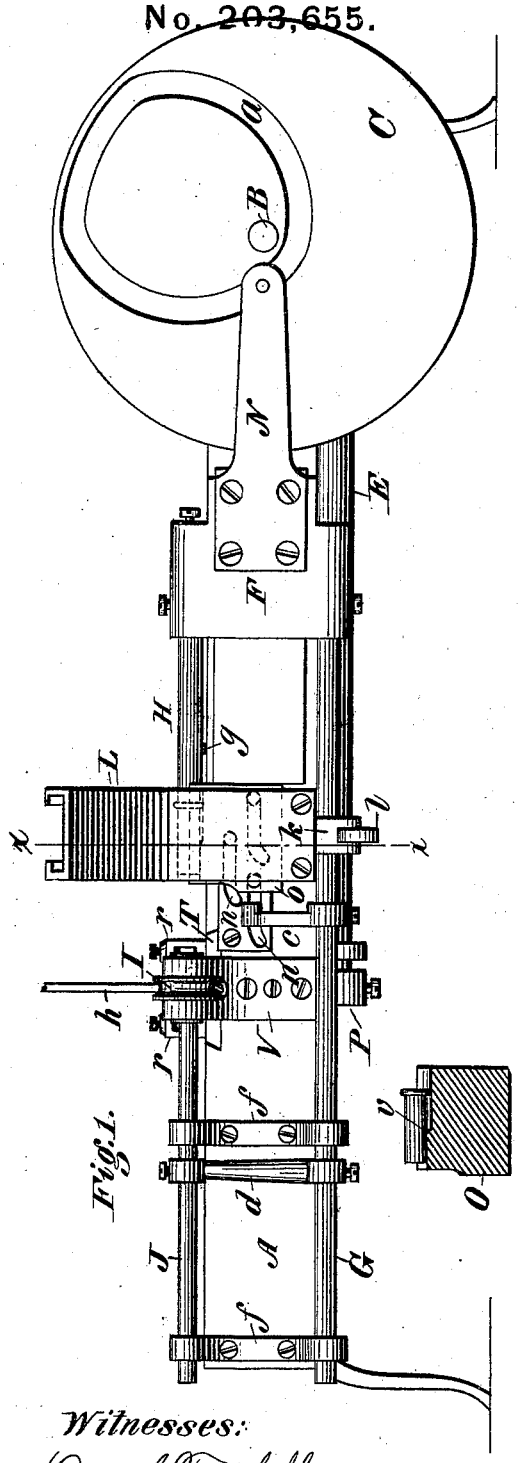

Fig. 1.

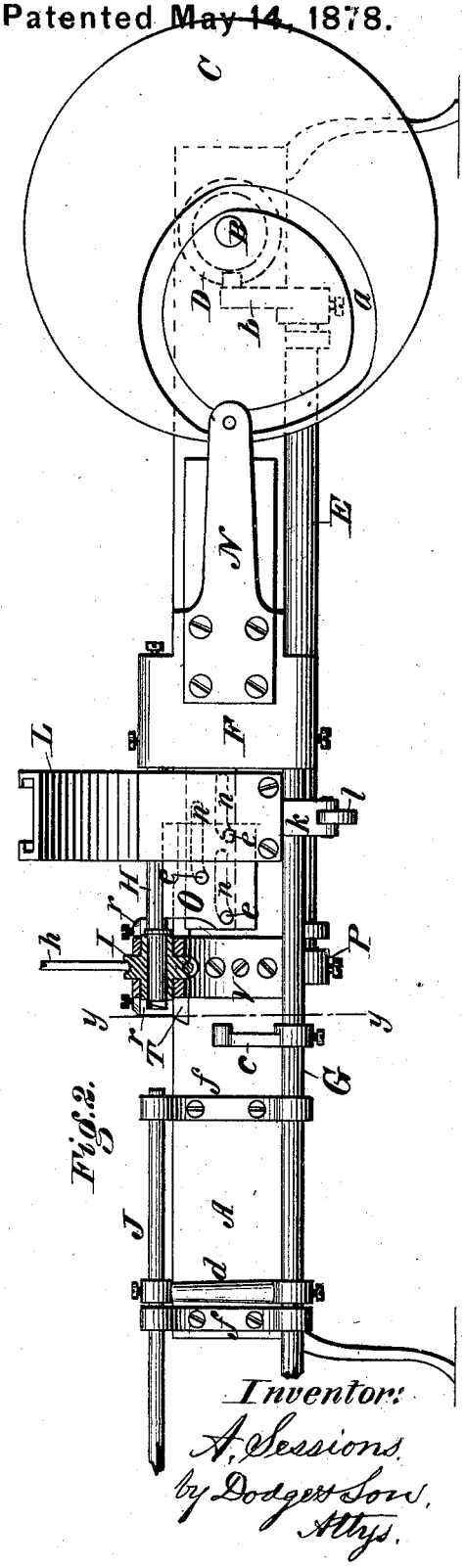

Fig. 2.

