

(No Model.)

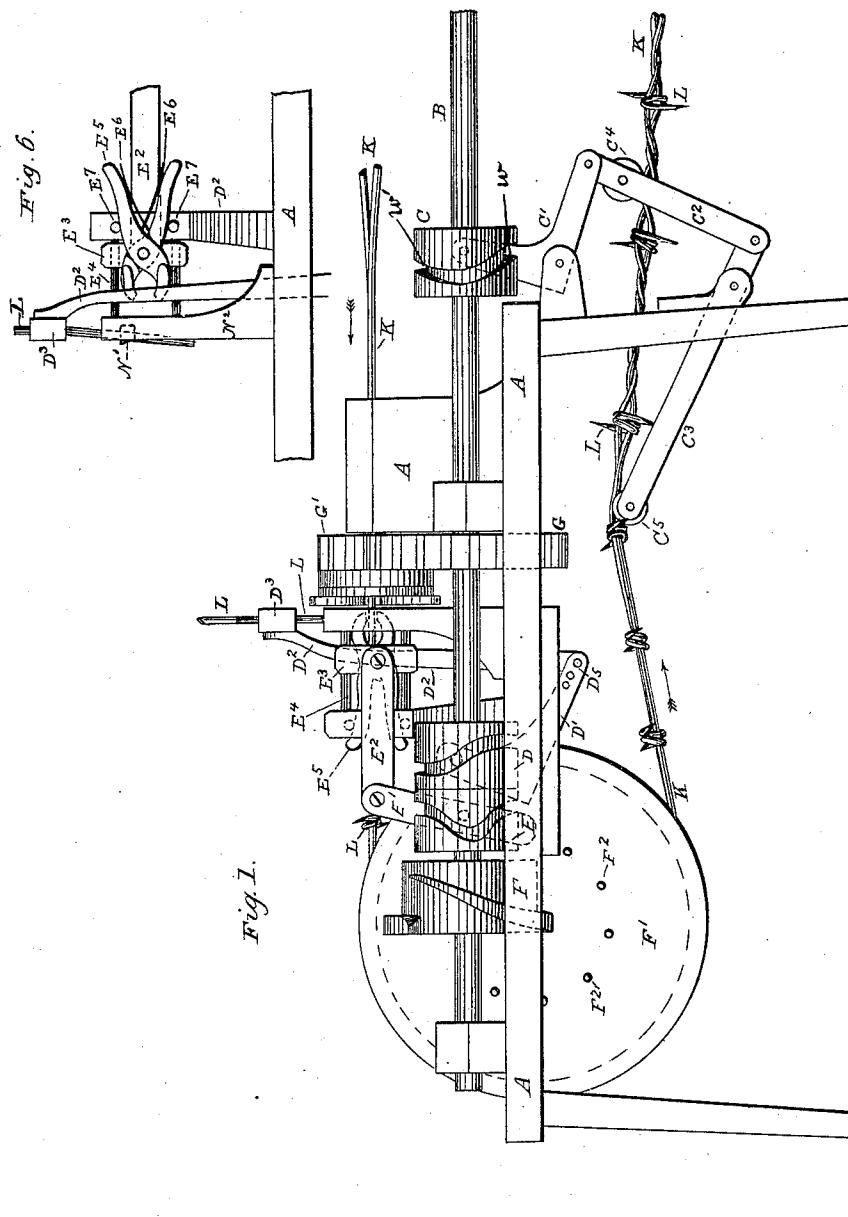
3 Sheets—Sheet 1.

M. CONVERSE & F. P. CADY.

MACHINE FOR MAKING BARBED FENCE WIRE.

No. 256,794.

Patented Apr. 18, 1882.



WITNESSES

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(No Model.)

