

J. M. HUMISTON.
POLE ERECTING APPARATUS.
APPLICATION FILED MAR. 28, 1907.

1,014,477.

Patented Jan. 9, 1912.

3 SHEETS—SHEET 1.

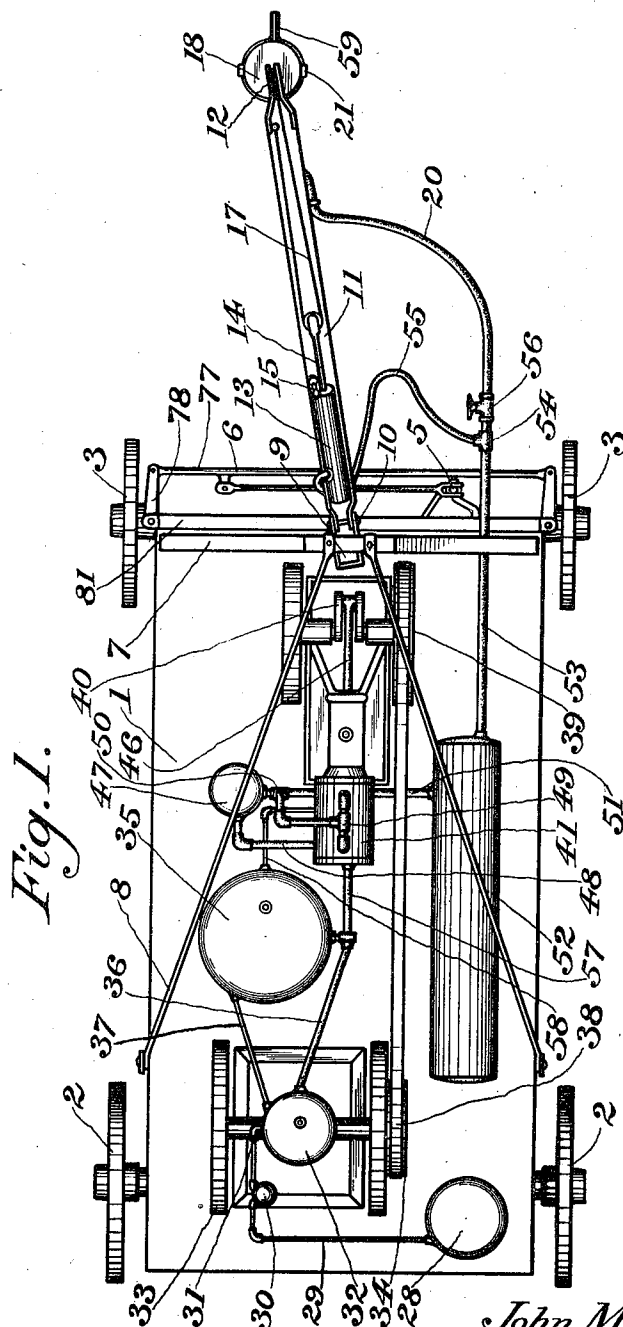


Fig. 1.

Witnesses:

Hassell C. Prado

David S. Hulfish

John M. Humiston,
Inventor.

by McQueen & Niles,
Attorneys.

J. M. HUMISTON.
POLE ERECTING APPARATUS.
APPLICATION FILED MAR. 28, 1907.

1,014,477.

Patented Jan. 9, 1912.

