Dec. 6, 1949 W. RAGOSS 2,490,471

POST HOLE DIGGER

Filed Aug. 10, 1948 5 Sheets-Sheet 1

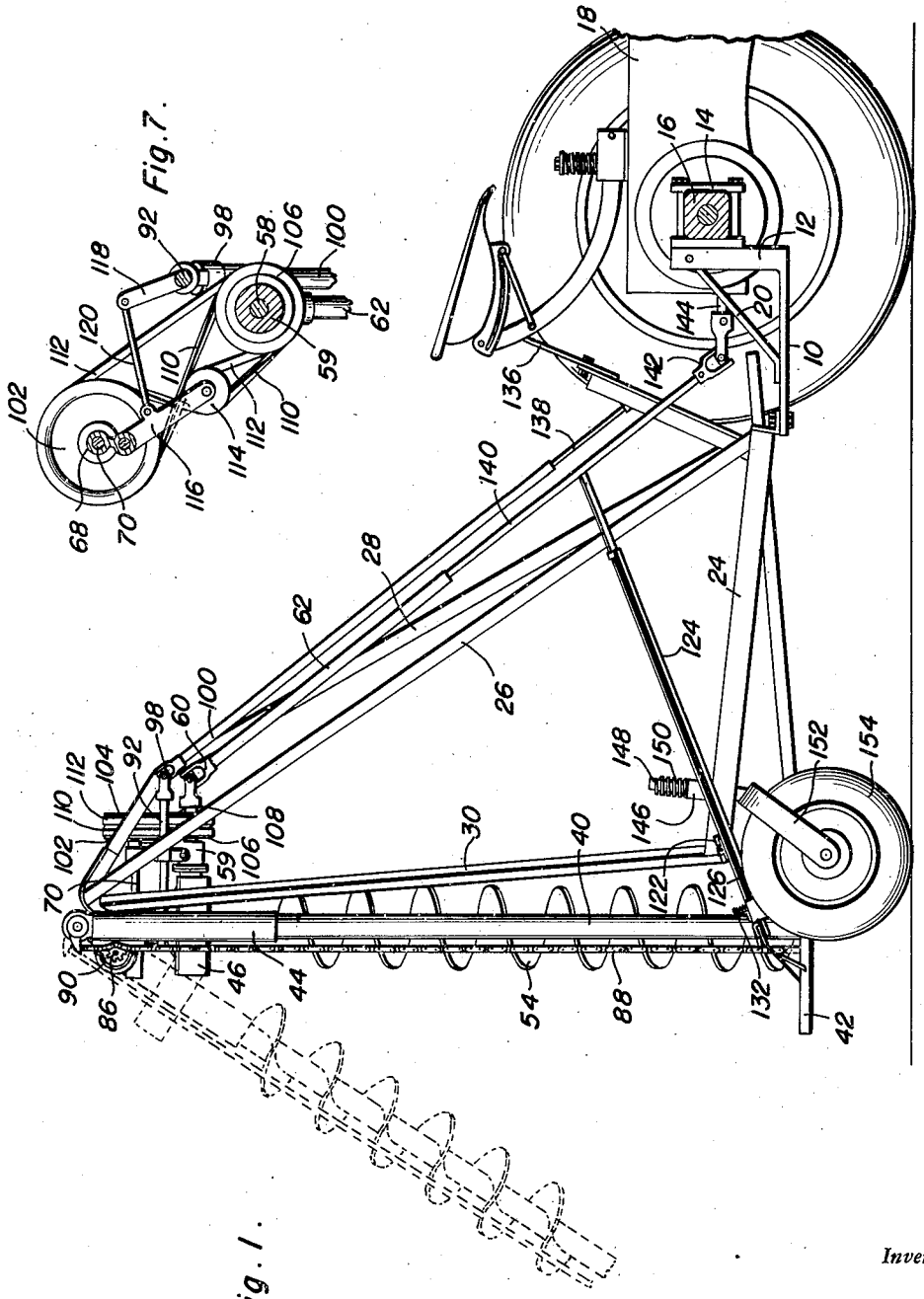


Fig. 1.

