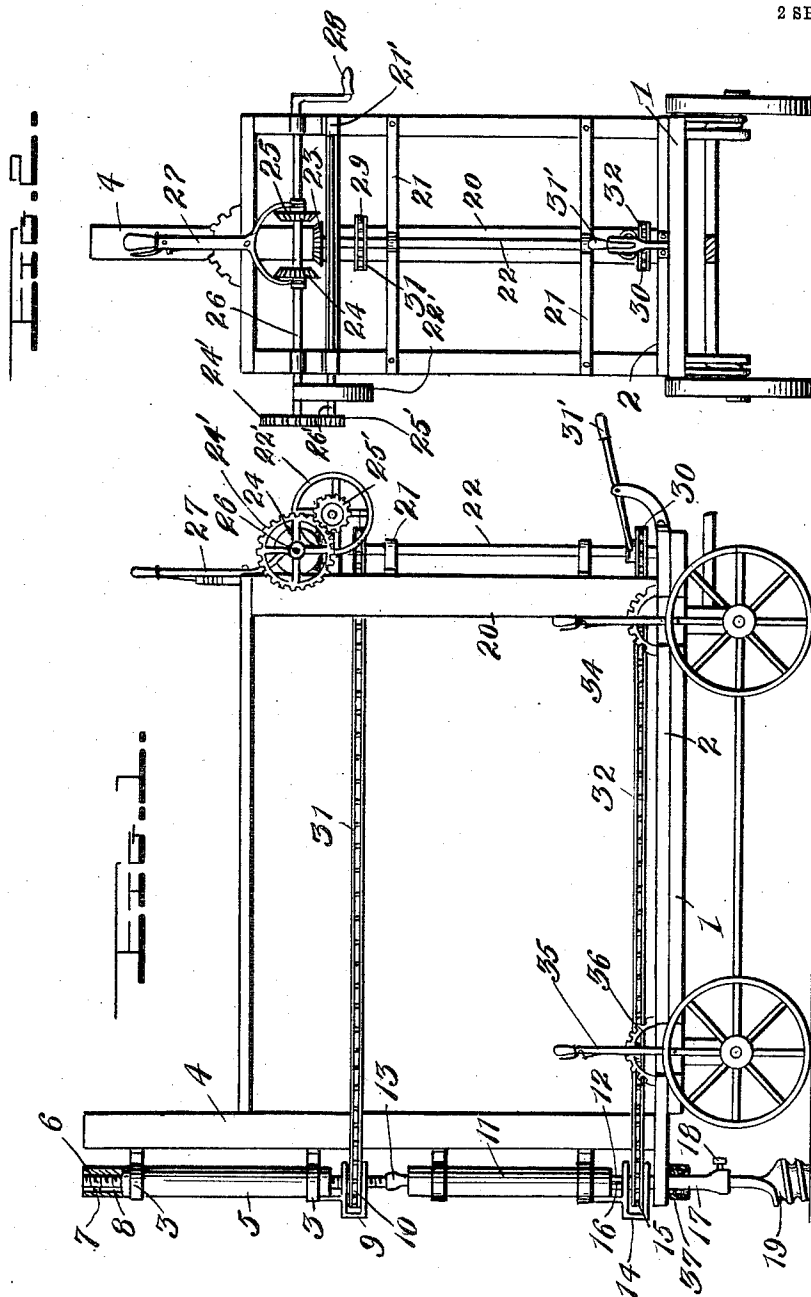


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POST HOLE DIGGING MACHINE.
APPLICATION FILED MAY 20, 1911.

1,006,156.

Patented Oct. 17, 1911.

2 SHEETS-SHEET 1.



Witnesses

Chas. L. Griebauer.
L. G. Ellis.

