

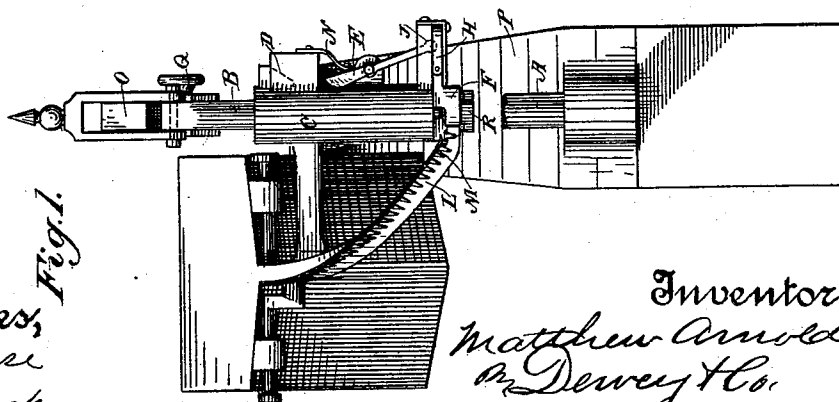
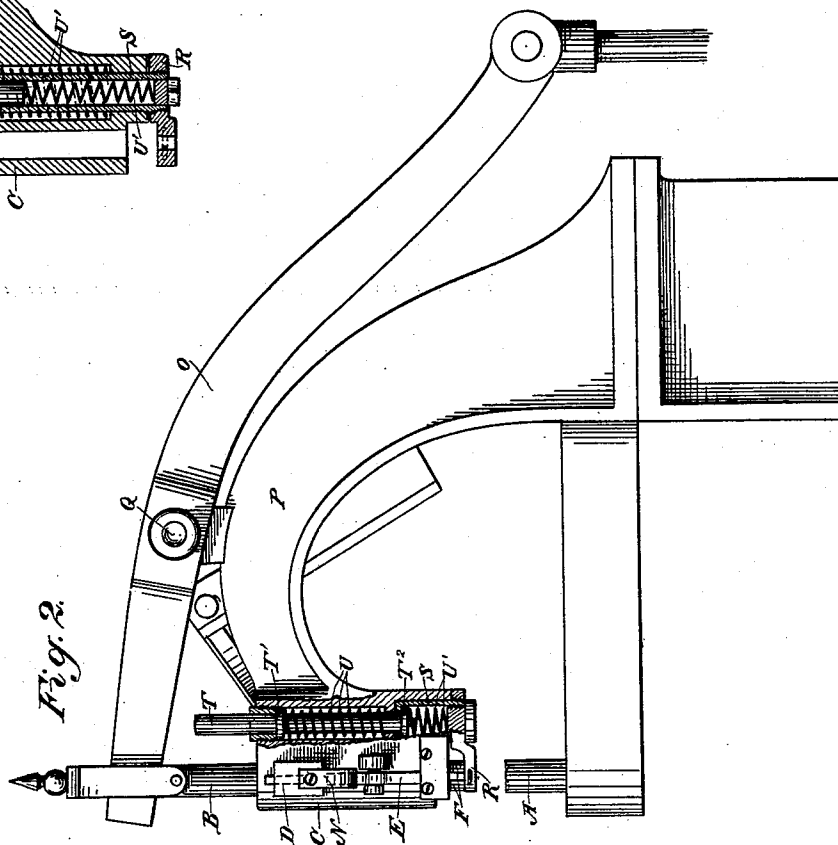
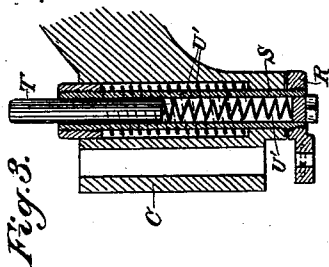
(No Model.)

2 Sheets—Sheet 1.

M. ARNOLD.
RIVETING MACHINE.

No. 469,891.

Patented Mar. 1, 1892.



