

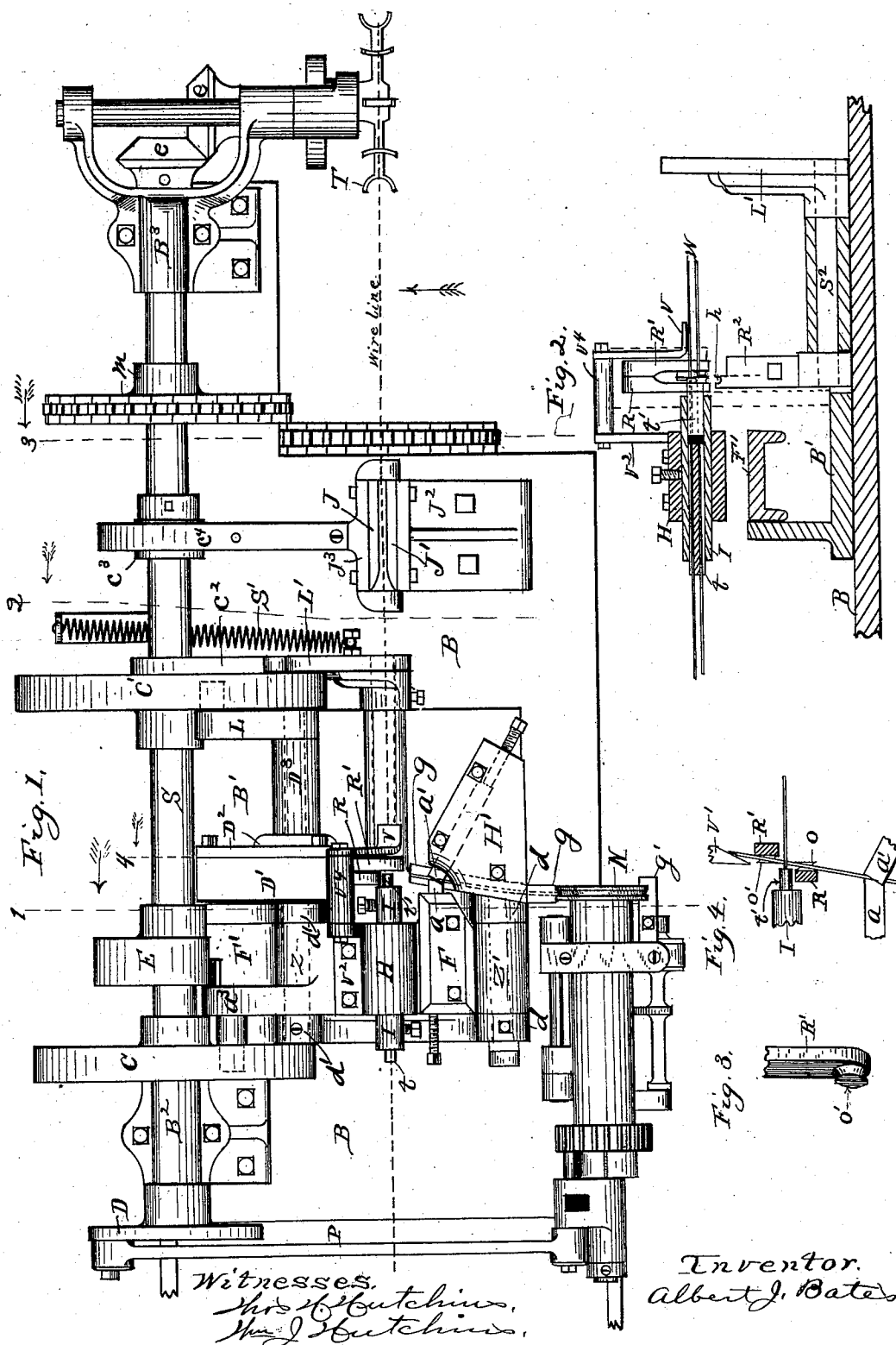
(No Model.)

3 Sheets—Sheet 1.

A. J. BATES.
WIRE BARBING MACHINE.

No. 367,085.

Patented July 26, 1887.



(No Model.)

