

(No Model.)

2 Sheets—Sheet 1.

A. J. BATES.
WIRE BARBING MACHINE.

No. 329,355.

Patented Oct. 27, 1885.

Fig. 1.

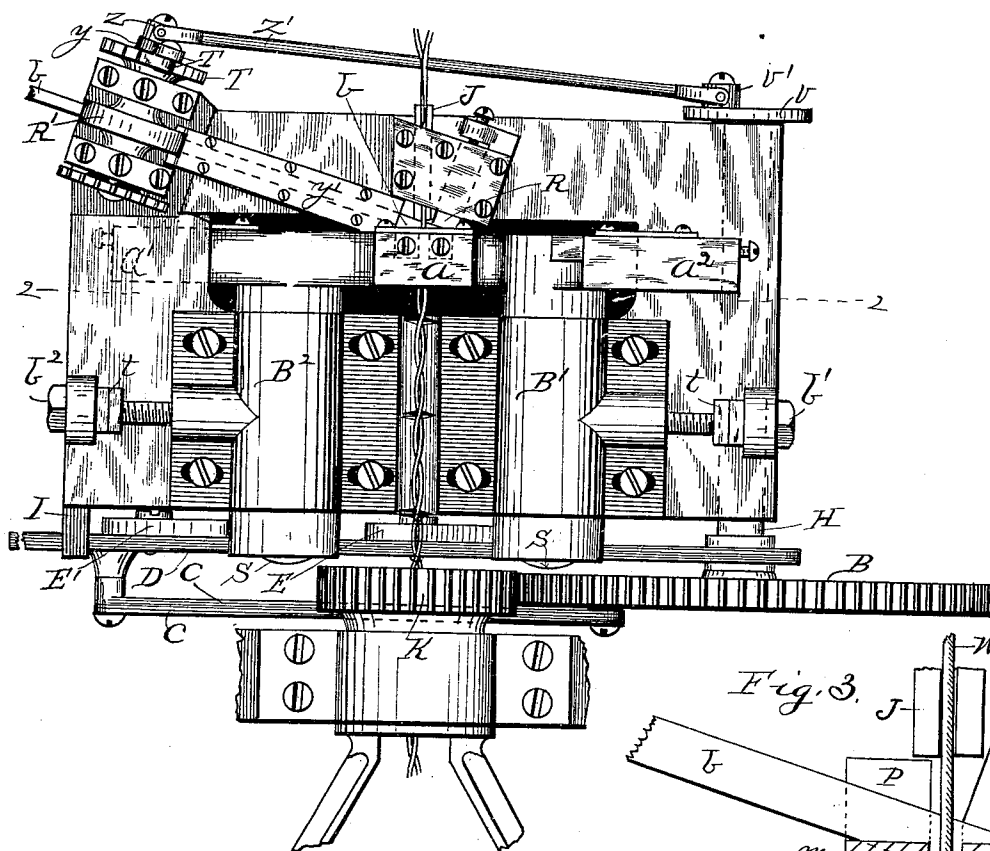


Fig. 2.

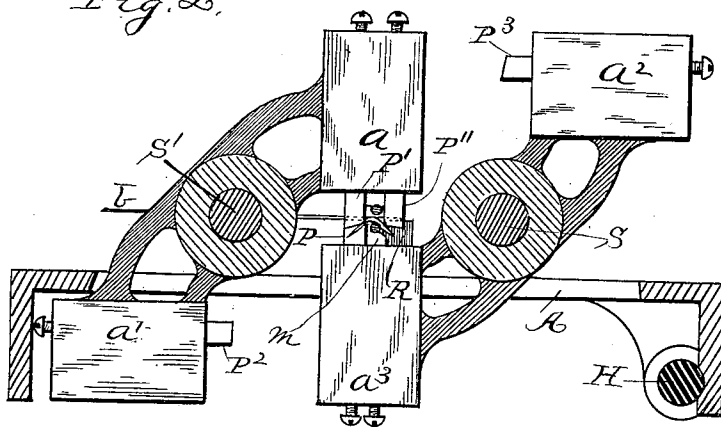
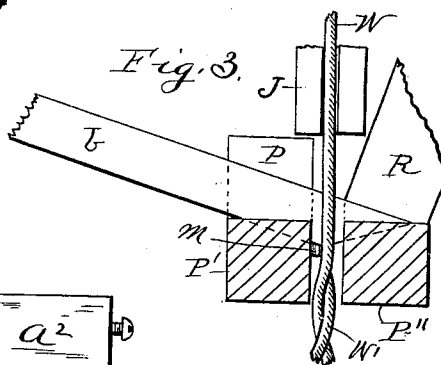


Fig. 3.