Witnesses,
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H. F. Aschbeck

Inventor,
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attys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

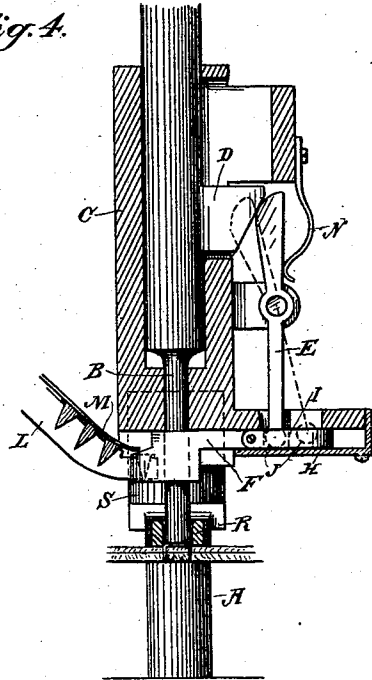


Fig. 5.

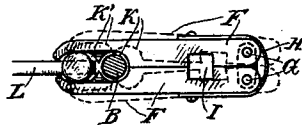
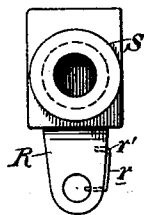


Fig. 6.



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UNITED STATES PATENT OFFICE.

MATTHEW ARNOLD, OF SAN FRANCISCO, CALIFORNIA.

RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 469,891, dated March 1, 1892.

Application filed January 28, 1891. Renewed October 28, 1891. Serial No. 410,047. (No model.)

To all whom it may concern:

Be it known that I, MATTHEW ARNOLD, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Riveting-Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in riveting-machines; and it consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of the machine. Fig. 2 is a side elevation. Fig. 3 is a section showing a modification of the presser-foot spring attachment. Fig. 4 is an enlarged sectional detail of the punch and connected parts. Fig. 5 is a plan view showing the carrier in the act of seizing a rivet. Fig. 6 is a top view of the presser-foot.

In my present invention I employ a horizontally-moving carrier with jaws which are opened when the carrier is advanced to take a rivet from the delivery-chute and transfer it beneath the punch, by which it is afterward forced down through the material upon the anvil. I have also shown a vertically-moving presser-foot, through which the rivet and punch pass, said presser-foot also being actuated in a vertical direction and having yielding springs, by which, after the presser-foot has been forced down upon the substance to be riveted, its shank is allowed to continue the movement in unison with the movement of the punch until the rivet has been secured.

A is the anvil or surface upon which the riveting takes place, this anvil being in the present case fixed and stationary within the table or surface upon which the belt or other article to be riveted is placed beneath the punch. The shank or stem B of the punch moves in a fixed vertical guide C, and it has a projecting lug or cam D extending through a slot in this guide in order to operate the lever E, which in turn moves the rivet-carrier and causes it to reciprocate beneath the punch. This rivet-carrier consists of two jaws F F, hinged together at the rear end by a connecting-link and pivots, as shown at G, and in order to keep these jaws closed with a light

pressure I have shown a spring H, which incloses them and presses them together.

I is an opening formed between the meeting faces of the rear portion of the jaws F, and into this opening, the head J of the lever E extends. The jaws proper have two openings K and K', which, when the jaws are closed together, are approximately of the form of cylindrical segments opening into each other, and the tips or points of the jaws extend sufficiently around the outer opening, so that when the jaws are closed together they will inclose a rivet and cause it to move with the carrier to the proper point.

L is the chute or guide, upon which the rivets are carried and delivered at the lower end at a point where the carrier can seize each rivet as it is presented. The rivets are made with a closed head and downwardly-projecting legs, which, riding astride of the guide-rib, will allow the rivets to slide down to the lower end, where they are retained in place by a guard-spring or other device M, which prevents the rivets from sliding out at the bottom; but the lower rivet will always rest upon the approximately-horizontal lower end of the guide-rib, so that when the carrier is advanced the jaws can easily encircle the rivet and draw it off the rib and transfer it beneath the punch. The two openings K and K', which form the jaws of the carrier, are only partially separated from each other by the points projecting from each side between these openings, and from their shape it will be seen that when the punch has been forced down through the outer opening K' while driving a rivet and before it is retracted the carrier may be advanced by the action of the lug D upon the upper end of the lever E, which, acting through the head J and the socket I, forces the carrier forward, and the projecting points between the openings K and K' being forced around the outside of the punch the spring H will yield and allow the jaws at the end of the carrier to open, and as the carrier advances, so that the opening K closes around the shank of the punch, the outer opening K' will inclose a rivet, as before described. When the punch is again drawn up, it will be drawn clear of the carrier before the lever E is released

