

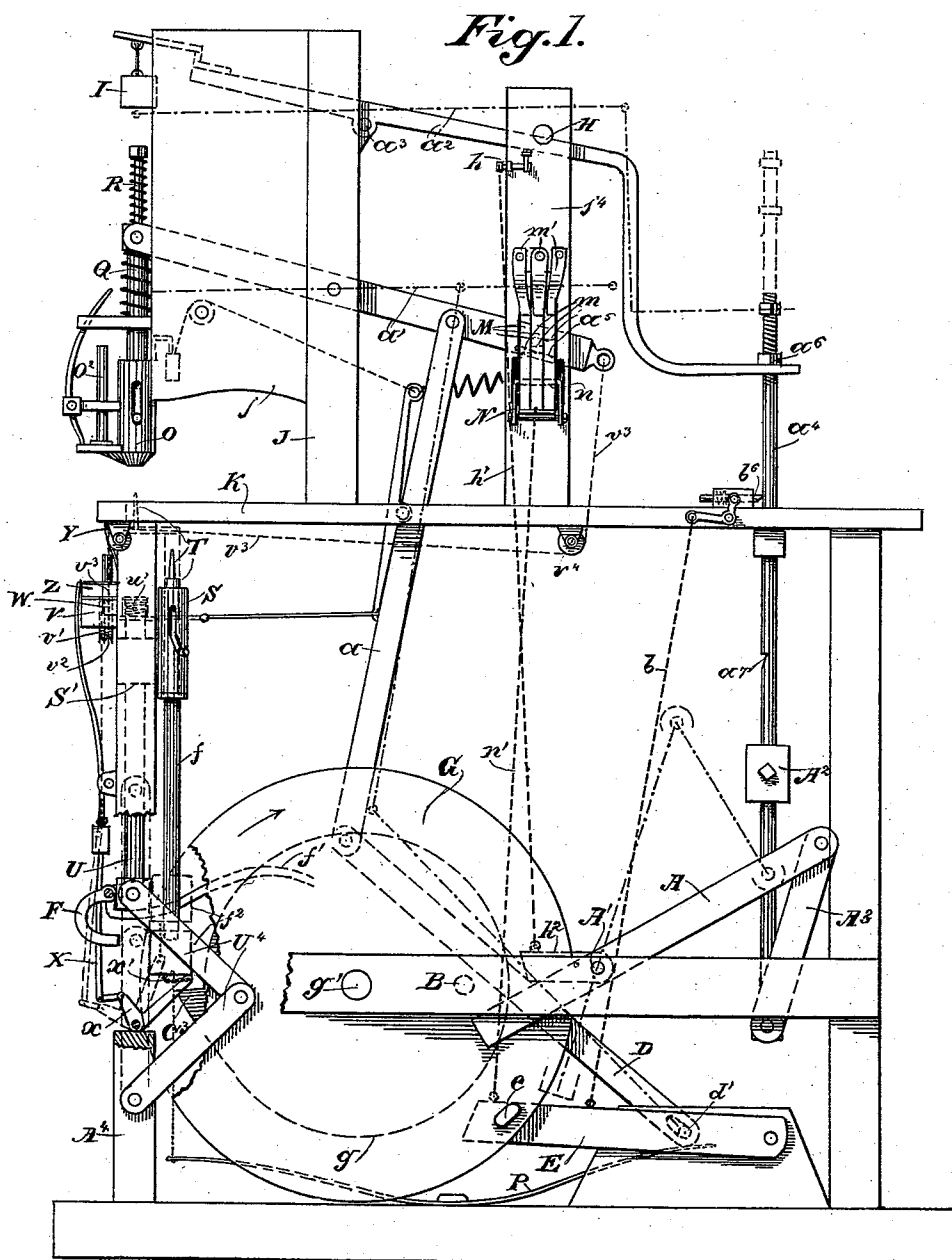
(No Model.)

2 Sheets—Sheet 1.

J. I. SMITH.
RIVETING MACHINE.

No. 537,314.

Patented Apr. 9, 1895.



Witnesses,
R. H. Morse
H. F. Aschbeck

Inventor,
John I. Smith
By D. W. Dwyer & Co. atty.

