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(No Model.)

F. M. EWERS.

POST DRIVER.

No. 308,310.

Patented Nov. 18, 1884.

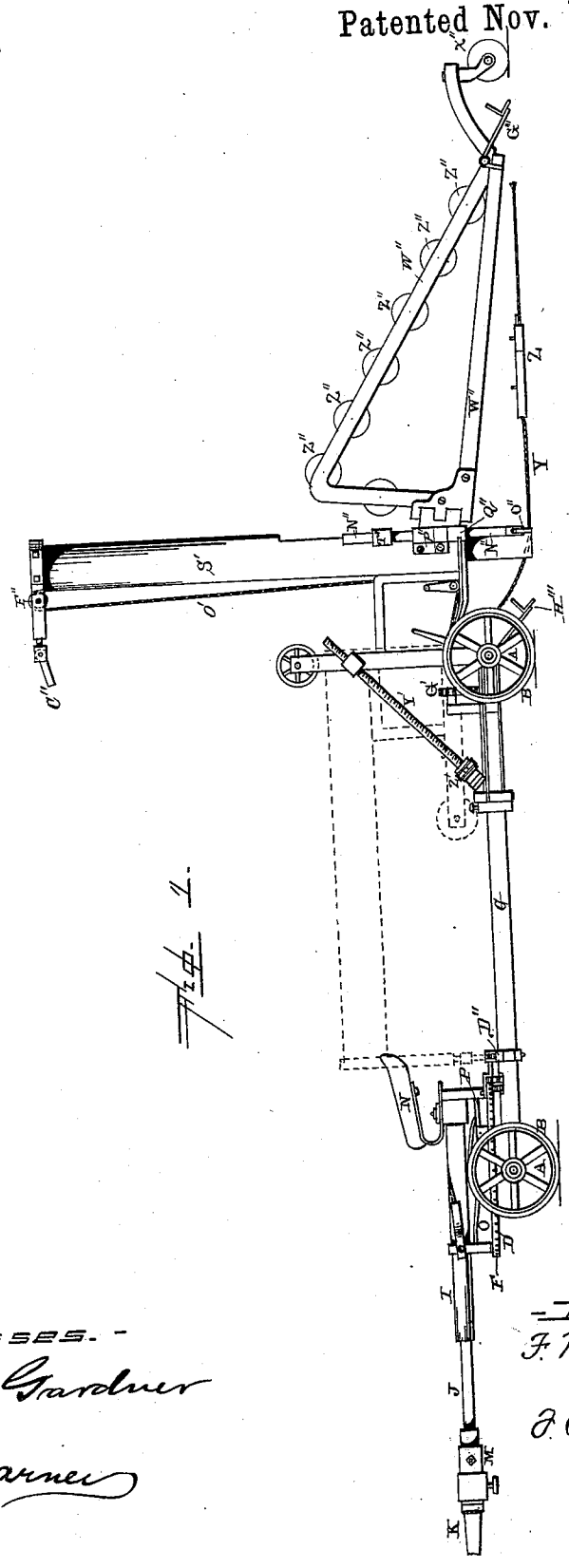


Fig. 1.

Witnesses.
Louis F. Gardner
J. W. Garner

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per
J. A. Lehmann,
Atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

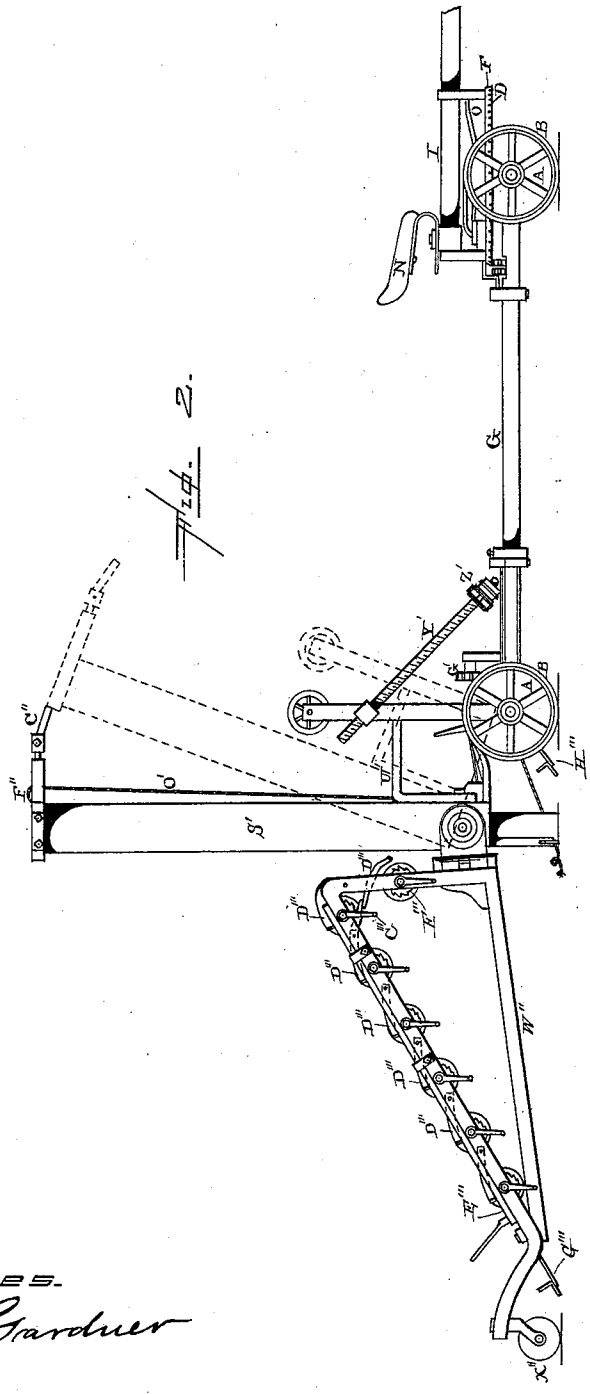
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F. M. EWERS.

