

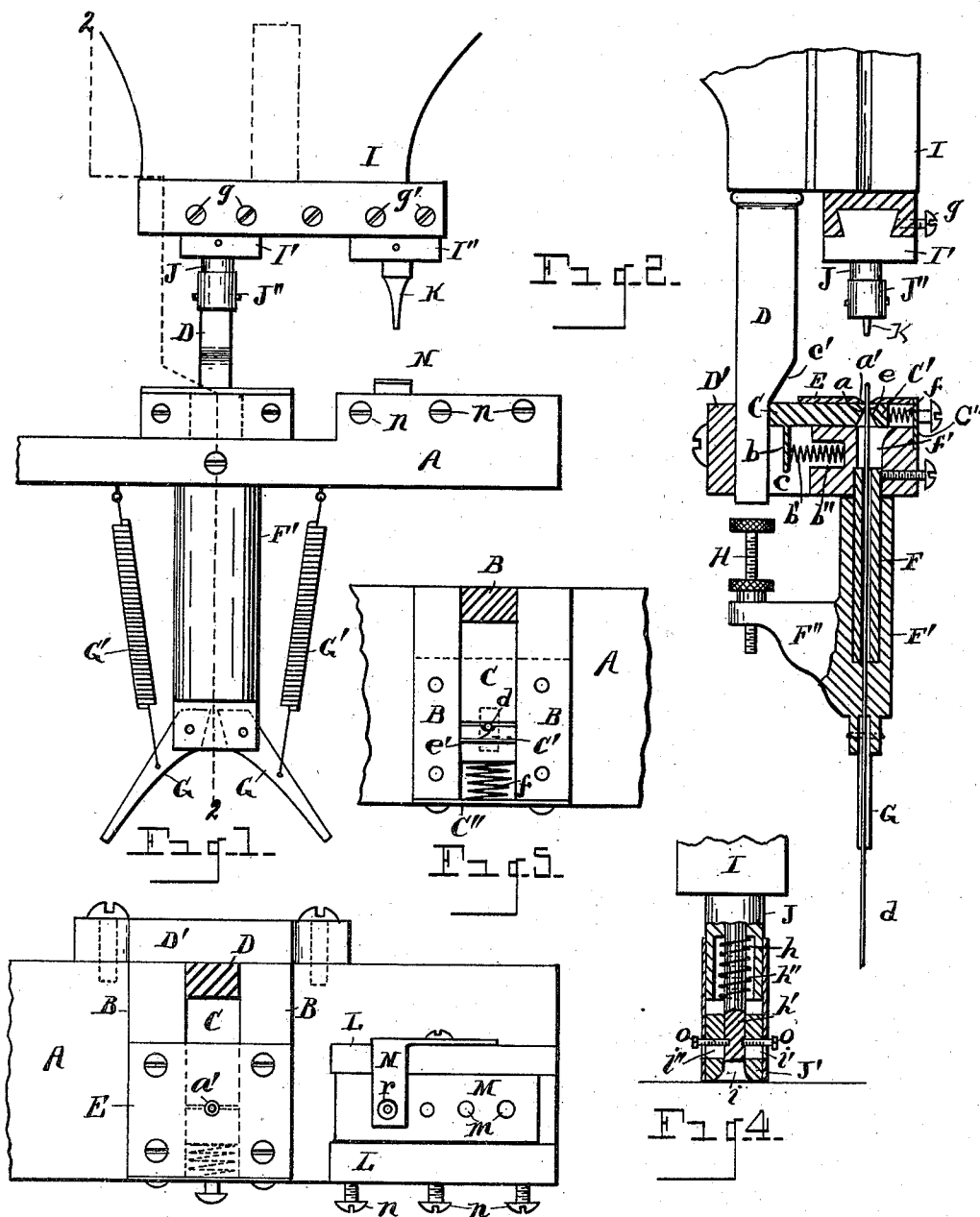
No. 624,759.

Patented May 9, 1899.

O. W. DAVIS.
RIVETING MACHINE.

(Application filed Nov. 22, 1897. Renewed Sept. 30, 1898.)

(No Model.)



WITNESSES
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UNITED STATES PATENT OFFICE.

