

Sept. 14, 1926.

S. LAZAR

1,599,477

DIGGING MACHINE

Filed Nov. 8, 1924

2 Sheets-Sheet 1

Fig. 1.

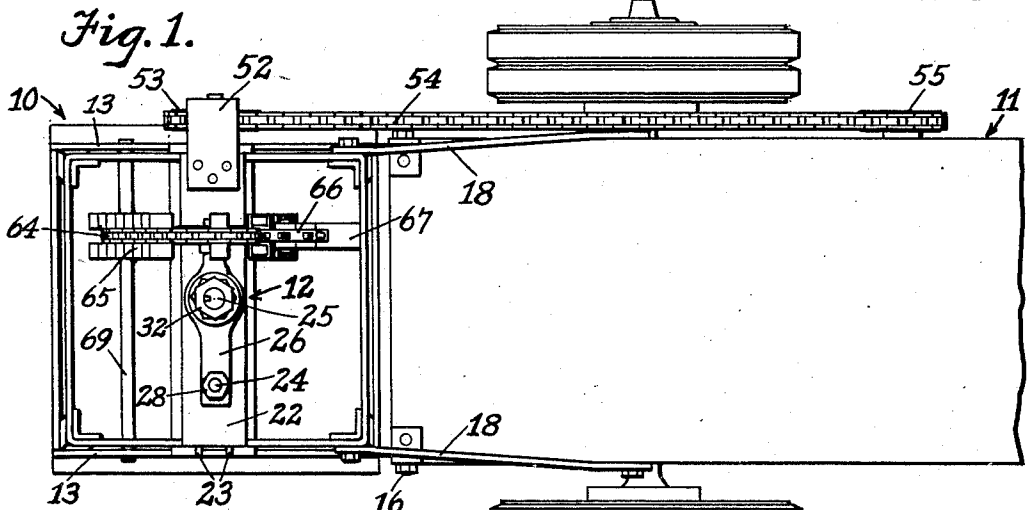
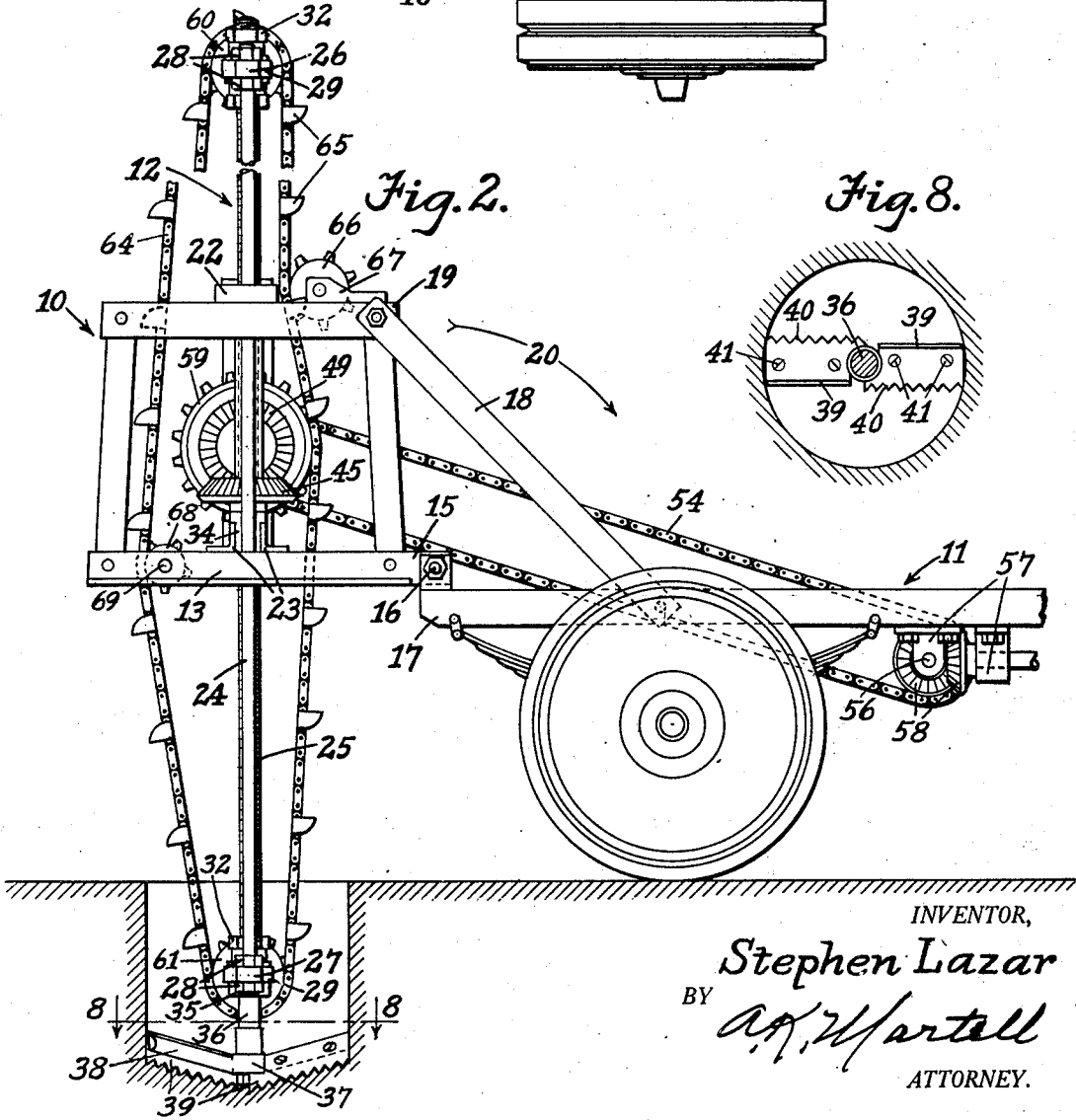