Witnesses,

Shoe of Hutchins
Mr J Hutchins

Inventor,

Albert J. Bates,

(No Model.)

2 Sheets—Sheet 2.

A. J. BATES.
WIRE BARBING MACHINE.

No. 329,355.

Patented Oct. 27, 1885.

Fig. 4.

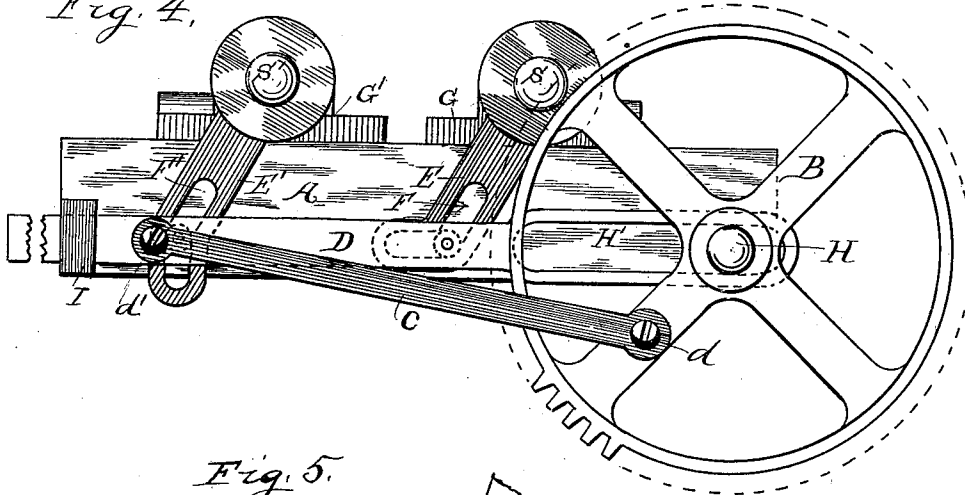


Fig. 5.

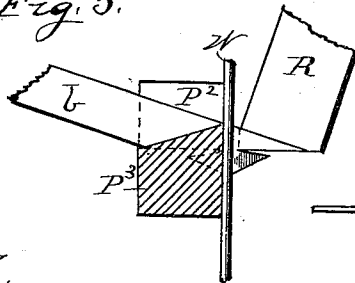


Fig. 6.

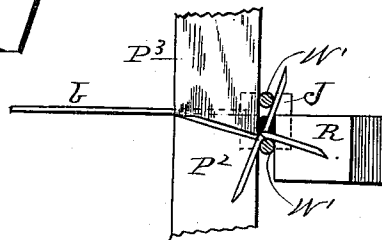


Fig. 7.

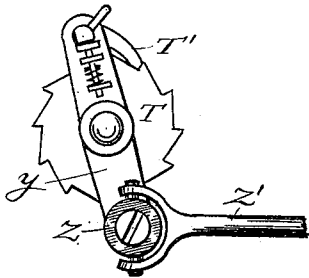


Fig. 8.

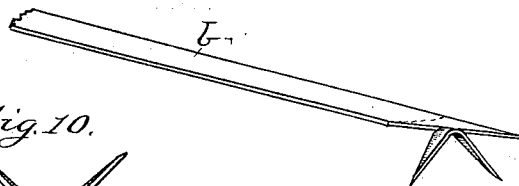


Fig. 10.

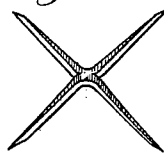


Fig. 11.

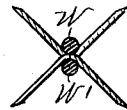
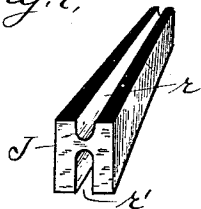


Fig. 9.



Witnesses.

Thos H. Hutchins
Wm J. Hutchins

Inventor.

Albert J. Bates.

UNITED STATES PATENT OFFICE.

ALBERT J. BATES, OF JOLIET, ILLINOIS.

WIRE-BARBING MACHINE.

SPECIFICATION forming part of Letters Patent No. 329,355, dated October 27, 1885.

