

No. 669,646.

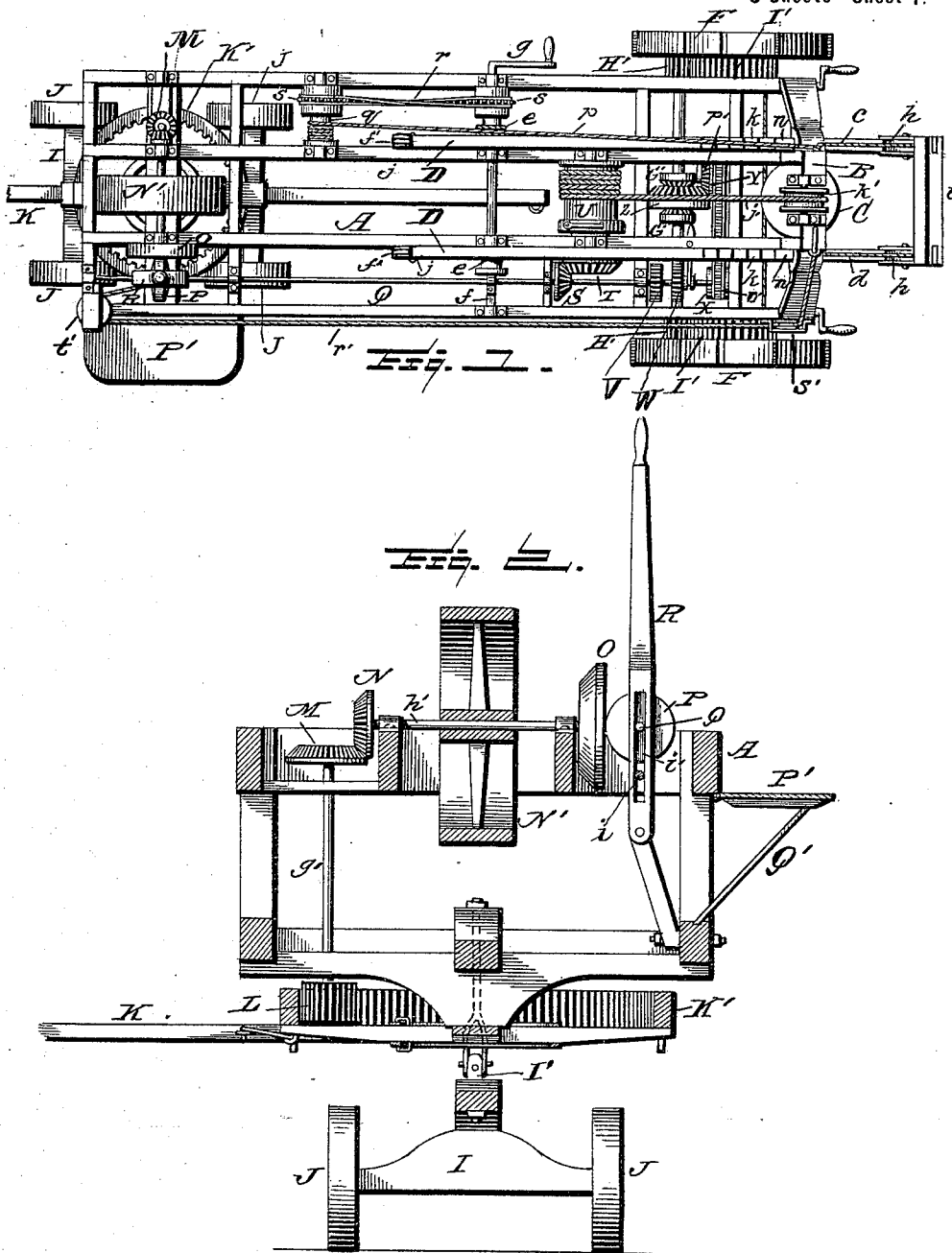
Patented Mar. 12, 1901.

J. S. KOESTER.
POST OR PILE DRIVER.

(No Model.)

(Application filed Oct. 30, 1900.)