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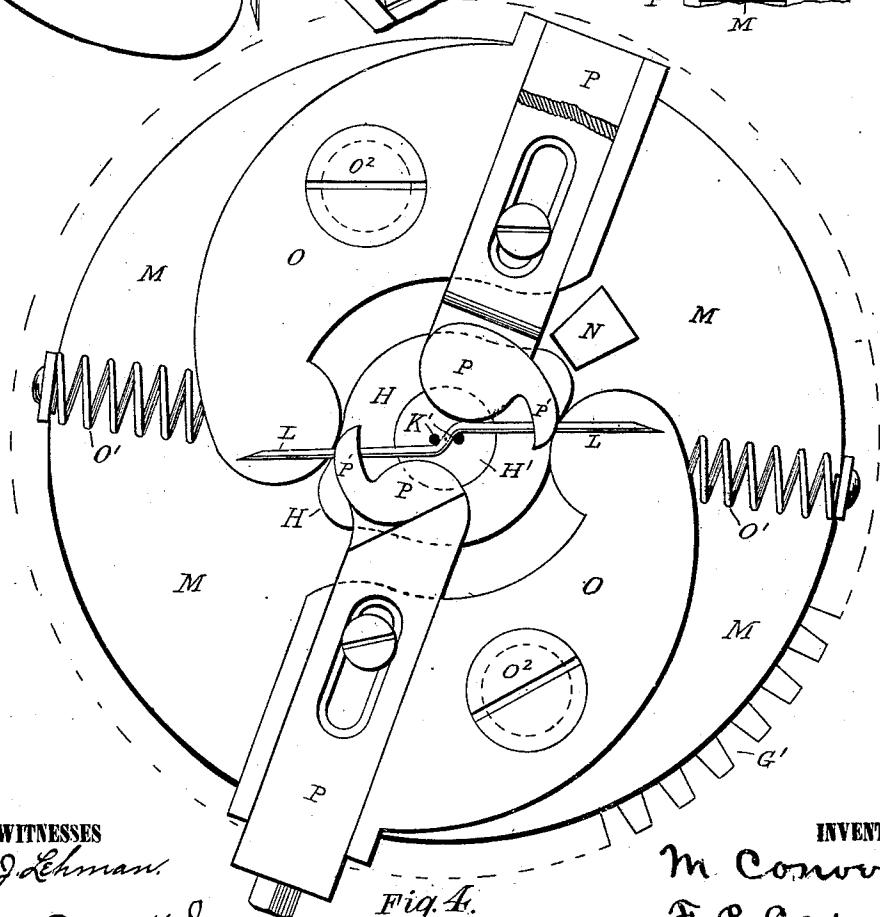
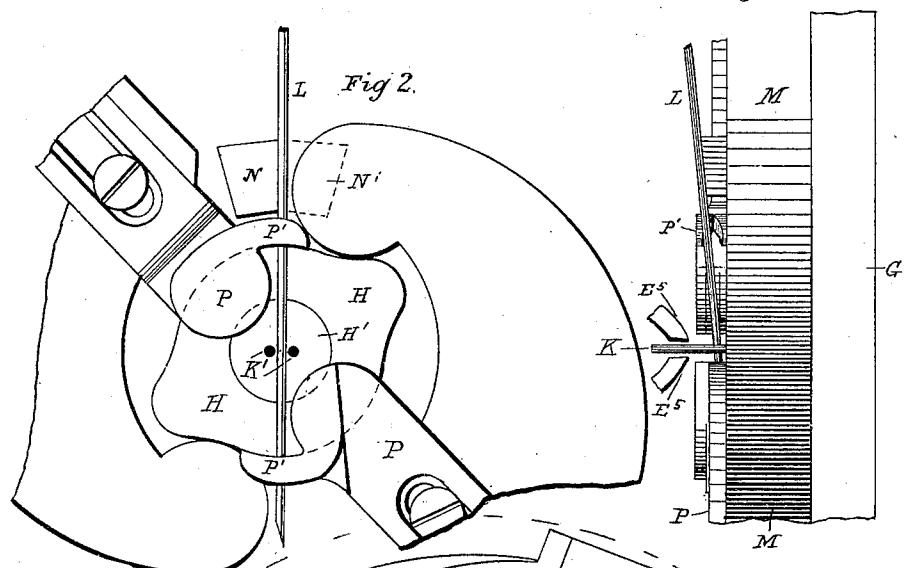
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Fig 3



WITNESSES

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(No Model.)

