

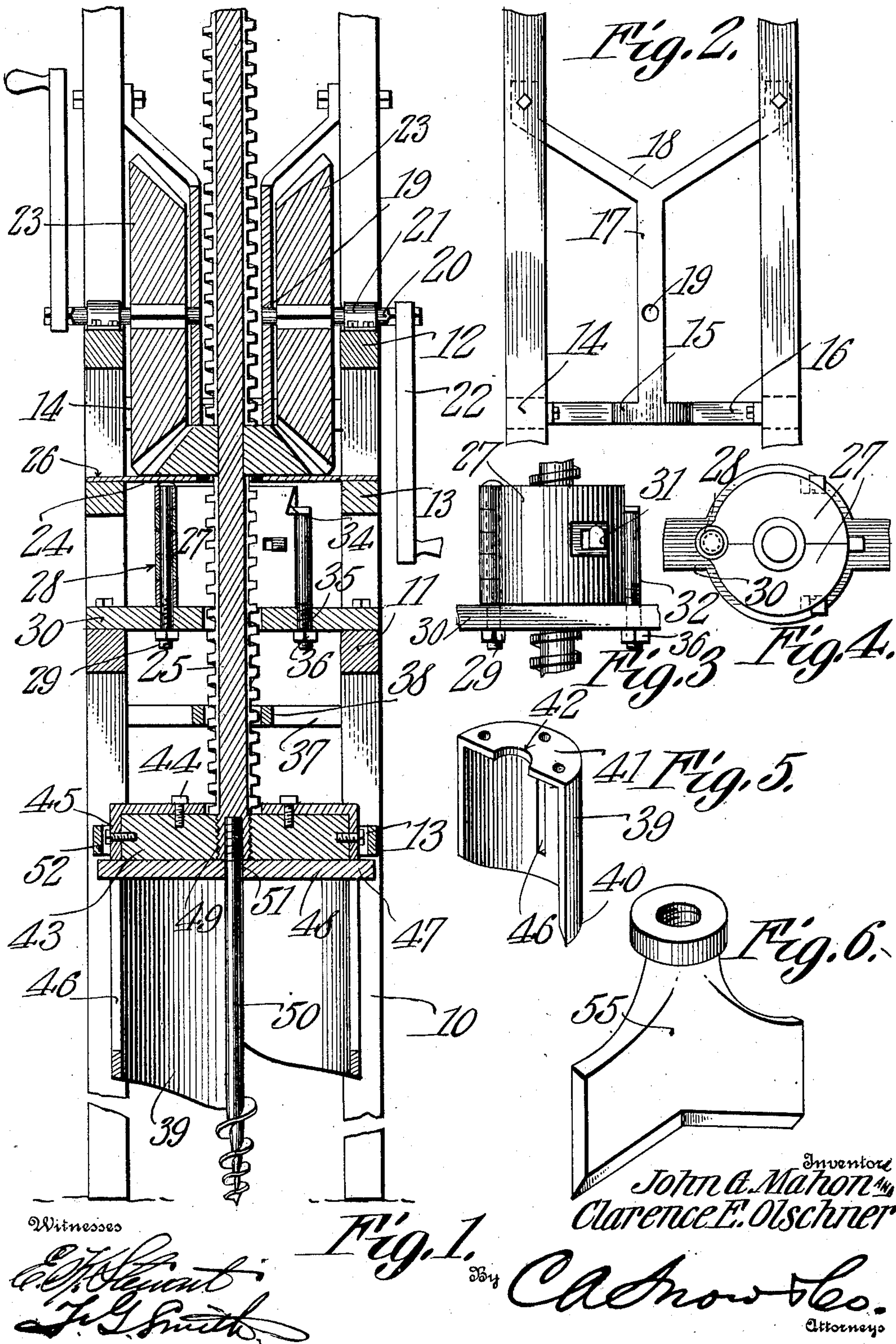
J. G. MAHON & C. E. OLSCHNER.

POST HOLE AUGER.

APPLICATION FILED OCT. 22, 1909.

983,455.

Patented Feb. 7, 1911.



UNITED STATES PATENT OFFICE.

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POST-HOLE AUGER.

983,455.

Specification of Letters Patent.

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Application filed October 22, 1909. Serial No. 524,023.

To all whom it may concern:

Be it known that we, JOHN G. MAHON and CLARENCE E. OLSCHNER, citizens of the United States, residing at Beaumont, in the
5 county of Jefferson, State of Texas, have invented a new and useful Post-Hole Auger, of which the following is a specification.

It is the object of the present invention to provide an improved construction of
10 earth auger and the invention relates more particularly to that class of such augers which are designed chiefly for use in boring post holes and it is one aim of the invention to so improve the construction of such de-
15 vices as to render them easier of operation and more efficient in their action.