Inventors

W.E. Ward and
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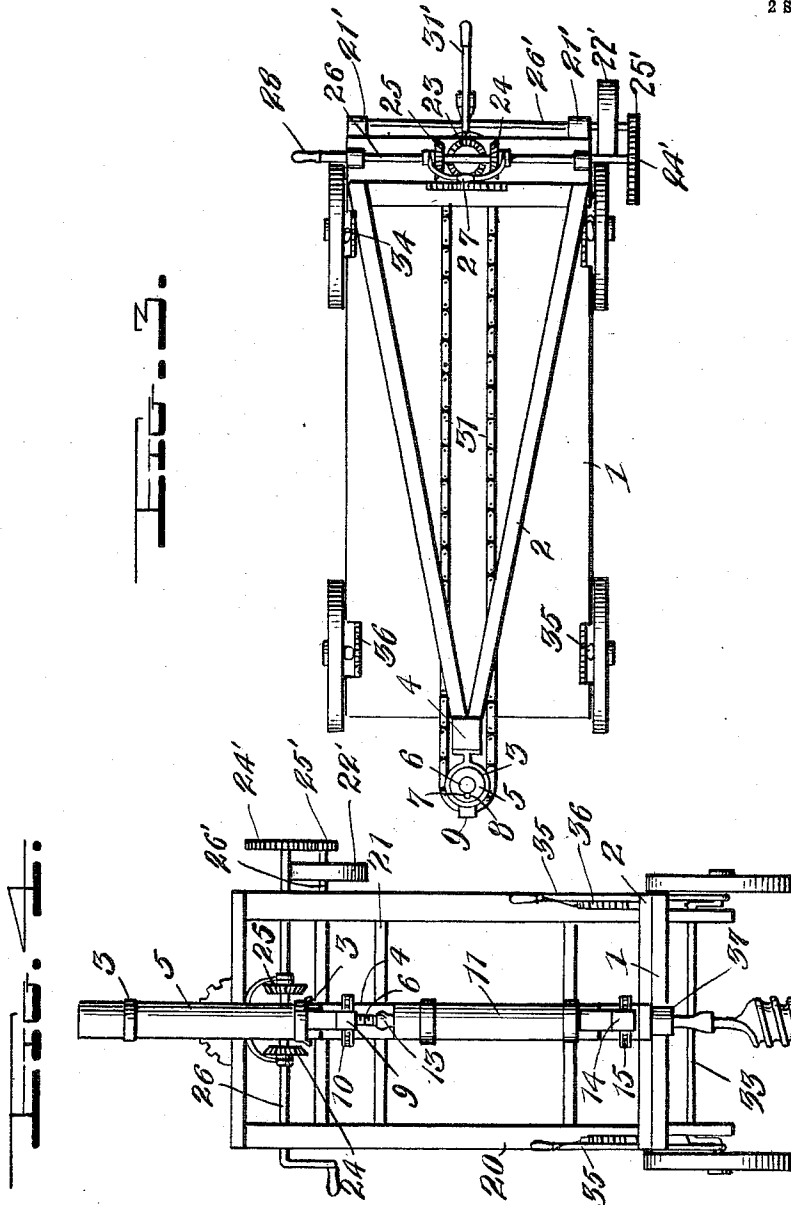
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UNITED STATES PATENT OFFICE.

WILLIAM E. WARD AND FRANK STEINES, OF SHEFFIELD, IOWA.

POST-HOLE-DIGGING MACHINE.

1,006,156.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed May 20, 1911. Serial No. 628,436.

To all whom it may concern:

Be it known that we, WILLIAM E. WARD and FRANK STEINES, citizens of the United States, residing at Sheffield, in the county of Franklin and State of Iowa, have invented certain new and useful Improvements in Post-Hole-Digging Machines, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to new and useful improvements in ground digging machines and more particularly to a post hole digger, and our object is to provide a machine of this character which may be readily moved from place to place and be manually operated to bore openings in the ground.

A further object resides in providing a shaft and a force feed shaft therefor, and means to rotate each of said shafts independently.

A further object is to provide a screw shaft having connection with an auger shaft, and a sprocket having threaded engagement with said screw shaft, whereby when said sprocket is rotated, the screw shaft will be raised or lowered to correspondingly raise or lower the auger shaft.

A still further object of the invention resides in providing a frame to carry the operating parts, which frame is adapted to be slidably mounted on a truck or the like, and a still further object is to provide a device which is extremely simple in construction, and one which is exceedingly effective in operation.

With these and other objects in view, our invention consists in the novel features of construction, combination and arrangement of parts as will be hereinafter referred to and more particularly pointed out in the specification and claims.

In the accompanying drawings forming a part of this application, Figure 1 is a side elevation of the machine. Fig. 2 is a front elevation thereof. Fig. 3 is a top plan view of the machine, and, Fig. 4 is a rear elevation of the same.

In carrying out our invention, we shall refer to the drawings in which similar reference characters designate corresponding parts throughout the several views and in which—

1 indicates a truck of any desired type, on which there is slidably mounted a frame 2, and mounted in bearing boxes 3 which are

carried on a standard 4 at the rear end of said frame, is a tubular member 5. This tubular member is positioned vertically of the frame and extending therethrough, is a screw shaft 6, said screw shaft being provided with a laterally extending lug 7 which fits in a vertical groove or slot 8 on the inner wall of said tubular member and mounted in a yoke 9 formed at the lower end of said tubular member, is a sprocket 10, the same having the inner periphery thereof threaded to engage the threads of the screw shaft 6.

