

UNITED STATES PATENT OFFICE.

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WIRE-FENCE FEEDER AND CRIMPER.

SPECIFICATION forming part of Letters Patent No. 735,842, dated August 11, 1903.

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To all whom it may concern:

Be it known that I, MILES D. TAYLOR, a citizen of the United States, residing at Janesville, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Wire-Fence Feeders and Crimpers, of which the following is a specification.

This invention provides a mechanism capable of crimping the warp-wires of wire fences and drawing the fence through the loom or fence-machine, so as to insure positive feed of the fence material. The mechanism is essentially of the endless type and comprises an apron mounted at its ends upon rotary supports and provided with wire crimping and gripping devices which act in succession upon the wires and let go of the same in regular order, the gripping and the releasing being effected automatically as the elements of the apron pass from the rotary support at one end to one straight portion of the apron and again from said straight portion around the rotary support at the opposite end of the apron to the other straight portion.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a wire-fence feeder and crimper constructed in accordance with and embodying the vital features of the invention, parts being broken away to indicate more clearly the relative arrangement and the structural details of the elements. Fig. 2 is a top plan view, the endless chains and the rotary supports therefor being omitted. Fig. 3 is a detail view of cooperating cam elements, showing their relation when traveling around the rotary supports of the chains or apron. Fig. 4 is a view of the parts indicated in Fig. 3, showing their relation when traveling with the straight portions of the apron. Fig. 5 is a section on the line *xx* of Fig. 6 looking in the direction of the arrow, showing a support-

ing slat or bar, operating-rods, and grip-blocks. Fig. 6 is a top plan view of a pair of grip-blocks, the supporting bar or slat therefor, and the operating-rods, the grip-blocks being shown pressed together and having a portion of a warp-wire gripped therebetween. Fig. 7 is a side view of one of the cam-levers to which the toggle or link is pivotally connected. Fig. 8 is a side view of one of the slotted cam-levers. Fig. 9 is a top plan view of parts corresponding to Fig. 6, showing one of the grip-blocks only movable. Fig. 10 is a side view of the parts shown in Fig. 9. Fig. 11 is a section on the line *YY* of Fig. 9 looking in the direction of the arrow. Fig. 12 is a detail perspective view of a toggle. Fig. 13 is a perspective view of a toggle and the end portion of the lever to which the said toggle is pivoted, showing more clearly the relation of the parts.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The mechanism is adapted for use in connection with any type of fence-machine or loom and is adapted either to crimp the warp-wires or to grip the same to insure positive feed of the fence material or to accomplish both results at one and the same operation.

The element indicated by the numeral 1 in Fig. 1 is a toothed drum or roller over which the fence 2 passes as it leaves the fence-forming mechanism or loom, and the numeral 3 represents a roller over which the fence passes after it leaves the feeder and crimper. These parts 1 and 3 form no essential part of the present invention.

The mechanism comprises, essentially, an endless apron, belt, or carrier, and rotary supports 4 and 5, which may be of any construction and, as shown, are toothed, so as to insure positive rotation of the apron or belt comprising the working parts. The rotary supports 4 and 5 may be mounted in any approved way, and actuating mechanism cooperates with one of said supports to compel positive rotation thereof to insure rotary movement of the apron or carrier. The actuating mechanism illustrated consists of a ratchet-wheel 6, secured to the shaft of the rotary support 5, so as to turn therewith, and

plates 7 and 8 are mounted upon said shaft for oscillatory movement and have spring-actuated dogs 9 and 10 pivoted thereto for alternate coöperation with the teeth of the ratchet-wheel 6, said plates 7 and 8 being oscillated in alternation by means of pitmen 11 and 12, adjustably connected therewith at one end and having the opposite end connected to any eccentric portion of the machine (not shown) in any accustomed way.