POST DRIVER.

No. 308,310. Patented Nov. 18, 1884.

Fig. 2.



Witnesses.
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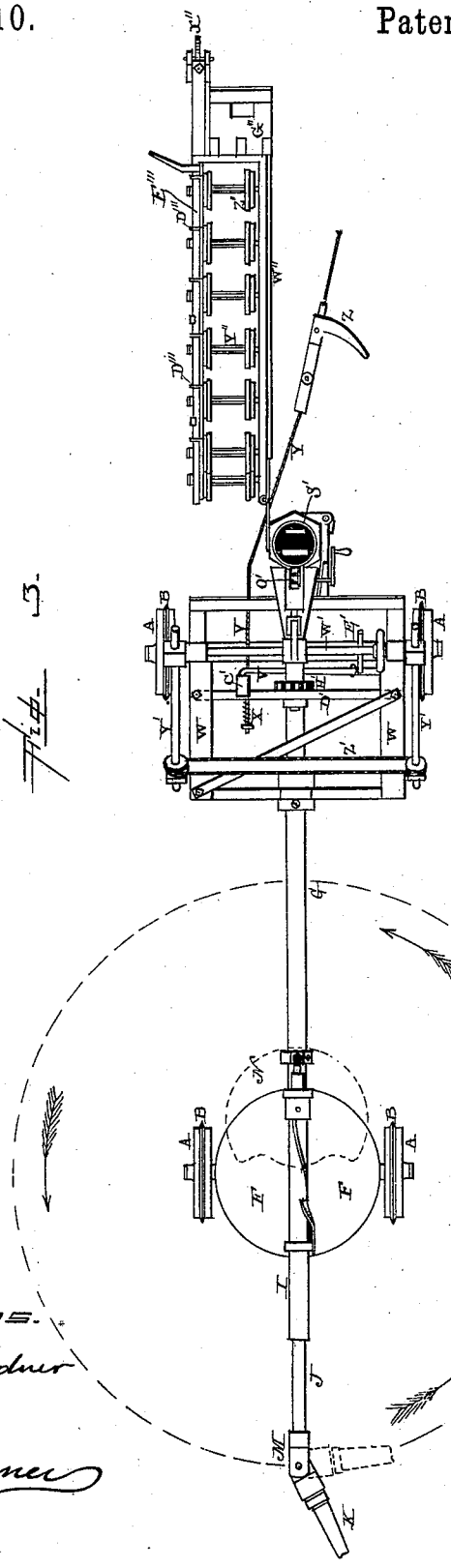
(No Model.) 7 Sheets—Sheet 3.

F. M. EWERS.

POST DRIVER.

No. 308,310. Patented Nov. 18, 1884.

Fig. 3.



Witnesses.
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7 Sheets—Sheet 4.

F. M. EWERS.

POST DRIVER.

No. 308,310.

Patented Nov. 18, 1884.

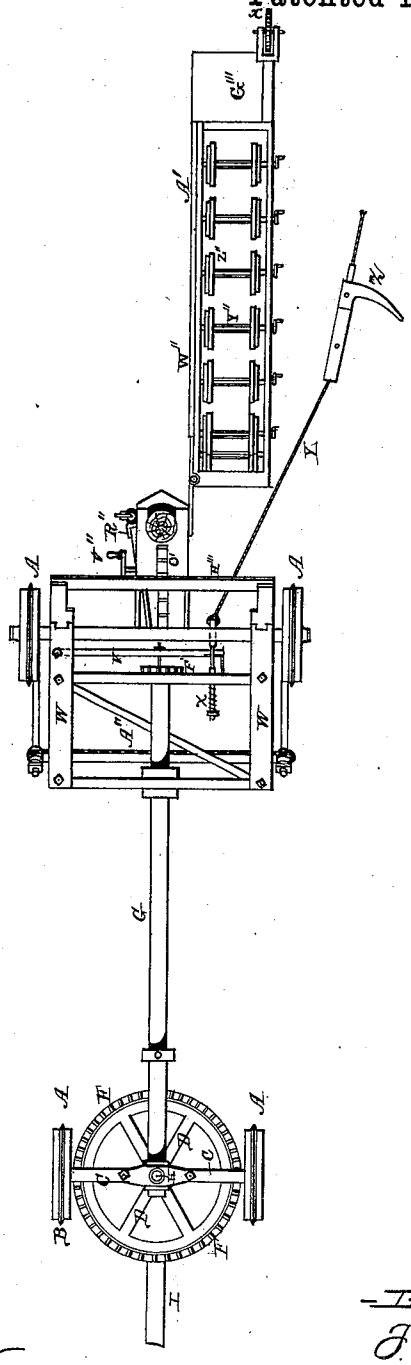


Fig. 4.