from the lug D, and when this release takes place a spring N acts to press the upper end of the lever against the side of the punch-guide, and the lower end being thereby
 5 forced outward will withdraw the carrier and with it the rivet which is contained in the outer opening K' of the jaws, thus depositing the rivet in line with the punch. When the punch again descends, it forces the rivet
 10 downward into the material which rests upon the anvil A, as before described, and the shape of the anvil is such as to turn the points of the rivet and secure it firmly. The punch is caused to reciprocate by means of
 15 a lever O, fulcrumed upon the frame P at the point Q, and the outer or long arm of the lever may be connected with a treadle, or may be operated by a cam or eccentric or by other suitable device. The short arm of the lever
 20 passes through a slot or unites with a link connected with the upper end of the punch-shank, and when this end of the lever is forced down it forces the punch downward. When the punch has been forced down to a
 25 certain distance, which carries the rivet down out of the carrier, the rivet will be carried into the presser-foot R, which extends from the vertical sleeve S to a point beneath the line of travel of the punch, and it has a hole
 30 in this outer end of sufficient size to allow a rivet and punch to be forced through it.

Attached to the side of the presser-foot R is a little wire spring r, one end of which projects slightly into the hole through which the
 35 rivets pass for the purpose of holding up any rivet which might be a little smaller, and consequently would fall through the opening, while the other end of this spring is secured firmly in the side of the presser-foot at r'.
 40 This projecting point of the spring is slightly rounded off and will yield as soon as the punch descends and so allow the rivet to be forced through the opening. The sleeve S extends upward into a counterbore made in the stand-
 45 ard or guide C just behind the guide-opening of the punch. Above this counterbore a hole extends parallel with the one which guides the punch, and a plunger T is fitted into this opening. The opening is of such size that a
 50 spiral spring U surrounds the plunger T and abuts against a collar T', which is formed upon this plunger near the upper end. The bottom of the spring U rests in the bottom of the chamber or opening, which is separated
 55 from the chamber or counterbore in which the sleeve S is guided, and a small hole between these chambers allows the shank of the plunger to pass through. A second spring U' is fitted into the chamber or counterbore
 60 within the sleeve S, and the lower end of the plunger T passes through the top of the sleeve and into this chamber, having a washer upon its lower end, which presses upon the top of the spring U'. The upper end of the
 65 plunger is situated at such a point beneath the lever O that when the lever is moved the punch B will be forced down sufficiently to

move the rivet out of the carrier K' and into the opening in the presser-foot R. At this instant the lever O will strike the top of the
 70 plunger T, and pressing it down simultaneously with the movement of the punch the presser-foot will be moved down until it rests upon the surface into which the rivet is to be driven. A further movement of the lever O
 75 forces the punch onward until the rivet is firmly fixed in the material. As the presser-foot can move no farther, the springs U and U' will yield to the continued pressure of the collars upon the plunger T, and will thus
 80 allow this plunger to move on in unison with the movement of the punch without further advancing the presser-foot, which remains in its position until the rivet has been driven, and when the punch is retracted the
 85 upward movement of the lever O allows the springs U and U' to act upon the plunger T and force it upward, carrying with it the presser-foot until it is in its original position beneath the carrier. As before described, the
 90 punch moving downward through its guide and through the opening K' forces the rivet out and downward through the carrier into the material, and as soon as the lug D engages the upper end of the lever E, and while the
 95 the lever E will act to force the carrier forward, thus opening the jaws until the outer opening K' has inclosed another rivet, and the punch will then be within the opening K through
 100 which it passes as it is drawn upward by the movement of the lever O. When it is fully withdrawn from the opening K of the jaws, the lug D will be raised out of contact with the upper end of the lever E and will thus
 105 allow the carrier to be drawn back by the action of the spring N, which brings the outer opening K' of the jaws and the rivet which it incloses beneath the punch and in position to be driven when the punch again makes a
 110 downward movement. By this construction I am enabled to leave the anvil in a stationary position and to properly guide and hold the rivet until the punch has forced it into the material, the vertically-moving presser-
 115 foot acting in this capacity. It also greatly simplifies the mechanism necessary for the operation of the machine, dispensing with all devices and connections beneath the table for the movement of the anvil.