Application filed June 25, 1885. Serial No. 169,726. (No model.)

To all whom it may concern:

Be it known that I, ALBERT J. BATES, a citizen of the United States of America, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Wire-Barbing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 Figure 1 is a plan view of the machine on the top. Fig. 2 is a cross-sectional view of the machine on line 2 of Fig. 1, looking in the direction from which the strand-wires enter the machine, to more clearly show the oscillating
15 cutter-heads for holding the barb-cutters. Fig. 3 is a detail view of the barb-cutters as they appear when making the first cut to form the first two prods of the barb, it being a face view of the ascending cutter and a plan view
20 of the stationary cutter and a cross-sectional view of the two descending cutters, all located as shown in Fig. 2. Fig. 4 is a side view of the machine, looking in the direction from the side to which the twister attaches and from
25 which the strand-wires emerge, showing the mechanism for oscillating the cutter-heads. Fig. 5 is a detail view of the cutters as they appear when they are severing the barb from the barb-strip and forming the two last prods
30 of the barb, it being a face view of the descending cutters, a plan view of the stationary cutter, which also serves as a barb bender, and a cross-sectional view of the descending cutter, it being the reverse position of the
35 cutter-heads and cutters as shown in Fig. 2. Fig. 6 is a detail view showing the cutters as they appear when severing the barb from the barb-strip to form the two last prods of the barb, it being a side view of Fig. 5, showing
40 a face view of the stationary cutter and a side view of both the ascending and descending cutters. Fig. 7 is a side view of the pawl-and-ratchet mechanism on the feed-roll shaft, to intermittingly rotate the feed-rolls and feed
45 in the barb-strip. Fig. 8 is a perspective view of the barb-strip as it appears when the two first prods of the barb are cut and formed. Fig. 9 is a perspective view of the guide that guides the two strand-wires into the machine
50 between the cutters in position so the barb-strip may be fed in between them. Fig. 10 is

a perspective view of a finished barb as it would appear detached from the strand-wires; and Fig. 11 is a side view of a barb and a cross-section of the strand-wires, showing the barb seated between them, it being the finished product of the machine.

This invention relates to certain improvements in a wire-barbing machine for automatically cutting and forming four-pointed flat metal barbs and setting them between a pair of strand-wires, to be held therein by means of the cabling together of said wires, which improvements are fully set forth and described in the following specification and claims.

Referring to the drawings, A represents the main frame or bed of the machine, and is intended to be supported on suitable legs or foundation, and supports the working parts of the machine.

70 S and S' are a pair of parallel rock-shafts mounted on said bed in their respective boxes B' and B². These boxes are held in position on the top of said bed by means of cap-screws (shown in Fig. 1) passing through the slots in the base of said boxes, so they may be set to or from each other by means of the set-screws b' and b², for the purpose of adjusting the barb-cutters. The outer ends of the shafts S
80 S' are respectively provided with the arms E E', rigidly secured thereto, as shown in Fig. 4. These arms are connected by means of the sliding bar D through the medium of roller-wrists attached to its side, and that traverse the slots F F' of said arms. A pitman, C, connects said sliding bar D with wheel B by means of the wrist-pins d d'. The slide is supported at one end in a box, I, and at the opposite end by means of the shaft H, which passes through slot H' in said bar. Power to
90 drive the machine may be imparted to said wheel, which, when it rotates, will reciprocate sliding bar D and rock the shafts S S' through the medium of pitman c and arms E E'. To the opposite end of said shafts are rigidly secured hubs, to which are attached the oscillating cutter-heads a, a', a², and a³, as shown in Fig. 2. The cutters P, P', P'', P², and P³ are each respectively held in said cutter-heads by means of proper cap-plates and cap-screws for their proper adjustment. The cutter-heads
100 on each shaft are set so they stand at right

angles with each other, and are arranged so that when they are oscillated they will alternately face and meet each other to cut and form the barbs. Cutter-head a has secured in it the two cutters P' and P'' , and cutter-head a^3 has secured in it the cutter P . These cutters, in conjunction with the stationary cutter R , secured to the top of the bed A by a cap-plate and cap-screws, as shown in Fig. 1, cut and form the first two prods of the barb and leave it in the form shown in Fig. 8. The barb is formed from a thin strip of flat metal, b . The cutter-head a' has secured in it the cutter P^2 , and cutter-head a^2 has secured in it the cutter P^3 , and when the cutter-heads are oscillated by means of partially rotating or rocking shafts S and S' , to which they attach, the said cutters P^2 and P^3 will meet, as shown in Fig. 6, and sever the barb loose from the barb-strip on a line shown by the dotted lines in Fig. 8, and bend the prods and form the barb, as shown in Figs. 6, 10, and 11.