Fig. 2.

Fig. 8.



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2 Sheets-Sheet 2

Fig. 3.

Fig. 4.

Fig. 6.

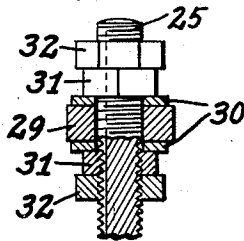
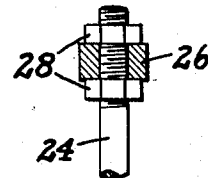
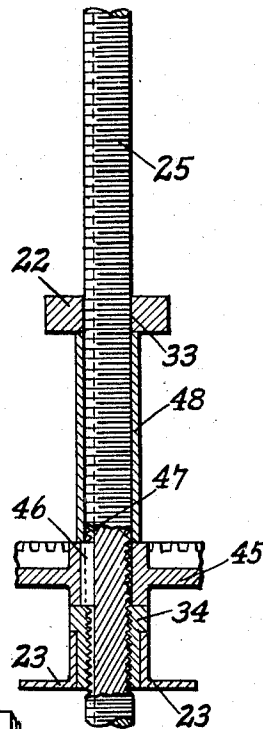
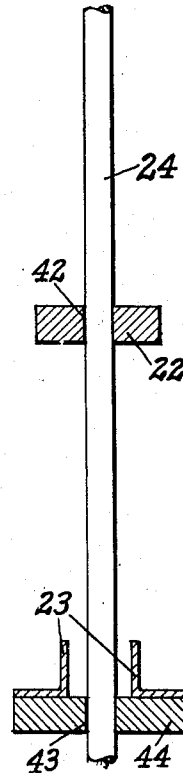
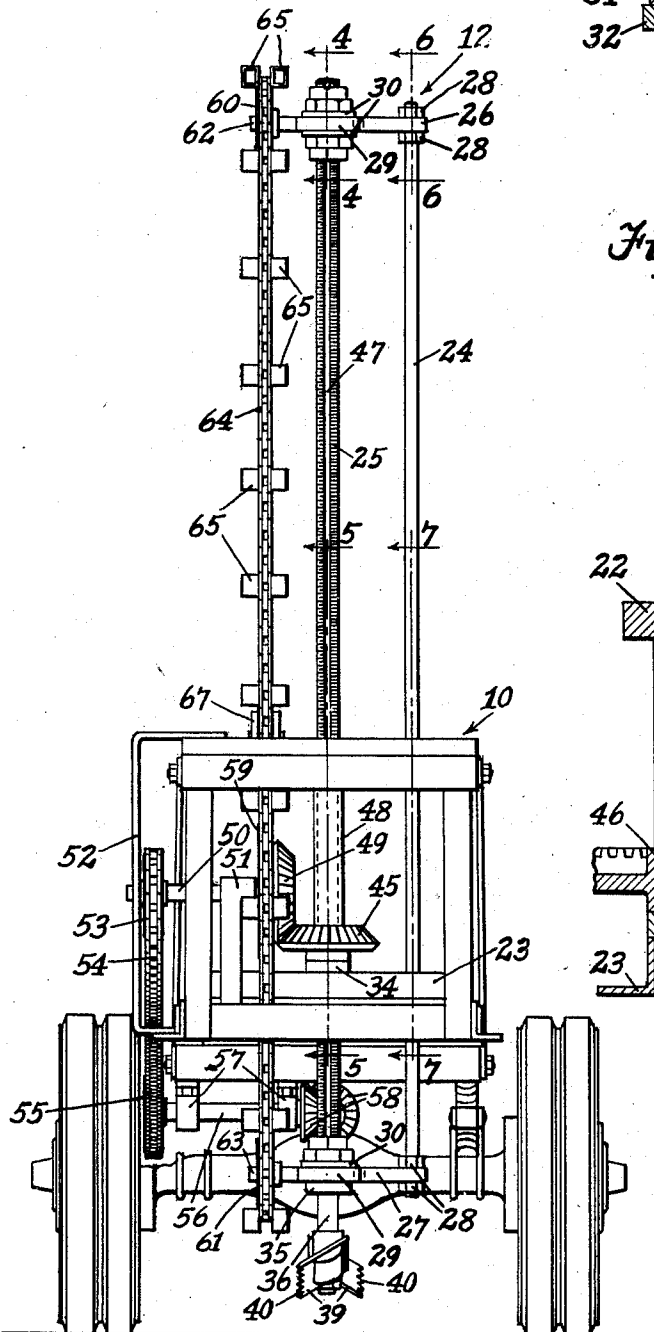