Fig. 7.

Inventor

Walter Ragoss

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

Dec. 6, 1949 W. RAGOSS 2,490,471

POST HOLE DIGGER

Filed Aug. 10, 1948 5 Sheets-Sheet 2

Fig. 2.

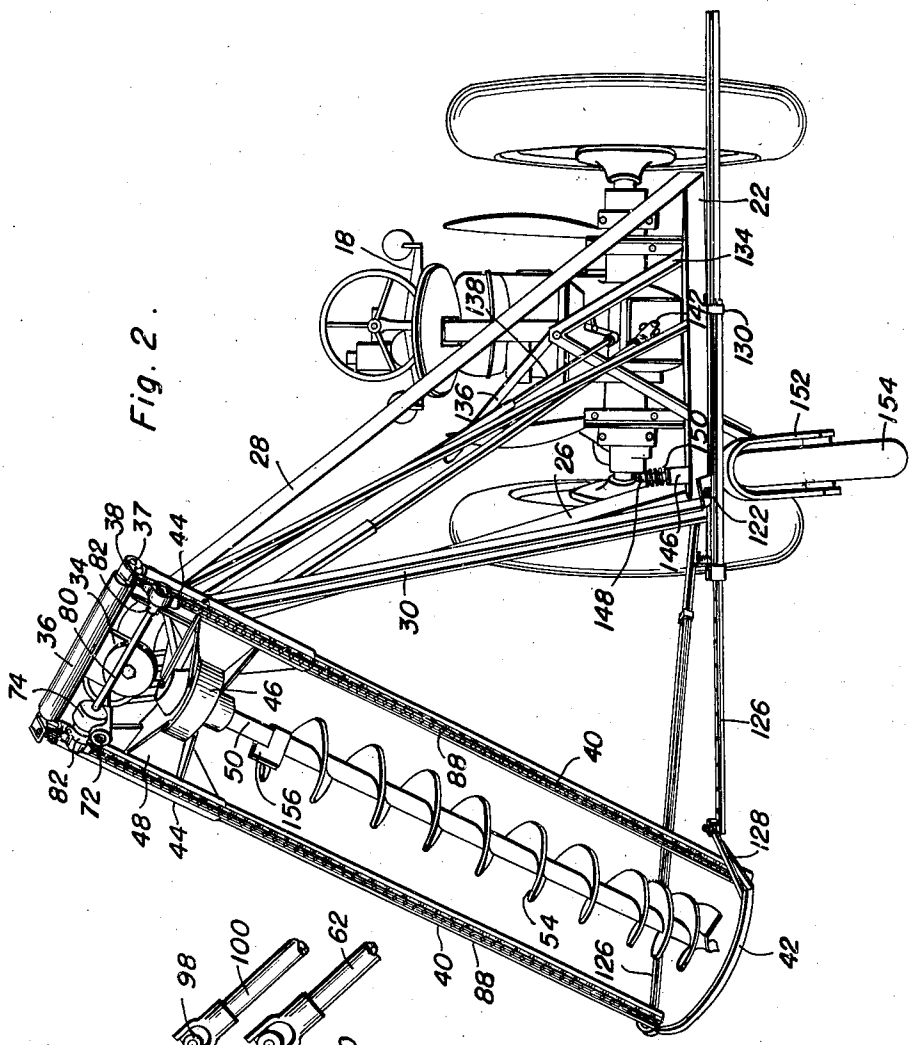
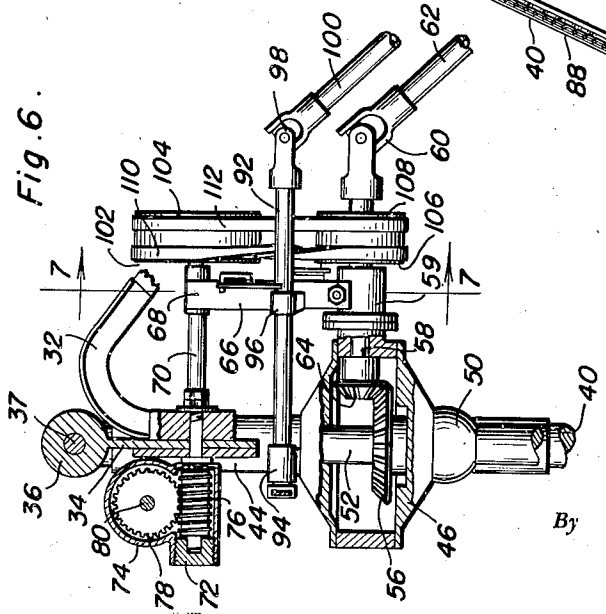


Fig. 6.