3 Sheets—Sheet 1.



WITNESSES:
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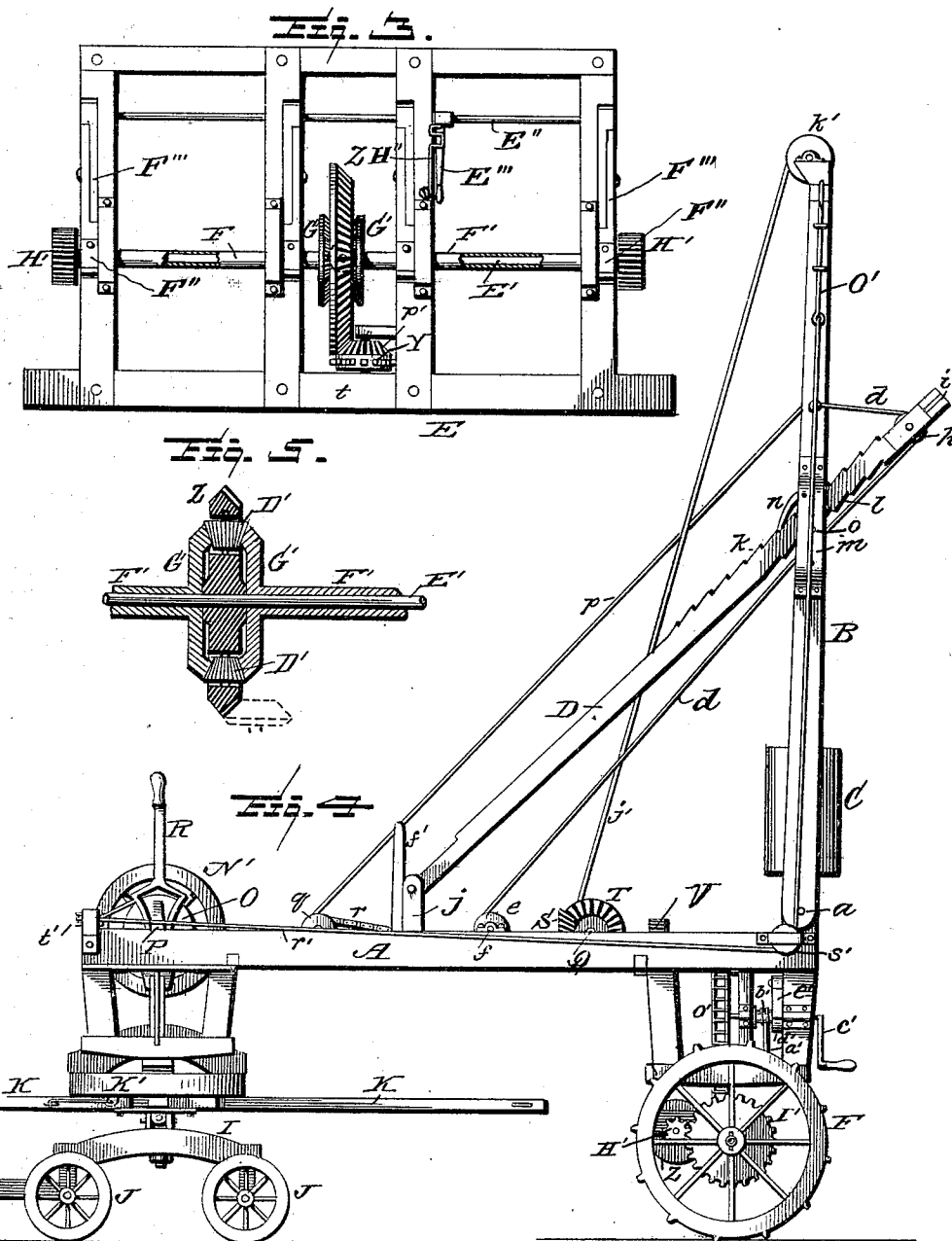
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3 Sheets—Sheet 2.