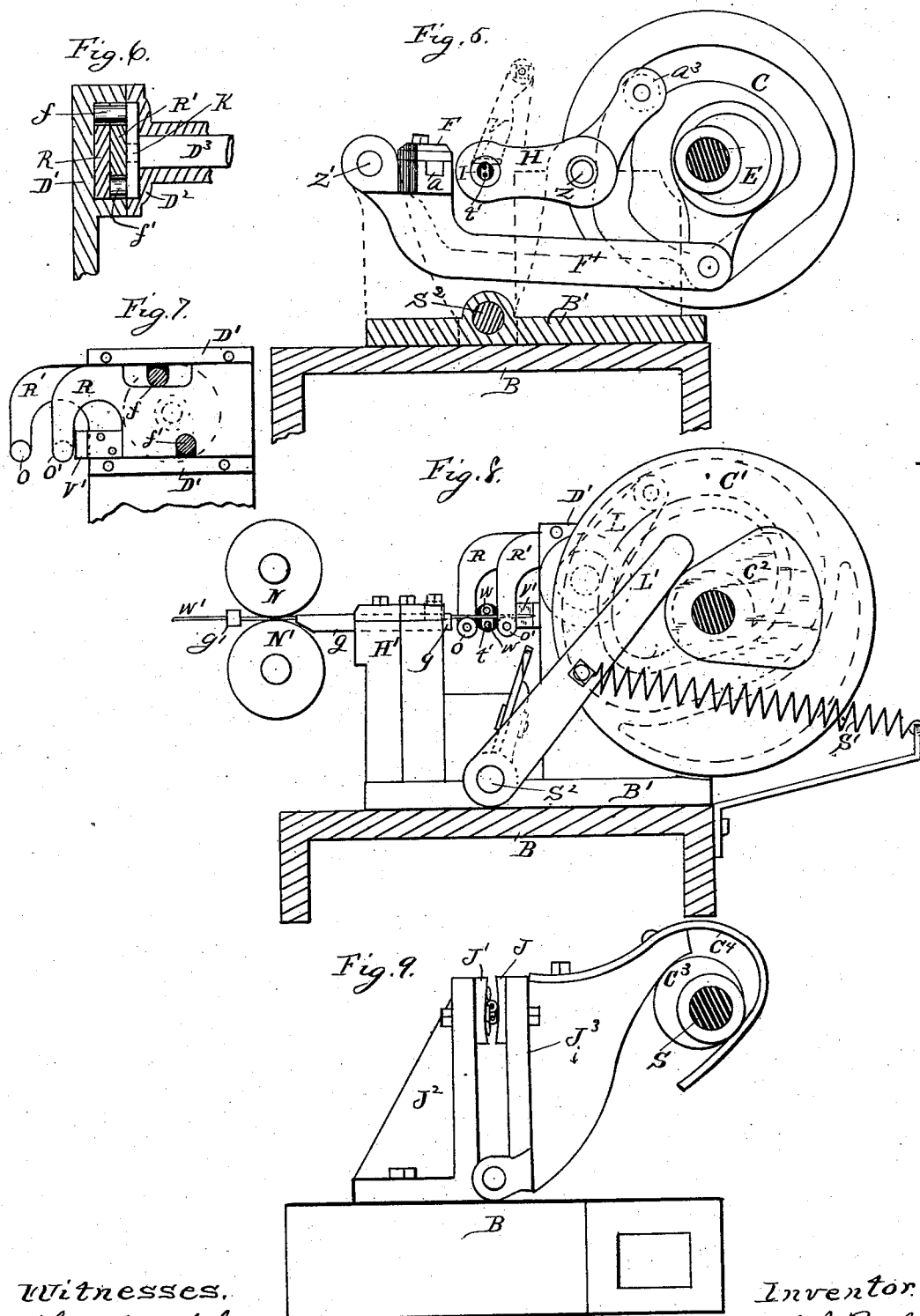
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Witnesses,

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Wm J Hutchins.

Inventor:
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(No Model.)

3 Sheets—Sheet 3.

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Fig. 10.