3 Sheets—Sheet 3.

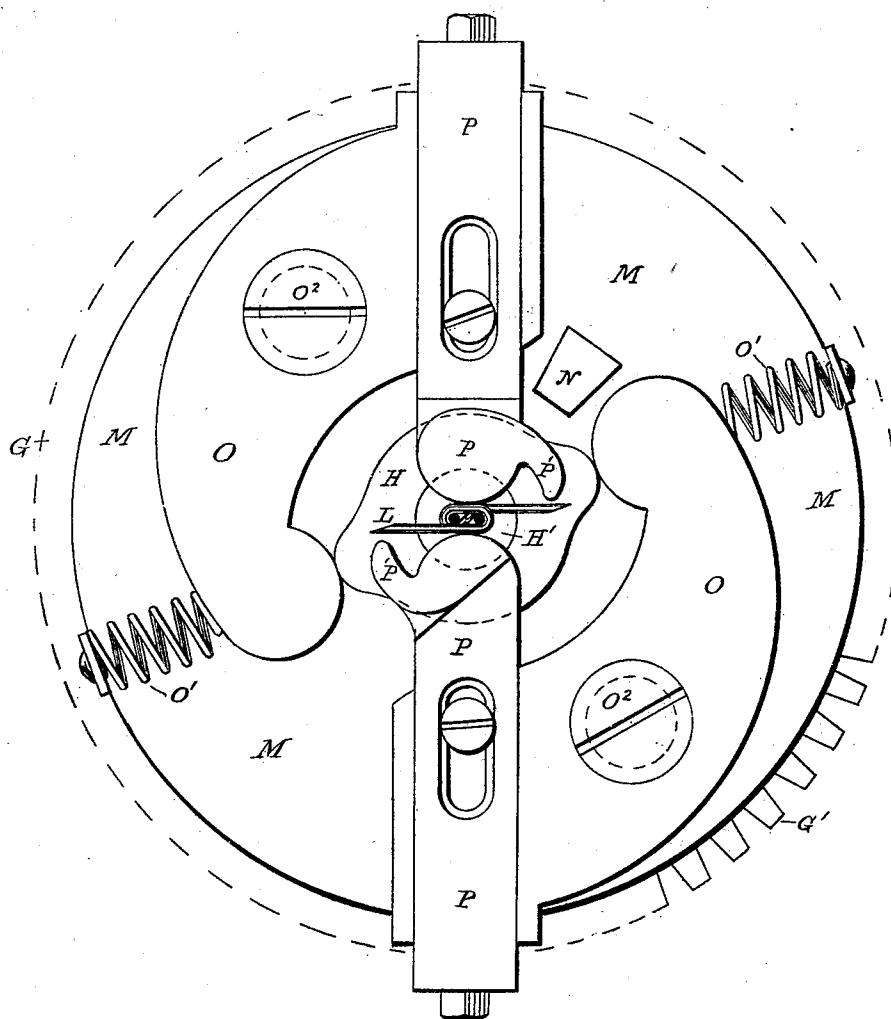
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Fig. 5.



WITNESSES

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# UNITED STATES PATENT OFFICE.

MAURICE CONVERSE AND FRANK P. CADY, OF CLEVELAND, OHIO, ASSIGNEES, BY DIRECT AND MESNE ASSIGNMENTS, TO WASHBURN & MOEN MANUFACTURING COMPANY, OF WORCESTER, MASSACHUSETTS, AND ISAAC L. ELLWOOD, OF DE KALB, ILLINOIS.

## MACHINE FOR MAKING BARBED FENCE-WIRE.

SPECIFICATION forming part of Letters Patent No. 256,794, dated April 18, 1882.

Application filed October 4, 1880. (No model.)

*To all whom it may concern:*

Be it known that we, MAURICE CONVERSE and FRANK P. CADY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machines for Making Barbed Fence-Wire; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Our invention relates to machinery for barbing fence-wires; and it consists in the features and combinations hereinafter specified and claimed.

In the drawings, Figure 1 represents our device in side elevation. Figs. 2, 3, 4, and 5 are detached and detail views, illustrating the barb bending and applying mechanism in the various stages of its operation. Fig. 6 is a view showing the pinching-fingers and their associated parts, together with the stationary cutter.

A is a frame or table of any suitable construction, dimensions, and material for carrying and accommodating the various parts of our machine.

B is the main shaft, to which driving-power is applied in any suitable way. Upon the main shaft B are placed four cams, one cam, C, suitably constructed to impart a reciprocating motion to the bent lever C', which is pivoted to the frame A. One arm of this lever

C' engages with the cam C, and the other is connected by a link, C<sup>2</sup>, with a lever, C<sup>3</sup>, which is also pivoted to the frame A, as indicated. Upon the link C<sup>2</sup> is carried the anti-friction guide-pulley C<sup>4</sup>. The function of the apparatus as thus far specified is to take up the slack of the wire as it is delivered from the barbing and feeding mechanism, and in the interval when the delivery of barbed wire from the said mechanism has ceased to give up the slack to the spooling and twisting mechanism.

