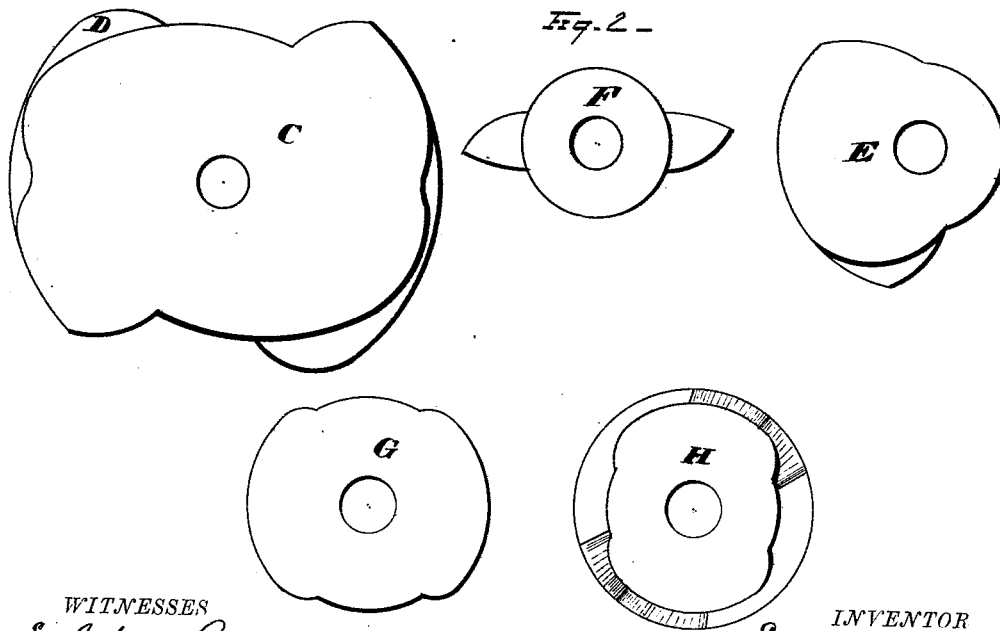
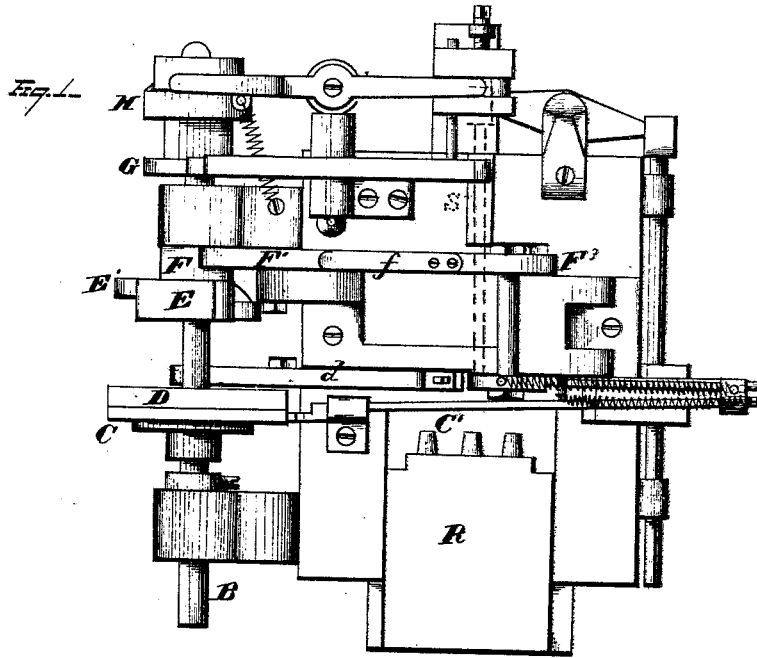


E. E. PIERCE.

MACHINES FOR MAKING RIVETS, &c.

No. 181,101.

Patented Aug. 15, 1876.



WITNESSES  
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# UNITED STATES PATENT OFFICE

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## IMPROVEMENT IN MACHINES FOR MAKING RIVETS, &c.

