

(No Model.)

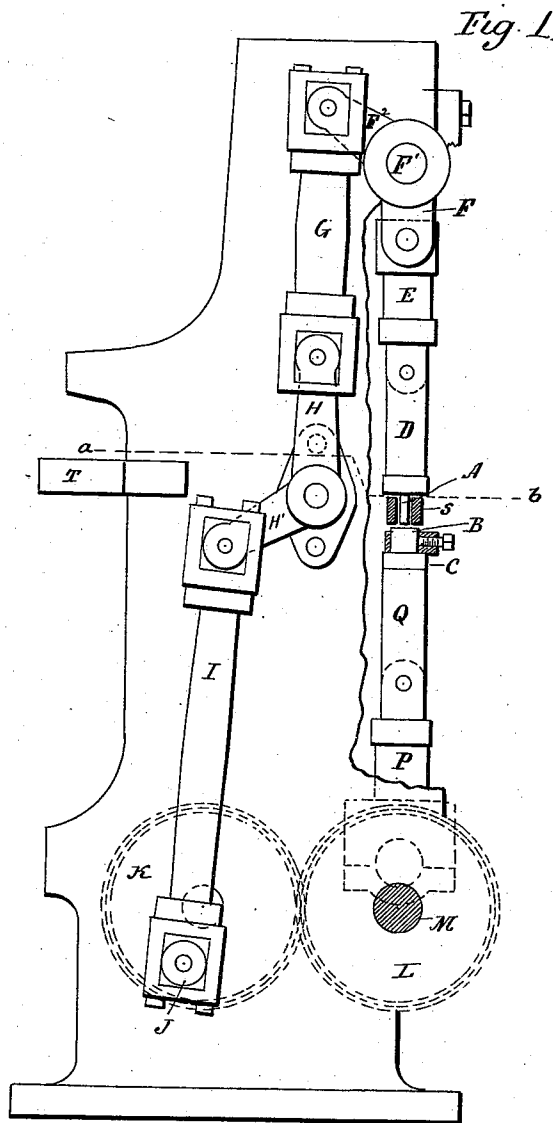
4 Sheets—Sheet 1.

W. MASON.

MACHINE FOR HEADING SHEET METAL SHELLS FOR CARTRIDGES.

No. 548,882.

Patented Oct. 29, 1895.



Witnessed
J. H. Shumway
Lillian D. Kellogg

William Mason
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(No Model.)