Heretofore when a spooling apparatus has been used with barbing mechanism in which the main or strand wires are fed intermittently

the spool has been obliged to conform itself to the intermittent feed, revolving rapidly while the barbed wire is delivered from the barbing mechanism and stopping when the delivery ceases. To effect the intermittent spooling the spool has been revolved through springs or friction-bearings, whereby it is allowed to come to rest in a state of tension, so to speak, ready to start ahead when the delivery of the barbed wire again begins. This constant starting and stopping obviously strains and produces wear in the machine, and obviously, also, it is not conducive to the regular and uniform winding of the barbed wire on the spool.

By means of the automatic take-up before referred to, the spooling apparatus is rendered independent of the intermittent delivery of the wire from the barbing mechanism, the take-up controlling the slack, so that the spooling apparatus is supplied continuously and uniformly. As shown, the cam C is so shaped that the slack is rapidly taken up during the feed, (corresponding to the quick movement imparted to the feed-wheel F', as hereinafter explained,) and is given up more slowly during the barbing operation when the wire is stationary, the incline w operating the levers C' C<sup>3</sup> to take up the slack, and the incline w', which is less oblique to the plane of rotation of the cam, returning them. The barbed wire is led in the manner shown in the drawings over a pulley, C<sup>5</sup>, at the free end of the lever C<sup>3</sup>, thence under the pulley C<sup>4</sup>, out to the spooling and strand-twisting mechanism.

The next cam, D, upon the main shaft is designed to actuate the barb-wire-feeding mechanism, and this cam is constructed to impart to said barb-wire-feeding mechanism a prompt feeding motion and a return motion, which may be either slow or fast, as desired.

The mechanism actuated by the cam D may be described as follows:

D' is a bent lever, pivoted at its angle to the frame A. One arm of this lever engages with the actuating-cam D, and has imparted to it a reciprocating horizontal motion, which is converted into a reciprocating vertical motion at the opposite arm of said lever. To this oppo-

site arm is attached a link, D<sup>2</sup>, which passes up and connects with a one-way clutch device, D<sup>3</sup>. The clutch D<sup>3</sup> may be constructed in any of the many well-known ways, so that the barb-wire L will be grasped and fed down with each downward movement of said clutch D<sup>3</sup>, but will be permitted to slip through said clutch on its upward movement.

5 To enable barb-blanks of different lengths to be fed and severed, adjusting-holes D<sup>4</sup> in the lever D' are provided.

10 By coupling the link D<sup>2</sup> into the adjusting-hole nearest the pivotal point of the lever D' the clutch mechanism D<sup>3</sup> will be given its shortest feeding motion, whereas if the link D<sup>2</sup> is pivoted to the extremity of the arm of the lever D' the clutch and barb-wire-feeding mechanism will be given its maximum feeding movement and the barb will be fed and severed.

15 The cam D is to be adjusted upon the main shaft B in such a manner as to impart to the barb-wire-feeding mechanism its motion and operation in proper concert with the other parts of the machine in the manner and to the effect hereinafter described.

20 The next cam, E, is for imparting an intermittent reciprocating motion to the pinching-fingers that hold the strand-wires in position while the barb is being fed and applied. This mechanism consists of a lever, E', of the third order, pivoted to one end to the frame A, engaging at its middle portion with the cam E, and jointed at its upper end to a link, E<sup>2</sup>, thus connecting the lever E' with a head-block, E<sup>3</sup>.  
 25 This head-block moves horizontally upon suitable fixed guides, E<sup>4</sup>, and carries the pinching-fingers E<sup>5</sup>. The arms of these fingers are associated with one or more springs, E<sup>6</sup>, that exert a continuous pressure tending to open said fingers. The arms of the fingers E<sup>5</sup>, from the point of their intersection and pivotal attachment to the head-block E<sup>3</sup>, have their outside surfaces diverging rearward. These finger-arms move between stationary pins or lugs E<sup>7</sup>, which operate, as the head-block E<sup>3</sup> moves forward, to bring together the finger-arms, and thus clutch the strand-wires in the manner and for the purposes hereinafter to be described. As the head-block E<sup>3</sup> recedes the springs E<sup>6</sup>,  
 30 will open the pinching-fingers and permit the barbed wire to pass through. The cam E is to be adjusted upon the main shaft B in such a manner as to impart motion to the pinching-fingers in proper concert with the operations of the other parts of the machine, as will hereinafter be described.

