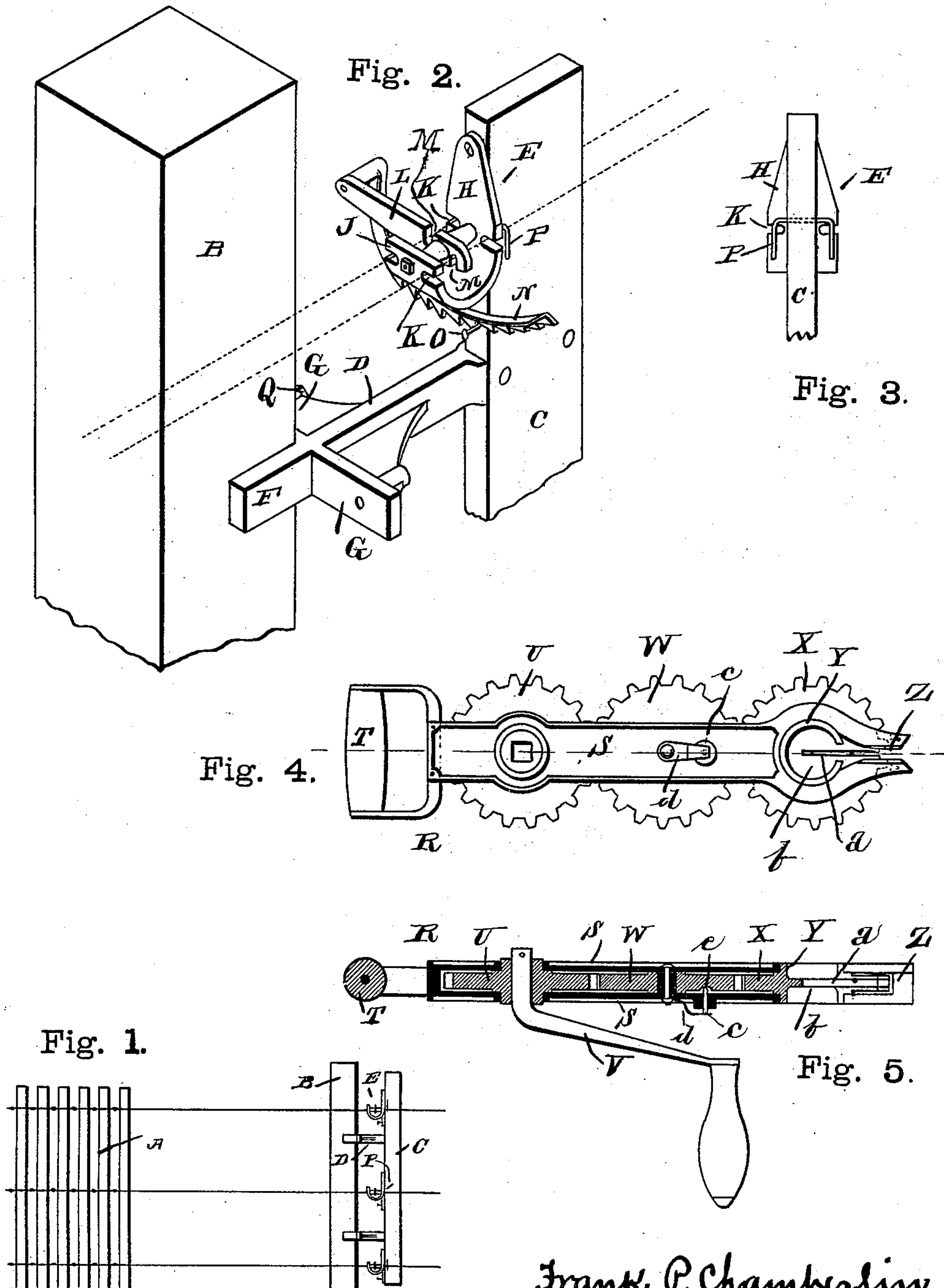


(No Model.)

F. P. CHAMBERLIN.
FENCE BUILDING APPARATUS.

No. 376,512.

Patented Jan. 17, 1888.



Witnesses:
W. Seward.
A. Myers

Frank P. Chamberlin
Inventor
by James W. See
Attorney

UNITED STATES PATENT OFFICE.

FRANK P. CHAMBERLIN, OF MIDDLETOWN, OHIO.

FENCE-BUILDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 376,512, dated January 17, 1888.

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To all whom it may concern:

Be it known that I, FRANK P. CHAMBERLIN, of Middletown, Butler county, Ohio, have invented certain new and useful Improvements in Fence-Building Apparatus, of which the following is a specification.