ORSON W. DAVIS, OF ADRIAN, MICHIGAN, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF PART TO JONATHAN B. DAVIS, OF SAME PLACE.

RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 624,759, dated May 9, 1899.

Application filed November 22, 1897. Renewed September 30, 1898. Serial No. 692,350. (No model.)

To all whom it may concern:

Be it known that I, ORSON W. DAVIS, a citizen of the United States, residing at Adrian, in the county of Lenawee, State of Michigan, have invented certain new and useful Improvements in Riveting-Machines; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in riveting-machines; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out in the claims.

The objects of the invention are to provide strong and simple means for cutting off the rivet and heading it on both sides of the work by one operation; also, to provide an automatic feed for the continuous strand from which the rivets are formed, so as to regulate the length of each successive rivet, and also to provide for punching the work by the same operation which cuts and heads the rivet in an aperture of the work previously punched. These objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of my improved machine. Fig. 2 is a vertical section on line 2 2 of Fig. 1. Fig. 3 is a plan view of the bed of the machine. Fig. 4 is an enlarged detail, partly in section, of the upper swage. Fig. 5 is a plan in detail of a portion of the bed with the plate removed which covers the lower cutting and swaging die.

Referring to the letters of reference, A designates the bed-plate of the machine, upon the face of which are the raised flanges B, forming an open way between their adjacent faces. Located in this way is the movable cutting and swaging die C, whose forward cutting edge is beveled, as at *a*, and whose rear end is provided with a depending integral arm *b*, which bears against the coiled spring *b'*, seated in a horizontal socket *b''*, formed in the bed of the table and communicating with

the vertical opening *c*, passing through said bed and in which the arm *b* of the cutting-die depends. Extending downward into said opening *c* in the table is the vertically-movable wedge-pin D, whose inner beveled face *c'* engages the inner end of the cutting-die C. Said movable wedge-pin is held to its work by means of a cross-plate D', which engages the rear vertical face thereof and which is securely fixed to the bed-plate.

Located in the outer end of the horizontal way in which the cutting-die C is seated is a movable block C', provided with a beveled edge *e*, which stands adjacent and opposed to the cutting edge of the die C and which is provided with a slight recess *e'*, (see Fig. 5,) that receives the wire or strand *d* from which the rivets are formed. Lying between the movable block C' and the outer confining-plate C'' is a coiled spring *f*, which serves to return said block to its normal position when caused to recede by the action of the cutting-die C and which moves said block inward, so as to carry the strand *d* into alinement with the aperture *a'* in the plate E, which is secured to the upper face of the parallel flanges B and whose under face lies adjacent to the cutting-die C and said movable block C'. This aperture *a'* in said plate E is in direct alinement with the meeting edges of the cutting-die and movable block when said parts are in their normal position and receives the end of the wire or strand *d*, which is fed upward through said aperture in said plate to form the rivet, as clearly shown in Fig. 2, the arrangement being such that the strand is severed by the lower edge of the plate E and the upper edge of the cutting-die C as said die is caused to shear past the aperture *a'* in said plate by the vertical movement of the wedge-pin D, the block C' receding during this operation of shearing against the spring *f*, which spring returns said block and carries the strand *d* into alinement with the opening *a'* in said plate when the wedge-pin D is raised, as before described.

As will be seen on referring to Fig. 2, the vertical opening *f'* in the bed-plate, through which the wire strand passes to the cutting-die, is sufficiently large to permit said strand

to be carried laterally by said die in its operation. Communicating with said vertical opening f' and depending from the under face of the table of the machine is a tube F, and surrounding said tube is a vertically-movable sleeve F', provided through its lower end with an aperture, which receives the strand d from which the rivets are formed, thereby permitting said strand to pass upward through said sleeve and tube. This sleeve F' is vertically movable upon the tube F, and between depending brackets at its lower end are pivoted two opposed jaws G, between whose inner ends the wire strand is adapted to pass, as shown by dotted lines in Fig. 1. Attached to the under face of the bed of the machine at their upper ends and engaged at their lower ends to said pivoted jaws are the coiled springs G', the tension of which is sufficient to normally retain the sleeve F' in its raised position and also to cause said jaws G to engage the wire strand lying between them.