Witnesses.—

Louis F. Gardner

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(No Model.)

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F. M. EWERS.

POST DRIVER.

No. 308,310. Patented Nov. 18, 1884.

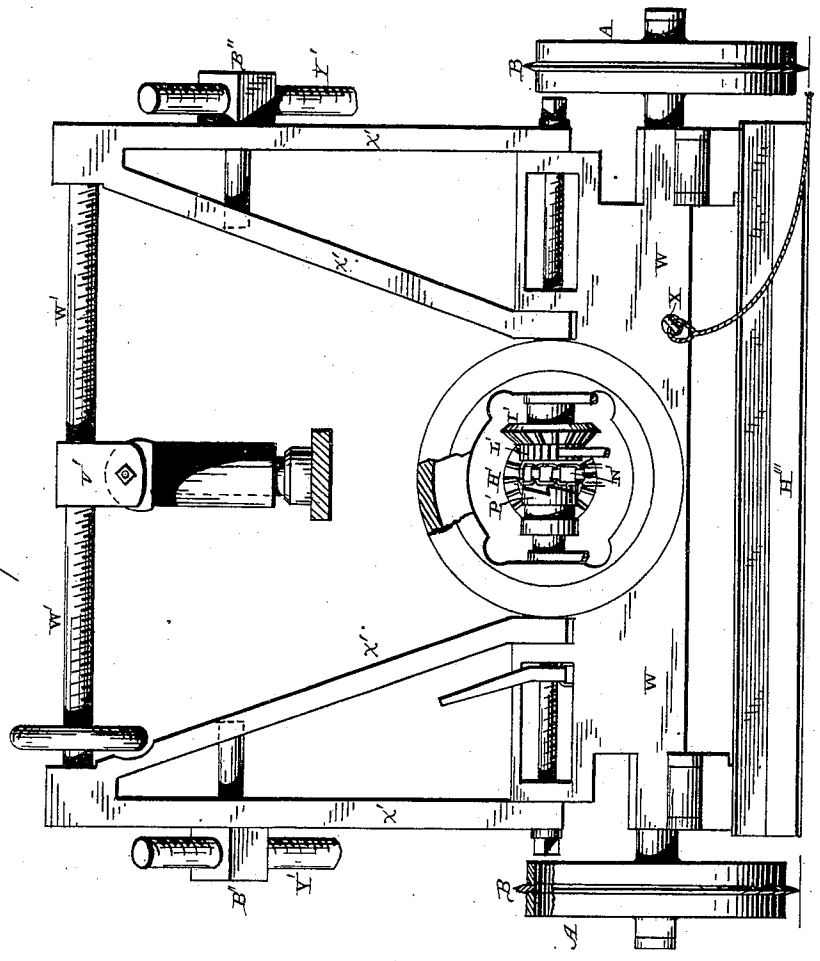


Fig. 5.

Witnesses.
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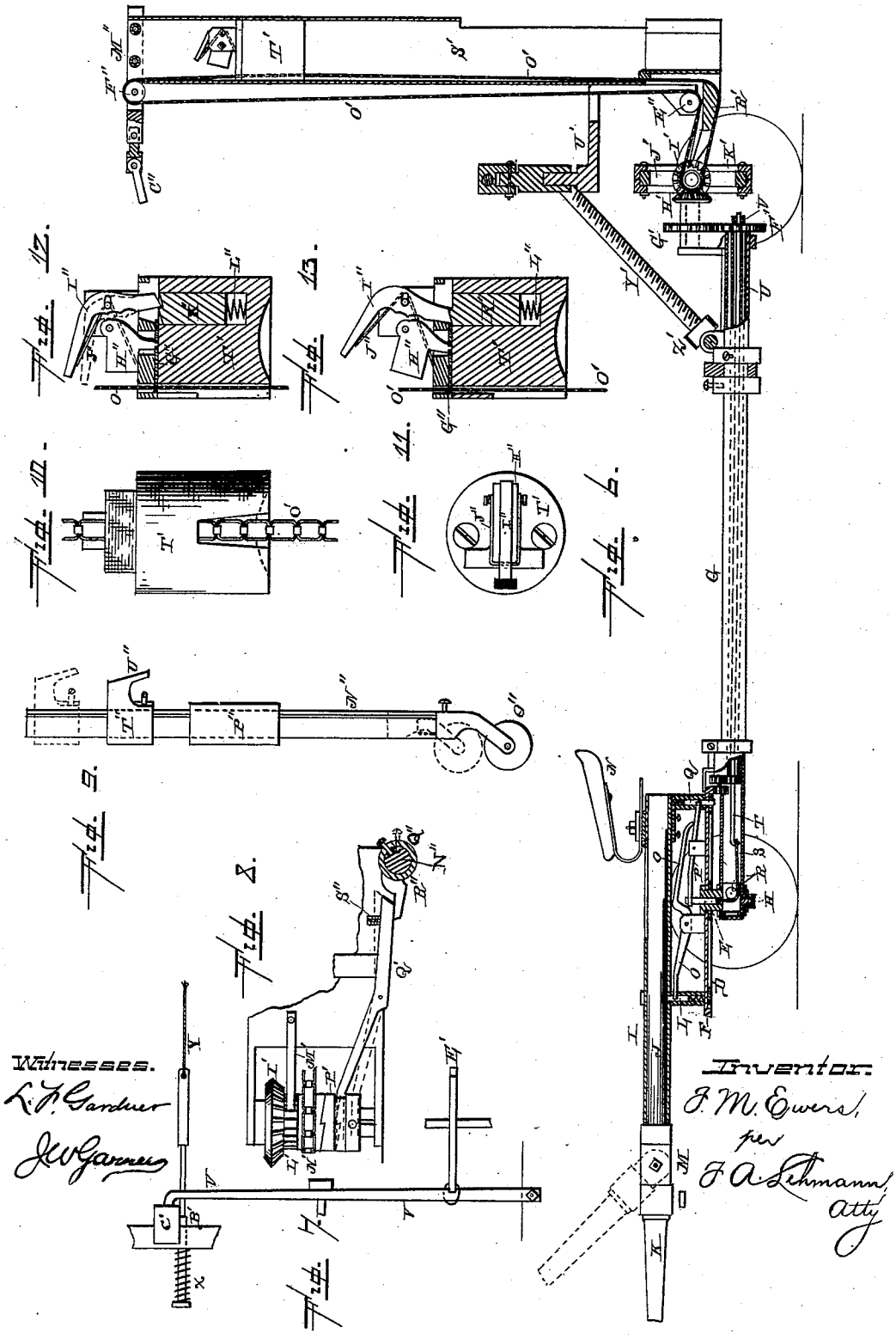
N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 7 Sheets—Sheet 6.