Inventor

Walter Ragoss

By *Clarence A. O'Brien and Harvey B. Jacobson*

Attorneys

Dec. 6, 1949 W. RAGOSS 2,490,471

POST HOLE DIGGER

Filed Aug. 10, 1948 5 Sheets-Sheet 3

Fig. 3.

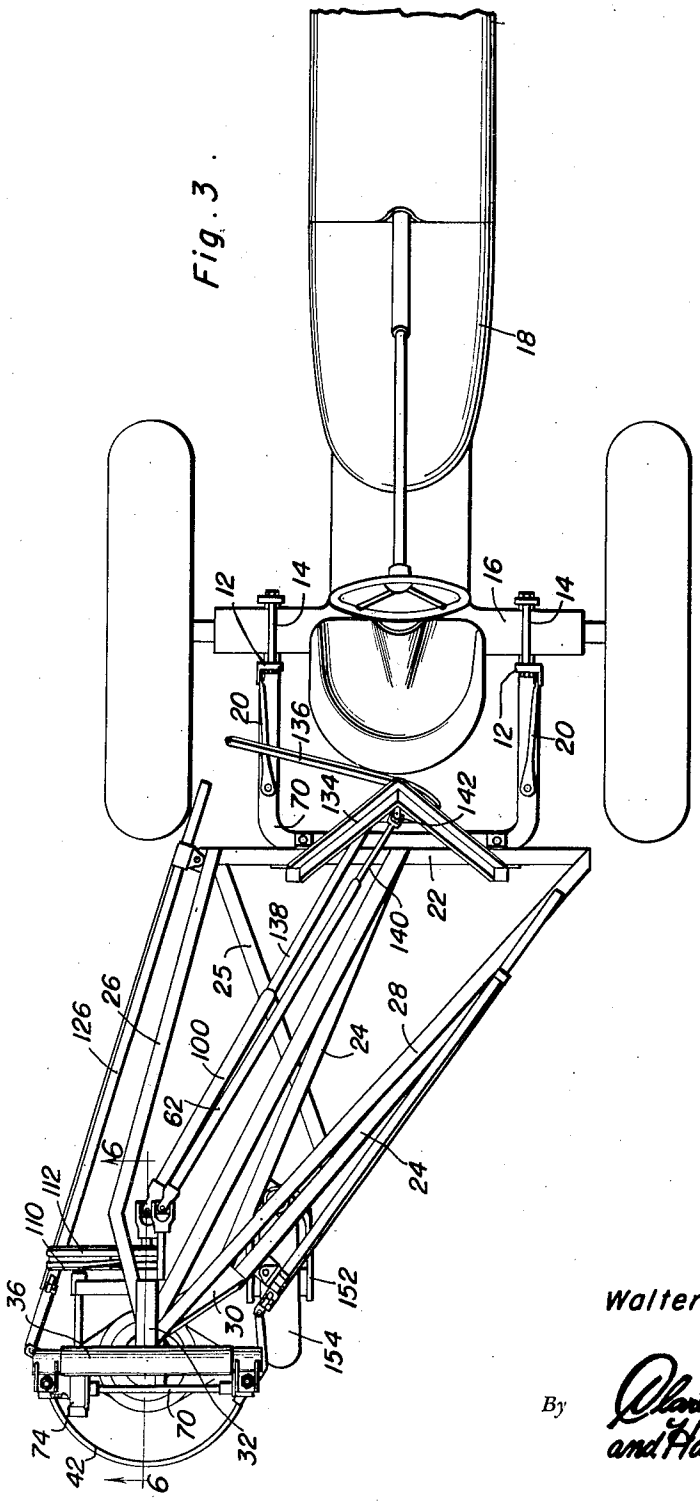
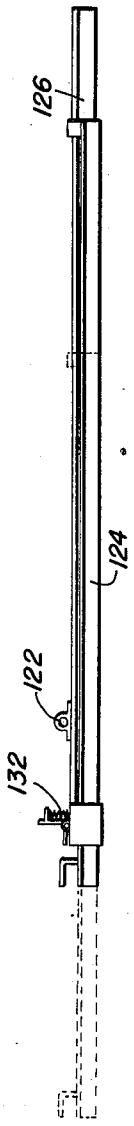