3 SHEETS—SHEET 2.

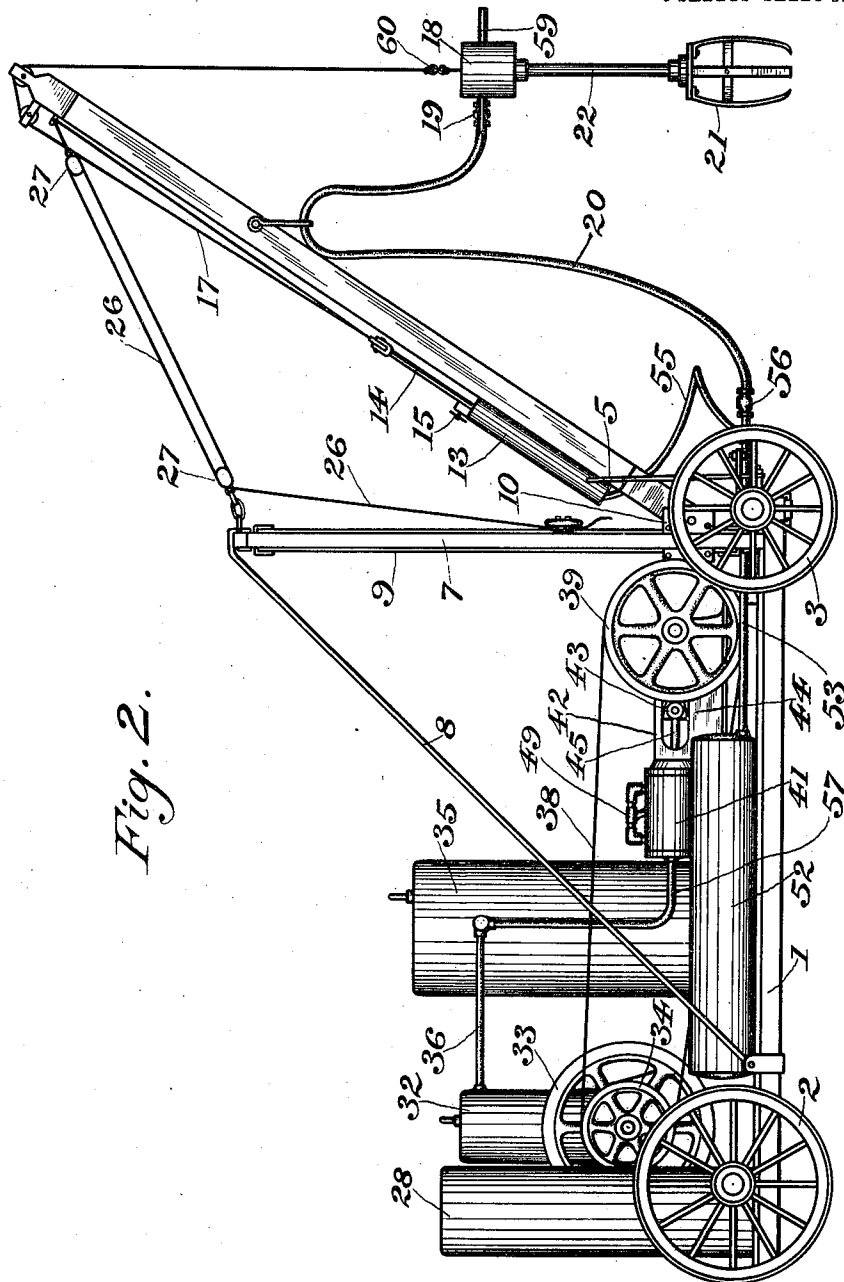


Fig. 2.

Witnesses:

Harold C. Prado.

David S. Knefish.

John M. Humiston,
Inventor.