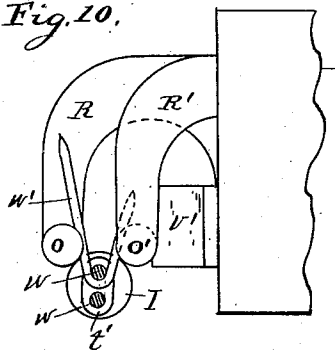


Fig. 11.

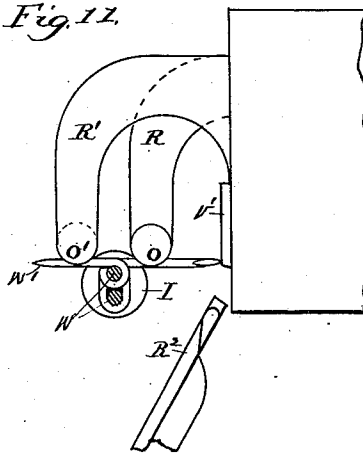


Fig. 12.

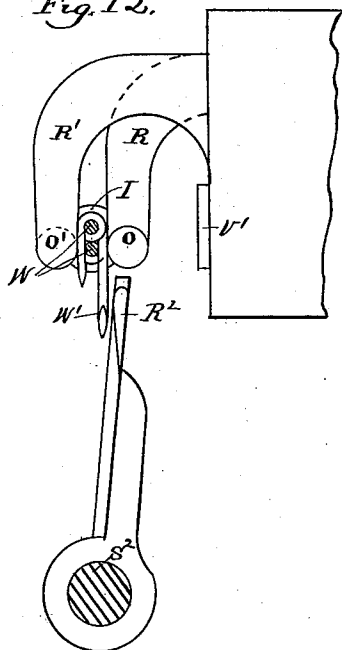


Fig. 13.

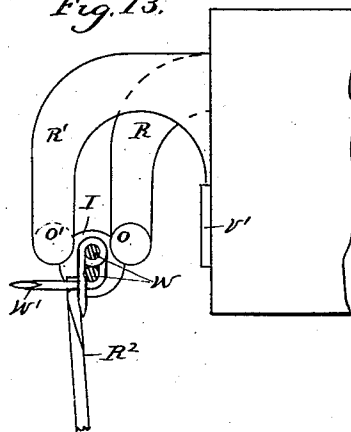


Fig. 14.

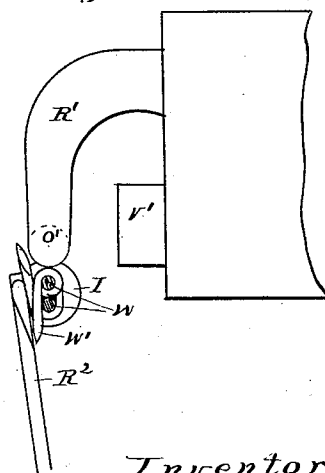
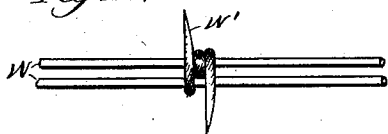


Fig. 15.



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UNITED STATES PATENT OFFICE.

ALBERT J. BATES, OF JOLIET, ILLINOIS.

WIRE-BARBING MACHINE.

SPECIFICATION forming part of Letters Patent No. 367,085, dated July 26, 1887.

Application filed May 31, 1887. Serial No. 239,807. (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.

This invention relates to certain improvements in wire-barbing machines, wherein the barbs are applied to the strand-wires by means of benders operated to fold the barbs upon the strand-wires, the construction and operation of which are fully set forth and explained in the following specification and claims, reference being had to the accompanying drawings, and the figures and letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 is a top plan view of the machine. Fig. 2 is a vertical longitudinal sectional view of the machine on the strand-wireline, (see Fig. 1,) looking in the direction indicated by the arrow shown in Fig. 1, showing a side view of the barb-bending mechanism. Fig. 3 is a perspective view of a portion of one of the barb-benders. Fig. 4 is a detailed top plan view of a portion of the strand-wire centers, of the barb-prod cutters, and of the barb-prod guide, and a sectional view of the two reciprocating barb-benders of the machine, showing the position in which a barb is first entered into the machine between the strand-wires and benders. Fig. 5 is a vertical cross-sectional view of the machine on line 1 of Fig. 1, looking in the direction of the arrow, showing a side view of the oscillating strand-wire center and barb-cutter and their operative mechanism. Fig. 6 is a detailed view showing the two reciprocating barb-benders of the machine and their supporting-box, in cross-section, and a side view of a portion of their operative mechanism. Fig. 7 is a detailed view showing a side of the two reciprocating barb-benders of the machine on line 4 of Fig. 1, looking in the direction of the arrow. Fig. 8 is a vertical cross-sectional view of the machine on line 2 of Fig. 1, looking in the direction of the arrow. Fig. 9 is a vertical cross-sectional view of the machine on line 3 of Fig. 1, looking in the direction of the arrow, showing a side view of the barb-compressing

