

(No Model.)

T. E. & C. H. LEE.
WIRE FENCE MACHINE.

No. 544,814.

Patented Aug. 20, 1895.

Fig. 1.

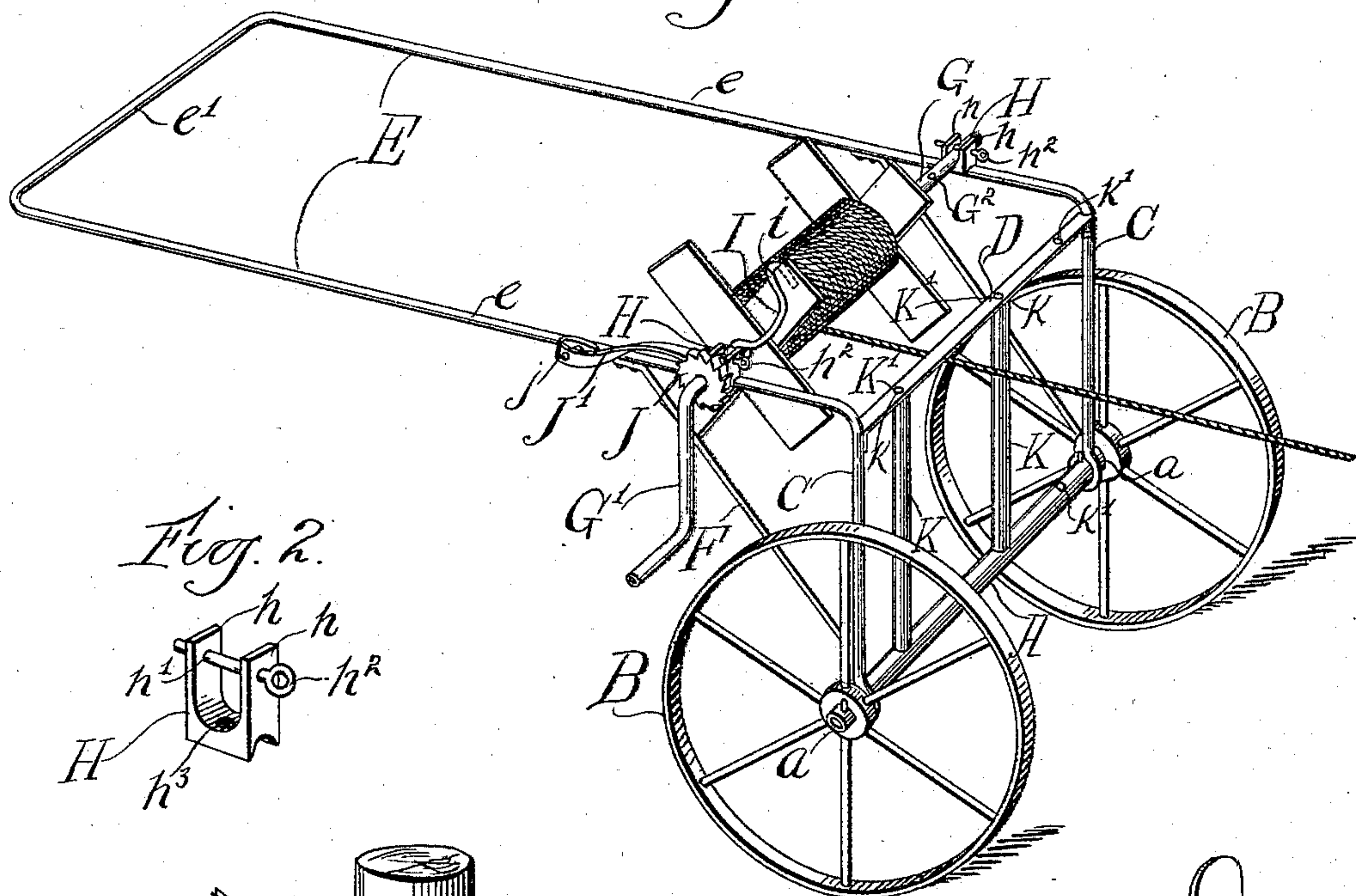


Fig. 2.