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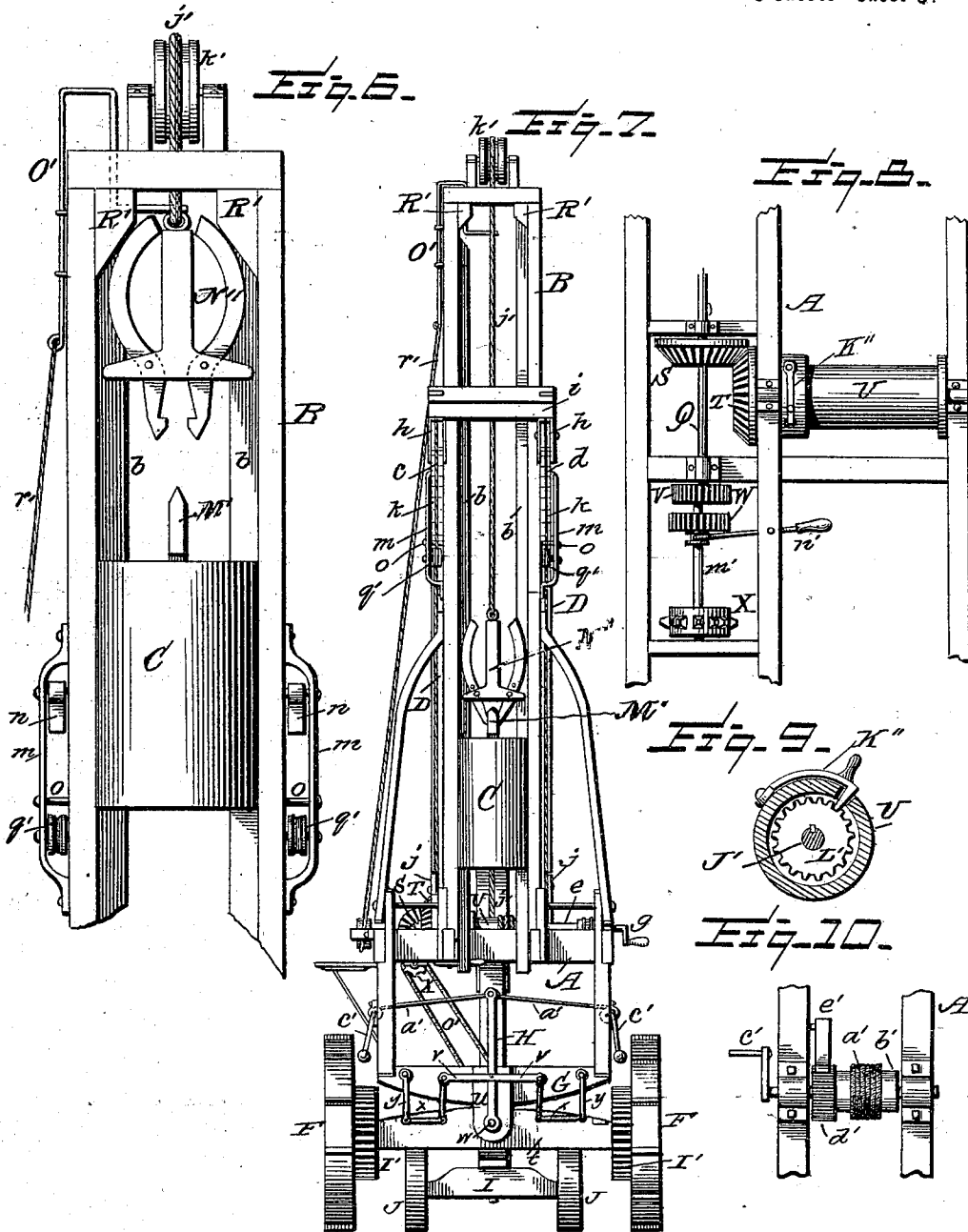
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3 Sheets—Sheet 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

JOHN S. KOESTER, OF IBERIA, MISSOURI.

POST OR PILE DRIVER.

SPECIFICATION forming part of Letters Patent No. 669,646, dated March 12, 1901.

Application filed October 30, 1900. Serial No. 34,891. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. KOESTER, a citizen of the United States, residing at Iberia, in the county of Miller and State of Missouri, have invented certain new and useful Improvements in Post or Pile Drivers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

The present invention has for its object to provide a simple, effective, and easily-operating machine for driving fence-posts and also piles and other like stays or supports, and that may be moved from one post to another by horse-power without the necessity of unhitching the team; and the invention consists in a machine constructed substantially as shown in the drawings and hereinafter described and claimed.