A kind of fence now commonly employed consists of several horizontal pairs of wires stretched along the line of the fence and supporting pickets inserted vertically between the wires of the pairs, the pickets being held firmly in place by twisting together the two wires of each pair at points between the pickets. These fences are sometimes woven complete in a loom and then erected in place, and they are sometimes constructed on the ground by stretching the wires along the line of fence-posts, inserting the pickets, and making the proper twists in the wires. There are two distinct modes employed in twisting the wires. One mode consists in twisting the wires in advance of the last picket inserted, then inserting a new picket, then twisting the wires again, and so on. The other mode consists in placing two or more pickets and twisting the wires between the pickets after the pickets are in place. My apparatus is designed with reference to the last-named mode of operation, though it is applicable to the first-named mode, and also to other modes and uses in connection with wire-straining and wire-twisting.

My invention has reference to devices for holding the strands of wire and producing the tension on the wire as the fence-building progresses, and also to the devices for twisting the wires.

My improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of a fence of the character specified under process of construction in the field, my improved tension apparatus being illustrated in connection therewith; Fig. 2, a perspective view of the upper portion of one of the fence-posts B in connection with a portion of my improved tension device, so much of the tension device being exhibited as pertains to one strand of wire; Fig. 3, a rear view of portions of one of the tension devices, exhibiting the wire-keeper; Fig. 4, a side ele-

vation of the machine employed in twisting the wires, and Fig. 5 a horizontal longitudinal section of the machine.

In the drawings, A indicates a portion of the completed fence, consisting of horizontal strands of wire with vertical pickets retained therein by intermediate twists of the wire in a common manner; B, one of the usual fence-posts, to which the fence is secured by properly fastening the strands of wire against the face of the post, as by staples, in the usual manner, this post in the illustration being in advance of the completed portion of the fence and having the strands of wire not yet permanently attached, the post serving as a tension-post or strain-point to which the strands of wire are stretched and by which they are tightly but yieldingly held; C, a tension-bar temporarily secured in advance of the tension-post and supporting devices by which the strands of wire are held in proper tension; D, brackets by means of which the tension-bar is attached to the fence-post B; E, the tension device, permanently secured to the tension-bar, there being one tension device for each strand of wire employed; F, a gage-toe forming a prolongation of the bracket D, this toe being so located with reference to the tension-bar that when the toe lies against the face of the fence-post B the tension-bar will be in the line of the intended fence; G, ears projecting from each side of the bracket D at right angles to the toe F, and provided each with a bolt-hole parallel with the toe F, through which a lag-screw may be inserted, the ears G and toe F forming angular seats each side of the bracket, these seats being adapted alternatively to engage the post B; H, a plate rigidly secured against the edge of the tension-bar, this plate forming a portion of the tension apparatus pertaining to one strand of wire; J, a plate to the rear of the plate H and parallel thereto, and formed by curving the plate H rearwardly and upwardly, both plates H and J being wider than the tension-bar is thick; K, notches in the side edges of the plates H and J, these notches forming seats in which the two wires of a strand may lie, the wires passing along the face of the fence-post B, thence through the notches K, and then straddling the tension-bar C; L, a lever piv-

