

(No Model.)

3 Sheets—Sheet 1.

J. F. McGRAIL.

MACHINE FOR SWAGING AND CREASING BULLETS.

No. 481,731.

Patented Aug. 30, 1892.

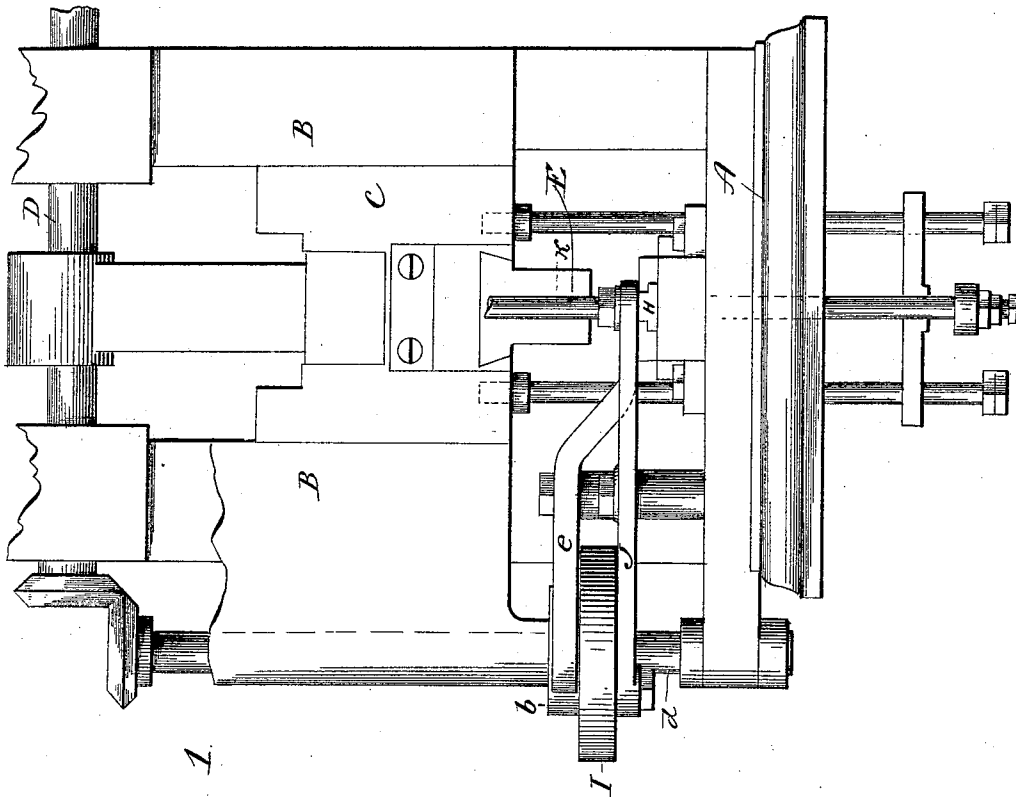


Fig 1.

