

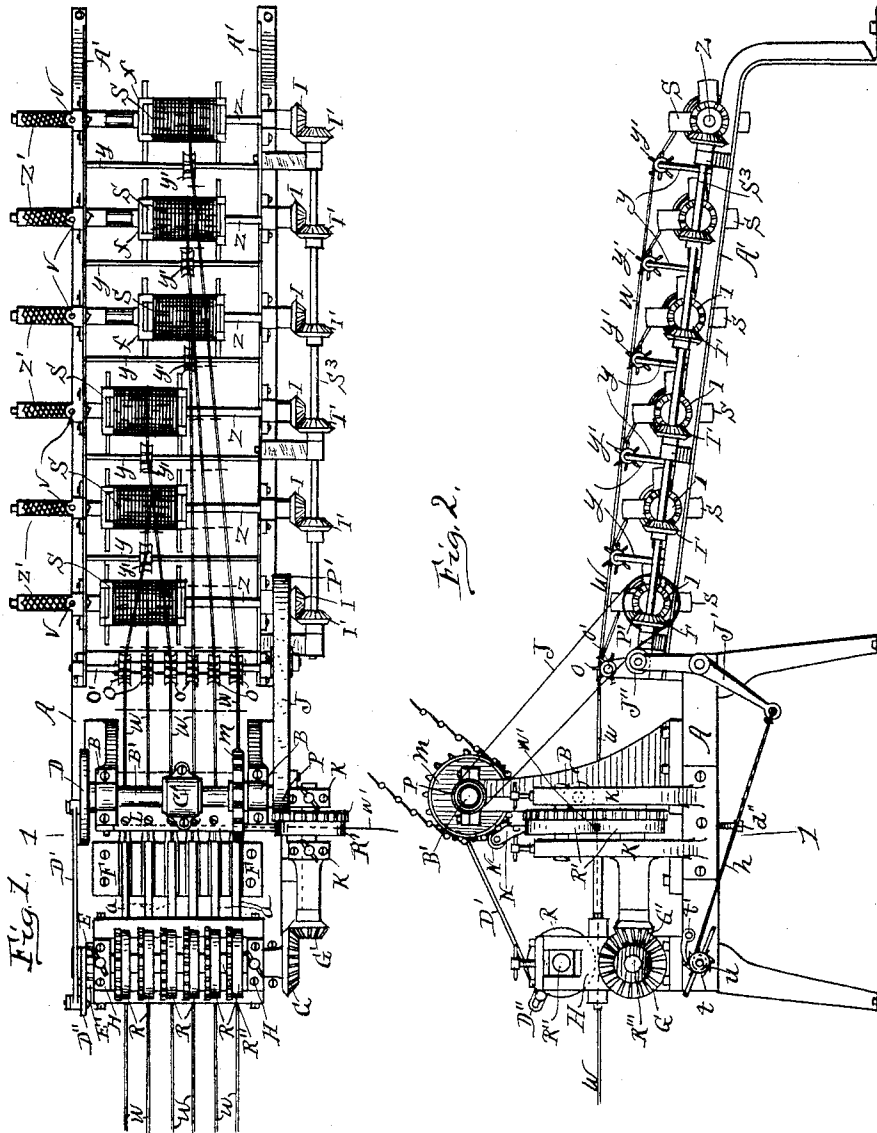
(No Model.)

2 Sheets—Sheet 1.

W. O. BATES & W. J. HUTCHINS.
ELECTRIC WIRE BARBING MACHINE.

No. 584,733.

Patented June 15, 1897.



Witnesses,
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UNITED STATES PATENT OFFICE.

WILLIAM O. BATES AND WILLIAM J. HUTCHINS, OF JOLIET, ILLINOIS.

ELECTRIC WIRE-BARBING MACHINE.

SPECIFICATION forming part of Letters Patent No. 584,733, dated June 15, 1897.

Application filed February 13, 1897. Serial No. 623,247. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM O. BATES and WILLIAM J. HUTCHINS, citizens 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 Electric Wire-Barbing Machines, of which the following is a specification, reference being had therein to the accompanying drawings and the letters of reference thereon, forming a part of this specification, in which—

Figure 1 is a plan of the machine; Fig. 2, a side elevation of same; Fig. 3, a central vertical longitudinal sectional elevation of the same, omitting the spooling mechanism; Fig. 4, a cross-sectional elevation on line 1 1 of Figs. 1 and 2; Fig. 5, a detailed view of one spooling-shaft of the machine; Fig. 6, a detailed side view of a pair of the machine-electrodes represented in service; Fig. 7, a detailed perspective of one pair of barb-prod cutters of the machine, represented in service; and Fig. 8, a perspective view of a section of barbed fencing, the same being a product of the machine.