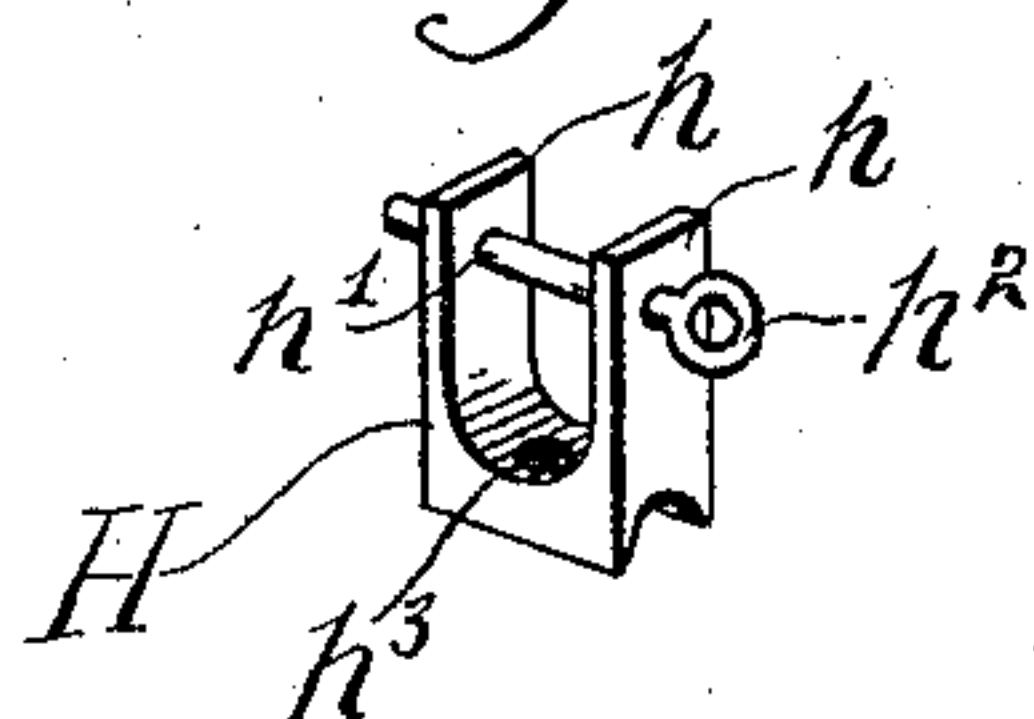


Fig. 3.