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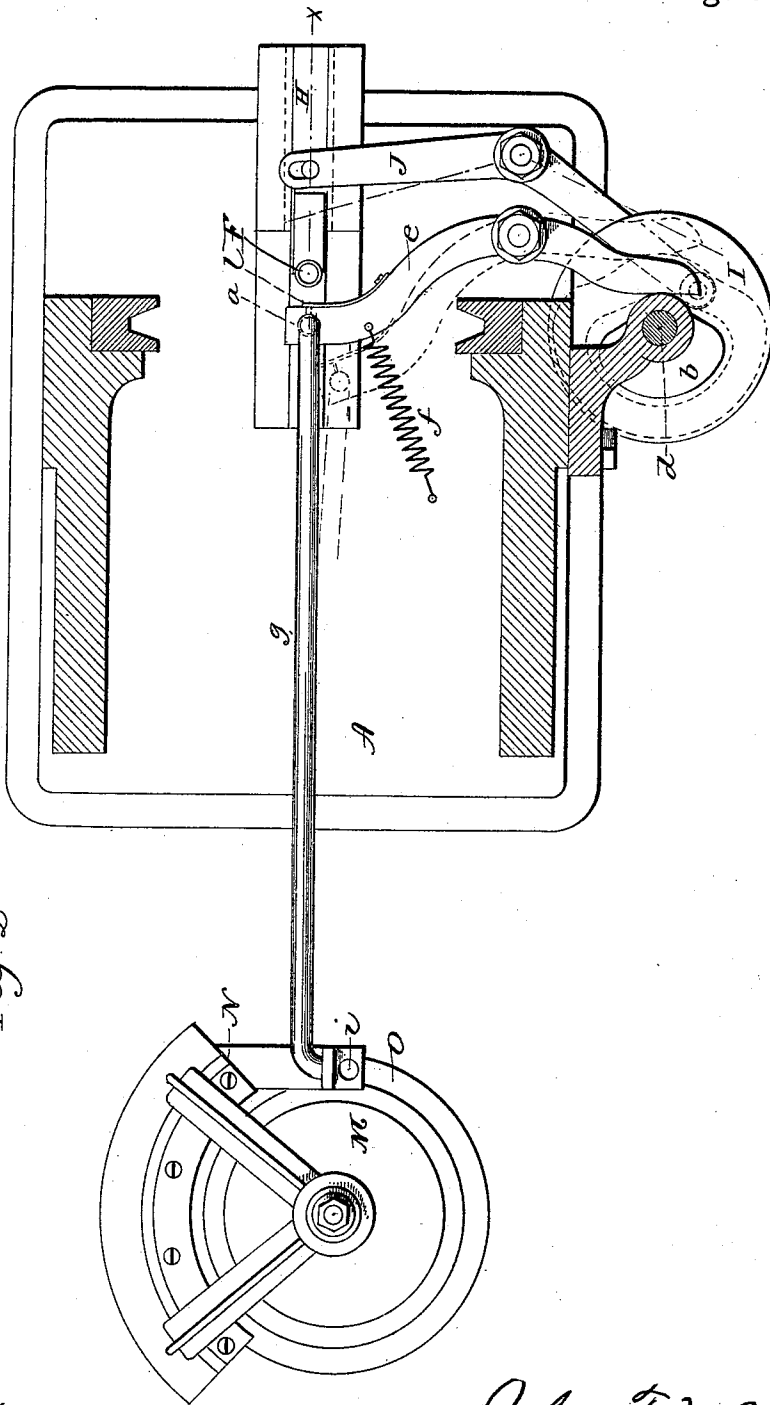


Fig. 2

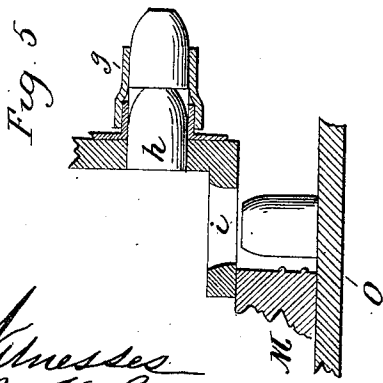
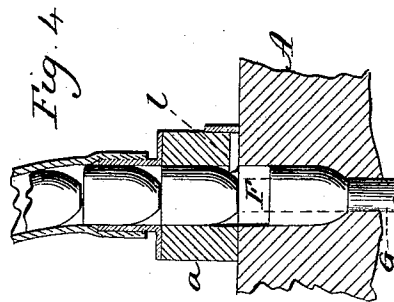
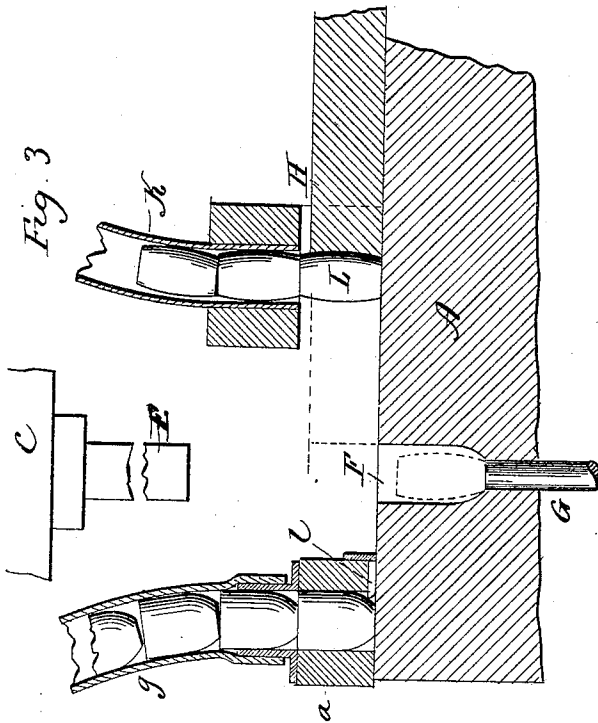
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UNITED STATES PATENT OFFICE.