Fig. 8.



Inventor

Walter Ragoss

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

Dec. 6, 1949 W. RAGOSS 2,490,471

POST HOLE DIGGER

Filed Aug. 10, 1948 5 Sheets-Sheet 4

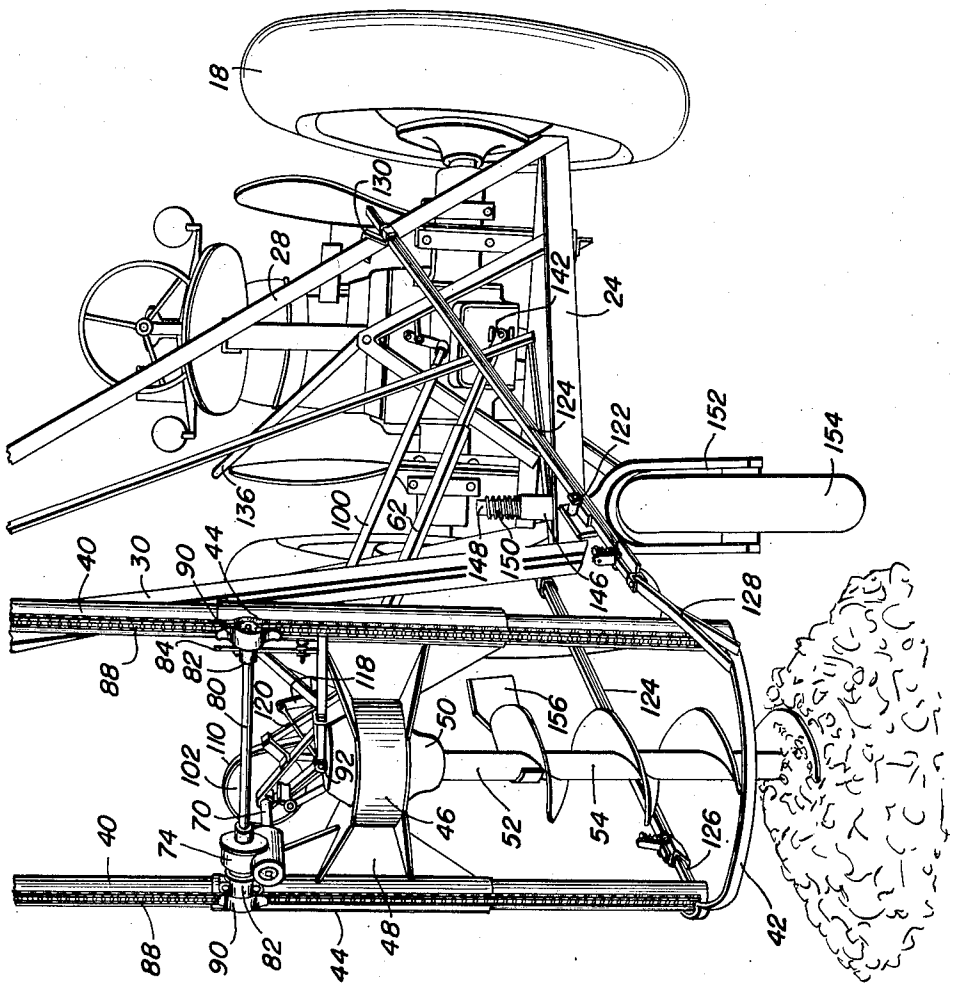


Fig. 4.