Specifically speaking, one aim of the invention is to provide, in a machine of this class embodying a screw shaft, which shaft
20 supports the auger proper and is designed, when rotated, not only to feed the auger into the earth, but also to rotate the same, a threaded sleeve or bearing through which this shaft works and which may be readily
25 disconnected therefrom whereby to permit of quick raising or lowering of the shaft. The advantage of this structure lies in the fact that by its provision it is not necessary to rotate the operating shaft or shafts of the
30 auger in a reverse direction in order to lift the auger out of the hole being bored nor is it necessary to rapidly rotate the shaft in a forward direction in order to lower the auger into the hole being bored but, on the
35 other hand, the auger may be quickly dropped into the hole and may be quickly lifted therefrom.

It is another aim of the invention to provide means for automatically clearing the
40 auger of dirt packing therein, when the auger is lifted from the hole being bored.

With the above and other objects in view, the invention consists in the construction and arrangement of parts shown in the ac-
45 companying drawings, in which—

Figure 1 is a vertical sectional view through an earth auger constructed in ac-
cordance with the present invention. Fig. 2 is a side elevation of the upper portion of
50 the frame thereof. Fig. 3 is a view in elevation of the sleeve in which the auger shaft is mounted. Fig. 4 is a top plan view of the said sleeve. Fig. 5 is a detail perspective
55 view of one section of the auger proper. Fig. 6 is a similar view of an auger which is

employed when boring in stone or exceedingly hard earth.

In the drawings, the machine is illustrated as embodying a frame structure which includes uprights 10 of which there
60 are preferably four and which are connected by cross pieces 11, cross pieces 12 located above the cross pieces 11 and connecting corresponding ones of the said up-
65 rights, cross bars 13, and other cross pieces 14, which connect opposite ones of the said uprights. These several elements of the frame structure afford a substantially rec-
70 tangular skeleton frame and it is in this frame that the elements comprising the auger and its operating mechanism are mounted. In addition to the elements above
described, the frame includes also a supplemental frame in which the drive shaft and
75 certain of the drive gears are mounted and this supplemental frame includes a collar portion which is indicated by the numeral
15 and from which project arms 16, these arms being diametrically oppositely located
80 and being secured at their outer ends to the cross pieces 14 of the main frame. Other arms 17 are formed integral with the upper
edge of the collar 15 and project vertically thereabove and at their upper ends are
85 formed with diverging branches 18 which are secured to opposite pairs of the uprights 10 as is clearly shown in Figs. 1 and 2 of
the drawings, it being understood that by such a structure, the collar 15 is firmly sup-
90 ported in place in line with the vertical axis of the frame. Each of the arms 17, it being understood that these arms are oppo-
sitely located, is formed with an opening 19 to rotatably receive one end of one of a pair
95 of drive shafts 20 which shafts are further journaled in bearings 21 upon the cross pieces 12 as is clearly shown in Fig. 1 of the draw-
ings. Each shaft has fixed upon it at its outer end a crank arm 22 and fixed upon
100 each shaft intermediate of its ends is a beveled gear 23, these gears being located each between the plane of the adjacent cross piece 12 and the adjacent or related arm 17. The gears 23 are in mesh with the beveled
105 gear 24 which is splined upon the auger shaft, this shaft being indicated by the numeral 25 and being in the form of a worm or screw shaft. It will be understood that the shaft 25 is slidable through the gear 24
110 but is held for rotation therewith and that

upon rotating either of the shafts 20 through the medium of the crank handle 22 or rotating both of said shafts simultaneously, rotation will be imparted to the gear 24 and consequently to the said shaft 25. The gear 24 is supported upon a plate 26 which is mounted and supported in the frame beneath the said gear.

As heretofore stated, the shaft 25 is arranged for rotation with the gear 24 and in order that the shaft may be fed in a downward direction as it is rotated, there is provided a means which will now be described. The means just mentioned is preferably in the nature of a sleeve having a threaded bore through which the shaft works and in the present instance, this sleeve is illustrated as embodying hinged sections which when closed, embrace the shaft but which may be separated by swinging upon their hinge, whereby to disengage from the shaft and permit the shaft to be quickly and freely elevated or lowered. These sleeve sections are indicated by the numeral 27 and are hingedly connected by forming upon them pintle lugs 28 through which a bolt 29 is secured, this bolt being secured also through a plate 30 which is supported upon the cross pieces 11 of the main frame of the machine and serving not only to hingedly connect the sleeve sections 27 but further to pivot them for independent swinging movement upon the said plate. As illustrated in the drawings, the sleeve sections 27 are comparatively thick and substantially semi-cylindrical and in order that these sections may be held firmly in closed position when they are to embrace the shaft 25, there is provided a key 31 which key is inserted transversely through the said sections 27 to that side of the bore in the sections opposite the side at which the pintle lugs are formed, and this key is headed at both ends as is clearly illustrated in Figs. 3 and 4 of the drawings and after insertion through openings in the said sleeve sections, is turned at right angles whereby to prevent separation of the sections upon the bolt 29 as a pivot. In order to firmly hold the sleeve upon the plate 30, there is provided a bolt 32 which at its upper end is formed with a head 33 engaging in a notch 34 in the free edge of the hinged sleeve section 27. This bolt engages at its lower end through an opening 35 in the plate 30 and upon the lower end of the bolt is threaded a nut 36 which may be tightened for the purpose of clamping the sleeve firmly upon the plate 30.