Mounted in bearings similar to the bearings 3 on the shaft 4 immediately below and in alinement with the tubular member 5, is an additional tubular member 11 through which extends a shaft 12, the upper end of said latter shaft being engaged with the lower end of said screw shaft through the medium of a ball and socket joint 13. The tubular member 11 is provided on its lower end with a yoke 14 similar to the yoke 9, and mounted therein, is an additional sprocket 15, which sprocket receives therethrough the shaft 12, and in order to provide for the turning of the shaft 12 by the sprocket 15 and at the same time allow said shaft to be raised and lowered, said sprocket is provided on its inner periphery with a lug or projection which enters a vertical slot 16 in the shaft 12. The lower end of said shaft 12 is provided with a socket or the like 17, through the wall of which extends an adjusting screw or the like 18, and an auger 19 of any desired type is adapted to have the upwardly projecting stem thereof inserted in said socket and engaged by the adjusting screw, whereby the same will be securely held to the shaft. In this manner, it will be seen that various sizes and types of augers may be readily applied and used in connection with the rotating and vertically adjustable shaft 12.

A vertical standard 20 at the opposite end of the frame 2 is provided with the bearings 21, in which is mounted and extended vertically thereof, the drive shaft 22. The upper end of said shaft 22 is provided with a bevel gear 23 which is adapted to mesh with either of the similar gears 24 or 25 mounted on a shaft 26 extending horizontally of said frame. These gears 24 and 25 are loosely keyed on said shaft 26 so as to be readily moved therealong, and in order to

provide for the engagement of one or the other of said gears with the bevel gear 23, a lever 27 is provided, whereby the same may be moved on said shaft. The engagement
 5 of one gear rotates the shaft 22 in one direction and the engagement of the other rotates it in a reverse direction, and we have provided for the rotation of the shaft 26 by providing a handle member or the like 28 at
 10 one end thereof, whereby the same may be manually rotated. It will be understood, however, that if desired, any form of engine may be provided and connected to this shaft 26, whereby the same may be mechanically driven.

The opposite end of the shaft 26 has mounted thereon a large gear which meshes with a similar but smaller gear 25' carried on one end of an additional shaft 26', the
 20 last referred to shaft being rotatably mounted in the bearings 21' and also carrying thereon a fly wheel 22' of the usual or any preferred type. Thus, as the shaft 26 is rotated, the shaft 26' will also be rotated
 25 therewith and, due to the fly wheel, the speed with which the same is being rotated, will be readily retained. This shaft 22 has also mounted thereon the upper and lower sprockets 29 and 30, respectively, and the
 30 sprocket 29 is connected with the sprocket 10 by means of a chain 31, while the sprocket 30 is connected with the sprocket 15 by means of a similar chain 32. It will be seen that with the rotation of the shaft 22 in
 35 either one direction or the other, the sprockets 10 and 15 will be rotated, the rotation of said sprocket 10 being sufficient to cause the screw shaft 6 to be lowered, forcing the shaft 12 downwardly and the rotation
 40 of the shaft 15 causing the rotation of said shaft 12. The auger on the lower end of said shaft 12 will, therefore, be rotated and forced downwardly into engagement with the ground to bore a hole therein to
 45 any depth desired, and when it is desired to move said auger from engagement with the ground, the opposite gear on the shaft 26 may be thrown into engagement with the gear 23 and the shaft 26 then rotated.

50 As the soil in which the post hole is adapted to be bored is not always level, some means must be provided whereby the device will be disposed in a position so that the hole will retain the post in a vertical position,
 55 and to this extent, the axles 33 of the machine are formed as cranks and rotatably mounted on the frame of the machine. The levers 34 and 35 are fulcrumed, respectively, on the frame adjacent the front and rear
 60 ends thereof and the lower ends of said levers are, respectively, engaged with the front and rear axles so that when said levers are operated, the axles may be rotated in their bearings to raise and lower the respective
 65 ends of the machine. The racks 36

are also provided in connection with the levers 34 and 35, whereby detents carried by said levers may be engaged therewith to retain the axles in their various adjusted
 70 positions, and thus, the rear end of the machine carrying the drill shaft may be so disposed as to bore a hole which will receive a post substantially vertical therein.

It has been before stated that the auger shaft is capable of vertical and rotating
 75 movement through the sleeve 11, and in order to prevent unnecessary binding of the same against the supporting portions of the frame 2, we provide an additional sleeve 37 which is mounted in the rear end of said
 80 frame 2. This sleeve is provided with a plurality of bearing balls and receives there-through the auger shaft 12, and thus, a perfect bearing will be formed for the shaft to prevent the wobbling and binding which is
 85 usual in such machines.