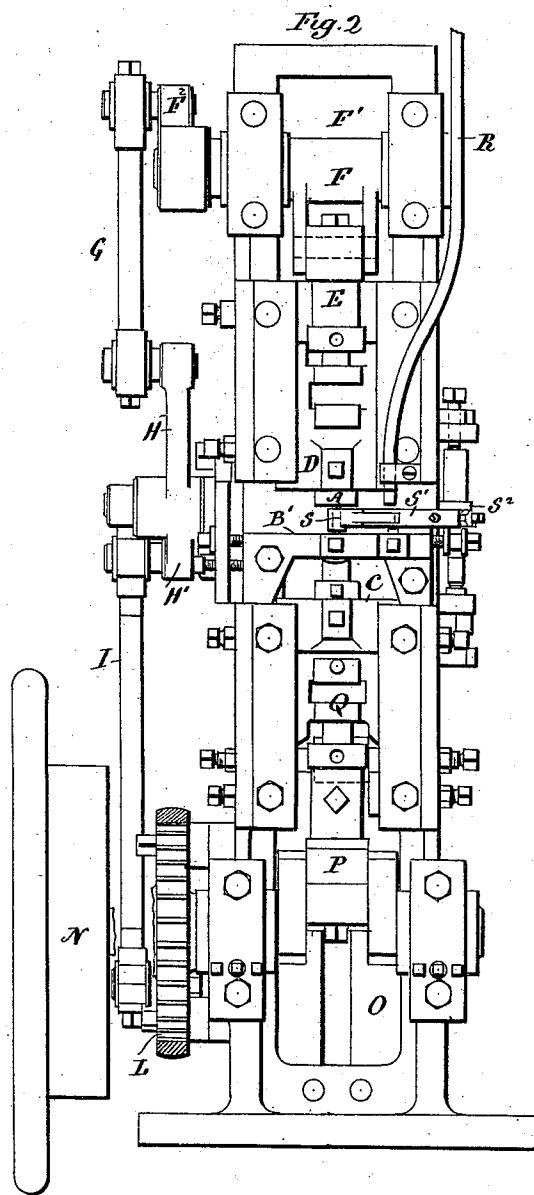
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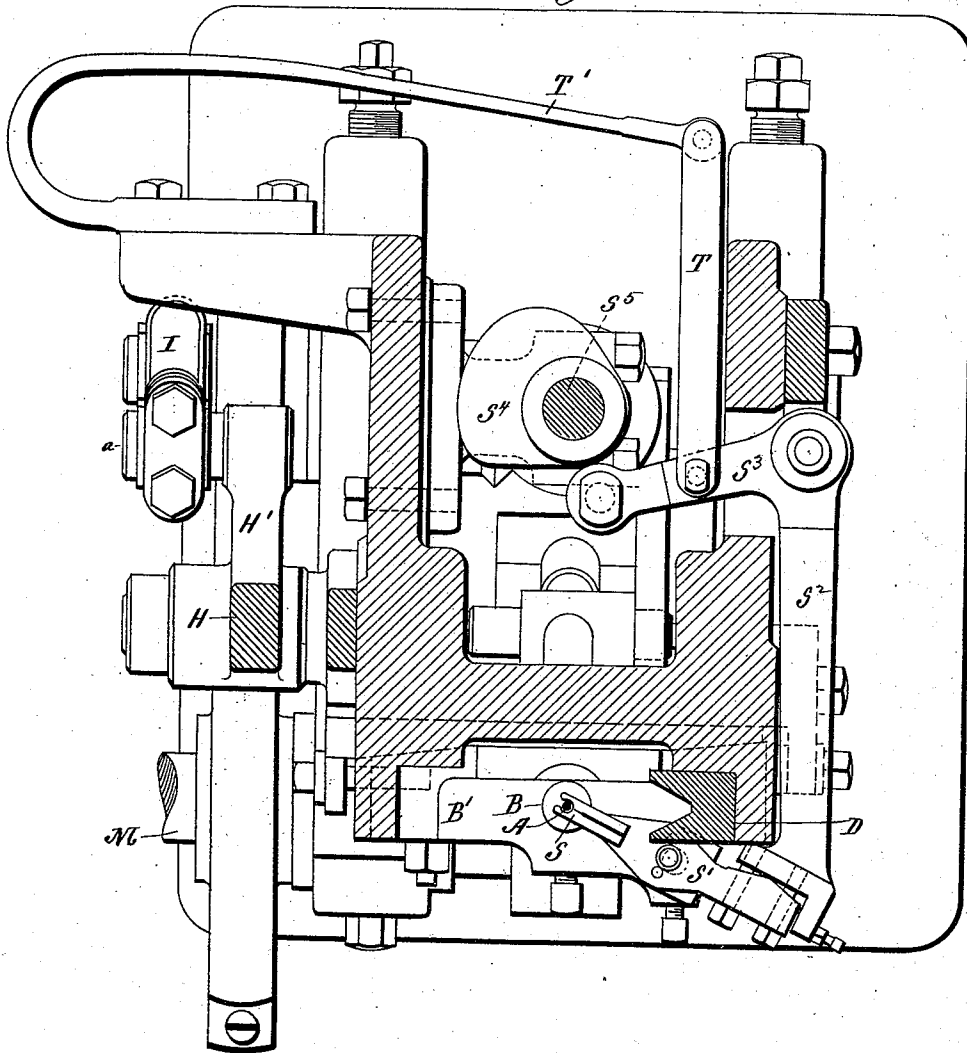
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Fig. 3.



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Fig. 4.