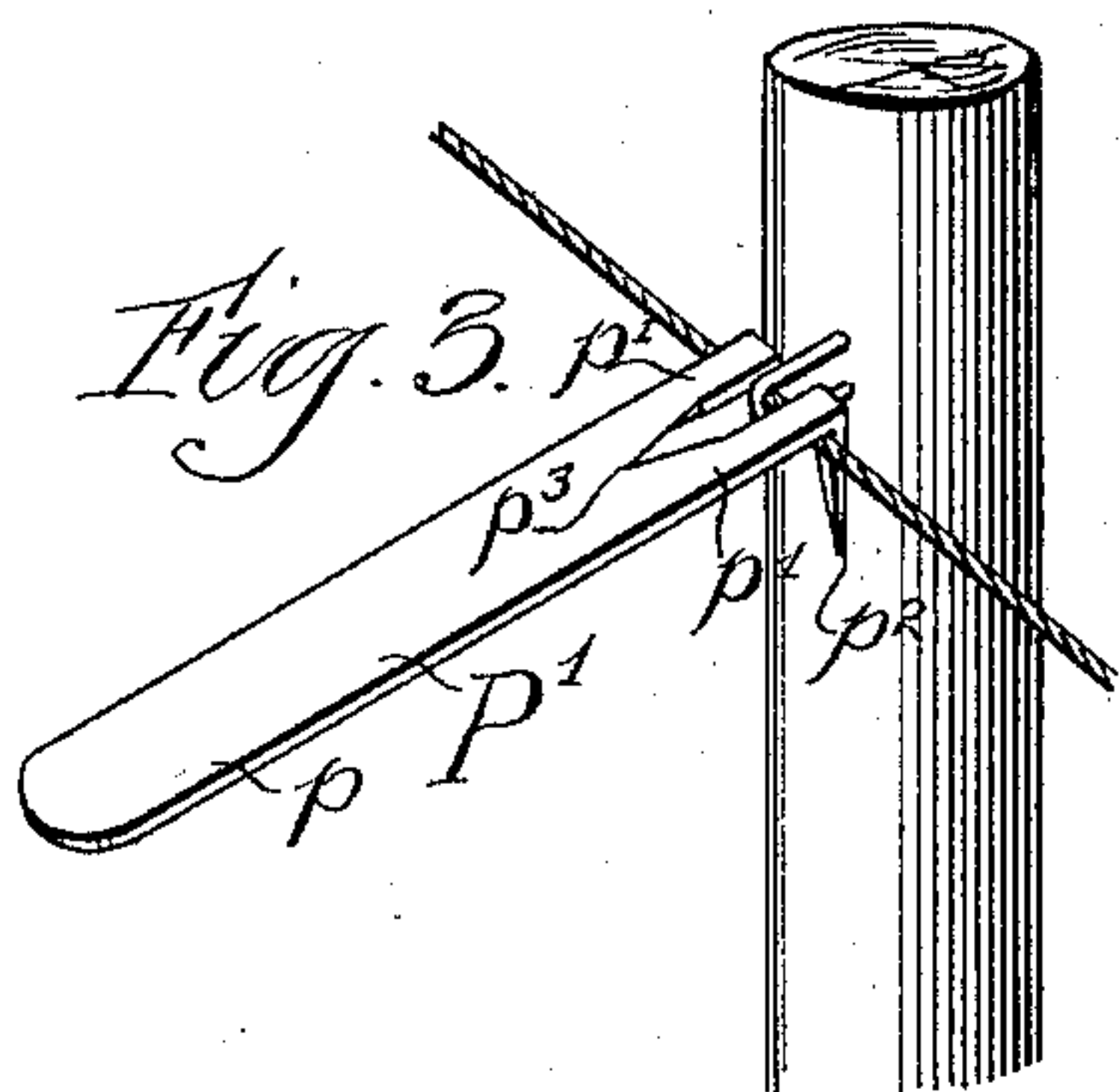


Fig. 4.