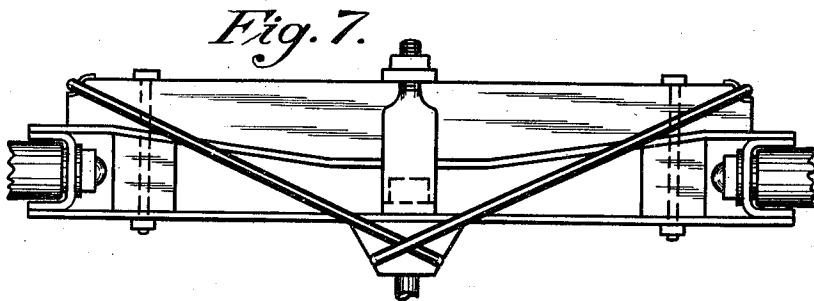
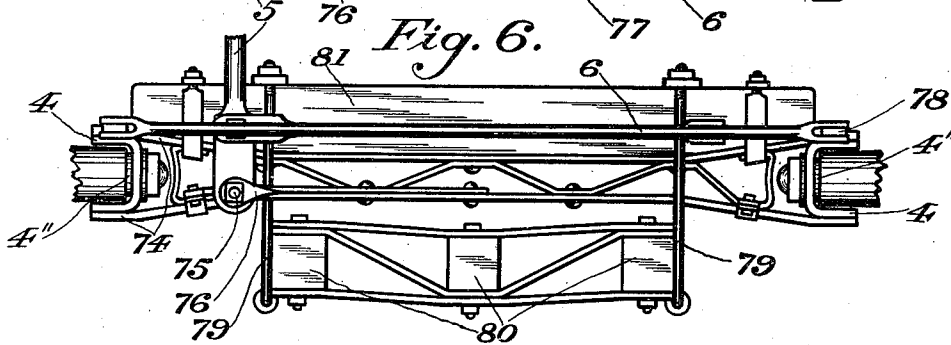
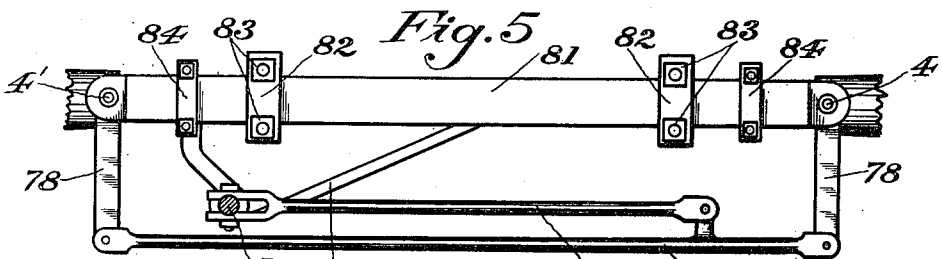
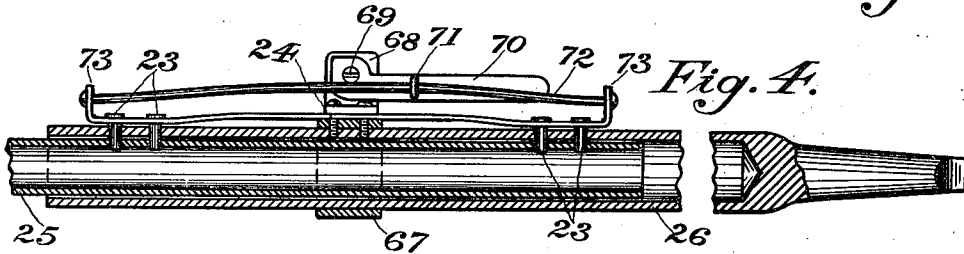
by McQuinn & McQuinn,
Attorneys.

J. M. HUMISTON.
POLE ERECTING APPARATUS.
APPLICATION FILED MAR. 28, 1907.

1,014,477.

Patented Jan. 9, 1912.

3 SHEETS—SHEET 3.



Witnesses:

Harold C. Prado.

David S. Bulfinch

John M. Humiston,
Inventor.

by McQueen & Miller
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN M. HUMISTON, OF BERWYN, ILLINOIS.

POLE-ERECTING APPARATUS.

1,014,477.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed March 28, 1907. Serial No. 364,957.

To all whom it may concern:

Be it known that I, JOHN M. HUMISTON, a citizen of the United States of America, and a resident of Berwyn, county of Cook, and State of Illinois, have invented a new and useful Improvement in Pole-Erecting Apparatus, of which the following is a specification.

My invention relates to a mechanical means for excavating holes in the ground for the setting of posts and poles.

The object of the present invention is to provide an efficient and flexible means for excavating holes for the reception of poles and to provide a means for erecting the poles.

Furthermore, the invention has for its object the provision of a mechanical apparatus, the several parts of which will be driven by a prime mover, the power of which may be conveniently applied to the locomotion of the equipment, to the excavation of holes and to the erection of poles.