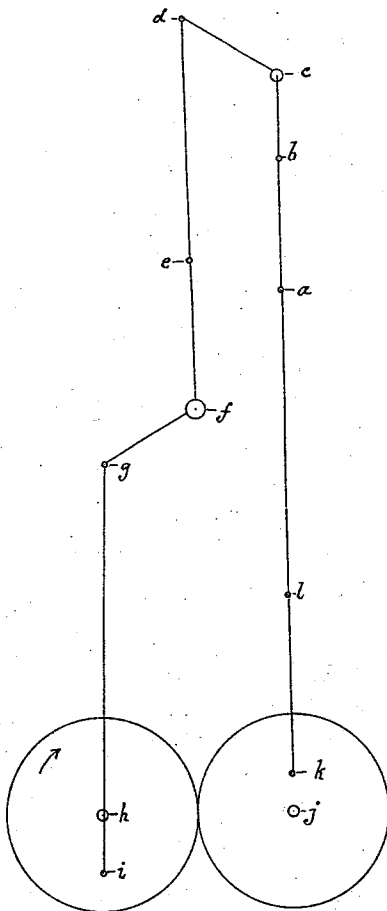
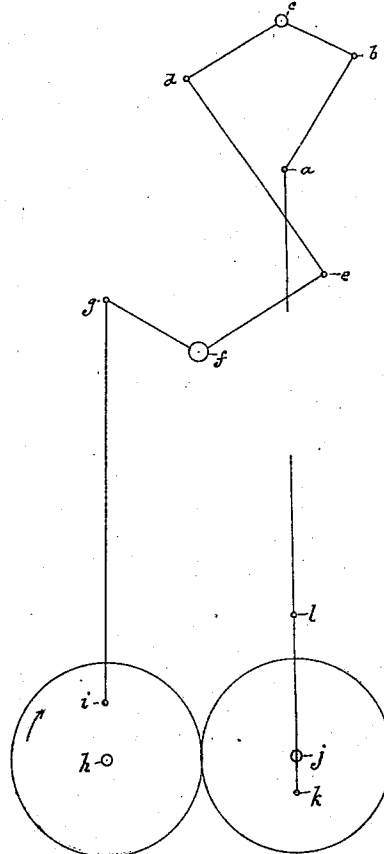


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM MASON, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE
WINCHESTER REPEATING ARMS COMPANY, OF SAME PLACE.

MACHINE FOR HEADING SHEET-METAL SHELLS FOR CARTRIDGES.

SPECIFICATION forming part of Letters Patent No. 548,882, dated October 29, 1895.

Application filed December 8, 1894. Serial No. 531,217. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MASON, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machines for Heading Sheet-Metal Shells for Cartridges; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of a heading-machine constructed in accordance with my invention; Fig. 2, a view thereof in front elevation; Fig. 3, an enlarged view, partly in plan and partly in horizontal section, on the line *ab* of Fig. 1; Figs. 4 and 5, diagrams showing the positions of the elements of the operating-train of the punch when the same is in its lowest and highest positions.

My invention relates to an improvement in machines for heading sheet-metal shells for cartridges, the object being to produce a simple and compact machine constructed with particular reference to avoidance of wear.

With these ends in view my invention consists in a machine having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention I employ a punch A, a die B, through which the said punch plays, a long transversely-arranged die-block B', in which the die is mounted, and a bunter C, all of the said parts being of any approved construction. Both the punch A and bunter C are reciprocated toward and away from each other; and the particular object of my invention is to provide simple and durable means whereby the punch may be moved through the die and toward the bunter and caused to pause while the same comes up to it and heads against the die the blank shell, which the punch has forced into the die. With that end in view I mount the punch in the lower end of a sliding gate D, the upper end of which is jointed to the lower end of a

short connecting-rod E, the upper end of which is jointed to the lower crank F of the double-crank shaft F', the upper crank F² whereof is connected with the upper end of a connecting-rod G, the lower end of which is connected with the the upper arm H of an angle-lever, the lower arm H' of which lever is connected with the upper end of a long connecting-rod I, the lower end of which rod is connected with a crank-pin J, carried by the gear K, which meshes into a gear L, mounted on the driving-shaft M, which carries a driving-pulley N. The said operating connections of the punch virtually form a train, which, it will be noted, contains no cams, but is composed of levers and rods or links. A rotating crank O, also mounted on the driving-shaft M, is jointed to the lower end of a connecting-rod P, the upper end of which is jointed to a reciprocating gate Q, in the upper end of which the bunter C is carried.

Although the train comprising the parts by means of which the punch A is actuated contains my present invention, I will, before proceeding to describe with further particularity that feature of the machine, point out that in the machine herein shown the blank shells are fed down into the machine through a tube R, the lower end of which presents them to a pair of spring-jaws S, of known construction, the said jaws being mounted in a head S', secured to the forward end of a feed-lever S², the rear end of which is furnished with an inwardly-projecting arm S³, which is engaged for the actuation of the lever by means of a cam S⁴, mounted upon an upright shaft S⁵, which is driven in any suitable manner from the shaft M. A link T, connected at its forward end with the arm S³, is connected at its rear end with a heavy spring T', which acts in opposition to the cam S⁴. It is thought it will be sufficient to say in this connection that the cam S⁴ operates upon the arm S³ to throw the same forward, and hence move the arm S² and the jaws S outward when they take a shell from the lower end of the tube, after which the spring T immediately swings the feed-lever inward, causing the shell to be

presented by the jaws S between the punch and the die, over which the jaws swing; but I do not limit myself to any particular means for feeding the blank shells to the punch and die, nor to any particular means for reciprocating the bunter.