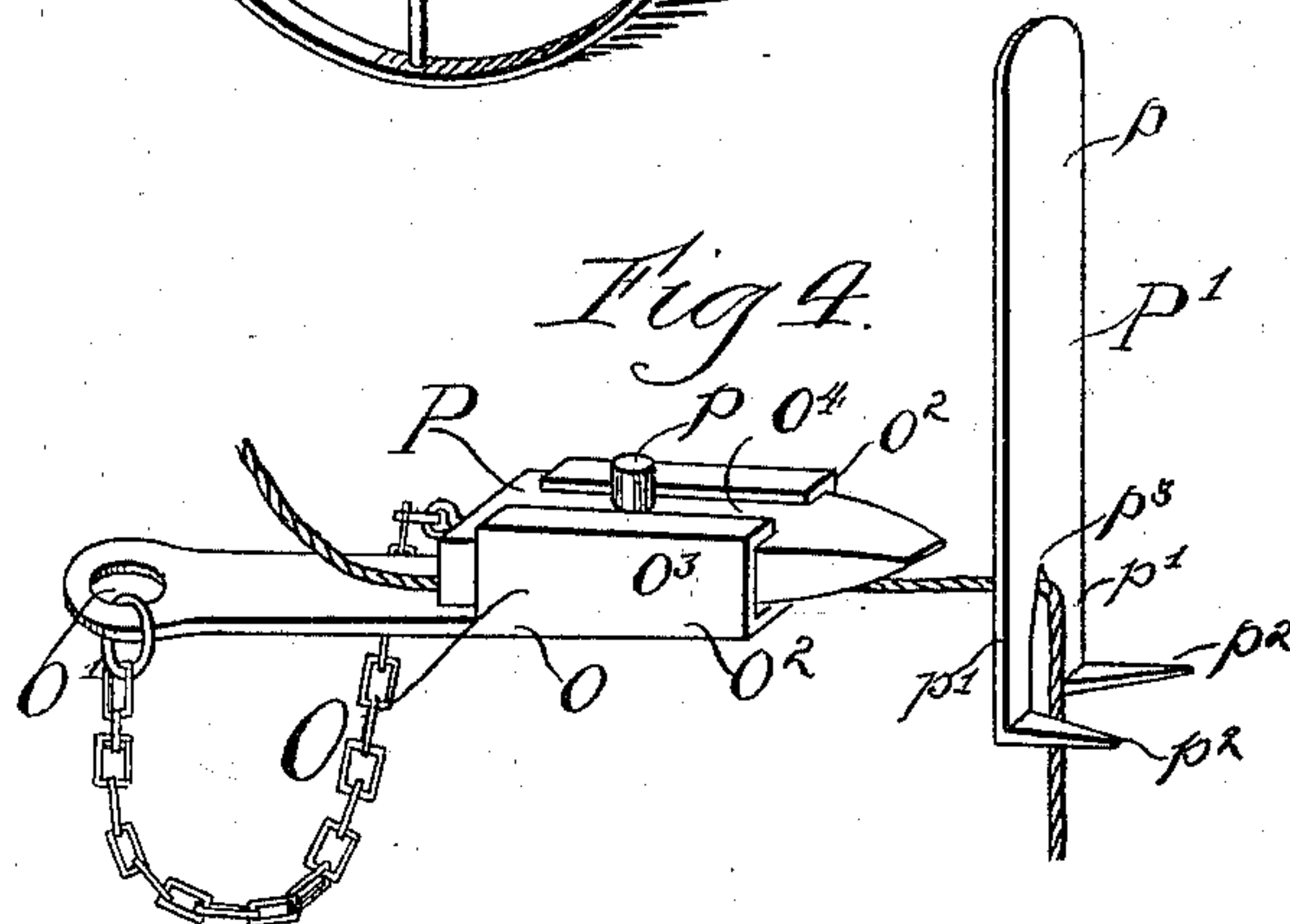
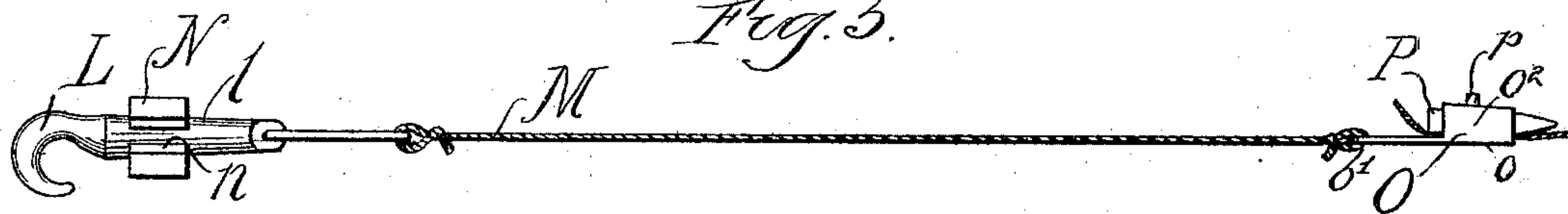


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS E. LEE AND CYRUS H. LEE, OF SILVER CREEK, NEBRASKA.

WIRE-FENCE MACHINE.

SPECIFICATION forming part of Letters Patent No. 544,814, dated August 20, 1895.

Application filed September 8, 1894. Serial No. 522,519. (No model.)

To all whom it may concern:

Be it known that we, THOMAS E. LEE and CYRUS H. LEE, of Silver Creek, in the county of Merrick and State of Nebraska, have invented certain new and useful Improvements in Wire-Fence Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to wire-fence machines of that class adapted for use in building, repairing, and taking down wire fences, and for handling fence-wire generally.

More specifically the invention relates to machines of the character above referred to in which the spool containing the wire or upon which the wire is to be wound is carried across the field upon a hand-cart, reeling or unreeling the wire, as the case may be, as the cart rolls along.