Projecting from the rear face of the sleeve F' is a bracket F'', in which is mounted an adjusting-screw H, which projects vertically in the path of the wedge-pin D. It will be seen that as the wedge-pin D is caused to descend in the operation of moving the cutting-die to sever the strand of wire to form the rivet the lower end of said pin will engage the upper end of the adjusting-screw H, thereby carrying downward the sleeve F', causing the jaws G, carried by said sleeve, to slip downward over the strand of wire d and placing tension upon the coiled springs G', whereby when said wedge-pin is raised the tension of the springs G' will raise the sleeve F' and cause the jaws to feed upward the wire strand which is firmly held between their engaging edges, thereby causing said strand from which the rivet is formed to project through the aperture in the plate E sufficiently to form the length of rivet required. By means of the adjusting-screw H the distance which the sleeve F' is depressed may be regulated, which in turn regulates the length of wire which is fed upward through the plate E to form the succeeding rivet.

The depression of the wedge-pin D to actuate the cutting-die and feeding mechanism is caused by a vertically-movable head I, carrying the adjustable head-block I', from which depends the upper swage J for heading the rivet upon the upper side of the work, the operation being as follows: As the head I is caused to move downward it engages the upper end of the wedge-pin D, depressing said pin and causing its inclined face c' to move the cutting-die C longitudinally and sever the strand of wire d to form the rivet. Said die after being moved longitudinally by the inclined face of the wedge-pin is held from receding by the vertical face of said pin, so that the body of said die lies under the opening a' through the plate E and forms an anvil upon which the under head of the rivet is formed. It will be understood that before the upper

swage is caused to descend the work to be riveted is first placed upon the bed of the machine with the projecting end of the strand d from which the rivet is formed standing in the aperture previously punched therein, so that when the cutting-die shall have severed the strand the severed portion which forms the rivet lies within the aperture in said work, at which time the upper swage engages and heads said rivet upon the upper face of said work, while the lower head is formed upon the lower side of the work within the flaring aperture a' in the plate E, the lower swage being formed by the face of the cutting-die C which stands across said aperture, whereby the rivet is cut and headed upon both sides of the work by one operation. The wedge-pin D in its downward movement not only actuates the cutting-die C, but the feed mechanism as well, by its engagement with the adjusting-screw H, carried by the vertically-movable sleeve carrying the feeding-jaws, as before described, so that as the upper head I is raised by any suitable means (not shown) the wire from which the rivet is formed is fed upward, the wedge-pin D is raised, and the cutting-die C and the movable block C' are returned to their normal position by their respective springs b' and f , and the parts are in position for a succeeding operation.

The head-block I', carrying the upper swage J, is dovetailed into the head I, as shown in Fig. 2, and is made horizontally movable, so as to permit of the adjustment of said block, so that said swage may be brought into perfect alinement with the rivet, said block I' being secured by the set-screws g .

Where copper wire is employed to form the rivet or other soft material, there is a great liability of the rivets being bent over by the action of the swage instead of being properly headed as desired. To prevent the rivet from bending over and enable the upper swage to form a proper head thereon, said swage is made as shown in Fig. 4, in which, as will be seen, the main portion of the swage is provided with a central recess h , from which projects an integral plunger h' , which is environed by a coiled spring h'' , which lies within said recess. This plunger H extends below the main portion of the swage and enters a lower movable section J', provided with a central opening i therethrough, made flaring at its lower terminus. Embracing the two parts J J' of the swage is an exterior sleeve J'', and passing through slots i' in said sleeve and slots i'' in the movable part J' of the swage are the screws o , which enter the plunger h' . By this arrangement the spring h'' forces downward the movable part of the swage J' to the limit permitted by the slots i'' therein, so that the lower end of said part normally stands below the lower end of the plunger h' , leaving an opening i , which receives and supports the upper end of the rivet as said swage descends. When the lower part J' shall have

reached the work, it is of course arrested, when the plunger *h'* follows down and completes the operation of heading the rivet, the movable part of the swage *J'* being held
 5 onto the work by the spring *h''* as the plunger forms the rivet-head, which fills the flared opening in said part *J'*. At the moment when the head of the rivet shall have been properly formed the upper part *J* of the swage will
 10 strike upon said lower part *J'*, so that all parts of the swage are then rigid and solid, making the forming of the head of the rivet perfect. During this operation it will be understood that the upper portion of the swage *J* slides
 15 within the sleeve *J''*.