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POST DRIVER.

No. 308,310. Patented Nov. 18, 1884.



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(No Model.) 7 Sheets—Sheet 7.

F. M. EWERS.

POST DRIVER.

No. 308,310. Patented Nov. 18, 1884.

Fig. 14.

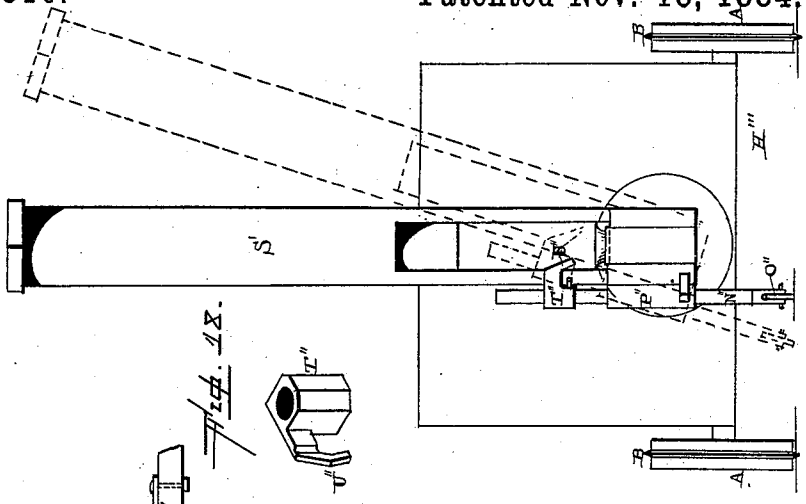


Fig. 14A.

Fig. 16.

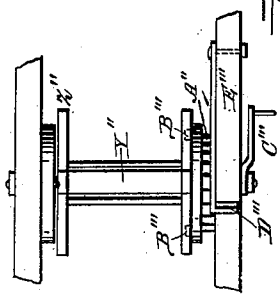


Fig. 15.

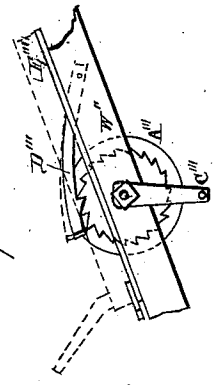
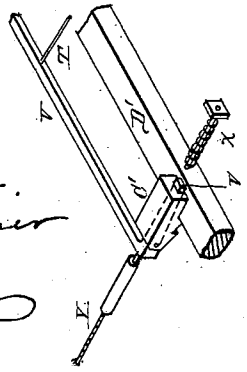


Fig. 17.



Witnesses.
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J. W. Garnier

Inventor
F. M. Ewers
per
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N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS M. EWERS, OF EDISON, OHIO.

POST-DRIVER.

SPECIFICATION forming part of Letters Patent No. 308,310, dated November 18, 1884.

Application filed April 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS M. EWERS, of Edison, in the county of Morrow and State of Ohio, have invented certain new and useful Improvements in Machines for Driving Posts and Building Wire Fences; and I 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.

My invention relates to an improvement in machines for driving posts and building wire fences; and it consists in a machine which is supported upon four wheels, and which is to be drawn along by two horses, and which is provided with a tongue, which is adapted both to be used as a tongue for drawing the machine along and as a sweep for operating the driving mechanism; and it further consists in the guiding-pipe, in the lower slotted end of which the post is placed for the purpose of being held in position while being driven, and mechanisms for adjusting the vertical position of the pipe, so that the posts will be driven in a vertical position whether the machine is on the side of a hill or not.

It still further consists in the peculiar construction of the latch mechanism upon the falling weight, whereby it is automatically released from the chain and again made to engage with it after striking upon the post.

It still further consists in the combination of the vertical post or rod, which is secured to the lower end of the guiding pipe, and a mechanism connected with this post for throwing the clutch out of gear and thus stop the action of the chain and the falling weight.