5 oted on an axis reaching across from plate H
 to plate J, this pivot-axis lying in the hori-
 zontal plane of and centrally between the pairs
 of notches K; M, vertical notches in the lever
 10 L, these notches being in the line of the notches
 K, so that the wires passing through the
 notches K will also pass through the notches
 M; N, a ratcheted segment pivoted to the free
 end of the lever L; O, a pin in the edge of the
 15 tension-bar, adapted to be engaged by any
 chosen one of the ratchet-teeth of the segment,
 and thus serve in retaining the free end of the
 lever L in any angular position of elevation in
 which it may have been placed; P, a wire-
 20 keeper pivoted in the tension-bar in advance
 of the plate H, this keeper consisting of a hori-
 zontal bar pivoted in the tension-bar and pro-
 vided with arms at each end projecting at right
 angles to the pivot portion, the keeper being
 25 capable of being turned in the tension-bar, so
 that the arms may project downward and pre-
 vent the wires from becoming displaced side-
 wise from the slot in the plate H, and also capa-
 ble of being turned up out of the way, so as to
 30 permit the wires to be inserted into or removed
 from these slots; Q, the lag-screw employed
 in bolting the bracket D to the fence-post B;
 R, a geared machine by means of which the
 twists are given to the wires between the pick-
 35 ets in constructing the fence; S, a pair of bars
 or plates riveted together parallel to each other
 flatwise, with a space between them to receive
 gear-wheels; T, a handle secured at one end
 of the pair of plates; U, a spur-gear disposed
 40 between the plates near the handle end thereof
 and having a hub each side journaled in proper
 bearings in the plates; V, a hand-crank de-
 tachably connected with the gear U, the shank
 of this crank being square and fitted for en-
 45 gagement with the central square opening of
 the gear; W, an intermediate gear disposed
 between the plates S and fitted to revolve
 freely on the pivot and engaging and adapted
 to be driven by the gear U; X, a wrench-gear
 50 journaled in the plates in a similar manner to
 the gear U and engaged and adapted to be
 driven by the gear W; Y, hubs projecting
 from each side of the gear X and journaled in
 suitable bearings in the plates S; Z, prolonga-
 55 tions of the plates S beyond the periphery of
 the gear X, these prolongations being slotted
 or gapped, so as to form openings from the ex-
 tremities of the plates rearwardly to the bear-
 ings which carry the hubs Y; *a*, a radial slot
 60 in the gear X from the periphery thereof in-
 wardly to and somewhat beyond the center,
 this slot extending transversely through the
 gear and having a width adapted to receive
 the wire of which the strands of the fence are
 65 formed; *b*, the central web of the gear X, this
 web being much less in thickness than the to-
 tal length of the hubs Y or than the total out-
 side thickness of the plates S where these hubs
 are journaled; *c*, a stop-pin fitted to slide
 through a hole in one of the plates S a short
 distance from the center of the intermediate
 gear; *d*, a spring secured to the plate S, into

which the stop-pin slides, and resting with its
 free end upon the outer end of the stop-pin
 and serving to press the stop-pin inward to-
 ward the intermediate gear; and *e*, a counter-
 70 sink in the face of the intermediate gear at a
 distance from the center of the gear corre-
 sponding with the position of the stop-pin, so
 that as the gear revolves the countersink will
 75 come opposite the stop-pin, the angular posi-
 tion of the countersink in the gear W being
 such as to be brought into coincidence with
 the stop-pin when the slot *a* of the gear X co-
 80 incides with the slot in the prolongation Z of
 the plate.

The crank V being turned, it is obvious that
 rotary motion will be transmitted through the
 gear W to the gear X and that two wires in the
 slot *a* will become twisted together.

85 In using the implement the handle is grasped
 by the left hand and the slotted prolongation
 Z is advanced horizontally over the two wires
 of the strand between two pickets—that is, in
 case the fence is being constructed in that mode.
 90 The instrument being pushed endwise, the two
 wires of the strands take position near together
 at the root of the slot *a*, this slot having been
 held in registry with the slotted prolongations
 Z by the stop-pin engaging the countersink
 95 in the gear W. When the instrument is thus
 properly engaged with the pair of wires, the
 crank is turned with a right-hand motion—that
 is to say, if the crank hangs downward the
 operator pulls it toward him. This right-hand
 100 motion of the crank and gear U serves in giv-
 ing a similar right motion to the slotted gear
 X. The consequence is that the first quarter-
 revolution of the gear X brings the slot *a* ver-
 tically with its opening downward. Were the
 105 crank turned in the other direction, or were
 it turned in the direction indicated, and an
 even number of gears employed in the system,
 the first quarter-turn of the gear X would re-
 110 sult in the slot *a* being vertical, with its open-
 ing upward, in which case the point of the im-
 plement would drop downward and disarrange
 the wires in the slot. The operator continues
 to turn the crank until the desired number of
 115 twists have been given to the wire—generally
 two twists—and each time the gear W makes
 one revolution the fact will be indicated by a
 snapping of the stop-pin into the countersink;
 but the walls of the countersink are not so
 120 abrupt as to prevent the continued turning of
 the mechanism. When the desired number
 of twists have been given, the motion is stopped
 when the stop-pin is in the countersink, thus
 leaving the slot *a* again in registry with the
 125 slotted prolongation Z. The result of the turn-
 ing of the gear X has been to form twists in
 the wires upon each side of the gear. Only
 that portion of the pairs of wires engaged by
 the slot not becoming subjected to the twisting
 action, the inner terminals of the twists will
 130 therefore lie closely up against the central web
 of the gear X, and this web being thin per-
 mits the inner ends of the twists of wires to
 lie very close together, thus permitting quite

a number of twists to be gotten into the wire between pickets placed very close together. When the twisting is complete, the implement is withdrawn horizontally from the wire, the untwisted central portion of the wires passing out of the slot in the gear, while the inner terminations of the twisted central portion of the wires pass out through the slots in the prolongations Z of the side plates. The crank V being removable from the hub of the gear U permits of the handle being removed, so that the implement may be stored away in smaller compass, and also permits of the crank being so placed in the gear U as to come in the proper position for giving the final twists to the strands both in high and low position upon the fence—that is to say, the highest strand of the fence, may be given its completing twists by a pulling motion of the crank toward the operator horizontally, while the completing twists with the lowest strands of the fence may be given by an upward pull of the crank, these conditions being most favorable for the accomplishment of the final and harder part of the work in the different positions necessarily assumed by the operator in twisting the high and low strands, respectively.