This invention relates to certain improvements in wire-barbing machines, and relates to a machine wherein barbs are electrically welded to a strand wire or wires; and it consists of means for intermittently conveying a plurality of strand-wires across the machine, means for placing barbing-wire across the strand-wires, means for actuating electrodes for grasping the strand and barbing wires during a period of time sufficient to make a weld, of means for cutting the barb-prods and means for spooling the barbed wire, which improvements are set forth and explained in the following specification, and pointed out in the claims.

The object of this invention is to produce a machine for electrically welding barbs to a fence strand wire or wires.

Referring to the drawings, A is the machine-bed, mounted on standards, as shown; A', a pair of angle-iron bars fixed at one end to bed A, bent down at their outer end to form floor feet, and arranged a distance apart, as shown.

B are uprights fixed upon bed A, one at

either side of the bed, and are made with guideways between which a vertically-sliding head L is arranged. B' is a cross-shaft boxed in the upper part of uprights B and has fixed upon it an eccentric C, which, through the agency of a strap C', operates head L. A sprocket-wheel M, about which a chain belt is passed, drives the shaft B', on which shaft a pulley P, through the agency of a belt J, drives the wire-spooling mechanism; and a disk D on this shaft B', through the agency of a crank-pin and connected rod D', operates the wire-feeding mechanism intermittently and by means of a peripheral cam-lug D² actuates the barb-prod-cutting mechanism.

S is a cross rock-shaft boxed at its end portions in uprights B, and has fixed on its portion between said uprights a cutter-head S', having adjustable barb-prod cutters d' set therein, and further has fixed on one end at the outer side of upright B an arm N, having a friction-roller N' housed in its extending end portion, arranged to impinge upon the periphery of disk D and be operated to actuate the said cutters by said cam-lug D², and is held yieldingly against said disk by means of a spring g, (see dotted lines in Fig. 3,) which returns the arm and cutters to their normal position after each actuation.

U is a cross-frame fixed upon bed A between uprights B and supports adjustable station upright cutters d in such position that cutters d' shear therewith to cut the barb-prods.

F is a cross-frame fixed upon bed A and supports electrodes e, insulated therefrom in a fixed position and between the cutting end portions of cutters d, and above are arranged fellow-electrodes e', insulated to stems adjustably set in the sliding head L in such manner as to be operated by said head to contact wire resting upon the lower electrodes e.

H are housings fixed upon bed A and support cross-shafts R'' R''', upon which are fixed pairs of wire-feeding rolls R R, which are geared together in pairs, as shown, and made adjustable so as to be set to firmly pinch the wire feeding between them. Fixed on one end of shaft R'' is a ratchet-wheel E, and sleeved on said shaft at the side of said ratchet is an arm D'', having a pawl E', arranged to en-

gage the ratchet-teeth and adjustably connected at its slotted end portion with rod D'. Fixed to housings H H are wire-guides *a*, arranged to guide wire W from rolls R R to the upper plane of electrode *e*, so the wire will be fed across said electrodes.

K K are other housings for barbing-wire feed-rolls R' R', stationed at the side of bed A in such position that wire W' will be fed through a guide X into the machine across wires W immediately above electrodes *e* and across cutters *d*. The lower shafts of rolls R and R' are geared together, as shown at G G', so they will operate jointly, the said gears being proportioned so as to turn rolls R' sufficiently to feed the required length of wire from which to properly cut the barbs. If so desired, a second housing, pair of rolls, and gears like unto said barbing-wire feed-roll mechanism may be stationed at the opposite side of the machine and one-half of the required barbing wire fed in at each side.

Boxed in bearings fixed to one angle-bar A' are right and left hand screw-threaded hollow screws Z'. Boxed in opposite similar bearings fixed to the opposite bar A' are miter-gears I, and Z are shafts placed through screws Z' on feathers brought to span the space between bars A' A' and entered at their end portion into gears I, where they are removably held by means of cross-pins I², (see Fig. 5,) and placed upon said shafts are spools S, placed connected with screws Z', so as to turn therewith by being coupled with heads *f* of said screws. (See Fig. 5.) Bracketed to one side of bar A', supporting-gears I, is a shaft S³, having fixed thereon gears I', arranged in mesh with gears I, so as to drive said shafts and screws Z Z' jointly, and the hub of the first of said train of gears I has fixed thereon a pulley P', about which the belt J passes to drive said train, which belt is made so as to slip on its pulleys at times when said train cannot turn, and as a means of holding said belt at a proper tension an idler-pulley J'', which is studded to the upper end of a lever J', fulcrumed to the side of bed A, is held thereagainst, which lever is held adjusted by means of a cord *h*, arranged connecting its lower end with a hand-winding spool U, studded to the side of bed A and provided with a ratchet-wheel *t*, which is engaged by a detent-pawl *t'* to hold the proper adjustment.