From the above, it will be understood that when the sections 27 of the sleeve are closed and locked in closed position, they will embrace the worm shaft and upon this shaft being rotated, it will be fed either in an upward or a downward direction depending upon the direction of rotation. Also it will

be understood that when it is desired to quickly raise or lower the shaft 25 as for example when a post hole has been bored to the desired depth and the machine is to be carried to another point to dig another post hole, or when it is desired after having placed the machine in position above a hole to be deepened, to quickly lower the auger carried by the shaft into the hole, the locking key 31 may be turned so as to bring its head into registration and alinement with the transverse openings in the sleeve sections and the key may then be entirely disengaged from the said sleeve sections and they may be swung upon the bolt 29 so as to disengage from the shaft. A brace 37 connects opposite ones of the uprights of the main frame of the machine and embodies a collar portion 38 through which the shaft 35 loosely passes.

The auger proper which is carried at the lower end of the shaft 25 will now be specifically described as will also the means, heretofore mentioned, for clearing the auger blade of soil when the auger is lifted. Each of the auger blades is illustrated as substantially semi-cylindrical and is indicated by the numeral 39, each blade having a volute cutting edge 40 and at its top a substantially semi-circular web 41, the straight edge of which is recessed however as at 42 to embrace one-half of the shaft 25. These blades 39 are assembled upon a head block 43 which is substantially circular in outline and the blades are secured upon this block by means of bolts 44 which are secured to the web 41 and into the head 43 and further, by bolts 45 secured through the vertical wall of each blade and into the peripheral edge of the head 43. It will be observed from inspection of Figs. 1 and 5 of the drawings that each of the blades 39 has its vertical wall formed with a slot 46 and projecting into these slots are lugs 47 formed at diametrically opposite points upon the peripheral edge of a disk 48, this disk being of such diameter as to fit exactly within and between the blades 39 whereby its edge will have scraping contact with the blades.

It will be observed that the head 43 is threaded onto the lower end of the shaft 25 as indicated by the numeral 49 and where an entering auger is employed in conjunction with the auger blade 39, such entering auger indicated by the numeral 50, is threaded at its upper end into a threaded socket formed in the lower end of the shaft 25, the entering auger being in this manner positioned axially with respect to the main auger.

It will be observed that the scraper disk 48 is formed axially with an opening 51 through which the shank of the entering auger 50 engages and it will be understood that this shank aids in properly guiding the disk 48 within the main auger. It will further

be observed that the lugs 47 project not only into the slots 46 in the blade 39 but beyond the outer surfaces of these blades and in the path of abutments in the nature of bars 52 secured at their ends between opposite ones of the uprights 10. It will be understood from the above description of this portion of the machine that upon reversing the shaft operating means whereby to backwardly rotate the shaft 25 and consequently gradually lift the same, any earth packing within the blades 39 will be cleared therefrom by the downward movement of the disk 48, this downward movement being had by reason of the engagement of the lugs 47 upon this disk with the abutment bars 52, which engagement serves to hold the plate 48 stationary or relatively fixed while the main auger continues its upward movement.

Where it is necessary to bore in extremely hard or closely packed soil or in rock or in limestone or similar soil where rocks are frequently encountered, there is provided an auger of the form illustrated in Fig. 6 of the drawings and indicated by the numeral 55 and this auger is threaded onto the lower end of the shaft 25 in place of the auger previously described when it is necessary to employ the machine under the conditions above noted.

What is claimed is:—

1. In a machine of the class described, a frame, a drive gear, a worm auger shaft slidable through the gear and held for rotation therewith, a plate mounted in the frame, a feed sleeve comprising sections disposed upon the plate and formed with registering pintle lugs a hinge bolt engaged through the lugs and through the plate and hingedly

connecting the sections and securing the same upon the plate in position to embrace the shaft when the sections are in closed relation, the said sections being formed with aligned openings, a member engaged through the openings comprising a shank formed at each end with a head engageable through the openings when the shank is in one position and non-engageable therethrough when the shank is turned to another position, the said sections at their meeting free edges being formed with registering recesses, and a bolt having a head engaging in said recesses and bearing upon the bottom walls thereof, the lower end of the bolt engaging through the plate, and a nut threaded upon the lower end of the bolt and engaging the under face of the plate.

2. In a machine of the class described, a rotatable feed shaft, a head fixed upon the shaft at the lower end thereof, semi-cylindrical blades fixed upon the head and descending therebeneath, a circular disk disposed between the blade with its peripheral edge in scraping contact with the inner faces of the blades, the said blades being slotted and lugs formed upon the said edge of the disk and projecting into the slot, and abutments arranged in the path of movement of the said lugs.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

JOHN G. MAHON.

CLARENCE E. OLSCHNER.

Witnesses:

SAM Z. POWELL,

WALTER G. CRAWFORD.