Specification forming part of Letters Patent No. **181,101**, dated August 15, 1876; application filed June 5, 1876.

*To all whom it may concern:*

Be it known that I, ERASTUS E. PIERCE, of Cuyahoga Falls, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Machinery for Making Rivets, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to machinery for making rivets, screw-blanks, &c.

In the drawing, Figure 1 is a plan view of a machine embodying my invention; Fig. 2, a side elevation of the cams on the main shaft, with their attachments; Fig. 3, a view part in section and part in side elevation. Fig. 4 represents detached views of certain parts of my device.

My invention consists of the following parts and combinations, as hereinafter specified and claimed, wherein A is a suitable frame, whereto is attached and wherein operates the various parts of the machine hereinafter to be described. B is the shaft to which power is applied for operating the machine. Upon this shaft are attached cams C, D, E, F, G, and H, which communicate proper motion at proper times to the various parts of my device, as will hereinafter more fully appear. All of these cams, except cam E, are double cams, performing the same operation twice by a single revolution. The cam C operates, through its arm or connection C<sup>1</sup>, to impart a reciprocating motion to the carrier C<sup>2</sup>. The carrier C<sup>2</sup> itself is upon the end of a rocking arm, pivoted at c to a reciprocating frame, c<sup>1</sup>, operated by the arm C<sup>1</sup>. The throw of the carrier is limited in one direction by the set-screw c<sup>2</sup>, and in the other direction by the set-screw c<sup>3</sup>. By the adjustment of these set-screws the carrier C<sup>2</sup> is made to travel exactly the distance desired. A spring or its equivalent is provided for the arm C<sup>1</sup>, whereby said arm is arranged in its proper position and relation to its neighboring parts. The rocking carrier-arm, which is pivoted at c, also has a spring, whereby the carrier may be returned to its elevated position after having been depressed,

as will hereinafter more fully appear. The office of cam D is to operate the fingers D<sup>1</sup> D<sup>2</sup>. The finger D<sup>1</sup> is stiff and stationary, while the finger D<sup>2</sup> is a spring. Either finger D<sup>1</sup> or D<sup>2</sup> near its end may be provided with a slot, excavation, or notch, whereby the body of the rivet may be grasped and securely held; preferably this should be held in D<sup>2</sup>. By the yielding of the spring-finger D<sup>2</sup> the rivet may be grasped between the fingers, and securely held as long as necessary. The fingers D<sup>1</sup> D<sup>2</sup> are carried at the end of a rocking lever, d, pivoted at d<sup>1</sup>. The cam D, operating the rear arm of the lever d, imparts proper motion to the fingers D<sup>1</sup> D<sup>2</sup>, as will hereinafter more fully appear. A spring, d<sup>2</sup>, or its equivalent, serves to give the proper return motion to the lever d after having been operated by the cam D. The cam E imparts a rocking motion to the lever E<sup>1</sup>. The arm of the lever E<sup>1</sup> that engages with the cam E is forked in such a manner as to present a branch upon each side of said cam E, thereby receiving motion in both directions by said cam. The reciprocating motion imparted to the lever E<sup>1</sup> by the cam E is communicated to the sliding arm E<sup>2</sup>, which moves in suitable guides attached to the frame A. To this arm is connected, by suitable joint or pivot, the lever E<sup>3</sup>, carrying the dies or recesses e e<sup>1</sup>. The arm or lever E<sup>3</sup> is pivoted or journaled at e<sup>2</sup>. By the operation of the cam E, and the parts and connections just described, a proper reciprocating movement is imparted to the recesses or dies e e<sup>1</sup>. F is the cam operating the cutter. This cam operates upon the rocking lever F<sup>1</sup> pivoted to the frame A, which lever, in turn, operates the second lever F<sup>2</sup>. The spring f operates to keep the levers F<sup>1</sup> F<sup>3</sup> in proper juxtaposition with each other. By the rocking motion imparted to the lever F<sup>3</sup>, through the connections just mentioned, a similar motion is given to the cutter f<sup>1</sup>, which operates by a shearing movement to cut the blank into proper rivet-lengths as said blank is fed to the machine. The cam G operates a clamp to retain the blank as it is operated upon by the machine. The cam H also operates a clamp and feeder. The cams G and H, inasmuch as they operate in a manner well known in machines of this nature, need have no specific description here. The head-

ing-hammer table R may be reciprocated by suitable mechanism, which latter forms no part of my invention, and may, if desired, connect with the same actuating shaft which operates, through attaching means, the ejector S.