The endless apron, belt, or carrier may be of any construction and comprises a series of endless chains 13, supported at their ends by the elements 4 and 5 and carrying transverse slats or bars 14, which also serve to connect the chains in series. Blocks 15 are secured to opposite ends of alternate slats or bars 14 and are provided with outwardly-extended pins 16, upon which play the toggles and slotted ends of one of the levers. Grip-blocks 17 and 18 are slidably mounted upon the slats or bars 14 and are provided in pairs or sets, one for each warp-wire. The lower ends of the grip-blocks are notched to receive the slats 14, and glands 19 close the open sides of the notches and secure the grip-blocks upon the parts 14, said glands being secured to the grip-blocks by machine-screws 20 at each side of the slats. Rods or bars 21 and 22 pass through openings formed in the grip-blocks 17 and 18 and serve to impart movement thereto. The grip-blocks 17 are secured to the rod or bar 21, and the grip-blocks 18 are secured to the rod or bar 22. Hence longitudinal movement imparted to one or both of the parts 21 and 22 effects either separation of the grip-blocks or a coming together thereof, according to the direction of movement of the said rod or rods. The grip-blocks 18 slide upon the rod or bar 21, and the grip-blocks 17 slide upon the rod or bar 22, or, in other words, the rods or bars of one set of grip-blocks have a sliding movement in the set of grip-blocks secured to the opposite set of rods or bars. The rods or bars 22 project beyond the outer ends of the corresponding parts 21 and receive the cam elements 23 and 24, which are loosely mounted upon the projecting ends and are confined thereon by nuts 25. The parts 21 and 22 have a longitudinal movement imparted thereto in opposite directions, so as to open and close the grip-blocks, and by moving the parts in opposite directions the play may be comparatively slight and only about half that which would be required if one set of grip-blocks only were moved.

The cam elements 23 and 24 consist of levers and are loosely mounted upon the outer ends of the parts 22 and have cam-lugs 26 and 27 upon their inner faces. One set of cam-lugs, as 27, have their outer ends straight or flattened to provide rests for the lugs 26 to hold the parts 23 and 24 separated, as indicated most clearly in Fig. 4, thereby relieving the actuating means of the strain which would otherwise be imposed thereon when the grip-blocks are closed upon and holding the

warp-wires of the fence. The cam levers or elements 23 and 24 project in diametrically opposite directions and coöperate with the pins 16. The cam-levers 24 have their longer arms longitudinally slotted, as shown at 28, to receive the pins 16, and the long arms of the cam-levers 23 are connected by toggle levers or links 29 with the said pins 16, whereby in the operation of the mechanism said levers 23 are oscillated to cause the cam-lugs 26 and 27 to ride upon one another in opposite directions either to close the grip-blocks or to open the same. The parts are proportioned and disposed so that when the cam-levers pass around the rotary supports 4 and 5 the distance between the parts 22 and 16 increases, thereby causing a relative oscillation of the cam-levers 23 and 24 to cause the cam-lugs 26 and 27 to drop by one another and assume the position shown most clearly in Fig. 3, thereby permitting the grip-blocks to open or separate. After the cam-levers clear the rotary supports and enter upon the straight runs or portions of the apron, belt, or carrier the parts 22 and 16 are crowded together, so as to throw the ends of the long arms of the levers 23 outward and cause the cam-lugs 26 and 27 to ride upon one another and assume the position shown most clearly in Fig. 4, thereby bringing the grip-blocks together and clamping the warp-wires of the fence therebetween. When the cam-levers are passing around the rotary supports 4 and 5, the toggles 29 straighten or approximately aline with the levers 23, as indicated most clearly in Fig. 1, at the left-hand end of the apron, and in order to prevent the toggles coming upon a dead-center or moving inward said toggles and the long arms of the cam-levers 23 are provided with stop-shoulders, after the fashion of a rule-joint, said stop-shoulders coming together and limiting the movement of the joint formed between the toggles and the cam-levers 23.

The rods 22 and pins 16 are exterior to and spaced from the apron or carrier 13, and hence travel in a greater circle than said carrier when passing around the rotary supports. When traveling around the supports 4 and 5, the parts 16 and 22 are spaced a greater distance apart than when on the straight runs, with the result that the levers 23 and 24 are turned a distance to throw the lugs 26 and 27 into the positions substantially as shown in Figs. 3 and 4, the latter position effecting a closing of the grip-blocks 17 and 18 and the former position permitting the said grip-blocks to separate.

Wire fences of meshed formation, substantially as illustrated, have the meshes in alternate relation, and in order to crimp the warp-wires opposite the meshes it is necessary to alternately dispose the grip-blocks and to operate the same from opposite sides of the apron or belt in alternation. Hence the application of the cam elements to the outer ends of alternate rods or bars 22. To effect the crimping

or kinking of the warp-wires, one set of grip-blocks is formed with depressions or notches 30, and the opposite set is provided with teats or projections 31. When the grip-blocks are brought together, the projecting parts 31 force the part of the warp-wires into the depressions 30 and produce the crimps or bends, as will be readily comprehended. If the device is designed solely for drawing the fence through the loom or fence mechanism, the parts 30 and 31 are dispensed with, and for crimping wire fence, either during the process of manufacture or subsequent thereto, the mechanism may be used in the capacity of a crimping-machine solely. It is preferred, however, to utilize the mechanism both as a feeder and crimper and in conjunction with any type of fence-machine.