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Fig. 3.

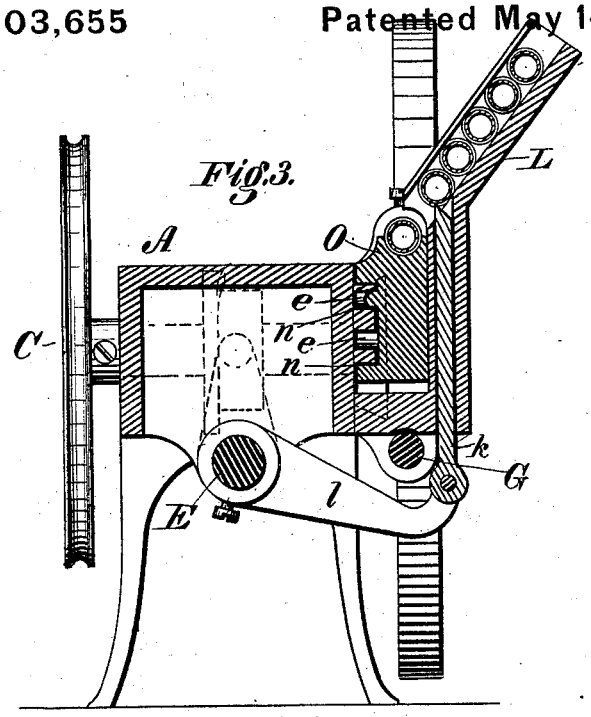
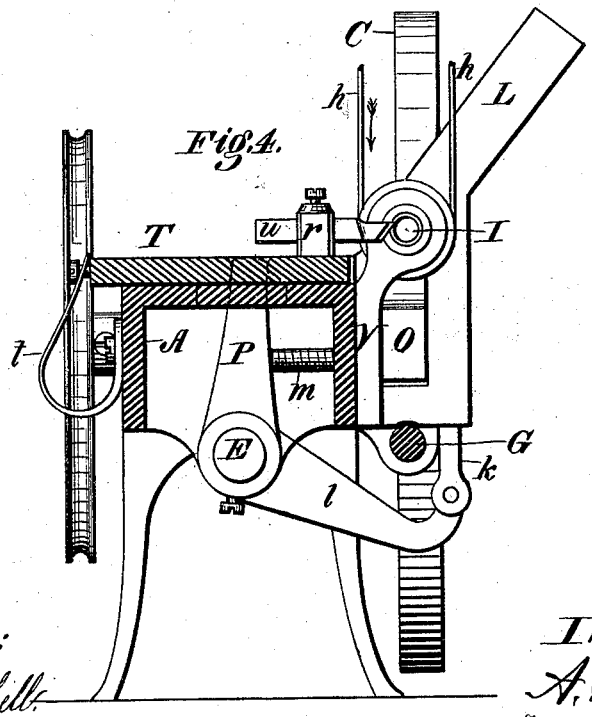


Fig. 4.



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UNITED STATES PATENT OFFICE.

ASA SESSIONS, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE WINCHESTER REPEATING ARMS COMPANY, OF SAME PLACE.

IMPROVEMENT IN CARTRIDGE-TRIMMING MACHINES.

Specification forming part of Letters Patent No. **203,655**, dated May 14, 1878; application filed March 23, 1878.

To all whom it may concern:

Be it known that I, ASA SESSIONS, of New Haven, in the county of New Haven and State of Connecticut, have invented certain Improvements in Cartridge-Trimming Machines, of which the following is a specification:

My invention consists of a machine having devices so arranged as to automatically feed cartridge-shells from a reservoir or chute into a revolving die or chuck, which holds them while tools advance and trim both the open end of the shell and the head thereof, and then automatically removes the finished shell from the die or chuck, as hereinafter more fully described.