Figures 1 and 2 are side elevations of a machine embodying my invention, taken from opposite sides. Fig. 3 is a plan view. Fig. 4 is an inverted view. Fig. 5 is an enlarged end view, taken from the rear, showing the guide-pipe removed. Fig. 6 is a longitudinal vertical section. Fig. 7 is a plan view of the lever and its attachments for operating the pins which hold the tongue and the master-wheel in position. Fig. 8 is a plan view of the gearing and the device for throwing the gearing out of action when the post has been driven deep enough. Fig. 9 is a side elevation of the device for regulating the depth of the post and for automatically operating the gearing. Figs. 10, 11, 12, and 13 are detail views of the weight used in driving the posts. Fig. 14 is a perspective of a part of the devices shown in Fig. 7. Fig. 15 is a side elevation of the device for holding the spool on which the barbed wire is placed and the device for throwing the pawls in and out of action. Fig. 16 is a plan view of the same. Fig. 17 is a rear view showing in dotted lines how the guide-pipe can be inclined from side to side. Fig. 18 is a perspective of the adjustable device used to regulate the depth to which the posts shall be driven.

The entire machine is supported by four wheels, A, each one of which consists of two wheels, between which a sharp cutting-edge, B, is rigidly clamped. The two wheels A and the sharp edge B revolve together, the sharp edge B serving to prevent any lateral movement of the wheels upon the ground, either while the machine is being drawn along or in actual use in driving a post. The front axle, C, is formed practically in two parts, and which parts are rigidly bolted to the wheel D, which is pivoted upon the bolt E, which passes down through both the wheel D and the master-wheel F, and just into the front end of the pipe or coupling G. A second bolt, H, is passed through the divided axle from its under side, and also catches in the front end of the coupling-pipe G, and these two bolts serve to pivot the entire truck upon the pipe, as will be more fully described hereinafter.

Secured upon the top of the master-wheel F, and which can be made to revolve independently of the small wheel D by means of a suitable bearing, is the slotted tube I, in which the pivoted rear end, J, of the tongue K is made to play back and forth. When the part J is forced back into the pipe I, the tongue K can be used as a tongue only, but when the end J is released from its locking-pin L the part J is drawn outward about two feet, and then the joint M, between the tongue K and the end J, is brought into play, so that the

tongue can be swung around to one side, as shown in dotted lines in Fig. 3, and thus used as a sweep to operate the machine in driving posts. The slot in the pipe I is made spiral, as shown, and the part J has a pin or projection, which catches in this spiral slot, so that when the part J is drawn outward the tongue K and the part J are made to revolve so as to turn the joint M from a vertical to a horizontal position. While the part J is forced back into the position shown in Fig. 6, this joint M being turned vertically, the tongue K has no other than a vertical play; but when the part J is turned outward, as shown in Fig. 3, the tongue is formed into a sweep at right angles, so that the team can walk around in a circle, as shown in dotted lines, and thus operate the driving mechanism. While the tongue is being used as a sweep the pipe I turns with it, and, this pipe I being rigidly secured upon the top of the master-wheel F, the wheel F revolves around upon the top of the wheel D while the wheel D remains stationary. The wheel D turns upon its journal only when the machine is being turned from a straight line as it is being drawn along.

Upon the rear end of the pipe I is secured the driver's seat N, and this seat N revolves with the pipe and the master-wheel, so that the driver always faces his team. Pivoted in suitable bearings upon the top of this master-wheel is a lever, O, which has its front end connected with the vertically-moving spring-actuated pin L. This pin L passes through the pipe I and catches into the side of the part J, so as to prevent it from being drawn outward. When this lever O is operated the pin L is depressed, and then the part J is drawn out by the forward motion of the team to its full extent. This lever O is operated by a second lever, P, which is also pivoted upon the top of the master-wheel, and which is connected at its rear end with the vertically-moving spring-actuated pin Q, which passes down through the wheel D for the purpose of locking the master-wheel and the wheel D together, the tongue then being at right angles to the axle, and the machine is ready to be drawn forward. The rear end of the lever O bears upon the top of the lever P, so that when the front end of the lever P is depressed it forces up the pin Q and at the same time raises the rear end of the lever O, and thus the two pins L Q are always operated at the same time.