Inventor

Walter Ragoss

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

Dec. 6, 1949 W. RAGOSS 2,490,471

POST HOLE DIGGER

Filed Aug. 10, 1948 5 Sheets-Sheet 5

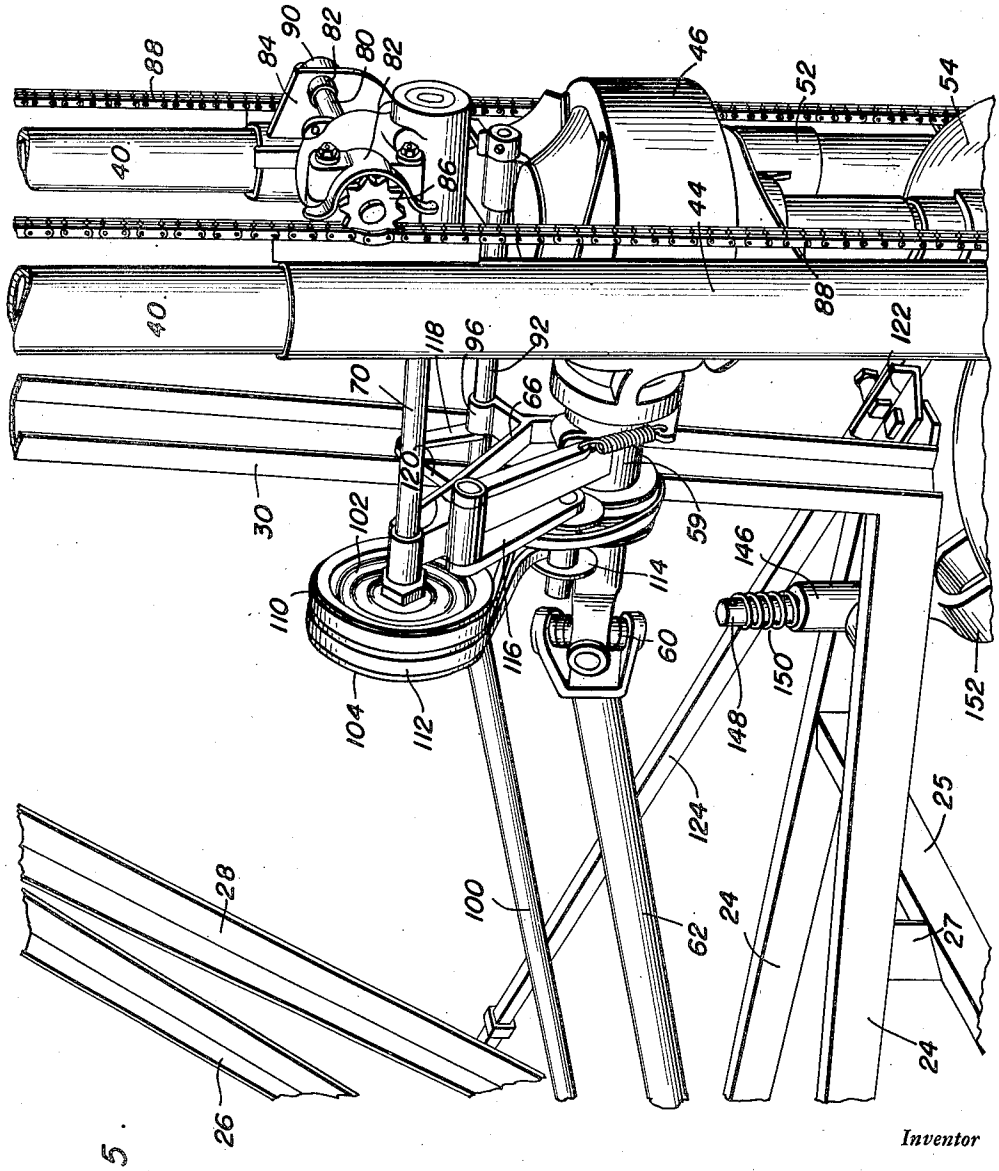


Fig. 5.