JOHN F. McGRAIL, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE WINCHESTER REPEATING ARMS COMPANY, OF SAME PLACE.

MACHINE FOR SWAGING AND CREASING BULLETS.

SPECIFICATION forming part of Letters Patent No. 481,731, dated August 30, 1892.

Application filed September 7, 1891. Serial No. 404,940. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. McGRAIL, of New Haven, in the county of New Haven and State of Connecticut, have invented a new
5 Improvement in Machines for Swaging and Creasing Bullets; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and
10 exact description of the same, which said drawings constitute part of this specification, and represent, in—

Figure 1, a front view of so much of the swaging-machine as is necessary to illustrate
15 the invention; Fig. 2, a plan view of the swaging-machine in partial horizontal section and of the creaser, showing so much of each machine as necessary to the understanding of the invention and also showing the conductor
20 and its mechanism for delivering the swaged bullets from the swaging-machine to the creaser; Fig. 3, a vertical central section through the swaging-die, through the blank-delivering slide, and through the receiving
25 slide and tube, showing the receiving-tube in its normal position; Fig. 4, the receiving-tube as arranged to receive a bullet from the swaging-die; Fig. 5, a vertical section of a portion of the creaser and the end of the delivering-tube at the creaser, illustrating the manner of successively delivering the bullets to
30 the creaser.

This invention relates to an improvement in machinery for the manufacture of bullets.
35 In the usual method of manufacturing bullets a machine is employed which is adapted to receive the lead blanks and present them to the dies to be swaged into shape. The swaged blank has heretofore been taken from
40 the machine and delivered by hand to the creasing-machine, thus necessitating the presence of an attendant between the two machines to properly deliver the swaged blanks to the creaser.

The object of my invention is to combine
45 with the two machines a device for automatically transferring the swaged blanks to the creaser, and in such a device, as more fully hereinafter described, and particularly recited
50 in the claim, my invention consists.

A represents the bed of the bullet-swaging

machine, in which, between vertical guides B
B, the gate or slide C is arranged to reciprocate, such reciprocation being imparted to the
55 slide from an eccentric on the driving-shaft D, the slide carrying the swaging-punch E, and the die F, arranged in the bed below, the die being of a shape corresponding to the outer surface of the bullet and so that, the
60 lead blank having been introduced into the die, the slide C descends, bringing the punch E upon the blank, so as to swage it into the required shape.

Beneath the die and in line therewith is a
65 vertically-reciprocating follower G, the upper end of which in operation forms the bottom of the die, as seen in Fig. 3, so that after the bullet has been swaged and the punch E withdrawn the follower G rises and forces the
70 swaged bullet up out of the die and then returns, preparatory to receiving the second blank.

H represents a slide arranged to reciprocate in a path at right angles to the path of
75 the punch E and so as to be moved inward over the die F, as indicated in broken lines, Fig. 3, or withdrawn therefrom to its normal position, as shown in that figure. Reciprocating movement is imparted to the slide H
80 by means of a cam I through a lever J. (See Fig. 2.)

A conductor K leads to the slide H when in its normal position, as seen in Fig. 3, and through which the blanks are conducted to the slide, so that one, as L, will fall therein
85 when the slide H stands beneath the conductor, as represented in Fig. 3, and which blank upon the next advance of the slide H will be presented over the die F, so that the
90 blank L may drop into that die, the slide returning before the punch E descends. The punch E having operated upon the blank the follower G rises and forces the swaged bullet from the die, as before described. So far the machine is a common and well-
95 known construction. The bullets thus swaged require that the annular creases shall be formed therein, and this is done upon a separate machine, that machine being represented in Fig. 2, M representing the disk arranged
100 to revolve in a horizontal plane, between which and the segment N the bullets are pre-