With this and other objects in view, the present invention consists in the combination and arrangement of parts as will be hereinafter more fully described, shown in the accompanying drawings and particularly pointed out in the appended claims, it being understood that changes in the form, construction, size and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a plan of an apparatus constructed and arranged in accordance with the present invention; Fig. 2 is an elevation of the same device; Fig. 3 is a detail of a portion of the auger; Fig. 4 is a detail of a clutch on the auger; Fig. 5 is a plan detail of the steering knuckle arrangement; Fig. 6 is a front elevation of the steering knuckles and axle, and showing the axle with the bolster carrying the wagon-bed which is suspended therefrom; Fig. 7 is a front elevation of a modified style of construction of steering knuckles and axle.

Like characters of reference designate corresponding parts in all the figures of the drawings.

For convenience in transportation, the present apparatus has a wheeled platform or body 1, hung from rear wheels 2 and front wheels 3, the front wheels being pro-

vided with steering knuckles 4 connected to the steering lever 5 which operates both knuckles simultaneously through the connecting lever 6. In the rear of this front axle is a derrick frame 7 anchored to the wagon platform by rods 8 and carrying a swiveled upright 9, this swiveled upright carrying an iron knuckle 10 on which an oblique boom 11 is mounted, this oblique boom being capable of having a vertical motion through the knuckle joint 10 and a horizontal motion through the rotatable pillar 9. On the end of this boom are mounted the pulleys 12, and at the lower part of it is placed a pneumatic cylinder hoist 13 with a piston and piston rod 14. By an admission of air to this cylinder hoist through the valve 15, the piston is moved, drawing rod 14 which in turn pulls rope 17 through pulleys 12, which rope is attached to a regular rotary air drill 18, connected through an automatic valve 19 with the air supply through the hose 20. This rotary air drill has a rotating element and a stationary body; the rotating element is coupled to and operates an auger 21 which has a telescoping stem 22, shown in detail in Fig. 4. By means of the dogs 23 of the clutch 24, the inner shell 25 of the auger 21 may be locked at any one of several predetermined points of the outer shell 26.

The appliance may be propelled either by transmitting power from the prime mover to the back wheels 2 through any suitable one of the well-known transmission gears, or by hitching draft animals to the frame 1 of the rig. The boom may be raised and lowered by means of rope 26 working through tackle 27, which is only shown in Fig. 2, being omitted from Fig. 1 for the sake of clearness.

In operation the gasoline engine generates power, taking gasoline from the tank 28 through pipe 29 through feed pump 30 through carbureter 31 into the cylinder 32. The impulses obtained from the explosions rotate fly wheels 33 and pulley 34 which is attached to the same shaft as fly wheels 33. The cylinder of the engine is cooled by water drawn from tank 35 through pipe 36 and returned to the tank through pipe 37. The belt 38 transmits the power through the combination fly wheel and pulley 39 to the crank shaft 40 of the air compressor of which 41 is the cylinder, 42 the guide rods, 43 the

cross-head, 44 the base frame, 45 the piston rod and 46 the connecting rod. Air is drawn into the cylinder of the air compressor through an automatic regulator 47 through the pipe 48 to the cylinder 41. It is ejected after compression through the pipe 49 leading to T 50. From this T all of the compressed air flows through pipe 51 to the air tank 52. The tank pressure bears against a small piston in the automatic regulator 47, which pressure is resisted by an adjustable spring in such a way that when the tank pressure rises above a certain value the supply of air is automatically stopped and the compressor continues to rotate and have its parts move without compressing any air. From tank 52 air is led through the pipe 53 to the T 54 at which point a branch hose 55 takes a supply of air to the cylinder of the hoist 13. Beyond 54 is the valve 56. From that point air passes through the hose 20 to the automatic valve 19 in the rotary drill 18. The cylinder of the air compressor is cooled by drawing water from the tank 35 through pipe 57 then through the water jacket of the cylinder 41, then returned through pipe 58 to the water tank 35.