Inventor

Walter Ragoss

By Clarence A. O'Brien and Harvey B. Jackson

Attorneys

Patented Dec. 6, 1949

2,490,471

UNITED STATES PATENT OFFICE

2,490,471

POSTHOLE DIGGER

Walter Ragoss, Breckinridge, Okla., assignor of two-thirds to A. D. Adair, Enid, Okla.

Application August 10, 1948, Serial No. 43,359

7 Claims. (Cl. 255—19)

1

This invention relates to new and useful improvements in a boring apparatus and the primary object of the present invention is to provide an attachment for tractors including an auger supporting carriage and embodying novel and improved means for longitudinally adjusting the carriage in a raised or lowered position at a selected predetermined angle for making earth borings at controlled angles from a tractor or the like.

Another important object of the present invention is to provide a boring machine including a longitudinally movable carriage, a pair of guides slidably supporting the carriage, and novel and improved power actuated means for lowering and raising the carriage so that an auger or drill rotatably supported by the same will be directed toward the ground or raised therefrom.

Another object of the present invention is to provide a post hole digger including a rotary auger that is operatively connected to the power take-off shaft of a tractor.

Another object of the present invention is to provide an earth boring apparatus including an auger having an attachment which will spread dirt removed from the hole being bored so that the same will not re-enter or fall into the hole during the raising operation of the auger.

Another object of the present invention is to provide a tractor operated hole digger wherein the auger driving mechanism is operatively connected to the auger supporting carriage and which is manually operable for raising or lowering the carriage.

A further object of the present invention is to provide a post hole digger that is extremely small and compact in structure and which is quickly and readily applied to or removed from a tractor in a convenient manner to be operated by the power take-off shaft of the tractor.

A still further aim of the present invention is to provide a post hole digger that is simple and practical in construction, strong and reliable in use, neat and attractive in appearance, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary side elevational view of a tractor, and showing the present post hole digger applied thereto, and dotted lines showing an alternate position for the boring element and supporting carriage therefor;

Figure 2 is a rear elevational view of Figure 1, and showing the earth bore disposed at a vertically inclined position relative to the tractor on which the present invention is mounted;

2

Figure 3 is a top plan view of Figure 1;

Figure 4 is a perspective view showing the present invention applied to a tractor, the auger supporting carriage in a lowered position, and the auger disposed in a hole being dug by the same;

Figure 5 is a fragmentary perspective view of the present invention, and illustrating the manner in which the carriage is raised and lowered;

Figure 6 is a side elevational view of the present invention, illustrating the manner in which the carriage is moved longitudinally on the guides therefor, and with parts broken away and shown in section;

Figure 7 is a vertical sectional view taken substantially on the plane of section line 7—7 of Figure 6; and

Figure 8 is a side elevational view of the means employed in conjunction with the present invention for adjusting the guides at a selected angle relative to the tractor.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a substantially U-shaped horizontal base member or frame, the leg portions of which are provided with upstanding, lateral extensions 12 that are removably secured by suitable anchoring means or brackets 14 to the rear axle bearings 16 of a tractor 18.

Braces 20 fixed between the extensions 12 and the legs of the base member 10 prevent upward or downward movement of the support member 10 relative to the bearing 16.

Fixed to the base member 10, is a transverse beam or rail 22 to which there is secured, by welding or the like, a pair of rearwardly joined side rails 24. A further brace rail 25 is fixed at one terminal to the beam 22 and extends beneath one rail 24 and is secured to the remaining rail 24, as shown best in Figure 5 of the drawings. A rigid spacer strip or plate 27 is fixed between the rail 25 and the side rail 24 beneath which the rail 25 is disposed.

The lower terminals of a plurality of upwardly converging beams or rails 26, 28 and 30 are fixed by welding or the like to the transverse beam 22, and the joined ends of the rails 24, respectively. The upper terminals of the rails 26, 28 and 30 are joined and support a block 32 to which there is pivoted, in any suitable manner, a plate 34.

The plate 34 is rigidly secured by welding or the like to the central portion of a hollow, upper cross member or sleeve 36 that forms a support for an axial shaft 37, the ends of which project outwardly from the sleeve 36 and pivotally engage the upper eye ends 38 of a pair of spaced, parallel, preferably tubular guide members or

bars 40, the lower ends of which are braced and connected by an arcuate strap 42.