Among the objects of the invention is to provide a machine of the character described which is simple, strong, and durable and which is capable of being operated by a single person with the utmost ease and convenience. The machine is also adapted to perform the combined functions of reel-cart, wire-stretcher, fence-repairer, post-puller, and general-purpose hand-cart.

The invention consists in the matters hereinafter described, and particularly pointed out in the appended claims, and the same will be readily understood, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a machine embodying our invention. Fig. 2 is a detail of one of the windlass-bearings. Fig. 3 is a perspective view of a staple-puller, showing the manner of applying the same in use. Fig. 4 is a perspective view of one of the wire-clamps, showing the wire clamped therein, and showing also the manner of applying the staple-puller when used as a wire-cutter. Fig. 5 is a view of a wire-stretcher for use in connection with the machine, comprising the wire-clamp shown in Fig. 4 and a second combined hook and clamp, the two being shown as connected by a rope or cord.

As shown in said drawings, A designates the axle and B B the supporting-wheels of a hand-cart. The axle A is preferably made of tubular iron throughout its main length and

provided with suitable spindles or bearing portions *a a* at each end for the wheels B. These latter are also preferably of iron, but may, of course, be of any desired construction, and are conveniently of the same size and character as those commonly used on what are designated as "low-wheeled" cultivators.

C C designate uprights secured to and extending upward from the axle A, one near each end thereof, and D is a horizontal cross-bar connecting the upper ends of said uprights C. *e e* are side members, and *e'* an end connecting-member of a rectangular frame E, constituting the handle by which the cart is manipulated. For convenience of construction said uprights C C and the handle-frame E are shown as formed integrally from a single rod or bar of iron, the side-handle members *e e* being bent to stand at right angles with the uprights C C, as shown, and rigidly held in this relation by means of side braces F F, which extend from near the lower ends of the uprights C C diagonally upward to points on the respective side members *e e* at some distance from their points of connection with said uprights.

G is a crank-shaft mounted transversely upon the handle-frame E in suitable bearings H H, secured upon the side members of the latter. Said shaft G is preferably formed of tubular iron and provided at one end with a crank-handle G', by means of which it may be turned to wind up or unwind the wire, as hereinafter explained. In order that said crank-shaft G may be readily removed from its bearings H H for placing upon or removing therefrom a spool, said bearings are herein shown as U shape, and their arms *h h* as provided with apertures *h' h'*, through which are inserted suitable retaining-pins *h²*, which prevent the shaft from lifting up out of said bearings. The bearings H are conveniently made in the form of clips adapted to fit upon and partially embrace the side-handle pieces *e e*, and are secured upon the latter by means of bolts *h³*, extending vertically through them and the subjacent frames *e*.

I is a radially-extending arm rigidly secured upon the crank-shaft G near the handle end thereof, and having at its outer end a hook *i*, adapted for engagement with a spool mounted upon the shaft G by hooking over one of the cross-strips which form the end of a spool as commonly constructed. G² is an aperture

formed in the shaft G, adjacent to the bearing H, remote from the handle end thereof, for a purpose hereinafter explained.

In order that the shaft G may be held from turning backward when desired, the latter is provided with a ratchet-wheel J, mounted on said shaft adjacent to the bearing H of the handle end thereof. Said ratchet-wheel is splined or otherwise secured from turning upon the shaft G, and a gravity-pawl J', pivotally mounted upon the handle-bar e, is arranged to engage the ratchet-teeth, as clearly shown in the drawings. This pawl J' is so secured upon its pivot j that it may be lifted up and turned back out of engagement with the ratchet-wheel when desired, thus permitting the shaft to turn freely in either direction.

K K are guide sleeves or rollers loosely secured upon removable bolts K' K', which extend vertically through bolt-apertures k k in the horizontal cross-frame D and rest at their lower ends within apertures or sockets formed through the upper side only of the hollow axle A. The guide sleeves or rollers K K are arranged at a distance apart corresponding substantially to the length of an ordinary spool of wire; but in order that a larger spool may be used, if desired, other bolt-apertures k' k' are provided, within which the nearer bolt K' may be placed.