Fastened to the front end of the lever P and passing down over a suitable guiding-pulley, R, is a wire, rope, or chain, S, which is fastened at its opposite end to the front end of the rod T, which passes through the hollow shaft U, inside of the coupling-pipe G. The rear end of this rod T is connected to the lever V, which is pivoted in one side of the frame W. Passing through the free end of this lever V is a spring-actuated rod, X, to the rear end of which is attached the cable Y, which has the hook Z adjustably secured thereto. This rod Z drags along the ground from post to post and regulates the distance the posts shall be set apart. This hook Z is forced sidewise so as to catch against the posts by the dragging action of the frame A′, in which the reels containing the wire are placed, and thus made to catch against the posts as the machine is drawn along. The distance that the posts are to be set apart is regulated after the first post has been driven by regulating this hook Z upon the cable Y. As the machine is drawn along after the first post has been driven, this hook Z catches against the post and exerts a pull upon the spring-actuated sliding rod, X, which has a suitable stop, B′, formed upon it. When this rod X is moved backward, so that the stop B′ strikes against the lever V, this free end of the lever V is forced backward, and this movement of the lever exerts a pull upon the rod T, which in turn operates the two spring-actuated pins L Q, and allows the part J to be drawn out, and the tongue K is converted into a sweep to operate the driving mechanism, and thus drive a second post. The spring-actuated rod X gradually stops the machine, so that no jerk is experienced by the team, and then when the part J begins to pull out the driver at once knows that another post has been reached, and so he swings his team around at right angles, so as to operate the driving mechanism. When the team is driven around in a circle, as shown by dotted lines in Fig. 3, they step over the coupling-pipe G, which extends along close to the ground, and in making this one circle the weight can be made to fall any desired number of times. Also secured to the lever V is a shouldered pivoted catch, C′, which catches against the cross-bar D′ of the frame W. When the cable Y draws the lever V backward, this pivoted block or catch C′ catches behind the cross-bar D′ for the purpose of preventing the lever V from being returned to position until the machine is again ready to be driven forward. As long as this block or catch C′ is catching behind the cross-bar D′ the lever V is held back as far as it can be moved, and for the purpose of exerting a pull upon the rod T′ and operating the levers O P, and through the levers the spring-actuated pins L Q, which lock the part J and the master-wheel in position. It will be seen that when the machine is being driven along, a pull is exerted upon the lever V, and with it the levers P O, allow the pins L Q to catch in the parts D J, and thus hold the tongue in a straight line at right angles to the front axle, C. As soon, however, as the machine is stopped by means of the hook Z, these pins L Q are operated, so as to release the part J, and thus allow the tongue to be used as a sweep and the driving mechanism to be operated. After the post has been driven, and it is desired to again start forward with the machine, the operator at the rear end of the machine exerts a pull upon the lever E′,

when the front end of the lever V is raised upward sufficiently to free the block or catch C′ from the cross-bar D′, when the lever V allows the levers O P to resume their normal position. At the same time that the lever E′ is operated, the hook Z is freed from next to the last post driven, and the machine is free to move forward again, until the hook Z catches against the last post driven, when the machine is again stopped, ready to drive the next post. The coupling-pipe G serves simply to connect the truck and the frame W together and as a covering for the hollow shaft U and the rod T, which passes through them. Secured to the rear end of this hollow shaft U is a gear-wheel, F′, which meshes with a second gear-wheel, G′, placed upon the short shaft just above. Upon the rear end of the short shaft is secured a bevel-gear, H′, which meshes with a second bevel-gear, I′, which is secured to a sleeve placed upon the rod which extends across the center wheel, J′. This wheel J′, as shown in Fig. 6, is held between two circular frames, K′, so that the wheel J′ can revolve freely around therein. Upon the same sleeve as the wheel I′ is placed the ratchet-wheel L′, which is prevented from turning backward by the spring-pawl M′. Formed as a part of this ratchet-wheel L′ is a sprocket-wheel, N′, around which passes the chain O′ for operating the weight. The ratchet-wheel L′ serves to prevent the chain from being moved backward at any time unless specially desired. By this construction the chain O′ is made always to move in one direction, for the purpose of raising the weight. Also placed upon the same sleeve as the wheel I′, ratchet-wheel L′, and sprocket-wheel O′ is the clutch P′, which is feathered to the sleeve, so that when thrown in gear with the ratchet-wheel on the end of the sprocket-wheel, the sprocket-wheel N′ and the ratchet-wheel L′ will be made to revolve with the wheel I′. When this clutch P′ is not in gear with the sprocket-wheel N′, the ratchet-wheel L′ and the sprocket-wheel O′ remain stationary upon the sleeve, and then the dropping mechanism is not operated. The sweep and the master-wheel may be kept constantly in action, and then the wheel I′ will be made to revolve, but without producing any effect whatever upon the dropping mechanism. This clutch P′ is automatically operated by means of the lever Q′, which is operated at its rear end by the mechanism which regulates the depth to which the post shall be driven.

Secured to the wheels J′ by means of the arms R′ is the guiding-pipe S′, in which the weight T′ moves back and forth, and in which lower slotted end of the pipe is inserted the post for the purpose of being driven into the ground. As this wheel J′ revolves freely inside of its casing K, and as the arms R′ are rigidly connected to the pipe S′, it will readily be seen that the pipe S′ can be inclined toward either side, as shown in dotted lines in Fig. 17, so that should the machine be upon the side of a hill the pipe S′ can be adjusted laterally at its upper end until it is in a vertical position. Also secured to the casting at the lower end of the pipe S′ are the arms U′, which are connected at their upper ends to the sliding nut V′, which is placed upon the screw-shaft W′, which is journaled in the upper ends of the two pivoted arms X′. This screw-shaft W′ is provided with a suitable hand-wheel, by means of which it can be freely turned, and thus the nut V′ can be moved toward either side of the center of the machine, and the pipe S′ will be correspondingly moved. The two pivoted arms X′, which are placed upon opposite sides of the pipe S′, are operated by means of the two screw-shafts Y′, which are swiveled at their lower ends in suitable bearings upon the frame W. Each one of these screw-shafts Y′ is provided with a small sprocket-wheel, Z′, and around these two wheels Z′ is passed the operating-chain A″, so that by moving the chain in either direction both of the screw-shafts will be turned at the same time. By connecting the two shafts together in this manner neither one can be turned more rapidly than another, nor to a greater extent. As the upper ends of these shafts pass through the screw-bearings B″ on the outer sides of the pivoted arms X′, by turning the screw-shafts the two arms X′ can be moved back and forth in a line with the machine to any desired extent, carrying with them the pipe S′. This adjustment of the pipe S′ is not only for the purpose of adjusting the upper end of the pipe back and forth, according as the machine may be going up or coming down the side of a hill, and thus cause it to drive the posts in a vertical position; but for the purpose of moving the pipe S′ forward in a horizontal position, as shown by dotted lines in Fig. 1, so that it will be out of the way while the machine is being transported from place to place, and to prevent any unnecessary vibration of the different parts. For the purpose of holding this pipe rigidly in place, when adjusted in a horizontal position, it is provided with a pivoted prong or projection, C″, (shown in Fig. 6,) which catches in a collar, D″, on the shaft G, where it is securely clamped. This collar D″ is placed upon the coupling G, and serves no other purpose than simply to hold the pipe S′ in position when it is moved forward, as shown by dotted lines in Fig. 1. While in this inclined position the machine is not shaken or vibrated to as great an extent in being moved from place to place as it would be were the pipe permitted to remain in a vertical position, as shown. Part of the operating-chain O′ passes under a suitable guiding-pulley, E″, over another driving-pulley, F″, at the top of the pipe S′, and then down through the pipe and through one side of the weight T′, back under the arms R′, to the sprocket-wheel. As already explained, the ratchet-wheel L and pawl M cause the chain O′ to move in one direction only. Through one side of the weight T′