In operation, the appliance is moved to a convenient point close to where the hole is to be dug. It may be moved either by furnishing its own motive power or by being drawn by draft animals fastened to the frame 1 by a line of sufficient length so that these draft animals may be out of the way of the boom and all its gear. The appliance is steered to the proper location by an operative turning the front wheels by means of the steering lever 5. When it is in the proper position the boom is adjusted by either a horizontal or a vertical motion, or both, until the drill and auger are suspended immediately over the point where it is desired to dig the hole. The motive power is in continuous operation, compressing air at all times except when governed by the regulator on the air compressor. When everything is ready an operative braces himself on the ground and grasps the drill by the handle 59 and the valve 19, a helper at the same time grasping the handle 59 which may be as much longer than shown on the drawing as necessary, and steadying the drill by the main body with the other hand to assist the operative in holding the stationary element of the drill against the thrust caused by the operation of the auger in the ground. The operative admits air to the drill which compels the rotation of the rotating element and causes the auger 21 to rotate. The auger 21 rotates and carries itself down in the ground until it is full of excavated material, when the operative releases valve 19 which automatically closes, shutting off the air supply, and gives the signal to another operative who, by the manipulation of valve 15 of the

cylinder hoist 13 raises, by means of the rope 17, the drill 18 and auger 21 out of the ground with its load of excavated material. This operative at the hoist then swings the boom 11 slightly to one side, and the operative at the drill shakes the excavated material out of the auger. The operative at the hoist then swings the boom back and by manipulating the hoist valve 15 lowers the auger into the hole for another operation. This series of actions is repeated until the hole is excavated to a depth where it is necessary to lengthen the stem of the auger to permit the auger to go deeper and yet retain for the operatives convenient and efficient manipulation of the auger and drill. The operative then, by moving handle 70 in Fig. 4, moves the dogs 23, Fig. 4, so as to disengage them from the seating holes in the inner shaft 25; then he lengthens the stem of the auger to a suitable point, when he releases lever 70 so that dogs 23 will engage other holes in the inner shaft 25, maintaining rigidity in the auger stem at a different length. The operative then admits air into the drill and repeats the operations described hereinbefore until the hole is of the desired ultimate depth. The valve 15 of the air hoist 13 is left so that the auger is at a sufficient height to clear the ground, and a signal is given, either to the driver of the draft animals or to the attendant who operates the clutch connecting the prime mover with the rear wheels, and the entire appliance is moved to the place where it is desired to excavate the next hole, and the cycle of operations is repeated.

In case it is desired to erect the pole at the same time, the drill 18 is disengaged from the hook 60 on the rope 17 and the hook is fastened into a sling of rope about the pole and the pole is raised by means of the cylinder hoist 13, manipulated through the valve 15, until it is at a sufficient height when it is guided into the hole by a man stationed at the proper point for that purpose, the valve 15 being properly manipulated to allow the pole to be lowered into the hole.

The clutch operating the telescoping auger stem shown in Fig. 4 may be further explained by noting that 67 is a collar on the outer tube 26; 68 is a lug fastened on said collar; 69 is a rotatable pin passing through said lug; 70 is a lever; 71 is a collar slidable along the rod 72 and swiveled in the lever 70, and by raising the lever 70 upward, as shown on the drawing, the rod 72 is raised, pulling the spring steel strap 73 away from the tube 26 and at the same time raising the dogs 23 and disengaging them from the holes in the inner tube 25.

With respect to Figs. 5 and 6, the plan and elevation respectively of the front axle, 4—4 are the recessed steering knuckles, hav-

ing axle recessed between pivots to insure ease of manipulation, rotatable horizontally in the ends of the axle frame 74; 4'—4' are vertical pivots of the recessed steering knuckle, placed as close to the plane of the wheel as possible, and arranged with respect to the axle so that a plane through these pivots intersects the bearing surface of said axle, to secure ease and certainty in steering; 4'' is the axle attached to the knuckle at a point recessed with respect to the steering knuckle pivots; 5 is a lever rotatable about the shaft 75, which is braced to the axle by the brace 76, and transmitting motion through the rod 77 to the connecting rod 6 which transmits motion and insures correspondence of motion through the steering knuckle lever 78 to the steering knuckles 4—4; 79 are steel rods swinging the braced platform 80 from the bolster 81 and being attached to same through the saddles 82 and nuts 83; 84 are clamps fastening the bolster to the axle frame work. Fig. 7 shows another form of construction of this front axle.