Placed in conjunction with each screw Z' is a forked switch V of the usual type (see Fig. 5) for the purpose of causing said screws and the spools connected therewith to assume a side alternating movement when rotated, so as to distribute wire evenly upon the spools. O' is a cross-rod supported by suitable up-rights and has sleeved thereon a plurality of butterfly-wheels *o*, and sleeved on other upright cross-rods *y* are other butterfly-wheels *y'*, over which wire is conducted to the several spools, as shown.

In operation the wires W to be barbed are

fed in between rolls R R, through guides *a*, over electrodes *e*, over butterflies *o* and *y'*, to their respective spools S. The barbing-wire is fed in between rolls R' R', through guide X, across wires W and cutters *d*, and over electrodes *e*; hence under electrodes *e'* and cutters *d'*. The electrodes *e* are electrically connected by means of conductors W''', and electrodes *e'* are similarly connected by conductors W'', which conductors are of the same electric circuit, and when the wires have been placed as stated the electrodes *e'* move down upon the barbing-wire W', pressing it firmly upon wires W on electrodes *e*, which action makes the electric circuit through said wires, and by reason of the resistance thereat the wires are fused and welded together, and such duration of contact is only sufficient to attain the result stated, which duration or time of contact is controlled by the speed of the machine. At the conclusion of each such weld the cutters *d'* are actuated and cut the barbing-wire W' obliquely between the wires W, and thus form the barbs, which, by reason of the oblique cuts, are pointed and form prods. At each feed of the wires W they are taken up by the spools S, which are driven with sufficient friction to aid in advancing said wires.

If desired, the cutters *d* and *d'* may be shaped and set to sever the wire W' squarely, or nearly so, so that instead of forming prods on said attached parts they may be used as fasteners and utilized as such by bending them to secure stay-wires to a fence, or the barbs, made as shown, may be likewise bent and serve as fasteners. Also flat metal strips or other shaped metal parts may be placed across the strand-wires W and electrically welded thereto instead of the wires W, if so desired.

Having thus described our invention, what we claim as new and useful, and desire to secure by Letters Patent, is as follows:

1. In an electric wire-barbing machine, means for supporting and advancing one or more strand-wires across or through a machine; means for placing barbing-wire across the strand wire or wires; means for supporting and actuating electrodes to contact said barbing and strand wires at the junction of their weld; and means for severing the barbs from the barbing-wire, substantially as set forth.

2. In an electric welding-machine, means for supporting one or more wires; means for placing other wire, strips, or parts, across said supported wires; means for supporting and actuating electrodes to clamp said supported wires and placed wire, strips, or parts, during the period of time of welding, substantially as set forth.

3. In an electric wire-barbing machine, a plurality of intermittent strand-wire-feeding devices; guides for conducting the wire to and from said feeding devices; a plurality

of spooling devices for taking up and spooling the strand-wires; an intermittent barbing-wire-feeding device or devices; a plurality of electrodes; and a plurality of barb-prod cutters; substantially as set forth.

4. In a wire-barbing machine, the combination of a strand-wire-feeding device or devices; a barbing-wire-feeding device, of one or more fixed electrodes; of one or more operative electrodes; of one or more stationary barb-prod cutters; of one or more operative barb-prod cutters; and of spooling mechanism for taking up and spooling the barbed wire; wherein the barbs are electrically welded to the strand wire or wires; substantially as set forth.

5. In a wire-barbing machine, intermittently-operated feeding devices for feeding forward strand-wire and barbing-wire simultaneously at or about a right angle to and across each other, electrodes stationed and actuated to grasp said wires at their crossing or crossings, and cutters stationed and actuated to cut said barbing-wire to form prods, substantially as set forth.

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6. In the machine described, the combination with the stationary electrodes and their supporting-frame; the operative electrodes, the sliding head, and the eccentric and strap thereof for operating said head and electrodes, substantially as set forth.

7. In the machine described, in combination with the stationary adjustable cutters and their supporting-frame; the cross rock-shaft, the cutter-head fixed on said shaft, the adjustable cutters set in said head, the arm fixed on said shaft, and the cam and spring for actuating said arm and head, substantially as and for the purpose set forth.

Signed at Joliet, Will county, State of Illinois, this 11th day of February, 1897.

WILLIAM O. BATES.

WILLIAM J. HUTCHINS.

In presence of—

FREDERICK M. KER,

EDWARD E. WOLCOTT.