Figure 1 of the drawings is a top plan view of a machine constructed in accordance with my invention; Fig. 2, a front end view of the machine, partly in section and upon an enlarged scale; Fig. 3, a top plan view of the forward truck on the front end of the machine, showing the gearing connecting therewith; Fig. 4, a side elevation of the machine with the derrick and brace-arms elevated and ready for use. Fig. 5 is a detail sectional view showing the center or butterfly gear-wheel and the two gear-wheels upon the hollow shafts which mesh with the pinions of the center or butterfly wheel; Fig. 6, a front elevation of the upper end of the derrick with its connections and also the hammer; Fig. 7, an elevation showing the rear end of the machine; Fig. 8, a detail plan view of a portion of the frame of the machine, showing the gearing and drum connected thereto; Fig. 9, a cross-section of the drum shown in Fig. 8; Fig. 10, a detail view of one of the drums connected to the frame at the rear of the machine, showing the ratchet, pawl, and the crank-handle for operating the same.

In the accompanying drawings, A represents a rectangular frame of any preferred construction, and when mounted upon its proper trucks will be sufficiently high to admit of the horses passing underneath said

frame when found necessary, said trucks and their connecting parts being hereinafter described.

A derrick B is pivotally connected to the rear end of the frame A in any well-known and preferred manner, said pivotal connection being shown at *a* in Fig. 4 of the drawings. This derrick may be of any suitable form and construction and has parallel guides *b* for a suitable hammer C to slide up and down thereon, the pivotal connection of the derrick with the frame admitting of the former being adjusted both backward and forward from a perpendicular and on line with the frame, as found necessary in the operation of the machine. The adjustability of the derrick is attained by means of the cords or ropes *c d*, which extend around suitable drums *e*, connected to a transverse shaft *f*, provided with a crank-handle *g* for turning the shaft and drums. The cords or ropes *c d* extend from the drums *e* over grooved pulleys *h* upon the upper ends of brace-arms D, which arms are connected at their upper ends by a suitable transverse bar *i* and at their lower ends pivotally connected to short standards *j*. The cords or ropes *c d* may pass over grooved pulleys *q'*, secured in the guides *m*, as shown in Figs. 6 and 7 of the drawings, although any special arrangement or number of pulleys may be varied or modified or changed without departing from the principle of the invention. These brace-arms D, near their upper ends, have ratchet-teeth *k l* upon the upper and under sides, respectively, the upper ends of the brace-arms extending through guides *m*, secured to the derrick B, as shown in Fig. 4 of the drawings. These ratchet-teeth upon the upper and under side of the brace-arms are disposed in opposite directions, so that the arms may be locked in one position by means of the pawls *n* engaging the ratchet-teeth *k*, and the ratchet-teeth *l* engaging the pins *o*, secured in the guides *m*, as shown in Fig. 6 of the drawings.

The employment of the two sets of ratchet-teeth, as herein described, gives double security in holding the brace-arms D in position and also the derrick in its adjusted position.

The cords or ropes *c d* are connected at their upper ends to the derrick B, and a third

cord or rope *p* is also attached to the derrick at its upper end and extends down and over a drum *q*, which drum connects with the drums *e* by means of a sprocket or other suitable connection *r* engaging sprocket or other form of wheels *s*, or any other suitable means may be provided for operating the derrick and brace-arms, as found most convenient.

The means herein described of controlling the derrick and the brace-arms and holding them in position enables the derrick to be tilted to any angle with relation to a perpendicular and also held in a perpendicular position regardless of the unevenness of the ground.

When the ground is uneven, the frame A of the machine is tilted to the required angle to bring it horizontally in position for operating the machine. To accomplish this, the frame A is pivoted to the truck E at the rear of the machine, said truck being provided with suitable wheels F of any desirable construction. This truck is provided with a segmental lower block *t*, as shown in Fig. 7 of the drawings, and above this segmental lower block is a segmental upper block G, connecting with the frame A, said segmental upper block being supported over the lower one and pivotally connected therewith by means of a plate *u* or by any other well-known means to enable the frame A to rock or move in adjusting the angle of the frame A. To operate the upper block G and also the frame A to bring said frame to the required angle, so that it will assume a horizontal position when on uneven ground, a lever H is provided, which is pivoted to the segmental lower block *t*, which lever may be of any preferred construction, but preferably with arms *v*, suitably connected pivotally to the lever, as shown in Fig. 7 of the drawings. The pivot pin or bolt *w*, which pivots the lower end of the lever H to the segmental lower block *t*, also serves to pivot the upper block G to said lower block through the medium of the plate *u*; but any other well-known means may be resorted to to form a pivotal connection between the segmental lower block and the upper block. To the ends of the arms *v* are pivoted bell-cranks *x*, and to these bell-cranks are pivoted the ends of hangers *y*, said hangers being in turn pivoted to the upper block G. To the upper end of the lever H are connected cords or ropes *a'*, which extend over drums *b'*, provided with crank-handles *c'*, whereby the drums may be rotated to wind or unwind the cord or rope *a'* to bring the frame A to the desired angle to secure its perfect horizontal position when the machine is on a side hill or uneven ground.