Operation: The blank, as it is fed to the machine by the operation of the cams G and H and their attachments, is cut into proper lengths by the cutter *f'*. The piece thus cut is received by the carrier C<sup>2</sup>, and is brought forward, where it is received and grasped between the fingers D<sup>1</sup> D<sup>2</sup>, and lifted out of said carrier, which, thus emptied, returns for a second rivet. In the meantime the fingers D<sup>1</sup> D<sup>2</sup> descend, carrying the first rivet-blank opposite the die *e*. At this moment the heading-hammer of the machine comes forward and delivers its blow, partly forming the head of the rivet, and driving it into the die *e*. At the same time a second rivet blank is cut by the cutter *f'*, and the empty fingers D<sup>1</sup> D<sup>2</sup> rise to meet and grasp it, while the arms carrying the dies *e e'* move to one side, so that the finger as it descends brings the rivet opposite the die *e'*; at the same time the heading-hammer delivers a second blow upon the first rivet, and the first blow upon the second rivet. The empty fingers again ascend to meet and grasp the third rivet-blank, and the die-carrier returns to its original position, and the first rivet is discharged, while the third rivet is brought opposite the die *e*, and receives its first blow from the heading-hammer, while the second rivet receives its second and finishing blow from said hammer. The heading-hammer is provided with three striking-surfaces, J K L. It will be observed that the middle hammer K delivers a blow at each movement of the heading-hammer, while the hammers J and L deliver their blow at every second movement of the said hammer.

It is essential that the carrier C<sup>2</sup> should be accurate in its movement, so as to properly receive the cut blank and deliver it to the fingers D<sup>1</sup> D<sup>2</sup>. In order to gage the movement of this carrier accurately the set-screws *c<sup>2</sup> c<sup>3</sup>* are provided.

No actual mechanism is shown or described for actuating the reciprocating heading-hammer table R, or the ejector S, it being apparent that same may be operated by suitable means connecting therewith, and same does not enter into the subject-matter of my invention.

What I claim is—

1. In combination with the heading-hammer having three hammering-faces, the reciprocating dies *e e'*, substantially as and for the purpose shown.
2. A rivet-machine, provided with a carrier, C<sup>2</sup>, in combination with the fingers D<sup>1</sup> D<sup>2</sup>, substantially as and for the purpose shown.
3. The combination of the cutter *f'* and carrier C<sup>2</sup>, substantially as and for the purpose shown.
4. The combination, with the fingers and hammers, of the carrier C<sup>2</sup> and the reciprocating dies *e e'*, substantially as and for the purpose shown.
5. The combination, with the carrier and hammers, of the fingers D<sup>1</sup> D<sup>2</sup> and reciprocating dies *e e'*, substantially as and for the purpose shown.
6. The combination of the cutter *f'*, carrier C<sup>2</sup>, fingers D<sup>1</sup> D<sup>2</sup>, and reciprocating dies *e e'*, substantially as and for the purpose shown.
7. The adjustable carrier C<sup>2</sup>, substantially as and for the purpose shown.
8. In a rivet-machine, the combination of two moving or reciprocating dies with fingers D<sup>1</sup> D<sup>2</sup>, carrier C<sup>2</sup>, and the hammering-surfaces, substantially as and for the purpose shown.
9. The combination of the reciprocating dies *e e'*, and heading-hammer, provided with three hammering-surfaces, J, K, and L, substantially as and for the purpose shown.

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

ERASTUS E. PIERCE.

Witnesses:

FRANCIS TOUMEY,  
JAMES P. WALSH.