In setting up the tension apparatus the tension-bar is secured to a fence-post at a reasonable distance from the starting-point of the fence. The wires are attached in the usual manner to a post at the starting-point and carried along the line of the fence against the faces of the intermediate posts and against the face of the terminal post B, and on through slots in the tension device, and then onward, straddling the tension-bar. Beyond the tension-bar the wires may lie upon the ground or go to their spools or coils, or otherwise, according to circumstances. After the wires are inserted sidewise in the notches of the tension device, the keepers P are turned down, thus preventing the displacement of the wires sidewise from the notches. When the wires are to be removed from the notches, or when wire splices are to pass the notches, the keepers are turned up out of the way. The wires are pulled as taut as practicable from the front of the tension-bar, and then the free ends of the levers f are elevated, so as to deflect the two wires of each pair upwardly and downwardly, respectively, the wires resting in the notches K and being deflected by the bottoms of the notches M in the levers. A bend is thus given to the wires at each tension device and frictional resistance offered to the passage of the wires through the tension device as the construction of the fence progresses. The degree of resistance offered by the tension device is adjusted by adjusting the position of the levers, any chosen one of the ratchet-teeth of the segments being engaged with its retaining-pin O. To arrange for the tension of the wire strands by deflecting the wires between supports is well known and has proved quite satisfactory, and my improved device offers many advantages for the purpose.

The tension-bar C has two of the brackets D, and the tension-bar is secured to the fence-post B by a lag-screw, Q, through each bracket into the post, and the toes F serve in gaging the position of the tension-bar, so as to bring the notches of the tension device in proper line with the wire strand, and they also serve to prevent the twisting of the tension-bar around the post under the strain of the wires, the toes being efficient for this purpose whether the post B be round or square. By having two of the ears G, the toe F being located centrally with reference to them, the tension-bar may be readily secured to a post so as to arrange for the wires passing upon either face of the post. In Fig. 2 the wires are indicated by dotted lines and are assumed as running in front of the post B. If the wires are to run against the rear face of the post, the lag-screw will be inserted through the hole in the ear G. (Shown as idle in Fig. 2.)

I claim as my invention—

1. The combination, with a supporting post or bar, of tension devices E, each having plates H and J, provided with outwardly-open side notches for the reception of wires, lever L, pivoted thereto and provided with notches M to engage the wire, a ratcheted segment, N, and pin O, arranged for adjusting the angular position of the lever, substantially as and for the purpose set forth.
2. The combination, with a supporting post or bar, of tension devices E, each provided with plates having outwardly-open notches K, lever L, pivoted thereto, a ratcheted segment and pin for regulating the angular position of the lever, and a wire-keeper, P, pivoted near one of said plates and arranged to turn down, so as to prevent the disengagement of wires from said slots, and to turn up, so as to permit such disengagement, substantially as and for the purpose set forth.
3. The combination, substantially as set forth, of tension-bar C, tension devices E, attached thereto, and brackets D, secured to the tension-bar and provided with a gage-toe and with ears G, having bolt-holes provided for the attachment of the tension-bar to a post.
4. Plates S, secured together so as to leave a space between them and provided with a handle and slotted prolongations Z, whose slots are of a width to permit the passage of two wires twisted together, and bearings for gears, a gear, X, having a slot of a width adapted to twist two wires together, as described, and journaled in the forward end of said plates, and having a central web, b, thinner than the total thickness of said plates where it supports said gear, and a gear provided with a crank and supported by said plates and arranged to transmit rotary motion to said slotted gear, combined and arranged for operation substantially as set forth.
5. The combination of plates S, provided with a handle and with slotted prolongations Z, gears mounted therein, the forward gear

being provided with slot *a*, and one of said
gears being provided with countersink *e*, stop-
pin *c*, adapted to engage said countersink,
spring *d*, arranged to press the stop-pin into
5 said countersink and to automatically yield
to the forcible rotation of the gear having the
countersink, and crank *V*, for giving rotary

motion to the gears, substantially as and for
the purpose set forth.

FRANK P. CHAMBERLIN.

Witnesses:

J. W. SEE,

W. A. SEWARD.