35 The fourth cam, F, upon the main shaft B is for imparting an intermittent rotary motion to the feed-wheel F'. The connection between the cam F and feed-wheel F' is more to be compared to a worm-gear than otherwise, as the point of said cam F engages with pins or teeth F<sup>2</sup>, and as said cam is revolved its impingement against the sides of said pins or teeth imparts to the feed-wheel F an intermittent rotary motion. This cam F is so con-

structed and adjusted upon the main shaft B as to impart to the wheel F a feeding motion just after a barb has been applied to the strand-wire.

40 G is a gear-wheel placed upon the main shaft B, which meshes with and drives the barb severing and applying mechanism.

45 Before describing the specific construction and operation of the device for severing and applying the barbs, we shall specify the concert of action between the various parts of our machine.

50 We will suppose a barb to have just been applied to the strand-wires by the barbing mechanism, yet to be specified. When the barb is applied the clutch D<sup>3</sup>, through the influence of the cam D, raises to a height equal to the length of the barb-blank, and ready upon its downward motion to clutch the barb-wire and feed a blank forward to be bent upon the strand-wires. At the same time the pinching-fingers E<sup>5</sup> recede and open, and the cam F imparts a quick feeding motion to the wheel F'. This operates to draw the strand-wires through the machine a length equal to the distance between the barbs. When this is accomplished the clutch D<sup>3</sup> descends and feeds a proper length of barb-wire. At the same time the pinching fingers move forward and grasp the strand-wires to hold them in proper position and relation during the application of the barb. After the barb is applied the operation just described is repeated.

55 Having now set forth the construction, operation, and concert of action of the parts actuated by the cams C D E F, we will now proceed to a description of the barb-applying mechanism and its operation.

60 As the main shaft B is kept in constant rotation, it will be evident that the barb-applying mechanism is also kept in constant and even revolution, and this feature of a constantly-revolving barb-applying apparatus is, so far as we are aware, novel with this our invention, and it constitutes a very important feature of our device.

65 For the sake of convenience in the specification and claims hereinafter following, we shall refer to the barb severing, bending, and applying apparatus collectively as a "barbing-head," and this barbing-head, with its various component parts, is illustrated in Figs. 2, 3, 4, and 5 of the drawings. It may be described as follows:

70 H is a stationary cam fixed upon the end of a stationary shaft, H', around which loosely revolves the gear-wheel G', driven by the wheel G. The shaft H' is hollowed or channeled to admit of the passage longitudinally through it of the strand-wires K. These strand-wires emerge from the face of the barbing-head through two apertures, K', located in the center of the face of the stationary cam H, as indicated in Figs. 2, 4, and 5 of the drawings. The office of the cam H is to impart a hammering or pressing motion to the barb-bending finger-

bars P for the purpose of firmly bending and applying the barb L to the strand-wires K.