The principle upon which the operating connections of the punch is arranged will be understood by reference to the diagrams forming Figs. 4 and 5 of the drawings, and respectively showing the positions of the joints of the said connections when the punch is in its lowest and highest positions. In these diagrams, *a* represents the joint between the upper end of the gate D and the short connecting-rod E; *b*, the joint between the upper end of the short connecting-rod E and the lower crank F of the double-crank shaft, which is represented by *c*. *d* represents the joint between the upper crank of the said shaft and the upper end of the connecting-rod G; *e*, the joint between the lower end of the connecting-rod G and the upper arm H of the angle-lever; *f*, the stud on which the angle-lever turns; *g*, the joint between the lower arm H' of the angle-lever and the upper end of the connecting-rod I; *h*, the center of the gear K; *i*, the crank-pin connecting the lower end of the connecting-rod I with the gear K; *j*, the driving-shaft, which has previously been lettered M; *k*, the joint between the rotary crank O and the lower end of the connecting-rod P, and *l* the joint between the upper end of the connecting-rod P and the lower end of the gate Q, carrying the bunter C. It will be observed by reference to Fig. 4, which represents the parts when the punch is in its lowest position, that at that time the points *a*, *b*, and *c* are in line with each other, also the points *g*, *h*, and *i* and the points *j*, *k*, and *l*, but that the points *d*, *e*, and *f* are slightly out of line.

I might construct the machine so that the points *d*, *e*, and *f* would be in line at the same time that the other points are; but by constructing the machine so that the said points *d*, *e*, and *f* will be out of line when the punch A is close to its very lowest position I virtually increase the duration of its pause. Under the construction shown and described the punch will be moved to the extreme limit of its depressed position and momentarily held there while the bunter does its work of heading the blank shell against the die. Then the punch is almost inappreciably lifted, while the point *e* is crossing the imaginary straight line joining the points *d* and *f*; then returns to its extreme lowest position, which it reaches when the point *e* returns to alignment with the said points *d* and *f*, and then rises to its elevated position, as shown in Fig. 5, which does not need particular description, more than to say that it represents the parts when the punch is in its highest position. If the bunter acted on the shell before the punch reached its extreme lowest position, the work

would be done while the bunter and punch were approaching each other, which would impose unnecessary strain on the punch.

By arranging the operating connections of the punch on the principle shown and described I am enabled to readily obtain all of the pause required for the punch in a construction in which strain and wear are reduced to the minimum, and hence most desirable in machines of this class, which are run at a high rate of speed. Furthermore, the links hold the required lubricant readily and are capable of adjustment and wear less than cams.

It is apparent that in carrying out my invention some changes in the construction and arrangement of parts may be made, and I would therefore have it understood that I do not limit myself to the exact construction shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention. Thus the number and arrangement of parts in the train employed for operating the punch may be considerably varied without departing from my invention; but however the train is composed it will be constructed so that its moving centers will be moving at their minimum rate, and therefore transmitting the minimum movement to the punch when the same is in position to coact with the bunter, the entire thrust of which, it will be noted, is borne by the train itself.

I do not broadly claim a camless machine for heading metallic cartridge-shells; nor a machine in which the tools are operated by cranks and connecting-rods, but only a camless machine in which the punch makes one movement for every movement of the bunter and is sustained in its operating position by means of the alignment of the operating connections immediately connected with it.

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

1. In a machine for heading blank sheet-metal shells for cartridges, the combination with a punch and die, and a bunter, of means for reciprocating the latter, and camless power connections for reciprocating the punch, and constructed and arranged to cause it to pause when it reaches its lowest, or substantially lowest, position when the bunter co-acts with it, and to form the sole means of resisting the thrust of the bunter, the said connections, including a series of parts arranged in a train and jointed together so that the moving centers of the train will be moving at their minimum rate of speed, and therefore transmit the minimum movement to the punch, when the same is in position to co-act with the bunter, substantially as described.

2. In a machine for heading blank sheet-metal shells for cartridges, the combination with a punch and a die and a bunter, of means for reciprocating the latter, and power con-

nections for reciprocating the punch and causing it to pause when it reaches its lowest position, the said connections consisting of a gate D, a connecting-rod E, a double crank-shaft F', having cranks F and F², a connecting-rod G, an angle-lever having arms H and H', a connecting-rod I, and means for driving the same, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM MASON.

Witnesses:

FRED C. EARLE,
LILLIAN D. KELSEY.