L is a hook adapted to readily engage within the aperture G² of the shaft G or upon the arm I, said hook having a relatively long shank l, tapering from a point adjacent to the bend of the hook proper toward its other end and terminating in an eye of proper size to receive one end of a rope or chain M. Upon this tapered shank l fits a heavy ring N, having an opening or cut n through one side thereof. The interior surface or bore of said ring is conical or tapering to correspond to the taper of the shank l of the hook L, and its interior diameter is substantially equal to that of the largest part of said shank, so that when the ring is slipped down toward the smaller end of the shank the wire may be passed through the slot and between the ring and the body of the shank. By slipping the ring back toward the larger end the wire is securely clamped or wedged between the ring and the hook in an obvious manner.

O is a second clamp, comprising a flat body portion o, provided at one end with a suitable eye o' and at its other end with a rectangular open-ended socket o², extending longitudinally of the clamp. The clamp O is preferably of wrought-iron, formed from a somewhat T-shaped blank, the side members O³ O³ being first bent up at right angles with the body of the blank and their ends turned thereafter at right angles inward toward each other, but so as to leave an intervening space or slot o⁴, as clearly shown in the drawings.

P is a wedge which is adapted to fit within the socket O² and serves, when in position, to clamp a wire placed within the socket O² between the body of the wedge and the bot-

tom or body of the clamp. In order that the wedge may be readily loosened and removed to release the wire, it is provided with a boss or lug p, extending out through the slot o⁴ of the clamp and forming a convenient finger-hold or shoulder which may be tapped to loosen the wedge.

P designates, as a whole, a combined staple-puller, wire-cutter, and splicer for use in connection with the apparatus hereinbefore described. Said device comprises a flat body or handle portion p, bifurcated at one end to form two arms p' p', which are turned or bent midway of their length to stand at right angles to the plane of the body portion p and parallel with each other, and terminate in prongs p² p². Said prongs taper gradually and terminate in sharp points, as shown. The opening or fork between said arms terminates at its inner end in an acute V-shaped point p³, for a purpose hereinafter explained.

The use of the apparatus thus described in constructing a fence is as follows: The crank-shaft or windlass G having been removed from its bearings, a spool of wire is placed thereon, the shaft replaced in its bearings, and the pins inserted to hold the shaft in place. The free end of the wire is now trained out between the sleeves or guide-rollers and attached to a post, the spool having been so placed upon the shaft of the windlass as to unwind from the lower side thereof. The cart is then drawn along, the spool being allowed to unwind freely until as much wire as can be well stretched at one time has been reeled out or until the opposite side of the proposed inclosure has been reached. Assuming that a corner has not been reached, the cart is drawn up to a post, the handle lifted up and placed over the post, and the end allowed to drop down to the ground at the foot of the post. The cart is thus securely anchored to the post in such manner as to have little tendency to pull the latter over under heavy strain. The constructing of the machine in such a manner as to permit this is a feature of considerable importance, inasmuch as the wire is ordinarily strung soon after the posts have been set, and they are therefore, owing to their recent setting, easily pulled out of plumb. Should it be impracticable to place the handle over the top of the post, the cart may be anchored by tying the handle to the foot of the post. The wire-clamps and connecting-rope are now brought into use to stretch or tighten the wire in the following manner: The hook L is hooked into the aperture in the shaft G or upon the arm I and the clamp at the other end of the rope connected with the wire at a point as far from the cart as is permitted by the length of said rope. The crank-handle is now turned to wind up the rope on the shaft, the pawl being arranged to engage the ratchet-wheel and prevent the shaft from turning backward when the wire has been tightened sufficiently. The relatively small size of the