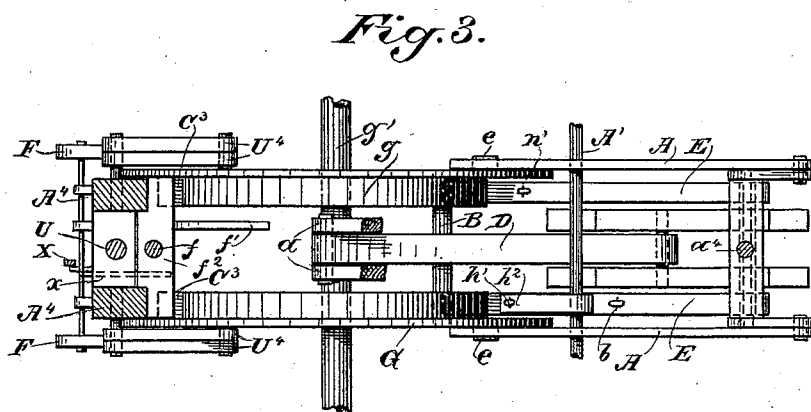
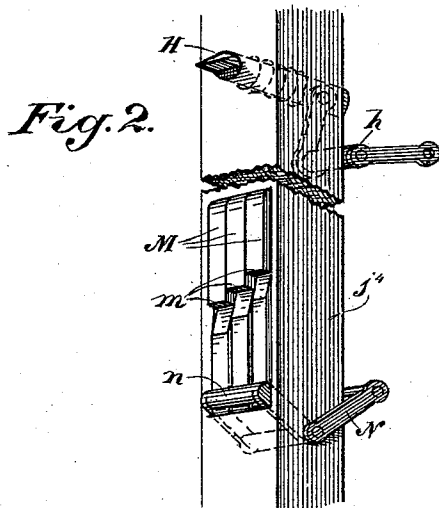
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UNITED STATES PATENT OFFICE.

JOHN I. SMITH, OF CHICO, CALIFORNIA.

RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 537,814, dated April 9, 1895.

Application filed November 27, 1894. Serial No. 530,162. (No model.)

To all whom it may concern:

Be it known that I, JOHN I. SMITH, a citizen of the United States, residing at Chico, Butte county, 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 a machine for riveting belts and other articles together.

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 side elevation of the machine.

Fig. 2 is an enlarged detail of the retaining pawls. Fig. 3 is a horizontal section showing a plan of the rotary wheels or disks.

My present invention is an improvement upon an apparatus for which a patent was allowed me on the 30th day of August, 1894, Serial No. 509,817.

The object of my present invention is to provide a rotary mechanism and connecting devices which actuate the devices for delivering metallic washers into position upon the part to be riveted, and by which a hole is punched through the parts in line with the hole in the center of the washer, and a rivet of proper size advanced into the hole, and the end of the rivet upset and headed down upon the washer.

The placing and holding of the washers, punching the holes, introducing and heading of the rivets are effected as described in my former application, and are only referred to here sufficiently to show the connection of the features novel to the present case.

K is a table adapted to receive the material to be riveted. A post J extends above this and has a guide *j* projecting to the front from it, and upon this guide the vertically sliding receiver O is adapted to move above the table. The lower end of the receiver is cone-shaped, and has a central opening made through it adapted to receive the sliding presser foot Q, and within this again is contained the vertically sliding hammer R which acts to head the end of the rivet after the washer has been placed thereon. These parts not forming any portion of my present invention, I do not describe the details of their operation. They are suspended by a lever arm *a'* centrally ful-

crumed upon the post J, having one end connected with the upper part of the tubular presser foot Q. Upon the opposite side of the fulcrum pin, a rod *a* has one end connected with this lever *a'*, and the other end of the rod is connected with a lever D, and this lever D is pivoted centrally in the lower part of the frame as shown at *d'*.

The rotary wheel is composed of disks G and *g* turning upon a central shaft *g'*.

B is a pin extending between the inner disks *g*, as shown plainly in Fig. 3, and as the disks are rotated, this pin comes in contact with the lower side of the lever D, thus forcing it up and operating through the connecting rods *a a'* to force the parts O and Q down upon the table at the proper time.

The punch by which the leather or other material is perforated, after the washer has been set upon the upper side, is shown at T.

The shank *f* extends downwardly and has a head *f*² upon the lower end. Upon the inner rims *g* of the wheel are formed teeth C³ and these teeth come into contact with the head *f*² at the proper time to force the awl T upward for the purpose of perforating the leather. The particular movements of the awl T being fully described in my former application, I do not further describe them here.

The rivets are fed up after the awl T has been withdrawn, by means of a bar or plunger U moving vertically between guide posts A⁴ and through cross piece S'. This plunger is actuated by toggle levers U⁴, the meeting angles of which are pivoted together, and one end of the lowermost levers turns upon a fixed pivot on the post A⁴, and the other being connected with the lower end of the plunger U. These toggle levers U⁴ are situated exterior to the flanges G, and they are actuated by pins *e* projecting from the sides of these disks in such position that as the disk rotates, they will come in contact with the levers and force them approximately into a straight line so as to force the plunger up.