Any suitable means may be provided for tipping the upper block G, with frame A, to adjust the frame to the unevenness of the ground, the lever, bell-cranks, and hangers, with the cords and ropes and the drums, being considered, however, a very simple and

practical means for attaining the object sought.

The drums *b'* are provided with ratchets *d'*, with which engage suitable pawls *e'* to hold the drums stationary after releasing the crank-handle *c'*, thereby making every provision for adjusting the frame of the machine, as shown in Fig. 10 of the drawings.

The derrick B and the brace-arms D are lowered so that they will rest flat upon the frame A when the machine is not in use, any suitable means being employed for this purpose or any system of cords or ropes and pulleys, as I do not wish to be understood as limiting my invention to any special means for lowering or raising the derrick and the brace-arms, the cords or ropes and the drums and pulleys being one of many means that may be resorted to in attaining the same end. The cords or ropes *c d*, which connect with the drums *e*, are supported on the notched ends of posts *f'* when the brace-arms are in lowered position, so that the cords or ropes will be in position to first raise the brace-arms toward the front to a position against the posts and then raise the derrick on the brace-arms, which are inclined rearwardly as the derrick assumes a perpendicular position. When the derrick is lowered, the derrick projects toward the front, while the brace-arms project toward the rear.

To the under side of the frame A and immediately above and over the truck I is an internal gear-wheel K', which I term a "master-wheel," which is pivoted by a king-bolt I', and with this internal gear meshes a pinion L upon the lower end of an upright shaft *g'*, which shaft has its bearing in the frame. The shaft *g'*, near its upper end, is provided with a bevel-pinion M, which engages a similar pinion N upon a transverse and horizontal shaft *h'*, as shown in Fig. 2 of the drawings. A suitable balance-wheel N' is keyed or otherwise rigidly connected to the shaft *h'*, and upon the end of this shaft is a friction-disk O, of any suitable construction, with which engages a friction-wheel P upon a horizontal line-shaft Q, extending nearly the entire length of the frame A and having its bearing therein. The friction-wheel P is mounted upon the shaft Q in the usual manner to admit of its moving lengthwise of the shaft, but prevented from loosely rotating thereon, whereby when the friction-wheel is rotated by frictional contact with the disk O the shaft Q will be rotated. The line-shaft Q extends through an elongated slot *i'* in the lower bifurcated end of a pivoted hand-lever R, which straddles the disk O and whose sidewise motion carries the friction-wheel P either to the right or left of the friction-disk O, away from the center thereof, thereby controlling the rotation of the line-shaft. This line-shaft Q at its rear end is provided with bevel-pinion S, which engages a bevel gear-wheel T upon the shaft of a drum U, said

drum having a cord or rope j' wound thereon and connecting with a grooved pulley k' at the top of the derrick B. The drum U is formed hollow, as shown in Fig. 9 of the drawings, and is locked to its shaft J' by means of a spring-actuated pawl K'' engaging the teeth of a wheel L', which is keyed to the shaft, as shown. When it is desired to have the drum revolve, the spring-pawl is engaged with the teeth, as shown in Fig. 9 of the drawings; but when it is desired to release the drum the pawl is disengaged with the teeth of the wheel, so that the drum will remain stationary while the shaft revolves. A guide-rod l' extends through the slot i' in the pivoted hand-lever R, and by means of the lever the friction-wheel P is brought in contact with greater or less friction against the face of the disk O, which will rotate the line-shaft Q through the medium of the friction-wheel, and by means of the pinion S and gear-wheel T the drum U will be rotated to wind or unwind the rope or cord j' , and thereby raise the hammer C.