A pair of tubular slides or sleeves 44 are mounted on the guides 40 and form a supporting means for a carriage or gear housing 46 that is rigidly secured to the same by suitable webs, spacers or gussets 48.

Rotatably supported in a suitable bearing 50 carried by the housing or carriage 46, is one end 52 of an auger or earth bore 54 of a known and conventional type on which there is suitably keyed for rotation therewith, a bevelled gear 56 that is disposed in the carriage or housing 46, as shown best in Figure 6 of the drawings.

A drive shaft 58 is journalled for rotation in suitable bearings 59 mounted on the carriage 46, the outer end thereof is coupled by a universal connector or coupling 60 to a main drive shaft 62, and its inner end is suitably keyed to a further bevelled gear 64 that engages the gear 56.

Support arms or arm 66 are mounted on the bearing 59 and are fixed to a bearing 68 that rotatably engages a driven shaft 70, one end of which engages a bearing 72 that is mounted in a gear casing 74.

A worm 76 mounted on the shaft 70, disposed in the casing 74, engages an annular gear 78 which is also disposed in the casing 74 and which is secured on a transverse driven shaft 80 that extends between the slides 44.

The shaft 80 is suitably supported by any suitable number of bearings 82 and braces 84 to retain the same perpendicular to the longitudinal axes of the guides 44, and sprockets 86 are secured on the ends of the shaft 80 and engage a pair of link chains 88, the ends of which are anchored to the guides 40 in any suitable manner so that the said chains will align the said guides. Shields 90 carried by the bearings 82 loosely embrace and guard the sprockets 86.

An actuating shaft 92 is rotatably supported in a bearing 94 fixed to the carriage 46, and a further bearing or sleeve 96 mounted on the arm 66, and the forward terminal of the shaft 92 is connected by virtue of a universal coupling 98 to an elongated link or bar 100.

Mounted on the shaft 70, is a pair of pulleys 102 and 104 that longitudinally align a further pair of pulleys 106 and 108 that are mounted on the shaft 58. The pulleys 102 and 106 are connected by an endless pulley belt 110, the flights of which are twisted, and the pulleys 104 and 108 are connected by an endless belt 112.

Obviously, the pulleys 102, 104 and also pulleys 106, 108 may be formed in suitable blocks by cutting grooves in which case the pulleys 102 and 104 would be integral with each other and the pulleys 106 and 108 would be integral with each other. However, by including groups of pulleys which are removable from each other, the same may be quickly and readily applied in position for use.

The belts 112 and 110 are loosely engaged with the pulleys so that it is necessary to provide a belt tightening means which may be actuated to tighten either of the belts to drive the shaft 70 in either a clockwise or counter-clockwise direction.

Reference is now directed to Figure 7, wherein there is disclosed the means for accomplishing the above desired results. A belt tightener or spool 114 engages the lower flights of both belts 110 and 112 and the spool 114 is supported by a link 116 which is pivoted in any suitable manner to the bearing 68.

A lateral projection or arm 118 is secured to the shaft 92 and is connected by a pitman or link 120 to the link 116, whereby the link 116 may be pivoted in a pendulous action by the shaft 92 to tighten either the belt 110 or 112 depending on whether the spool 114 is forced downwardly or upwardly.

Pivoted as at 122 to the joined ends of the rails 24, is a pair of elongated guide bars 124 that slidably or telescopically engage further elongated bars 126. The bars 126 are pivoted to straps or braces 128 which are fixed to the arcuate member 42 and the guide bars 124 include suitable pivot means or hanger straps 130 that will engage the rails 26 and 28.

Spring urged locking pins 132 are mounted on the guide bars 24 and engage suitable apertures or openings in the bars 124 for locking the bars 126 in a selected extended position and thus retain the guides 40 and auger 54 at a selected vertically inclined angle or at a vertical angle. Obviously, any suitable locking means could be employed whereby the slidable members 126 will be disposed in a selected extended position relative to the members 124.