In order to allow the plunger to fall after the lugs E have passed, curved arms F are fixed upon a transverse shaft, shown plainly in Fig. 3, and this shaft has a lever *f'* projecting inwardly between the disks *g* in such position that the pin B will contact with it, and forcing it up will rotate the shaft and

cause the ends of the arms F to press against the upper members of the toggle levers U⁴, and thus force them backward, so that the plunger may fall by gravitation.

5 The rivets are contained in horizontal carriers Z and are delivered upon the vertically reciprocating head of the plunger U by a transversely moving carrier which is actuated by a lever arm X fulcrumed near the center as shown, having the upper end adapted to engage and move the carrier, and the lower end is connected with one end of a bell crank lever α . The head f^2 , to which the awl carrying shaft f is fixed normally rests upon the other end of this bell crank lever, and this, being pressed down, draws the lower end of the lever arm X inwardly, and the upper end is correspondingly moved outwardly.

A chain or cord α' connects the head f^2 with the long arm of the bell crank lever α , and when the head f^2 is moved up, it acts, through the chain, to pull up the end of the bell crank lever with which it is connected. This forces out the other arm of the bell crank lever and with it the lower end of the lever arm X which, in turn, acts upon the carrier to force the rivet inwardly upon the head of the plunger U.

The various sizes of rivets contained in separate tubes are brought opposite the carrier as occasion may require by means of a sliding bar W. This bar is actuated by a cord v^3 passing around a pulley v^2 , thence beneath a pulley v^4 under the table K, and thence to the end of the lever α' with which it is connected, so that when this lever is moved, the slide bar W will also be moved to perform its office.

The notches m in the swinging levers M (shown plainly in Figs. 1 and 2) which represent the varying thicknesses of the leather or material to be riveted, are normally pressed forward by springs m' , and a plate α^5 fixed to the lever α' will engage either of these notches which is presented to it so as to hold the receiver and connected parts at the proper height with relation to the leather beneath.

The lever α' is released when the notched levers M are forced backwardly. This operation of forcing them backwardly is effected by a cross bar n actuated by a lever N. A cord n' (Fig. 1) connects with this lever N extending downwardly to the end of one of the levers E (of which there are two) fulcrumed in the lower part of the frame, and extending toward the peripheries of the inner disks g , as shown plainly in Fig. 3. The ends of the levers E are engaged by the teeth C³, previously described, upon these disks, and the operation of the one with which the cord n' is connected, draws upon this cord, and presses the lever M inwardly and out of engagement with the plate α^5 . This releases the lever α' and allows it to rise.

The weight I which falls upon the hammer or shank R for the purpose of upsetting the end of the rivet, after it has passed through the washer, is held up normally by means of

the lever α^2 which is engaged by a transversely sliding pin II movable through the post j^4 , as plainly shown in Figs. 1 and 2, and this latch or pin is connected with a lever h so that by its operation it may be withdrawn at the proper time to release the lever arm α^2 , and allow the weight I to fall.

The lever arm h is connected by a cord h' (Fig. 1) with the lever h^2 which is so fulcrumed that its end will also be engaged by the teeth C³ of the disk g with which it is in line. The weight A² fixed upon the vertically sliding rod α^4 serves to again raise the weight I by the engagement of a collar or nut α^6 with the end of the lever α^2 through which the rod α^4 slides. When the weight I has thus been raised, the rod α^4 is again moved upwardly until the notch α^7 engages with a sliding catch b^6 on the table, and this holds the rod α^4 and the collar α^6 sufficiently high to allow the lever arm α^2 a free movement when the weight I falls. The weight rod α^4 and weight A² are raised by means of lever arms A fulcrumed as shown at A', and having links A³ connecting with the cross bar of the rod α^4 . The opposite ends of the levers A are in position to be engaged by the lugs e upon the outer disks G and this raises the rod α^4 as previously described.

In order to withdraw the sliding catch b^6 and release the notch α^7 from it, I have shown a cord b which connects with one of the levers E, as shown in Figs. 1 and 3, and this is also actuated by the contact of the teeth C³ on the rim of the inner disk g .

P is a spring fixed to the lower part of the frame. One end of this spring is connected by a cord with the awl carrying shank, and acts to retract the awl after it has been forced up through the leather. The other end of the spring presses upon the lower end of the lever D, and keeps the bottom of the slot, in its lower end, normally in contact with the pin d' .

The object of this present invention is to substitute the rotary disk or wheel with its teeth, pin and lugs, for reciprocating levers for the purpose of actuating the different portions of the mechanism of the machine.

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

1. In a riveting machine, mechanism for feeding the washers, mechanism for setting the rivets upon the part to be riveted, consisting of the vertically moving receiver and presser foot, a lever from one end of which these parts are suspended, a second lever fulcrumed at the lower part of the machine, and an intermediate connecting rod uniting the two, in combination with the rotary wheel or disk having a pin fixed eccentrically therein and adapted to engage the lowermost lever during the rotation of the wheel.