is formed a suitable opening through which this chain O′ passes, and in the weight T′ is a sliding bolt, G″, which engages with the chain O′, and locks the chain O′ and the weight T′ together. This latch G″ is operated by the lever H″, and has its lower end passed through an opening in the latch G″, for the purpose of forcing the latch back out of contact with the spring. The upper end of this lever H″ is made quite heavy, so that whenever it is left free to move its upper end will sink downward and thus force the latch G″ back out of contact with the chain O′, when the weight immediately drops. Also pivoted in suitable bearings upon the top of this weight T′ is the lever I″, which has its upper end thrown backward and upward by the spring J″, when it is left free to move, and which has its lower end forced forward against the bolt G″, for the purpose of forcing the bolt G″ through the chain.

In the weight, just under the lower end of the pivoted lever I″, is made a suitable cavity, and in this cavity is placed a shouldered catch, K′, and spring L″. When the upper end of this slotted lever I″ is forced downward by coming in contact with the cross-bar M″ in the upper end of the pipe S′, its lower end is forced backward, so as to catch behind the shoulder on the catch K″. This shoulder serves to hold the lower end of the lever I″ out of contact with the latch G″, and then the lever H″ is free to be moved by the upper end of the lever I″, so as to force the latch G″ backward out of the chain, when the weight immediately falls. As the weight T′ strikes the upper end of the post which is being driven into the ground the spring L″ is compressed just far enough to allow the catch K″ to sink downward far enough to release the lower end of the lever I″, when it moves forward and strikes against the bolt G″ and forces it again through one of the links of the chain. This lever I″ is slotted, as shown in Figs. 12 and 13, so that after its lower end is caught behind the shoulder on the upper end of the catch K″ the upward pressure of the weight caused by the chain O′ will cause the upper end of the lever I″, after striking against the cross-bar M″, to be depressed just far enough to strike against the upper weighted end of the lever H″, and thus withdraw the latch G″ from the chain. By driving the sweep once around, this weight T′ will be made to engage with the chain and be carried to the top of the pipe S′, and dropped three or more times, as may be desired.

In order that all of the posts may be driven to exactly the same depth into the ground, there is secured to the lower end of the pipe S′, at one side, the grooved sliding rod N″, which is provided with a swiveled caster-wheel, O″, in its lower end, so as to run along upon the ground. This rod N″ plays up and down through the guide P″, secured to one side of the pipe S′, and through the collar T″, just below the guide, which collar T″ is feathered in the groove made in the rod N″, so as to turn with the rod, but at the same time allow the rod N″ to slide freely back and forth through it. To the collar Q″ is secured the arm R″, which bears against the rear end of the lever Q′, as shown in Fig. 8. As there is a spring, S″, placed under the rear end of the lever Q′, the lever Q′ always automatically holds the clutch P′ in gear with the sprocket-wheel N′, and also returns the collar Q″ back into position, thus returning the rod N″ at the same time. This rod N″ plays freely up and down, so as to always follow the inequalities of the ground as the machine is drawn along.

In order to regulate the distance to which the posts shall be driven, there is secured to the upper end of the rod N″ a collar, T″, which has the inclined pronged end U″, which extends inside of the opening in the lower end of the tube S′. When the weight descends, if the posts have not been driven sufficiently deep into the ground, it does not touch the part U″; but when the post has been driven in sufficiently far the weight strikes this part U″ in its descent and forces it back out of the way. As this part is being forced back out of the way it turns the rod N″ and the rod N″ in turn turns the collar Q″, which operates the lever Q′, which in turn moves the clutch P′ out of contact with the sprocket-wheel N′. The moment the clutch is thrown out of gear with the sprocket-wheel the chain ceases to move, and hence while the weight engages with it it is not raised upward. As long as the weight T′ remains in this part of the tube S′, where it bears against the part U″, the rod N″ is turned partially around, and thus made to operate the clutch. The operator then cannot drive the post further into the ground, even if he wished to do so. In starting the machine again, this weight T is then raised upward a slight distance by means of the crank V″, which is connected with the wheel E, which is provided with teeth for the purpose of moving the chain by hand. This wheel E″ serves both as a guide-pulley and to operate the chain by hand when so desired. As soon as the weight is raised upward by hand, the rod N″ is freed, when the part U″ is again forced into the tube ready for operation.