In the construction herein set forth it is contemplated to impart movement to both sets of grip devices. However, this is not essential, since within the purview of the invention one set of grip-blocks may be stationary and the other set movable. Figs. 9, 10, and 11 illustrate a construction in which the grip-blocks 17 are firmly attached to the slats or bars 14 and the grip-blocks 18 movable on said parts 14 and connected to the rod or bar 22. In operating the machine embodying this construction the cam-levers 24 do not impart movement to the grip-blocks 17, since the latter are stationary; but the elements 23 move the parts 22 by a pulling action, as will be readily understood.

In the operation of the mechanism the warp-wires of the fence 2 are passed between the respective grip-blocks, and motion being imparted to the apron or carrier the grip-blocks are opened in succession as they pass around the rotary support 4 and receive the warp-wires, as indicated in Fig. 2, and as they enter upon the upper straight run or portion of the attachment they close upon the warp-wires and grip and crimp the same and when they reach the rotary support 5 and begin to pass around the same the grip-blocks again open and release the warp-wires in successive order. The apron or belt being positively driven in the manner stated or in any convenient way draws the fence forward and simultaneously crimps the warp-wires. The grip-blocks are adjustable upon their supporting rods or bars and are held in place by clamp-screws. Hence their position may be changed to adapt them to any style of fence having a greater or less number of warp-wires.

Having thus described the invention, what is claimed as new is—

1. A wire-fence feeder and crimper comprising an endless apron, a series of grip devices applied to said apron at regular intervals throughout its length, and actuating means carried by said apron and operated by the change of position due to the movement of the apron for opening and closing the grip

devices in successive order, whereby they receive the warp-wires at one end of the machine and release the same at the opposite end, substantially as set forth.

2. In a wire-fence feeder and crimper, an endless apron or carrier, rotary supports at opposite ends thereof, grip devices at regular intervals in the length of the carrier, and actuating means cooperating with the grip devices to open the same when passing around the rotary supports and to close the said grip devices when traveling on the straight runs between the rotary supports, substantially as specified.

3. In a wire-fence feeder and crimper, an endless apron or carrier, grip devices arranged at intervals in the length thereof, and cooperating cam elements to automatically effect an opening and a closing of the grip devices according as they are passing around the rotary supports or along the straight runs between said supports of the endless carrier, substantially as described.

4. In a wire-fence feeder and crimper, an endless apron or carrier, rotary supports at the ends thereof, grip devices at intervals in the length of said carrier, cooperating cam elements for actuating the grip devices, and toggles between companion parts of adjacent cam elements, substantially as specified.

5. In a wire-fence feeder and crimper, an endless apron or carrier, grip devices arranged at regular intervals in the length thereof, and cooperating cam elements for effecting an opening and a closing of the grip devices, one set of cam elements being slotted to allow for variation in the distance between pivotal supports for cooperating parts of the cam elements, substantially as set forth.

6. In a wire-fence feeder and crimper, an endless apron or carrier, grip devices in the length thereof, cooperating cam elements to effect an opening or a closing of the grip devices, one set of cam elements having a longitudinal slot, pins projected from the said carrier to enter said slot, and toggles connecting the other grip elements with the said pins, substantially as described.

7. In a wire-fence feeder and crimper, an endless apron, grip devices arranged at intervals in the length thereof, and automatic actuating means for the grip devices carried by said apron and consisting of levers having cam-lugs terminating in flat faces to sustain the strain when the grip devices are closed, substantially as set forth.

8. In a wire-fence feeder and crimper, the combination of an endless carrier, grip devices arranged at intervals in the length of the carrier and alternately disposed, operating-rods connecting the grip devices in series, the alternate rods having their ends extended, and actuating means applied to the projected ends of the rods for operating the alternate set of grip devices in regular succession, substantially as specified.

9. In combination, an endless carrier, grip
devices located at regular intervals in the
length thereof, cam elements for automatic-
ally actuating the grip devices, one set of
5 cam elements being slotted, pins entering said
slots, and toggles connecting the other set of
cam elements with said pins and provided
with stop-shoulders to cooperate with corre-
sponding stop-shoulders of the cam elements

to which they are pivoted, substantially as is
and for the purpose set forth.

In testimony whereof I affix my signature
in presence of two witnesses.

MILES D. TAYLOR. [L. S.]

Witnesses:

W. O. NEWHOUSE,
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