In practice, it will be seen that the truck 1 may be readily moved from place to place either by hand or by draft, and the rear end
 90 of the truck moved adjacent the place wherein the post is adapted to be applied. The frame 2 is then thrown outwardly from the truck until the auger carried on the bottom of the shaft 12 is immediately over the place in which the post is to be positioned. The
 95 gear on the shaft 26 which is adapted to cause the screw shaft 6 to be lowered, is then moved into engagement with the gear 23 and said shaft 26 rotated, and the shaft 22 will, of course, be rotated through this operation
 100 and the speed thereof determined through the operator, the rotary motion being transmitted to the sprockets 10 and 15, and the rotation of said sprocket 10 causing the screw shaft 6 to be lowered. The rotation
 105 of the sprocket 15 will, of course, cause the shaft 12 to be rotated and simultaneously the lowering of the screw shaft 6 will cause said shaft 12 to be lowered, so that the auger on the lower end of said shaft 12 will also
 110 be lowered into engagement with the ground. As stated, the shaft 22 may be rotated with a speed, as desired by the operator, but it will be understood that the rotation of the shaft 12 through direct engagement with the
 115 sprocket 15, will be at a considerably greater speed than the lowering of the screw shaft 6, and such speeds may be also determined through the size of sprockets used.

It has been before stated that to reverse
 120 the operation of the machine so as to withdraw the auger from the ground, one or the other of the gears 24 or 25 is thrown out of effective position and the other moved into effective engagement with the gear 23,
 125 and in order to provide for the non-rotation of the auger, as the same is being withdrawn from its engagement with the ground, the gear 30 is keyed and slidably mounted on the shaft 22. A lever 31' is
 130

provided, whereby said gear 30 may be moved from its effective engagement with the shaft 22, whereupon the machine may be operated to raise the screw shaft 6 and correspondingly the auger shaft without rotating the auger.

From the foregoing, it will be seen that we have provided a simple and economical machine for boring post holes in the ground, which machine may be operated manually or mechanically. It will further be seen that we have provided an auger shaft in connection with a screw shaft and means provided for the rotation of said auger shaft and the simultaneous lowering of the screw shaft. It will still further be seen that by providing a drive shaft for the pair of sprockets, each having connection with the sprockets on the screw shaft and auger shaft, the lowering of said screw shaft and the rotation of the auger shaft will be independent, but the lowering of the auger shaft will be caused by the lowering of the screw shaft. It will still further be seen that the device is of such simple construction as to be readily and cheaply manufactured and thereby adapted for both city and rural use.

What we claim is:—

1. A post hole digging machine, comprising a truck and a frame slidably mounted thereon, a screw shaft extending vertically of said frame, an auger shaft having connection with the lower end of said screw shaft, and an additional shaft mounted vertically on said frame and having operative connection with said screw and auger shafts, and means to rotate the last referred to shaft, whereby said auger shaft will be rotated and said screw shaft lowered to correspondingly lower said auger shaft.

2. A machine of the character described, comprising a frame, a screw shaft supported thereon, an auger shaft having connection with the lower end of said screw shaft, a sprocket in threaded engagement with said screw shaft, an additional sprocket through which said auger shaft extends, an additional shaft vertically mounted on said frame having operative connection with each of said sprockets, and means to retain the last referred to shaft to lower the screw

shaft and correspondingly lower and rotate the auger shaft.

3. A post hole digging machine, comprising a frame, a pair of alining tubular members mounted at one end thereof, a screw shaft extending through one of said tubular members, an auger shaft extending through the other and having connection with the lower end of said screw shaft, a sprocket carried below the upper of the tubular members and in threaded engagement with the screw shaft, an additional sprocket supported below the lower of said tubular members and through which said auger shaft extends, an additional shaft vertically mounted on said frame, sprockets carried by the last referred to frame and having independent connection with the aforesaid sprockets, and means to rotate the last referred to shaft to correspondingly lower the screw shaft and rotate the auger shaft.

4. A post hole digging machine, comprising a frame, a pair of alining tubular members mounted at one end thereof, a screw shaft extending through one of said tubular members and capable of vertical movement therein, an auger shaft extending through the other of said tubular members and having connection with the lower end of said screw shaft, a sprocket having the inner periphery thereof threaded to engage the threads of said screw shaft, and an additional sprocket having connection with said auger shaft and through which said auger shaft is capable of vertical movement; of an additional shaft vertically mounted on said frame, means operatively and independently connecting said sprockets with the last referred to shaft, means to rotate the last referred to shaft and correspondingly lower and rotate the auger shaft, and reversing means therefor.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

WILLIAM E. WARD.
FRANK STEINES.

Witnesses:

C. J. LE VALLEY,
C. C. STAREK.