To the extreme rear end of the line-shaft Q is a pinion V, which engages a similar pinion W beneath it on a short horizontal shaft m' , which latter pinion is movable lengthwise upon the shaft by means of a hand-lever n' , as shown in Fig. 8 of the drawings, thereby enabling the pinion to be brought in or out of gear with the pinion on the line-shaft, as circumstances may require in the operation of the gearing. The short horizontal shaft m' is provided with a sprocket-wheel X, with which engages a sprocket-chain o' , said chain engaging a second sprocket-wheel Y, provided with a bevel-gear p' , which gear engages a large bevel-gear Z, as shown in Fig. 3 of the drawings. The bevel gear-wheel Z is what I term a "butterfly-wheel," said wheel having journaled therein a plurality of pinions D', as shown in Fig. 5 of the drawings. The gear-wheel Z is mounted on a horizontal shaft E', which passes through hollow shafts F', which latter shafts are provided with bevel gear-wheels G' and which mesh with the teeth of the pinions D'. The hollow shafts F' are mounted in sliding journal-boxes F'', connected by toggle-levers F''' with a rock-shaft E'', having a lever E''', so that by pulling the lever rearward the gear-wheel Z can be disconnected from its driving-gear. The lever is held in desired position by a catch H''. The hollow shafts F' are provided with pinions H' at their ends to engage the gear-wheels I', which are connected to the traction-wheels F, as shown. By thus gearing the hollow shafts F' with the bevel-pinions D' within the bevel gear-wheel Z the rear wheels are enabled to move in unison or one faster than the other in different directions independently of the movement of the large gear-wheel.

The cord or rope j' extends up and over pulley k' and has connected thereto a suitable holding and releasing device N'', as shown in

Figs. 6 and 7 of the drawings. This holding and releasing device may be of any of the usual forms or of the construction shown, as I do not wish to be understood as limiting myself to any special form or construction of device, as any holding and releasing device that will successfully engage and disengage the shank M' of the weight or hammer C may be used and any suitable weight or hammer may be employed with grooves therein to engage the guides b , as found most desirable.

In connection with the holding and releasing device a sliding trip device O' is employed, which also may be of any preferred construction, said trip device being suitably connected to the upper end of the derrick B, as shown in Fig. 6 of the drawings. This trip device has connected thereto one end of a cord or rope r' for operating it, the cord or rope passing under pulleys s t and then extending to the lever R, to which it is attached. A hinged stand P' is provided, which may be swung up into position and held in place by means of a prop Q', as shown in Fig. 2 of the drawings, for supporting the person who is operating the hand-lever R.

After the machine is driven to the place where the posts are to be driven the frame A is properly adjusted to a perfectly horizontal position when required by the grade of the land or when on a hillside. This adjustment of the frame A is accomplished by the crank-handles c' and their connections with the rocker G, which rocker forms a part of the frame and which is supported on the segmental bearing t . The derrick B and the brace-arms D are elevated to their proper working position by means of the cords or ropes, the drums and the pulleys, as hereinbefore described, or by any other suitable and well-known means which may be employed for the purpose. When the machine is in position to bring the hammer C directly over the post and on line therewith, the holding and releasing device N' is now operated by means of the cams R' when the device is elevated sufficiently to bring the arms of the device in contact with the cams, which action will spread outward the notched or lower ends of the arms and release the hammer C, which will fall by its own gravity on the top of the post and successfully drive it into the ground. The hammer C is again elevated to its striking position by means of the cord or rope j' winding around the drum U, which drum is operated by means of the bevel gear-wheels S T. The bevel gear-wheel S has motion imparted to it by means of the line-shaft Q through the medium of the friction-wheel P and friction-disk O, and this disk in turn has motion imparted to it through the bevel-gears M N and the pinion L engaging with the teeth of the internal gear-wheel or master-wheel K', as illustrated in Fig. 2 of the drawings. This internal gear or master wheel K' is revolved or rotated by means of the horses traveling