R' represents the upper roll of a pair of feed-rolls, between and by means of which the barb-strip is fed into the machine intermittingly and in a diagonal direction along on the top of bed A , under a guide-plate, y' , so it will enter between a pair of strand-wires, w , and over the stationary cutter R , as shown in Figs. 1, 2, 3, 5, and 6, and between the oscillating cutters, so that a diamond-shaped barb may be cut from the end of the barb-strip and waste no material. The feed-rolls R' are rotated forward intermittingly to feed in the barb-strip by means of the pawl-and-ratchet device shown at T , T' , y , and z , Figs. 1 and 7. This ratchet mechanism is connected by means of the pitman z' to a crank-pin on the crank-wheel V on the rear end of shaft H , and when the said shaft rotates said mechanism will be operated to feed the barb-strip forward intermittingly far enough each time to form a barb. The upper face of bed A is provided with a guide-block, J , (shown in Figs. 1, 2, 3, 5, and 9,) secured thereto by means of a cap-plate and cap-screws, as shown in Fig. 1. The strand-wires w enter the machine from one side, the upper wire lying in the channel r , and the lower one in channel r' , of said guide. The inner end of said guide stands in relation to the cutters as shown in Figs. 1, 2, 3, and 6, and holds the said wires firmly, one immediately above the other, and far enough apart, as shown in Figs. 2 and 6, so the barb-strip b can be fed in between them. The strand-wires are intended to be taken up and cabled by means of an ordinary twister and spooler, not necessary to be shown, as it forms no part of this invention. However, the throat of the twister having on it the pinion K , is shown in Fig. 1 to locate it and show the strand-wires entering it.

The operation of the machine is substantially as follows: The strand-wires $w w$ are first threaded through the machine off their respective reels through their respective

guide-channels $r r'$ of guide-block J to a spool in the twister. The barb-strip b , having its end cut off in a diagonal manner in the form shown in Fig. 3, is then passed into the machine between the feed-rolls R' until its pointed end has passed in between the strand-wires far enough so they will stand over the center of the barb to be formed, the point of the barb-strip lying on the upper face of stationary cutter R , as shown in Figs. 1, 2, and 3. The barb-strip b is then in position for the oscillating cutters $P P' P''$ to cut and form the first two prods of the barb and leave them in the form shown in Figs. 2 and 8. The partial rotation of the shafts $S S'$ by the means hereinbefore described will oscillate or move the cutter-heads a and a^3 , with their respective cutters, toward each other. The form of slot T in arm E on shaft S , to which cutter-head a^3 is attached, is such that the face of its cutter P will be moved to stand on the same plane with the upper face of stationary cutter R , as shown in Fig. 2, and hold it stationary until cutter-head a descends with its cutters P' and P'' , and, in conjunction with cutter P and stationary cutter R , shear the two first prods of the barb and bend them down to the position shown in Figs. 2 and 8.

Fig. 3 is designed to show the relative position of the cutters with relation to each other and the position of the barb-strip at the instant the operation of cutting and forming the first two prods of the barb. The cutters P' and P'' have their cutting-faces so formed that they will, in conjunction with cutters P and R , begin to cut at the points of the barb-prods first, and as they descend bend the two first-formed prods downward, as shown in Figs. 2, 5, 6, 8, 10, and 11, so they stand at about right angles with each other. Cutter-head a^3 is provided on its face with a small bender-port, m , (shown in Figs. 2 and 3,) set a little forward of cutter P and a little at one side, and attached to said head in the same manner as said cutter serves to support the central part of the barb while the operation of cutting and forming the two first prods is being performed. The barb-strip and partially-formed barb remain stationary and in position as left by the said cutters until the cutter-heads $a' a^2$ have been oscillated toward each other by means of the reverse movement of arms $E E'$ and slide D , and their cutters P^2 and P^3 close upon the barb to sever it loose from the barb-strip and form the two remaining barbs, as shown in Figs. 5, 6, and 10. The form of slot F' in arm E' is such that the slide D will move cutter P^2 to a position so its upper face will be on the same plane as the upper face of stationary cutter R , as shown in Fig. 6, and stand in that position until cutter P^3 moves farther down and, in conjunction with cutter P^2 , severs the barb loose from the strip b , as shown in Fig. 6. The cutter P^3 is formed on its cutting-face, as shown in Fig. 6, so it begins to