I prefer to employ the device illustrated and described herein for the purpose of excavating the pole holes only, allowing another simpler device for raising and setting the poles in the holes so dug to follow. Instead of employing this more complete scheme of two coöperating devices, I submit the device of Fig. 2, having the hook 60 for detaching the drill and auger from the derrick, thus temporarily converting the hole digger to be a pole erector. In using this single device for both purposes, the economy of operating is reduced in the consideration of the feature of idle equipment, since during the erection of the pole the entire excavating apparatus remains unproductive; some increase of efficiency, however, tends to counterbalance this by reason of having to set but the one device to excavate, and to erect the pole. Where a sufficient quantity of work exists, I prefer to use the two separate devices, keeping the device of Fig. 2 continuously operating in excavating and keeping the pole erecting device continuously operating in erection of poles; however, for the erection of an isolated pole, or any task of limited extent, it will be found more economical to discard the separate erecting device and use the device of Fig. 2 in its modified capacity of combined excavator and erector.

Having thus described in detail the operations and different forms of this appliance, and having shown the flexibility possessed by the same, what I claim as new and desire to secure by United States Letters Patent is:

1. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon one end of said platform; steering knuckles associated with the wheels

of said platform at the end supporting said derrick, whereby said derrick may be brought conveniently into position for operation; an air drill suspended from said derrick by tackle; an air hoist associated with said derrick and adapted to operate said tackle, said derrick and hoist being jointly adapted to bring said air drill into position for operation, substantially as described.

2. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels of said platform whereby said derrick may be brought conveniently into position for operation; an earth auger suspended from said derrick by tackle; and an air hoist associated with said derrick and adapted to operate said tackle, said derrick and hoist being jointly adapted to bring said earth auger into position for operation, substantially as described.

3. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels of said platform whereby said derrick may be brought conveniently into position for operation; a rotary air drill suspended from said derrick by tackle; an air hoist associated with said derrick and adapted to operate said tackle, said derrick and hoist being jointly adapted to bring said rotary air drill into position for operation; and an earth auger attached to the revolving spindle of said rotary air drill and adapted to be operated by said air drill, substantially as described.

4. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels supporting said platform, whereby said derrick may be conveniently brought into position; a rotary air drill suspended from said derrick by a tackle; an air hoist associated with said derrick and controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said rotary air drill into position for operation; an earth auger attached to the revolving spindle of said rotary air drill and adapted to be operated by said air drill; and a source of compressed air carried by said wheeled platform, substantially as described.

5. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels supporting said platform, whereby said derrick may conveniently be brought into position; an air drill suspended from said derrick by a tackle; an air hoist associated with said derrick and controlling the operation of said tackle, said derrick and hoist being

jointly adapted to bring said air drill into position for operation; an air compressor mounted upon said platform; and a prime mover operating said air compressor, substantially as described.

6. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels supporting said platform whereby said derrick may be conveniently brought into position; a rotary air drill suspended from said derrick by a tackle; an air hoist associated with said derrick and controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said rotary air drill into position for operation; an earth auger attached to the revolving spindle of said rotary air drill and adapted to be operated by said air drill; an air compressor; and a prime mover operating said air compressor, substantially as described.

7. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels supporting said platform whereby said derrick may be conveniently brought into position; an air drill suspended from said derrick by tackle; an air hoist associated with said derrick and controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said air drill into position for operation; a source of compressed air carried by said wheeled platform; and a flexible air hose connecting said air drill and said source of compressed air, substantially as described.

8. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels supporting said platform whereby said derrick may be conveniently brought into position; a rotary air drill suspended from said derrick by a tackle; an air hoist associated with said derrick and controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said rotary air drill into position for operation; an earth auger attached to the revolving spindle of said rotary air drill and adapted to be operated by said air drill; a source of compressed air carried by said wheeled platform; and a flexible air hose connecting said rotary air drill and said source of compressed air, substantially as described.

9. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels supporting said platform whereby said derrick may be conveniently brought into position; an air drill suspended from said derrick by a tackle; an air hoist associated with said derrick

and controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said air drill into position for operation; an air compressor; a prime mover operating said air compressor; and a flexible air hose connecting said air drill and air compressor, substantially as described.

10. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels supporting said platform whereby said derrick may be conveniently brought into position; a rotary air drill suspended from said derrick by a tackle; an air hoist associated with said derrick and controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said rotary air drill into position for operation; an earth auger attached to the revolving spindle of said rotary air drill and adapted to be operated by said air drill; an air compressor; a prime mover operating said air compressor; and a flexible hose connecting said rotary air drill and said air compressor, substantially as described.

11. In pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; a drill suspended from said derrick by a tackle; a hoist associated with said derrick and controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said air drill into position for operation; a generator of energy mounted upon said platform and adapted to generate energy of a character adapted to operate said drill and said hoist; and a prime mover operating said generator, substantially as described.

12. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; steering knuckles associated with the wheels of said platform at the end supporting said derrick whereby said derrick may be brought conveniently into position for operation; and a drill suspended from said derrick, said derrick being adapted to bring said drill into position for operation, substantially as described.

13. In a pole erecting apparatus, a vehicle; a derrick mounted upon one end of said vehicle; steering knuckles associated with the wheels of said vehicle at the end supporting said derrick, whereby said derrick may be brought conveniently into position for operation, a drill suspended from said derrick by tackle; a hoist associated with said derrick and adapted to operate said tackle, said derrick and hoist being jointly adapted to bring said drill into position for operation, substantially as described.

14. In a pole erecting apparatus, a ve-

hicle; a derrick mounted upon said vehicle; an air drill suspended from said derrick; and a source of compressed air carried by said vehicle, substantially as described.

5 15. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; a rotary air drill suspended from said derrick by a tackle; an air hoist associated with said
10 derrick and controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said rotary air drill into position for operation; an earth
15 auger attached to the revolving spindle of said rotary air drill and adapted to be operated by said air drill; and a source of compressed air carried by said wheeled platform, substantially as described.

20 16. In a pole erecting apparatus a vehicle; a derrick mounted upon said vehicle; an air drill suspended from said derrick; an air compressor; and a prime mover operating said air compressor, said air compressor and prime mover being carried by
25 said vehicle, substantially as described.

30 17. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; a rotary air drill suspended from said derrick by a tackle; an air hoist associated with said derrick and
35 controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said rotary air drill into position for operation; an earth auger attached to the revolving spindle of said rotary air drill and

adapted to be operated by said air drill; an air compressor; and a prime mover operating said air compressor, substantially as described.

40 18. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; a rotary air drill suspended from said derrick by a tackle; an air hoist associated with said
45 derrick and controlling the operation of said tackle, said derrick and hoist being jointly adapted to bring said rotary air drill into position for operation; an earth auger attached to the revolving spindle of said rotary air drill and adapted to be op-
50 erated by said air drill; a source of compressed air carried by said wheeled platform; and a flexible air hose connecting said rotary air drill and said source of compressed air, substantially as described. 55

19. In a pole erecting apparatus the combination of a wheeled platform; a derrick mounted upon said platform; an air drill suspended from said derrick; an air compressor; a prime mover operating said air
60 compressor; and a flexible air hose connecting said air drill and said air compressor, substantially as described.

Signed by me at Chicago, county of Cook and State of Illinois, in the presence of
65 two witnesses.

JOHN M. HUMISTON.

Witnesses:

DAVID S. HULFISH,
HARRIET L. SMITH.