shaft or windlass-drum G as compared with the length of the crank-handle enables the operator to exert a very powerful pull on the wire with ease, so that the same is readily strained as tight as its strength will stand. The wire, while thus held stretched tight, is securely stapled to the post, after which the clamps are removed, the handle of the cart removed or loosened from the post, and the cart again drawn forward. When a corner is reached, the cart is drawn past the corner post, turned around, and the end portion *e'* of the handle placed against the foot of the post. The wire-stretcher is then connected with the wire and windlass, as before, and the wire tightened, thus straining the wire past the corner-post, to which it is thereafter stapled. If it is desired to attach the wire to the post at a point considerably above the ground, lifting it to this point while strained tight would have a tendency to lift the wheels of the cart from the ground. This is obviated by raising the handle of the cart and allowing it to rest against the post at a point in line with the proposed point of attachment of the wire, the latter passing over the bar *e'*. If the point of attachment is below the level of the windlass, the wire is allowed to pass under the handle, the object being to cause the end portion *e'* of the handle to act as a guide past which the wire is drawn, thus bringing the strain on the windlass in a direct line with the plane of the handle-bars *e e* in every case and effectually preventing any injurious strain upon the machine. If it should be impracticable to place the cart on the outside of the proposed inclosure and in direct line with the line of strain, the cart may be placed on the inside of the fence at a right angle or at any desired angle with the corner-post, and the rope of the stretcher carried around the post in tightening the wire. It is to be especially noted in this connection that in any case the wire is drawn past the corner-post, and may therefore be stapled directly to the latter without any intervening slack wire. This is a feature of much importance, as it has been necessary with the machines heretofore commonly in use to secure the wire to the post at a point beyond the point of attachment of the clamp by which it was stretched, thus leaving several feet of slack or relatively loose wire between the clamp and staple.

The use of the machine in spooling or taking down fence is as follows: The staple-puller hereinbefore described is first used to draw the staples, this being effected by forcing the prongs of the staple-puller down between the wire and post, one of the prongs passing on each side of the staple and the handle of the puller being held approximately at right angles to the post and wire. After having been forced down until the wire lies within the angle of the prongs, as clearly shown in Fig. 3, the staple is forced out by depressing the end of the handle, thus effect-

ively prying it out. If necessary, a hammer or other tool may be used to drive the prongs of the puller between the wire and post. The wire having been removed from the posts and lying on the ground, one end is passed between the guide-sleeves and attached to the drum of an empty spool mounted upon the shaft G. The hooked arm is now engaged with the spool, the side piece *e* of the handle E taken in the left hand, and the crank turned with the right. As the wire is wound up it draws the cart along; and by guiding the cart first to one side and then to the other slightly with the left hand the operator is enabled to cause the wire to wind back and forth across the spool evenly until the spool is filled.

In using the apparatus for repairing or splicing broken wire the crank-shaft is removed from its bearings and used without the remainder of the cart. In this instance the clamping-ring of the hook L is used to attach it to one end of the broken wire, while the clamp P is attached to the other end. The rope of the stretcher is then doubled near its middle and hooked over the arm I of the shaft G, and the latter held at right angles to the line of the fence and turned by means of the crank-handle to wind up both ends of the rope simultaneously. When the ends of the wire have been drawn together sufficiently, the shaft is turned in such position as to permit the arm I to be hooked upon one of the wires, thus holding it from unwinding. The wires may now be each bent at a right angle midway of the lap, the angled ends laid parallel and twisted together by the use of the staple-puller, thus making a reliable splice and taking up all slack in the wire. If it is simply desired to draw a wire up so as to attach it to a post, the end of the rope carrying the hook may be passed around the post and hooked upon itself, the clamp P then attached to the wire, and the windlass-shaft used to wind up the rope, as before described.

Should it be desired to cut or break the wire, this is readily accomplished by the use of the staple-puller, as follows: One of the clamps, preferably the clamp P, is placed upon the wire adjacent to the proposed point of separation, so as to afford a convenient means of holding the wire firmly. The wire is then bent at a right angle near the clamp and the fork of the staple-puller placed upon the unbent portion of the wire adjacent to the clamp and with the angled end of the wire passing between the prongs, as shown in Fig. 4. Now using the straight portion of wire passing through the clamp as an axis, the staple-puller is carried around it, the V-shaped throat between the arms grasping the wire in the manner of a pipe-wrench and twisting it off readily. This twisting action is rendered certain by the engagement of one or the other of the prongs with the right-angled portion of the wire.