cut at the base of the prod, and in its descent carries the body of the barb down with it, and by means of the point of its fellow prod, resting on the upper face of stationary cutter R, the body of the barb is bent, as shown in said figure, so these two last-formed prods will stand at a right angle from each other, and when severed entirely loose from the barb-strip is left in the form shown in Figs. 10 and 11.

In order to permit the bending of said two last prods, as stated, the lower strand-wire must of necessity be sprung downward a little distance, which spring is permitted by the depth of the guide-channel r' of guide-block J.

Figs. 5 and 6 are designed to show the relative position of the cutters with relation to each other when the operation of cutting and forming the two last prods is being performed. When the cutters P^2 P^3 separate, the strand-wires will immediately close on the newly-formed barb, so it may be held between them by means of their being cabled together by the twister, and is carried along out of the way of the next succeeding barb as the strands are being spooled by the twister and spooler. The strand-wires pass continuously through the machine, but their frictional contact with the barb is not sufficient to interfere with its formation, or carry it along out of the machine until it is severed loose from the barb-strip, as stated. The portion of the cutting-face of cutter P^2 , that cuts off the extreme point of the last-formed barb, is square, so the metal at and near the point of the barb may all be cut at once, to prevent breaking or bending of the barb-point.

The machine is timed so that the instant the barb is severed loose from the barb-strip, and begins to pass on out of the machine by being cabled with the strand-wires, the feed mechanism will feed forward the barb-strip far enough for the next succeeding barb, when another like operation cuts, forms, and sets the next succeeding barb.

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

1. In a wire-barbing machine, the combination of the oscillating cutter-heads a a' a^2 a^3 , having the cutters P P' P'' P^2 P^3 , stationary cutter R, strand-wire guide J, having the guide-channels r r' , shafts SS' , arms EE' , having respectively the slots FF' , slide D, having roller-wrists to traverse said slots, pitman C, drive-wheel B, and the barb-strip mechanism, all adapted to operate substantially as and for the purpose set forth.

2. In the wire-barbing machine shown and described, the combination of the oscillating cutter-heads a and a^3 , cutters P , P' , P'' , and R, and guide J, having the guide-channels r and r' , arranged to operate as and for the purpose set forth.

3. In the automatic wire-barbing machine shown and described, the cutter-heads a a' a^2 a^3 , for holding their several respective barb-cutters, and arranged to be oscillated to alternately bring their barb-cutters together, substantially as and for the purpose set forth.

4. In the wire-barbing machine shown and described, the several movable barb-cutters, supported in their respective oscillating heads, and arranged in such manner that the cutters of the first two facing heads will, in conjunction with a stationary cutter, cut and form the first two prods of a barb, and the cutters of the opposite heads, when brought to face each other, will, in conjunction with a stationary bender and supporter, sever the barb loose from the barb-strip and form its two last prods in the manner substantially as set forth.

5. In a wire-barbing machine, the oscillating or rocking shafts S S' , each respectively having a pair of cutter-heads arranged to support their respective cutters, in combination with a stationary cutter, R, and strand-wire guide J, and the mechanism, substantially as shown and described, for oscillating said cutter-heads and their barb-cutters, whereby the oppositely-located cutter-heads of each shaft are caused to alternately face each other, to automatically cut and form the several prods of a flat-metal barb and seat it between a pair of strand-wires in the manner substantially as set forth.

6. In a wire-barbing machine, the combination of the stationary cutter R, oscillating cutter-heads a a' a^2 a^3 , cutters P P' P'' P^2 P^3 , and strand-wire guide J, for cutting, forming, and setting a four-pointed flat-metal barb between a pair of strand-wires, substantially as set forth.

7. In the wire-barbing machine shown and described, the combination of the oscillating cutter-heads a' a^2 , cutters P^2 , P^3 , and R, and guide J, having the guide-channels r and r' , arranged to operate as and for the purpose set forth.

ALBERT J. BATES.

Witnesses:

WILLIAM M. CLOW,
WM. J. HUTCHINS.