Figure 1 is a front elevation of the machine, showing the moving parts drawn back to receive a shell while the finished one is being removed. Fig. 2 is a similar view, showing the parts in the reverse position. Figs. 3 and 4 are transverse vertical sections taken on the lines *x x* and *y y*, respectively.

Machines have been heretofore made of various kinds for trimming or cutting off the open end of cartridge-shells; but as a general rule it has not been customary to trim the flanges or heads of shells, nor the mouths or open ends of the same after they have been headed.

In the formation of what are known as "solid-headed shells" it is difficult to so gage or adjust the tools and the shell as to always get in the head of the shell the exact quantity of metal required to just fill the die, and no more; and the result is that sometimes the flange is too large and at others too small. If too large, the shell will not enter the gun, and if too small the extractor is apt to slip off, thus leaving the shell in the gun. So, too, it sometimes happens that the mouth or open end of the shell is bruised or injured in the operation of the forming of the head, or that the shells will vary slightly in length after their heads have been formed, owing to the fact of there being too much or too little metal in the head.

The object of this invention, therefore, is to provide a machine that will automatically trim either the head or mouth of the shells, or do both at once, if desired.

In constructing a machine for this purpose I provide a frame or bed, A, preferably cast in a single solid piece, and at one end mount a transverse shaft, B, on which is secured at one end a wheel, C, having a cam-groove, *a*, in its face, as shown in Figs. 1 and 2. On this same shaft, underneath the bed, as indicated in dotted lines in Fig. 2, I mount a wheel, D, which has on one side a cam, which bears against an arm, *b*, which is secured to the end of a rock-shaft, E, mounted in suitable bearings underneath and lengthwise of the bed A, as shown in the drawings.

Upon one side of the bed is secured a bracket, V, in the upper end of which is mounted a tubular die or shell-holder, I, the central periphery of which is made into or has secured to it a pulley, so that by means of a cord, *h*, a rapid rotary motion may be imparted to this shell-holder, the cord being driven from any suitable power or line of shafting.

At one side of the die or shell holder I is secured an upright inclined guide or chute, L, which has an inwardly-projecting flange on each side of its upper face, so as to hold the shells therein, as represented in Fig. 3, and permit them to slide down in regular order when released. To regulate their feed, a slide, *k*, Fig. 3, is arranged to work up through an opening in the lower part of the chute L, this slide being operated by an arm, *l*, secured to the rock-shaft E.

Upon the side of the bed is mounted a reciprocating cross head or slide, F, which works on or in suitable guides, it being connected by an arm or bar, N, to the cam-groove *a* in wheel C, as shown in Figs. 1 and 2, by which there is imparted to it an intermittent reciprocating movement. To the lower part of the cross-head F is secured a rod, G, which works in guides *f*, secured to the side of the frame, and on this rod G is secured an arm, *d*, which carries a sliding rod, J, that also works in guides so arranged as to make the rod J move in line with and enter the die or shell-holder I. To the upper part of the cross-head F is secured another rod, H, Figs. 1 and 2, which is also arranged to be and move in line with the die I, each of these rods J and H being adjustable to and from the die I.

Upon the side of the frame, and between it and the vertical support of the guide or chute

L, I locate a slide, O, Fig. 3, the upper edge of which is hollowed out or made cancave, of the proper size to receive and hold a shell as the latter drops from the chute L upon this block or carrier O, which is arranged to come under the lower end of the chute for that purpose. From the face of this block or carrier O project a series of pins, *e*, as shown in Figs. 2 and 3, which work in curved slots *n* in the frame A, or in a plate secured thereto, by which it is guided in its to-and-fro movements, it dropping slightly as it approaches the die or shell holder I, and rising as it recedes therefrom. This carrier O is shoved toward the die-holder I, at the proper time, by a pin or projection, *g*, on the under side of rod H, and is moved in the opposite direction by an arm, *c*, secured to the lower rod G, as shown in Figs. 1 and 2.

Upon the face of the bed A, directly opposite the shell-holder I, is located a reciprocating slide, T, Figs. 1, 2, and 3, it being arranged to move with accuracy to and from the shell-holder I transversely of the bed. It is driven forward by an arm, P, secured to the rock-shaft E, Fig. 4, and is forced back by a spring, *t*, as shown.