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

1. In riveting-machines, the inclined chute having a central rib or guide upon which the
 125 rivets are received and retained in their proper position, a vertically-moving punch by which the rivets are forced downward into the material beneath, a carrier reciprocating trans-
 130 versely beneath the guide and having jaws by which the rivets are successively removed from the chute, a lever fulcrumed to the side of the punch-guide, having one end connected with the carrier, and a lug projecting from the

vertically-moving punch through a slot in the side of the guide, so as to engage the upper end of the carrier-lever and force the carrier forward when the punch descends, substantially as herein described.

2. In riveting-machines, the inclined chute and guides by which the rivets are delivered at the lower end in their proper position, a retaining lip or spring by which they are prevented from escaping by gravitation, a transversely-moving carrier having horizontally-opening jaws adapted to seize a rivet and remove it from the chute, a lever fulcrumed upon the punch-guide, having the lower end connected with the carrier, a lug projecting from the punch through a slot in the guide to engage the upper end of the lever and move the carrier forward as the punch descends, and a returning device whereby the movement of the lever is reversed and the carrier is drawn back after the lug upon the punch has passed out of engagement with the carrier-lever, substantially as herein described.

3. The combination of the transversely-moving carrier, consisting of two horizontally-opening jaws hinged together at the rear, so that the front ends may open and close about the hinges, and a spring by which the jaws are closed when released from other pressure, openings K and K', made vertically through the front of the jaws with the projecting points between the openings, a vertically-moving punch, and a lug upon said punch acting upon a lever by which the carrier is forced forward after the lower part of the punch has passed through the outer opening K' of the jaws and the points between the openings passing around the punch to force the jaws open and allow them to close again to seize a rivet and to inclose the punch within the rear opening K at the same time, substantially as herein described.

4. In riveting-machines, the inclined chute or guide delivering the rivets by gravitation in their proper position, a vertically-moving punch by which the rivets are forced downward into the material beneath, a transversely-moving carrier having horizontally-opening hinged jaws, and means for moving said

carrier so that it seizes the rivets successively and transfers them from the lower end of the chute to a point beneath the punch, in combination with a presser-foot situated beneath the punch, having an opening through which the rivet and punch may pass, a guide by which the vertical movement of the presser-foot is maintained, a spring secured to the presser-foot, having one end projecting into the path of the rivet to prevent the latter passing through the foot, a plunger movable through said guide and engaging the rear of the presser-foot, and a lever by which the punch and plunger are actuated, substantially as herein described.

5. The combination of the vertically-moving punch by which the rivets are forced into the material, a transversely-moving carrier having horizontally-opening hinged jaws for receiving the rivets from the chute and transferring them beneath the punch, the presser-foot situated beneath said punch and having an opening into which the rivet is forced by the punch, a spring having an arm projecting into the path of the rivet for preventing the latter dropping through the foot, a plunger passing through a vertical guide and engaging the presser-foot, said plunger being actuated by the lever which moves the punch, so that after the rivet has been entered into the presser-foot the latter will be forced down by the plunger until it rests upon the material to be riveted, springs surrounding the presser-foot plunger, so that the action of the plunger is communicated through these springs to the presser-foot until the latter rests upon the material to be riveted, the springs yielding after the presser-foot has reached the material, so as to allow a further movement of the punch and plunger to force the rivet into the material without further action upon the presser-foot, substantially as herein described.

In witness whereof I have hereunto set my hand.

MATTHEW ARNOLD.

Witnesses:

LINCOLN SONNTAG,
S. H. NOURSE.