Rigidly attached to or formed with one side of the gear-wheel G' is a plate or disk, M, which of course revolves with the gear-wheel G'. Upon the face of the plate M is fixed a revolving shear-blade, N, for severing the barb-blank. Pivotaly attached to this disk M are two levers, O. One end of these levers im-  
pings against and is operated by the stationary cam H, and is held against said cam by suitable springs, O'. The levers O are pivoted at O' to the face of the disk M. To the outer end of each of the levers O are adjustably attached the bending finger-bars P. These finger-bars are attached to their respective levers O by the slot and set-screw connection indicated in the drawings. It will be evident that as the disk or plate M is revolved around the stationary cam H the levers O will be rocked twice upon their pivots at every revolution of the disk M, and it is also evident that when the levers O are rocked or moved by the stationary cam H it will operate to bring together in a direction toward each other the bending finger-bars P, as indicated in Fig. 5 of the drawings. The barb-bending finger-bars P are provided at their inner ends with grooved or notched noses P', as indicated in Figs. 2 and 3 of the drawings, and these noses are so constructed and relatively arranged that as a barb-blank, L, (see Fig. 2,) is fed to the barbing-head it will pass down, not only between the strand-wires K, but also between the bending fingers and noses P P'. As this is done the revolving shear-blade N and the stationary blade N' (fixed to the standard N<sup>2</sup> of the frame A) operate to sever the barb-blank in a slanting way, so as to point it. This slanting cut is effected by feeding the barb-wire to the barbing-head at a slant, as indicated in Fig. 3 of the drawings, so that when the vertical cutting-blades N N' sever the barb-blank it will be at an acute angle to the longitudinal axis of the barb-wire. As soon as the barb-blank L has been severed the fingers and noses P P' grasp it, and pressing upon its ends at opposite sides, as indicated in Fig. 4, begin to bend said blank around the strand-wires. Meanwhile the pinching-fingers E<sup>5</sup> are grasping the strand-wires immediately in front of the point where the barb is being applied, so as to hold said strand-wires rigid while the finger-bars are revolving and bending the barb upon them. As the disk revolves, carrying with it the bending-fingers P P', the barb is bent around the strand-wires, as indicated in Figs. 4 and 5 of the drawings, and whenever the barbing-fingers are in a vertical position the stationary cam H operates to bring them together with a bending or pressing movement, (see Fig. 5,) which results in bending the barb closely and firmly upon the strand-wires. After a barb has been applied as just specified the cam F operates to actuate the feed-wheel F', the pinching-fingers relax their grip

and recede, and the strand-wires are drawn forward, while the next succeeding barb-blank, as indicated in Figs. 2 and 3, is fed into the barbing-head to be severed and bent upon the strand-wires in the manner already specified.

What we claim is—

1. In a machine for making barbed fencing, the combination, with means for supporting the strand-wires and preventing them from twisting around each other, and mechanism for inserting barbs between said wires, of a barbing-head for wrapping the barbs around said strand-wires and means for imparting a continuous rotation in the same direction to said barbing-head, substantially as described. 75

2. The combination, with the barb-bending devices of a barbing-head and means for supporting the strand-wires, of pressing-fingers for pressing the barbs upon the strand-wires 85 during the barbing operation, substantially as described.

3. The combination, with the stationary cam H, of a revolving disk or carrier, M, and levers O and barb-bending device P P', substantially as and for the purposes shown. 90

4. The combination, with barb-bending finger-bars P, of operating mechanism, as explained, whereby a pressing or pounding action is imparted to said finger-bars, substantially 95 as and for the purposes shown.

5. The combination of a stationary cam, H, and a constantly-revolving barbing-head with the barb bending and pressing fingers carried by said head and arranged to be operated by 100 said cam, substantially as and for the purposes shown.

6. The combination, with mechanism for feeding barb-wire, a barbing-head mounted on an axis at, or approximately at, right angles 105 to the direction in which the barb-wire is fed, and mechanism for revolving said barbing-head continuously in the same direction, of a cutter carried by and revolving with said head and a second cutter co-operating with the revolving cutter to sever the barb-wire, substantially as described. 110

7. The combination, with the wire barbing and feeding mechanism operating to deliver the barbed wire intermittently, of an automatic 115 take-up between the said mechanism and the spooling mechanism, substantially as and for the purpose described.

8. In a barb-fence machine, the pinching-fingers carried by a reciprocating head movable lengthwise of the strand-wires, and combined with mechanism for closing and opening said fingers, substantially as described. 120

9. The combination, with the feed-wheel, its operating-cam, and means for conveying motion from the cam to said wheel, of the take-up lever, its operating-cam, and devices for conveying motion to said lever from said last-named cam, substantially as described. 125

10. In a fence-wire-barbing machine, the main shaft B, carrying and revolving the cams C, D, E, and F, in combination with the take-

up mechanism, the barb-blank-feeding mechanism, the pinching-finger mechanism, and the strand-wire-feeding mechanism, substantially as and for the purposes shown.

5 11. The combination of the non-rotating holder for the strand-wires, the stationary cam mounted thereon, the rotating barbing-head surrounding said holder, the barb bending and pressing fingers, and the operating-levers carried by and rotating with said head, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

MAURICE CONVERSE.  
FRANK P. CADY.

Witnesses:

JNO. CROWELL, Jr.,  
ALBERT E. LYNCH.