mechanism. Figs. 10, 11, 12, 13, and 14 are detailed views of the barb bending and folding mechanism, showing the barb in the various stages of formation, and Fig. 15 is a view of a section of a pair of strand-wires having a barb applied thereon, being a production of this machine.

Referring to the drawings, B represents the principal bed of the machine, intended to be supported on suitable legs, and B' is a secondary bed or plate, secured to the upper face of bed B, for supporting the barb bending, folding, and cutting mechanism.

S is the main shaft, arranged above and along one side of bed B in the standard-boxes B² B³, and has keyed on it sprocket-wheel *m*, to which power is applied to drive said shaft, cams C, C', and C², eccentrics C³ E, crank-disk D, and miter-gear *e*.

A' is a stationary barb-point cutter, secured in a standard-box on bed B' by means of cap-plate H' and on a line with the space between the strand-wires.

A is an oscillating barb-point cutter, arranged to shear with stationary cutter A', and is secured by means of cap-plate F to the upper side of lever F', fulcrumed at Z' between standard-lugs *d d*, and connected at its opposite end, through the medium of an eccentric strap, with eccentric E on shaft S, by means of which said lever and its cutter A is oscillated. (See Figs. 1 and 5.)

H is a lever fulcrumed near its center at Z, between a pair of standard-lugs, *d' d'*, on bed B', and having its rear end provided with a roller-wrist, A³, for operating in the channel of cam C, and its opposite end having a chamber for holding the strand-wire guides adapted to be adjustably held thereon by set-screws. (See Figs. 1, 2, and 5.) The said strand-wire guide consists of the sleeve I, for containing the center *t*, provided with opposite longitudinal channels, and the center *t'*, having a pair of longitudinal holes corresponding with the channels in center *t*, through which channels and holes the strand-wires W are threaded. (See Figs. 2, 4, and 8.) These centers *t* and *t'* are secured within said sleeve by set-screws.

R and R' are a pair of reciprocating barb-prod benders arranged in box D' and held therein by means of the cap-plate D².

D³ is a rock-shaft arranged in an extending

box of cap D², and has on its inner end a disk, K, provided on its face with a pair of opposite pins, *f* and *f'*, respectively connected to the reciprocating barb-benders R R'. (See Figs. 6 and 7.) The barb-bender R is provided with an opening, as shown in Fig. 7, for the purpose of permitting pin *f* to pass through it to connect with the opposite barb-bender, R', and so barb-bender R can reciprocate. The opposite end of shaft D² is provided with crank L, having a roller-wrist for operating in the channel of cam C'. The form of said cam-channel is such that said shaft D² is intermittently rocked when said cam rotates, and through its connection with the barb-benders R R' will reciprocate them in opposite directions, for the purpose hereinafter described.

S² is a rock shaft secured in a box on bed B', and has secured on its outer end the arm L', for engaging cam C² on shaft S, and has secured on its inner end the oscillating barb-prod-bending arm R².

S' is a spring for holding arm L' engaged with cam C². (See Figs. 2 and 8.) When said cam rotates, the barb-prod-bending arm R² will be intermittently oscillated, for the purpose hereinafter stated.

N N' are a pair of ordinary barb-wire feed rolls having their shafts geared together and intermittently driven by shaft S, through the medium of crank-disk D, pitman P, and a pawl-and-ratchet mechanism, in the ordinary manner, (see Fig. 1,) and *g* is a guide for conducting the barb-wire from said rolls between the strand-wires and cutters.