When used as a post-puller, the handle of the machine is placed over the post, the cart

drawn up so as to bring the windlass-shaft close to the post, and the handle allowed to rest upon the ground. One end of the rope of the wire-stretcher is secured around the post adjacent to the ground, the other hooked to the windlass-shaft, and the rope wound up by means of the crank in the same manner as in stretching a wire. Should it be necessary, a brace-timber or shore may be placed beneath and extending from the ground up to the frame *e* to support the latter while pulling the post.

When used as an ordinary hand-cart, the windlass cross-bar *D* and guide-sleeves *k k* are removed and any suitable box is secured upon the axle between the members of the handle-frame *E*.

From the foregoing it will be obvious that an apparatus thus constructed possesses many features of improvement.

While the machine is adapted to perform efficiently all of the numerous functions herebefore described, yet it is extremely simple, and may be handled with perfect ease by a single operator. Being constructed entirely of metal, it is practically indestructible, while the tubular form of the larger members of the machine insures the minimum weight consistent with the required strength. It is also to be noted that the construction is such that it may be readily manufactured without an expensive plant.

The construction of the machine by which it may be anchored by placing the handle over the post and allowing it to drop to the ground we consider a feature of special importance. When anchored in this position, the strain on the machine due to stretching the wire is most effectually resisted by reason of its peculiar construction. The anchoring is also accomplished in a most convenient manner and without the use of stakes or other special adjuncts.

Another feature of importance is the making of the windlass-shaft long enough to provide room for winding the stretcher thereon without removing the spool.

While we have herein shown what we consider to be the most desirable construction, yet it will be obvious that the invention may be varied considerably as to details without departing from the spirit thereof. We do not, therefore, desire to be limited to the precise details herein shown, but on the contrary desire to secure broadly the novel features claimed.

We claim as our invention—

1. A machine for handling fence wire, comprising a wheel supported axle, vertical standards secured on said axle, an upper cross-member connecting said standards and forming in conjunction therewith a vertical frame, guide rollers extending between said axle and upper cross-member, a handle frame, comprising side members rigidly connected at one end with said vertical frame and a transverse member connecting the other ends of the side

members; said several handle members forming, in conjunction with the cross-member of the vertical frame, an open rectangular frame extending at right angles to said vertical frame and adapted to rest at its forward end directly upon the ground when unsupported, and a winding-shaft mounted upon the handle frame, substantially as set forth.

2. A machine for handling fence wire, comprising a wheel supported axle, vertical standards secured on said axle, an upper cross-member connecting said standards and forming in conjunction therewith a vertical frame, vertically arranged rollers forming guides extending between said axle and the upper cross-member, a handle frame comprising side members rigidly connected at one end with said vertical frame, and a transverse member connecting the other ends of the side members; said several handle members forming in conjunction with the cross-member of the vertical frame, an open rectangular frame attached to and extending at right angles to said vertical frame, brace members extending from the lower part of the vertical frame diagonally upward one to each side handle member, and a windlass transversely mounted upon the handle frame between the ends thereof, substantially as set forth.

3. A device for use with a wire stretching machine, comprising a wire clamp having a tapered conical shank, a hook at the larger end of said shank, a ring adapted to fit upon said tapered shank, said ring being cut or provided with an opening at one side, and an eye for attaching the smaller end of the shank to a rope or the like, substantially as set forth.

4. A device for use with a wire handling machine, comprising a wire clamp having a body portion provided with an eye at one end, and with an open-ended rectangular socket extending longitudinally of said body, and a wedge adapted to fit within said socket; a second wire clamp comprising a hook provided with a tapered shank and an eye, said shank being tapered toward the eye thereof, and a ring provided with an opening in one side adapted to fit upon said shank, and a flexible strand connecting said clamps, substantially as set forth.

5. A staple puller, comprising an elongated body portion forming a handle, bifurcated at one end by means of a central opening terminating at its inner end in V-form, the arms formed by said bifurcation being bent midway of their lengths to stand at right angles with the body portion and substantially parallel with each other, and terminating in sharp points, substantially as set forth.

In testimony that we claim the foregoing as our invention we affix our signatures in presence of two witnesses.

THOMAS E. LEE.
CYRUS H. LEE.

Witnesses:

N. T. SQUIER,
D. D. HALL.