Fig. 5.

Fig. 7.



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DIGGING MACHINE.

Application filed November 8, 1924. Serial No. 748,585.

My invention relates to a machine for digging circular holes in the ground.

The main object of my invention is to provide a power-driven digging machine which will speedily dig holes in the ground to a depth suitable for setting posts, telephone poles, telegraph poles and the like.

Another object is to provide a digging machine, of the character described, which may be mounted on the rear end of a motor truck for transportation from place to place and, which, when in position, may be operated by the engine of the motor truck to dig holes to a predetermined depth.

Other objects and advantages will appear hereinafter, and while I show herewith and will describe a preferred form of construction I desire it to be understood that I do not limit my invention to such preferred form, but that various changes and adaptations may be made therein without departing from the spirit of my invention as hereinafter claimed.

Referring to the drawings, which accompany this specification and form a part thereof,

Fig. 1 is a plan view of the preferred form of my digging machine, mounted on the rear end of a motor truck.

Fig. 2 is a view in side of elevation of the digging machine shown in Fig. 1 in its digging position, part of its upper section being broken away to save space.

Fig. 3 is a view in rear elevation of the complete machine, with the boring element in withdrawn position.

Fig. 4 is an enlarged vertical section on line 4—4 of Fig. 3, showing details of the upper end of the movable frame and feed shaft.

Fig. 5 is an enlarged vertical section on line 5—5 of Fig. 3, showing further details of feeding parts.

Figs. 6 and 7 are enlarged vertical sections on lines 6—6 and 7—7 respectively of Fig. 3, showing details of movable frame and supporting frame.

Fig. 8 is a horizontal section on line 8—8 of Fig. 2, showing a plan view of the boring element.

As shown in Figs. 1, 2 and 3 the digging machine consists of a supporting frame 10 pivotally attached to the rear end of a motor truck 11 and a movable frame 12 vertically slidable in supporting frame 10, said

movable frame carrying the digging elements of the machine.

The supporting frame is a rigid structure of metal bars approximately square in plan and of a height somewhat less than its width, having its lower side-bars 13 extended forwardly as at 15 and fixed with pivot bolts 16 to the rear end of the auto truck frame 17. Braces 18, bolted to the truck frame and to the forward upper corners 19 of the supporting frame hold the latter in operative position. These braces are adapted to be loosened or removed, when the machine is not in use, so that the supporting frame, together with the movable frame, may be swung on pivot bolts 16 forwardly and downwardly onto the motor truck, as indicated by arrow 20. A horizontal guide plate 22 is fixed across the top part of supporting frame 10 at its longitudinal center and a pair of parallel transverse angle-bars 23 are secured to side bars 13 so that the center line of the space between them coincides vertically with the center line of guide-plate 22.