sented, the edge of the disk and segment having annular ribs thereon adapted to impress the creases into the bullets. Below the disk M is a revolving table O, upon which the
 5 bullets are set with their base downward, and which serves to carry the bullets into the space between the disk M and the segment N. This machine is too well known to require
 detailed description. As before stated, the
 10 bullets have been taken from the swaging-machine by hand and set with their base downward upon the creaser, so as to be operated upon thereby. To avoid this hand
 labor and make the transfer automatic, the
 15 swaging-machine is provided with a slide *a*, arranged to reciprocate in a path at right angles to the path of the punch E and similar to the slide H, so that the slide *a* may be
 moved in over the die F, as seen in Fig. 4, or
 20 withdrawn therefrom, as seen in Fig. 3, which shows the slide in its normal position. The reciprocating movement is imparted to the slide *a* by means of a cam *b* on the shaft *d*,
 being the same shaft as that upon which the
 25 cam I is arranged, this cam operating upon a lever *e* to take the slide into a position over the die, as seen in Fig. 4. A spring *f* is provided to return the slide to the position
 seen in Fig. 3. The time for the presentation of
 30 the slide *a* over the die is after the punch E has risen from the swaging operation and before the follower G rises. Hence when the follower G rises it will force the bullet which
 has been swaged up into the slide *a*, as represented in Fig. 4. Then the slide *a* returns
 35 it to its normal position, as seen in Fig. 3. From the upper side of the slide *a* a tube *g* leads to the creaser as a conductor for the bullets. This tube is flexible sufficient to permit
 the movement of the slide without de-
 40 rangling the tube as a conductor. There will therefore be a column of bullets within the tube, each successive swaged bullet raised therein pressing the column upward and forward
 through the tube *g* to the extent of the
 45 last bullet introduced. The tube or conductor *g* leads to the creaser, as seen in Fig. 2, so as to conduct the swaged bullets to the creaser. At the creaser and in order to bring
 the bullets into proper position thereon the
 50 tube *g* opens horizontally, as seen in Fig. 5, and is supported on a bracket on the creaser, the bracket having a horizontal opening *h*, corresponding to the tube, and over the disk
 O is a like opening *i*, in line with the opening
 55 *h* from the tube, (see Fig. 5,) so that a bullet discharged from the tube *g* through the opening *h* will drop with its base downward through the opening *i* onto the disk O,

as represented in Fig. 5, from whence it will
 60 be carried between the creasing disk and segment. As each successive bullet is introduced into the tube *g*, a bullet at the other end of the column will be discharged into the
 creaser, and thus, the swaging operation being
 65 continuous the supply to the creasing-machine will be equally so, and this without the interposition of hand labor between the two machines, practically combining the two
 machines as one automatic machine. To engage
 70 the bullet which is introduced into the slide *a*, so as to prevent its return into the die as the follower G descends, a spring-latch *l* is arranged upon the under side of the slide
 a, which will yield as the bullet rises and return
 75 when the bullet is completely raised, so as to hold the column of bullets against return movement, the nose of the latch being beveled upon the under side, so that the rising bullet
 will readily force the latch out of the path of
 80 the bullet, the spring of the latch permitting it to return as soon as the smaller portion or point of the bullet shall have passed above the latch. In case the follower G is arranged
 to stand in its up position flush with the surface
 85 on which the slide *a* moves and so that the slide *a* may take the bullet directly from the end of the follower onto the surface beneath the slide the latch *l* may be dispensed with.

I claim—

In an apparatus for swaging and creasing
 90 bullets, the combination of the swaging die and punch, a reciprocating follower adapted to work up and down through the die, a slide arranged to reciprocate in a path at right
 angles to the path of the punch and between
 95 the punch and die, the slide having an opening through it of a diameter corresponding substantially to the diameter of the swaged bullet and so that when the said slide is presented
 over the die the upward movement of
 100 the follower in the die will force a swaged bullet from the die into said slide, a tube leading from the upper side of said slide and terminating at an opening to the creaser,
 substantially as described, whereby the swaged
 105 bullets delivered from the die through said slide form a column in the tube, which automatically conducts and delivers the said bullets successively to the creaser.

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

JOHN F. McGRAIL.

Witnesses:

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