2. In a riveting machine, a table adapted to receive the material to be riveted, a vertically moving awl by which the material is perforated, a plunger adapted to receive a rivet upon its upper end and force it upwardly

through the hole thus made, a rotary wheel or disk having projecting lugs, toggle levers having one end connected with the plunger, and the other with stationary points, the intermediate jointed portions projecting so as to be engaged by the lugs projecting from the rotary wheel or disk, whereby the lever is straightened and the plunger is moved upwardly.

3. The rivet carrying plunger, toggle levers and the rotary disk or wheel with lugs whereby said levers are straightened so as to force the plunger upwardly, in combination with curved levers mounted upon an oscillating shaft so that the ends may be brought into contact with the toggle levers to force them back and allow the plunger to fall, a lever arm fixed to the shaft of the curved levers and extending inwardly, a rotary wheel or disk having an eccentrically placed pin adapted to form contact with said lever and actuate the parts when the wheel rotates.

4. In a riveting machine, a punch for perforating the material to be riveted, a plunger adapted to receive and force the rivets through the material, a transversely moving slide by which the rivets are transferred from their holders upon the head of the plunger, a lever arm, one end of which engages the carrier, a bell crank lever with one arm of which the opposite end of said lever is connected, a chain by which the other arm of the bell crank lever is connected with the head of the vertically moving punch shank whereby the elevation of the latter operates to move the levers and transfer a rivet to the carrying plunger.

5. In a riveting machine, the combination of the lever a' , the plunger U for rivets of various sizes, a transversely movable bar by which the rivet holders are moved, and a means for operating the slide bar consisting of a cord v^3 connected with the slide passing around direction pulleys and having its opposite end connected with the lever a' , the setting mechanism connected with said lever and means for operating the lever.

6. In a riveting machine, mechanism for adjusting the presser foot and receiver for the washers, consisting of lever arms M having notches m , a plate a^5 fixed upon the lever arm a' by which the receiver and presser foot are raised and depressed, said plate being adapted to engage a notch in one of the levers M when the latter is projected, a means for retracting said levers and disengaging the plate from the notch, consisting of a presser bar m , a lever N by which it is actuated, and a cord n' connecting said lever with a lever E, in combination with a rotary disk or wheel having a projecting tooth upon its periphery adapted to engage the lever E whereby it is moved and the levers M retracted.

7. In a riveting machine, mechanism for placing and holding the washers, mechanism for perforating the material to be riveted in

line with the hole in the washer, mechanism whereby the rivet is transferred from its holder and introduced into the perforated hole with its end through the hole in the washer, a hammer by which the end of the rivet is upset after being thus placed, a weight adapted to fall upon said hammer when released, a lever arm upon one end of which said weight is suspended, a vertical weight carrying rod by which the other end of the lever is actuated to raise the hammer weight, and mechanism for moving said rod so as to relieve the hammer carrying lever, said mechanism consisting of levers A fulcrumed to the frame having one end connected by links with the weight carrying rod, and a rotary wheel or disk having projecting lugs adapted to engage the opposite ends of said levers, whereby they are actuated to raise the weight, and a spring-actuated catch engaging a notch in the weight carrying rod whereby it is retained after having been raised.

8. In a riveting machine, a mechanism for placing the washers and rivets, a hammer weight adapted to upset the end of the rivet after being so placed, a lever arm from which it is suspended, a sliding catch H by which the lever is temporarily locked when the hammer has been elevated, a means for withdrawing said catch and releasing the lever, consisting of a lever arm h connected with the catch, and a cord h' connecting said lever arm with a second lever h^2 , a rotary wheel or disk having a tooth upon its periphery adapted to engage the end of the last named lever when the wheel is rotated, and release the hammer carrying lever.

9. In a riveting machine, mechanism for placing the washers and rivets upon the material to be riveted, a hammer weight adapted to fall and form a head upon the rivet after being placed, a slidable rod carrying a weight heavier than the hammer and engaging the rear end of the hammer carrying lever so as to raise the latter after it has fallen to upset the rivet, mechanism by which the rod and weight are raised and a catch by which they are engaged and held in the raised position until after the hammer has fallen, means for withdrawing the catch to allow the weight to fall and again raise the hammer, consisting of the cord b connecting with the latch b^6 and with a lever E fulcrumed in the lower part of the machine, and a rotary wheel or disk having a projecting tooth adapted to engage the end of the lever E whereby the lever is moved to withdraw the catch and release the weight carrying rod.

In witness whereof I have hereunto set my hand.

JOHN I. SMITH.

Witnesses:

S. H. NOURSE,
GEO. H. STRONG.