To provide for punching the work with the same operation that cuts and heads the rivet, I mount within the head *I*, in line with the swage *J*, a suitable punch *K*, which is fixed
 20 in a suitable head-block *I''*, seated in the dovetailed way in said head *I*, so as to be adjustable toward and from said swage, the block carrying said punch being adapted to be secured when adjusted by the set-screws
 25 *g'*. Below said punch upon the bed of the machine are the opposed flanges *L*, forming a way between their adjacent faces which receives a movable die-plate *M*, having a series of apertures *m* therein to correspond with the
 30 various sizes of punches which may be used. This die-plate may be moved in said way, so as to bring the desired sized aperture therein in alinement with the punch above when said plate is secured by the set-screws *n*, by which
 35 arrangement as the head *I* is caused to descend by any suitable means to cut and form the rivet the work is at the same time punched for the succeeding rivet, the adjustment of the punch and die-plate enabling the rivets
 40 to be placed at any desired distance apart.

Mounted upon one of the flanges of the way containing said die-plate is an angled stripping-plate *N*, which projects over said die-plate and is provided in its outer end with an
 45 aperture *r*, through which the die passes.

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

1. In a riveting-machine, the combination
 50 with the wire-feeding mechanism and the upper swage, the horizontally-movable cutting-die and means for moving said cutting-die to sever the rivet from the strand and to extend under the rivet, thus acting as an anvil, substantially as described.

2. In a riveting-machine, the combination
 60 with the wire-feeding mechanism, of the vertically-movable head carrying the upper swage, the horizontally-movable cutting-die for severing the wire from which the rivet is formed, the wedge-pin engaging said cutting-die adapted to be actuated by said movable head simultaneously with the operation of said plunger.

3. In a riveting-machine, the combination
 65 with the wire-feeding mechanism, the apertured plate through which the upper end of said wire passes, the horizontally-movable die lying adjacent to the face of said plate and adapted to move across said opening to
 70 sever the wire, the movable block on the opposite side of said opening adapted to receive the wire and return it when said cutting-die recedes, and means for actuating said cutting-die.

4. In a riveting-machine, the combination
 75 with the vertically-movable head carrying the upper swage, the wire-cutting die, the wedge-pin for actuating said die engaged by said movable head, the vertically-movable sleeve
 80 carrying the wire-feeding jaws, the bracket extending from said sleeve, and the adjusting-screw in said bracket standing in the path of said wedge-pin.

5. In a riveting-machine, the combination
 85 with the wire-feeding mechanism, the head carrying the upper swage, the movable cutting-jaw, the wedge-pin adapted to actuate said jaw, and the spring engaging said jaw to return it to its normal position.

6. In a riveting-machine, the combination
 90 with the wire-feeding mechanism, the movable head carrying the upper swage, the apertured plate through which the upper end of the wire passes, the movable cutting-die
 95 lying adjacent to the under face of said plate and adapted to move across the aperture therein, the movable block for receiving said wire also located under said plate opposed to said die, and the spring engaging said block
 100 for returning it to carry the severed end of the wire into alinement with the aperture in said plate.

7. In a riveting-machine, the combination
 105 with the wire feeding and cutting mechanism, the head carrying the upper swage, the punch also mounted in said head and made adjustable with respect to said swage, the movable die-plate on the bed of the machine in line with said punch and made adjustable there-
 110 with.

8. In a riveting-machine, the combination
 115 with the wire feeding and cutting mechanism, of the upper swage consisting of a central plunger, a fixed upper part, a movable lower part through which said plunger passes, said lower part being spaced from said upper part, a spring surrounding said plunger and bearing upon said movable lower part, and an exterior sleeve embracing the upper and lower
 120 parts of said swage.

In testimony whereof I affix my signature in presence of two witnesses.

ORSON W. DAVIS.

Witnesses:

JOHN E. BIRD,
 MAURICE W. FAWAH.