J² and J³ are jaws forming a press for compressing the barbs properly on the strand-wires after they have been folded thereon by the barb-benders. The jaw J² is stationarily fixed on bed B and jaw J³ is hinged to jaw J² at its foot and rests at its upper rear side against eccentric C³ on shaft S, by means of which it is oscillated to open and close said jaws.

C⁴ is a curved spring secured to the upper side of jaw J³, and extends over said eccentric for the purpose of holding jaw J³ in engagement with said eccentric C³.

J and J' are removable interchangeable plates secured respectively to the inner face of said jaws and have their faces concaved, so when they compress a barb they will bring its prods and strand-wires in line with each other, (see Figs. 1 and 9,) or nearly so.

V' is a barb-point guide secured to the body of the reciprocating barb-bender R, in a suitable recess between the benders R R', and is formed, as is shown in Figs. 4, 8, and 10, so it will guide the barb prod properly between the benders R R' and over the grooved lugs O thereof. (See Figs. 4 and 8.)

The reciprocating barb-prod benders R R' are formed in such manner that each has a depending arm overreaching the strand-wire line of the machine, (see Fig. 8,) and are respectively provided at the lower end on their sides facing each other with circular grooved

lugs O and O', as shown in Figs. 3, 4, 8, 10, 11, 12, 13, for engaging the barb-prods to assist to fold them on the strand-wires.

V is a presser-foot secured to lever II by means of standard V² and arm V⁴, as shown in Figs. 1 and 2, and is for the purpose of pressing on the strand-wires to hold them in line with their guide when the strand-wire guide is descending. *g'* is an outer guide or eyelet through which the barb-wire is guided to the feed-rolls.

The two reciprocating barb-prod benders R and R' have their outer extending ends constructed, as shown, to form depending arms having the circular grooved lugs O and O' respectively secured to them on their sides facing each other and at their lower extremity, and are adapted to reciprocate only when the strand-wire guide has descended to be below them.

The lugs O O' are not relieved from contact with the barb-prods until they are completely folded on the strand-wires and operate as a rest for the prods to lie against while the strand-wire guide is ascending and descending between them, and they change position with each other when the strand-wire guide is out from between them to fold the prods over in opposite direction on the strand-wires.

In this machine the principal new features are in the parts that fold the barb on the strand-wires, and consist of an oscillating strand-wire guide for elevating and lowering the strand-wires during the process of folding the barbs thereon; of a pair of oppositely-reciprocating barb-prod benders arranged one on either side of the strand-wires at the place the barb is fed between the said strands, and in such manner as to engage and support a prod on either side of the strand-wires after being severed from the barb-wire, and while the strand wire guide descends and bends the two prods up they then reciprocate in opposite directions and fold the two barb-prods over the upper strand-wire, so they project in a horizontal plane in opposite directions and hold the prods while the strand-wire guide ascends and bends the two prods to project downward; of an oscillating bender-arm for engaging one of the downwardly-projecting barb-prods and bending it laterally under the lower strand-wire and support it until the strand-wire guide descends again, which will bend said prod upward to project in an opposite direction from the opposite prod, thus completing the fold of the barb upon the two strand-wires, after which the strand-wire guides further descend, so that the two barb-prod benders can reciprocate back to their first position, and the strand-wires are drawn along to carry the said barb along out of the way, so the next succeeding barb can be applied.

In operation the two strand-wires W W are taken from the coil, passed over a suitable guide in the ordinary manner, thence they are threaded through the center guides, *t* and