in a circle and passing in their course under the frame of the machine, and I wish it understood that in this special feature of the invention, a tongue, sweep, or any other contrivance may be employed for connecting the team with the master-wheel, so that it may be operated by the team, as hereinbefore described. It will be noticed that as the hammer ascends the holding and releasing device N' will come in contact with the trip device O' and raise it and thereby tighten the rope or cord r' , and as said rope or cord is connected to the hand-lever R it will cause the lever to move and carry the friction-wheel P back to the center of the friction-disk O and stop the holding and releasing device without causing any jerk which would otherwise occur. The rotation of the shaft Q is controlled and governed by the position and force with which the friction-wheel bears against the friction-disk, as circumstances may require. When it is desired to lower the holding and releasing device N', the spring-actuated pawl K'' is released from engagement with the ratchet-wheel L', which will allow the drum to rotate independent of the shaft by the descent of the holding and releasing device and the cord or rope connecting it with the drum. There is a special construction of gearing on the rear truck E, as shown in Fig. 3 of the drawings and hereinbefore described, which gearing is in connection with the traction-wheels F and the shaft Q and also the pinion W on the shaft m' . This pinion W is brought in or out of gear by the hand-lever n' , and the sprocket-wheels X Y and the sprocket-chain o' connect with the butterfly gear-wheel Z. This arrangement of gearing enables the traction-wheels to be controlled in moving the machine from post to post or only a short distance. When the pinion W is shifted to engage the pinion V, motion will be imparted to the shaft m' and likewise to the sprocket-wheel X, and through said sprocket-wheel and the chain o' and sprocket-wheel Y motion is imparted to the large butterfly-wheel Z through the medium of the bevel-gear p' engaging the teeth of said wheel. Through the gear-wheels G' engaging with the pinions D' the shafts F' are caused to revolve and also the pinions H'. These pinions H' engaging with the gear-wheels I' as a fixture on the traction-wheels F will force said traction-wheels to rotate, and thereby carry the machine a short distance to the next post to be driven.

Any suitable gearing may be substituted for that shown to impart motion to the traction-wheels independent of the draft of the team, and such changes may be resorted to as circumstances require to render the operation successful.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A machine for driving posts, piles and other objects, consisting of a suitable frame mounted upon wheels, and a derrick pivoted thereto, a weight or hammer and a suitable holding and releasing mechanism therefor, and suitable brace-arms pivoted to the frame having ratchet-teeth upon their upper and under side, and means for engaging the ratchet-teeth to hold the arms in position, substantially as and for the purpose set forth.

2. A machine for driving posts, piles and other objects, consisting of a suitable frame, wheeled trucks connecting therewith, a derrick pivoted to the frame and adapted to fold down toward the front end of the machine, a suitable weight or hammer, a holding and releasing device therefor, cams upon the upper end of the derrick and acting on the arms of the holding and releasing device when brought in contact therewith to release the weight or hammer, pivoted brace-arms engaging the derrick to hold it in position and adapted to fold down toward the rear end of the machine, and a suitable arrangement of cords or ropes, pulleys and drums for raising and lowering the derrick and arms, substantially as and for the purpose specified.

3. A machine for driving posts, piles or other objects, consisting of a suitable frame mounted upon wheeled trucks, a pivoted derrick, pivoted brace-arms for supporting the derrick when in use, an internal gear-wheel connecting with the front truck of the machine, a vertical shaft carrying a pinion engaging the teeth of the wheel, a pinion upon the upper end of the shaft, a horizontal shaft carrying a pinion engaging the pinion of the vertical shaft, a balance-wheel on the horizontal shaft, a friction-disk thereon, and a friction-wheel adapted to bear against the disk and provided with a hand-lever, and a line-shaft to which the friction-wheel and the lever are connected, substantially as and for the purpose described.

4. A machine for driving posts, piles or other objects, consisting of a suitable frame mounted upon wheeled trucks, a pivoted derrick and pivoted arms for supporting the derrick in an upright position, a line-driving shaft provided with a pinion at its rear end, a short shaft and a pinion adjustable thereon to bring it in or out of engagement with the pinion on the line-driving shaft, a shaft with pinions at its ends, traction-wheels having gear-wheels engaging the pinions, and a suitable gearing connecting with the gearing of the line-drive shaft, whereby the traction-wheels are revolved to move the machine from post to post or for a short distance, substantially as and for the purpose specified.

5. A machine for driving posts, piles or other objects, consisting of a suitable frame, wheeled trucks connecting therewith, a derrick pivoted to the frame, pivoted brace-arms to support the derrick in an upright position,

a weight or hammer, a holding and releasing device, cams upon the upper end of the derrick adapted to act upon the holding and releasing device, a line-shaft having suitable gearing, a friction-wheel and a lever connecting therewith, and friction-disk against which the friction-wheel acts, a suitable mechanism for operating the traction-wheels, and a trip to act in against the holding and releasing device, and means for operating the

trip, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JOHN S. KOESTER.

Witnesses:

E. F. MADDEN,
W. HAINES.