The movable frame 12 consists of a vertical guide-rod 24 and a vertical screw-threaded feed-shaft 25, held in parallel spaced relation to each other by an upper tie-bar 26 and a lower tie-bar 27, rigidly clamped on guide-rod 24 by nuts 28. Feed-shaft 25 is adapted to turn in bearings 29 formed on tie-bars 26 and 27, there being washers 30 adjacent the bearings and spacing nuts 31 adjacent the washers with lock-nuts 32 in contact therewith. It extends through an aperture 33 in guide-plate 22 and through a nut 34 fixed between angle bars 23. Its lower end is provided with a collar 35 adjacent lower bearing 29 and an extension 36 therebelow on which is mounted a boring head 37 having upwardly inclined radial arms 38 to which are fixed detachable blades 39, with serrated cutting edges 40, by means of screws 41. Guide-rod 24 extends through an aperture 42 in guide plate 22 and through an aperture 43 in a lower guide plate 44 fixed to angle-bars 23, thus being slidably held in a vertical position. Boring head 37 with arms 38 and blades 39 constitute the boring elements of the machine. A beveled gear wheel 45, with a fixed key 46 adapted to engage a spline 47 in feed-shaft 25 co-extensive with the threaded portion thereof, is mounted on said

feed-shaft just above nut 34, so that when it is turned feed shaft 25 turns with it and feeds downwardly through nut 34 during the operation of digging. When turned in the reverse direction it feeds upwardly to withdraw the digging elements from the hole. A spacing sleeve 48 surrounding feed-rod 25 extends between gear wheel 45 and guide-plate 22. A companion bevel gear wheel 49, which meshes with gear-wheel 45, is keyed to the inner end of a horizontal shaft 50 which is journaled in a bearing bracket 51 inside supporting frame 10 and has its outer end journaled in an outer bracket 52 fixed on one side of the supporting frame.

A sprocket wheel 53 is keyed to shaft 50 just inside of bracket 52 and a sprocket chain 54 runs over this sprocket wheel and over a drive sprocket 55 which is keyed to a drive-shaft 56 journaled in bearings 57 on the under side of truck frame 17, said drive-shaft being connected through gears 58 to the engine (not shown) of the motor truck. A relatively large sprocket wheel 59 is fixed on shaft 50 adjacent gear-wheel 49 and upper and lower sprocket wheels 60 and 61 are mounted in vertical alignment therewith on pivot pins 62 and 63 respectively formed on extensions to tie-bars 26 and 27. An endless sprocket chain 64, equipped at intervals with pairs of elevator buckets 65, attached to its sides, runs over upper and lower sprocket wheels 60 and 61 and is held in engagement with one side of sprocket wheel 59 by an idler sprocket 66 supported in a bracket 67 on the top side of supporting frame 10 while it is held out of engagement with the other side of sprocket wheel 59 by a second idler sprocket 68, which turns on a shaft 69, having its ends fixed in side bars 13 of the supporting frame. Chain 64 and buckets 65 constitute the elevating member of the machine which reciprocates vertically with the boring element.

The operation of my digging machine is as follows:

Drive shaft 56 is turned through gears 58 by the motor truck engine and shaft 50 of the digging machine is driven by sprocket chain 54 running over drive sprocket 55 and sprocket wheel 53. Bevel gear 49 turning with shaft 50 turns feed-shaft 25 through bevel gear 45, feeding shaft 25 downwardly through nut 34, which causes blades 39 to sink deeper and deeper into the ground. Simultaneously sprocket-wheel 59 turns with shaft 50 and causes sprocket chain 64 to travel vertically so that the elevator buckets 65, attached thereto, dip down into the loosened dirt adjacent the blades of the boring element and carry it upwardly throwing it out, as they pass over upper sprocket wheel 60, to the rear of the digging machine.

It should be noted that blades 39 are made in pairs having the serrations on the cutting edge of one in staggered relation to those of the others, so that the cutting effect is made as great as possible.

It will be seen that by driving the digger at a comparatively high speed the digging of holes is rapidly accomplished by my machine. By reversing the direction of operation the digging element is readily withdrawn from a finished hole preparatory to moving to the next position.

Having thus illustrated and described my invention, I claim:

In a machine for digging post holes and the like, an elongated carrying frame, means to raise and lower said frame, a chain extending from end to end of said frame, sprocket wheels for said chain mounted on said frame, elevator buckets carried by said chain, digging means comprising a boring bar extending longitudinally of said carrying frame, a gear on said boring bar, a driving shaft, a driving gear thereon meshing with said gear of the boring bar, and a sprocket wheel on said driving shaft, the latter wheel directly engaging said sprocket chain at a point which permits the raising and lowering of said carrying frame.

STEPHEN LAZAR.