5 t' , between the barb-prod benders, between the barb-compressing jaws, and thence to and over an ordinary oscillating sprocket-wheel, T, to a spooler and twister below the barbing mechanism, (not necessary to be shown, as it forms no part of this invention,) and so that one wire will be directly above the other, as shown in Fig. 2 particularly, and are intermit-
 10 tingly drawn through the machine by means of said sprocket-wheel T, in the ordinary manner. The barb-wire is fed through the guide g by means of the feed-rolls N N', so as to enter between the two strand-wires and between the two reciprocating barb-benders R R', and
 15 when first fed in is in the position shown in Figs. 4 and 8, the barb lying over and in the grooves of the lugs O and O'. Further rotation of the machine will cause the strand-wire guide I t t' and strand-wires W therein to descend from the position shown in Fig. 8 to that
 20 shown in Fig. 10, the cutters A A' severing the barb from the barb-wire at the same instant. While the barb is in the position shown in Fig. 10 the reciprocating barb-prod benders reciprocate and change position with each
 25 other to that shown in Fig. 11, thus folding the barb on the upper strand-wire. The strand-wire guides, with the strand-wires, then ascend between the benders R R' to the position
 30 shown in Fig. 12, causing the benders to bend the two barb-prods downward, one prod, W', being longer than the other. The arm R² then moves forward and engages the long prod W' and bends it to the position shown in Fig. 13.
 35 The strand-wire guide and strand-wires then descend and cause the arm R² to bend prod W' upward, as shown in Fig. 14, and so that it incloses the lower strand-wire and projects in the opposite direction from the other prod, and at the same time the two barb-benders R
 40 R' reciprocate and change position back to that shown in Figs. 4 and 8, finishing bending and folding the barb on the strand-wires.
 The upper end of arm R² is provided with
 45 a notch, h , for engaging said barb-prod, and is cut away at the side of said notch, as shown in Fig. 2, so as not to engage the opposite prod. After the barb has passed through said various stages, and is formed as shown in Fig. 14, the
 50 strand-wires are drawn along by means of a take-up mechanism, (not necessary to be shown,) and the barb thus formed passes between jaws J² J³, which compress it on the strand-wires in the proper form, and leaves it
 55 finished and applied to the strand-wires, as shown in Fig. 15.

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

60 1. In the wire-barbing machine described, and in combination with the oscillating strand-wire guide, the reciprocating barb-point benders R and R', having the lugs O O', cutters A A', and barb-bending arm R², substantially as and
 65 for the purpose set forth.

2. In the wire-barbing machine described, the combination of the oscillating strand-wire guide H I t t', cutters A A', reciprocating barb-benders R R', having the grooved lugs O O', barb-bending arm R², guide g , feed-rolls N N',
 70 guide V', jaws J² J³, and the means shown for operating said parts, substantially as and for the purpose set forth.

3. In the wire-barbing machine described, the combination of the reciprocating barb-benders R R', having the grooved lugs O O', the oscillating strand-wire guide H I t t', and cutters A A', substantially as and for the pur-
 75 pose set forth.

4. In the wire-barbing machine described, the combination of the barb-prod benders arranged to change position with each other, and the strand-wire guide arranged to oscil-
 80 late between said benders, substantially as and for the purpose set forth.

5. In the wire-barbing machine described, and in combination with the oscillating strand-wire guide, the presser-foot V, substantially as and for the purpose set forth.
 85

6. In the wire-barbing machine shown and described, and in combination with the barb-benders and oscillating strand-wire guide, the oscillating barb-prod bender R², substantially as and for the purpose set forth.
 90

7. In the wire-barbing machine shown and described, and in combination with the reciprocating barb-prod benders R R', having the grooved lugs O O', the barb-point guide V', sub-
 95 stantially as and for the purpose set forth.

8. In the wire-barbing machine described, and in combination with the barb-wire feed-rolls and the barb-point cutters and barb-wire guide, the reciprocating barb-point benders R R', having the grooved lugs O O', and the
 100 barb-prod guide V', substantially as and for the purpose set forth.

9. In a wire-barbing machine, the strand-wire center guide thereof arranged to move vertically to form the body-bends of a barb placed between or beneath the strand-wires,
 110 in combination with a pair of reciprocating benders, and an oscillating bender for supporting and bending the barb-prods to fold them about the strand-wires, in the manner substantially as specified.
 115

10. In a wire-barbing machine, the strand-wire center guide arranged to oscillate to raise and lower the strand-wires to bend a barb during its formation, in combination with a pair of oppositely-reciprocated benders for
 120 supporting the barb-prods during said bending and for folding the barb-prods about the strand-wires, and an oscillating bender for bending latterly a barb-prod and supporting it during its final bending, in the manner sub-
 125 stantially as specified.

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