Pivoted to the rear end of the frame W is the sharp-edged catch or stop H‴, which slides along over the ground, and which serves to prevent the machine from having any backward movement after the team has been stopped. The lower edge of this stop, by engaging with the ground, holds the machine in the position, either against any tendency on the part of the spring on the rod X to pull it back, or to run downhill.

Loosely attached to one side of the casting, at the lower end of the pipe S′, by means of a suitable hinge or strap, is the triangular frame W″, which is supported at its rear end by means of the caster-wheel X″. In this frame are placed the rods Y″, which are provided

with the disks Z″ at one end, and the ratchet-wheels A‴ at the other. The spools, upon which the wire is wound, are placed upon the shafts Y″ and then connected to the ratchet-wheels by means of the small projections B‴, formed upon their inner sides, for the purpose of causing the spool to revolve with the ratchet-wheel.

To one end of the rods Y are secured suitable cranks, C‴, and which cranks cause the ratchet-wheels to revolve. By tightening up upon the nuts outside of the cranks, the disks Z″ can be thrown toward the ratchet-wheels A‴, and thus the spools clamped rigidly in between the two.

Pivoted to the triangular frame W″ are a suitable number of pawls D‴, which engage with the ratchet-wheels and prevent them from turning backward as the machine is drawn forward, when it is desired to reel out the wire. In order to operate all these pawls D‴ at the same time, a pivoted bar, E‴, is placed upon the top of the frame W″, and by turning this bar E‴ up on edge, it will catch under the turned-out ends of all of the pawls, and thus raise them upward with the exception of the reel F‴, which is placed at the inner end of the frame W″. The pawl of this reel F‴ is operated by the pawl of one of the reels above it, as shown in Fig. 2. Upon this reel F‴ is intended to be placed a smooth wire. As the machine is driven along, the bar E‴ is turned up on edge so as to release all of the pawls, and then the wire from all of the reels will unwind. When it is desired to stretch the wires at any point it is only necessary to turn down the bar E‴, when the pawls will again engage with the ratchet-wheels, and prevent the spools from unwinding, and then all the forward draft of the machine will be applied to stretching the wires. In case it is not desired to stretch them by the forward movement of the machine, they can be stretched to any desired extent by means of the crank C‴.

Loosely connected to the rear end of the frame W″ is the stop G‴, which acts to prevent any forward movement of the machine in connection with the step H‴.

No claim whatever is here made to the devices for stretching the wires, as these form another invention, and will be made the subject of another application. They are shown and described in this connection merely to illustrate a full working machine for driving the fence-posts and stretching the wires at the same time.

Having thus described my invention, I claim—

1. The combination of the tongue, which is jointed to the part J, the slotted tube I, and a locking-pin, which is operated by the catching of the hook Z against the post, substantially as shown.

2. The combination of the tongue K, which is hinged to the front end of the part J, slotted tube I, a locking-pin for locking the part J in position, and a locking-pin for locking the wheel D, and a mechanism for operating the pins, whereby, when the machine is stopped by the catching of the hook Z against the post, the team can be made to operate the driving mechanism, substantially as described.

3. The combination of the two locking-pins L Q, their operating-levers O P, rod T, lever V, rope Y, and hook Z, with the part J, which is connected to the tongue, and the wheel D, substantially as set forth.

4. In a machine for driving fence-posts, the combination of the device for catching against the last post driven, a mechanism which is operated by this hook for releasing both the extension connected to the tongue and the wheel which operates the driving mechanism, and a driving mechanism for driving the post when the team is driven around in a circle, substantially as specified.

5. The combination of the truck, the tube G, the hollow driving-shaft U, with the wheels F′ G′ H′ I′, ratchet-wheel L′, sprocket-wheel N′, clutch P′, chain O′, tube S′, and weight T′, substantially as shown.

6. The combination of the tube S′, the weight, the chain O′, rod N″, and a device which is connected to the rod, and which is operated by the falling of the weight for the purpose of throwing the clutch out of gear and stopping the movement of the chain and the operation of the weight, substantially as described.

7. The combination of the tube S′, the chain O′, the weight which is operated by the chain, the rod N″, having a device attached to its upper end for partially rotating it with the weight-drops, and a lever, Q′, and clutch P′, substantially as set forth.

8. The combination of the tube S′, the weight which operates therein, the chain for operating the weight, and an automatic mechanism for stopping the movement of the chain as soon as the post has been driven sufficiently far into the ground, said automatic mechanism being operated by the falling of the weight, substantially as specified.

9. In a machine for driving posts, the combination of the tube, the operating-chain, the weight, the lever I″, bolt G″, spring J″, pivoted lever H″, catch K′, and spring L″, substantially as shown.

10. The combination of the hook Z, the wire or rope Y, spring-rod X, lever V, provided with the catch C′, the rod T, and the levers for operating the locking-pin, the tongue, and the wheel, substantially as described.

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

FRANCIS M. EWERS.

Witnesses:
A. S. PATTISON,
J. W. GARNER.