A set-screw, *m*, is arranged in front of the arm P, as shown in Fig. 4, by which the throw of the arm and consequent movement of the tool-slide T with its tools are adjusted or regulated at will by setting the screw, and then adjusting the arm P to it. Upon this slide are mounted two tool-posts, *r*, Fig. 4, which, as shown in Figs. 1 and 2, are arranged so as to be one at each end of the shell-holder or die I, and each of which is arranged to carry a chisel or cutting-tool, *u*, as represented in Fig. 4.

The operation of the machine is as follows: Motion being imparted to it, and the chute L being filled with the shells to be trimmed, as the slide *k* is drawn down a shell drops down upon the top of the carrier O, when the rod or punch H advances and shoves the shell forward upon the carrier, so as to cause its open end to project some distance beyond the face or edge of the carrier, at which instant the rod imparts its forward motion to the carrier also by means of the pin or projection *g*, which strikes against its rear edge. The carrier advances in a straight line far enough to cause the open end of the shell to enter some little distance into the shell-holder I, when the curvature or incline at the end of the slots *n* permits the carrier O to drop away from the shell, while the rod H shoves the latter entirely into the revolving die I, the head of the shell protruding at one end of the latter, and its mouth projecting slightly at the other end. At this instant the tool-slide T advances, and the tool or cutter *u* at one side trims the head, while that at the other side trims the end or mouth of the shell. As this operation is completed the cross-head is drawn back, carrying with it the rod H and the carrier O, at the same time causing the rod or punch J to enter the shell-holder I and push out the shell thus trimmed, and this operation is repeated at each revolution of the wheel C.

It will be understood that the shell-holder or die I rotates continuously, and is to be made with its central opening of such a size and form as to hold the shell firmly when the latter is pushed into it. The tools or cutters *u* may both be used at once, or either one alone, and thus the machine may be made to trim both ends of the shell simultaneously, or either end alone. By giving to the cutter which trims the head the proper shape and adjustment, it is obvious that it may be made to operate either upon the periphery or on the face of the head of the shell, or upon both at once, and thus make the heads of all the shells of precisely the same shape and size.

It will be observed by examining the detached figure of the carrier O that its concave face is not uniform, but is slightly raised for about one-third of its length on the side next to the shell-holder I, so that as the shell rests thereon it will be held in a line with the axis of the shell-holder, its forward portion resting on the raised part, while the flange or head of the shell will rest on the depressed portion of the carrier, and thus the shell is held in the position necessary to enable it to enter the shell-holder I as it is carried forward.

It will be easy to adapt the machine to trim cartridges of various sizes, if required, by simply changing the shell-holder I, the chute L, and carrier O, which latter may have its upper portion made separate, so as to be removed and replaced by another of different size at will without removing the body of it. Of course, it will also be necessary to change and properly adjust the rods H and J, and to properly adjust the cutters or tools *u;* but where there is much work to be performed it will be better to make several machines of different sizes, each being adapted to a cartridge of a particular size.

It is obvious that various means may be used to impart the requisite movements to the several parts other than those here shown, and therefore I do not limit myself to the precise means or arrangement of devices, but propose to use any known mechanical means by which the several parts may be made to operate in the manner described.

The method or means shown are exceedingly simple, there being but two wheels or cams, both mounted on the same shaft, so that when the parts are once adjusted the movements are sure to be in perfect accord, each part coming into operation precisely at the required instant, and the parts not being likely to get out of order. This enables the machine to be run at a comparatively high speed, and at the same time perform its work with accuracy.

Having thus described my invention, what I claim is—

1. The combination, in a cartridge-trimming machine, of the feeding-chute L, provid-

ed with the stop *k*, the carrier O, and rotating chuck I with the reciprocating punches H and J, all arranged to operate substantially as described.

2. The combination of the rotating shell-holder or chuck I, the carrier O, arranged to move in line with the opening of the chuck, and the reciprocating rods J and H, all arranged to operate substantially as described.

3. In combination with the rotating chuck I, the transversely-moving slide T, provided with suitable tool-holders *r r*, whereby the shells may be automatically trimmed at both ends simultaneously, substantially as described.

4. In a cartridge-trimming machine, the carrier O, provided with the ledge V, arranged to receive a shell from the chute L and carry it in a straight line to the chuck I, and after the end of the shell has entered the chuck drop by gravity and allow the shell to be pushed into the chuck, as set forth.

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