A V-shaped support 134 fixed to the beam 22 supports a lever 136 that is connected to a rod or bar 138. The rod 138 being telescoped in and adjustably connected to the bar 100 for rotating the latter slightly in a clockwise and counter-clockwise direction, and the same is so rotated that it will be conveniently accessible to an operator seated on the tractor 18.

The shaft 62 is hollow and slidably and adjustably receives, in any suitable manner, a further shaft or rod 140 that is coupled by a universal connection or coupling element 142 to the power take-off shaft 144 of the tractor 18.

In order to support the present invention relative to the tractor 18, so that the same will be mobile, there is provided an open-ended socket 146, mounted on the rails 24, that rotatably engages a vertically disposed post 148 which is spring supported as at 50 to reduce the normal shock prevalent to the present invention as the same is moved over rough terrain. The lower end 152 of the post 148 is bifurcated and supports an axle for swivel wheel 154.

As best shown in Figure 2 of the drawings, there is provided a panel or ground engaging element 156 that will prevent dirt dug by the auger 54 from falling back into the hole as the said auger is retracted or raised from the hole that it is digging. Since as the auger is raised, the same will still rotate, and the panel 156 will engage and push the dirt aside from the bore made by the auger.

In practical use of the present invention, it is obvious that as the power take-off shaft of the tractor 18 rotates the shaft 58 and the auger 54 will be rotated. When it is desirable to lower the auger 54 into the ground, the lever 136 is actuated and the spool 114 will tighten the belt 110 whereby the shaft 80 will be rotated in one direction to cause the sprockets 86 to engage and move downwardly upon the chains 88. After the auger has been extended or inserted into the ground surface a selected distance, the lever 36 is actuated in an opposite direction from that previously described, the pulley 110 will become loose and the pulley 112 will become tightened to rotate the shaft 80 in an opposite direction from that previously described and the carriage will move upwardly upon the guides 40.

By adjusting the members 126, it is obvious

that the guides **40** may be retained in a selected inclined vertical position so that the auger **54** will bore holes, openings or the like at a predetermined angle.

In view of the foregoing description taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A post hole digger comprising a frame having a pair of elongated guide bars, a carriage, slides fixed to said carriage slidably engaging said guide bars, a pair of link chains held stationary on said frame and disposed adjacent and parallel to said guide bars, a driven shaft carried by said carriage, sprockets carried by said driven shaft engaging said link chains, a main drive shaft, an auger rotatably supported by said carriage, a further drive shaft connected to said main drive shaft and said auger, and means operatively connecting said further drive shaft to said driven shaft for rotation of the latter.

2. A post hole digger comprising a frame having a pair of elongated guide bars, a carriage, slides fixed to said carriage slidably engaging said guide bars, a pair of link chains held stationary on said frame and disposed adjacent and parallel to said guide bars, a driven shaft carried by said carriage, sprockets carried by said driven shaft engaging said link chains, a main drive shaft, an auger rotatably supported by said carriage, a further drive shaft connected to said main drive shaft and said auger, means connecting said driven shaft to said further drive shaft for rotation of the driven shaft in one direction, means connecting said driven shaft to said further drive shaft for rotation of said driven shaft in an opposite direction relative to said further drive shaft, and means for selectively actuating both of said last two mentioned connecting means.

3. A post hole digger comprising a frame having a pair of elongated guide bars, a carriage, slides fixed to said carriage slidably engaging said guide bars, a pair of link chains held stationary on said frame and disposed adjacent and parallel to said guide bars, a driven shaft carried by said carriage, sprockets carried by said driven shaft engaging said link chains, a main drive shaft, an auger rotatably supported by said carriage, a further drive shaft connected to said main drive shaft and said auger, a first pulley carried by said driven shaft, a second pulley mounted on said further drive shaft, an endless belt connecting said first pulley to said second pulley, a further pulley secured to said driven shaft, a still further pulley mounted on said further drive shaft, an endless belt connecting said further pulley to said still further pulley and having crossed flights, and belt tightening means for selectively tightening a selected one of said belts.

4. The combination of claim 3 and a lever universally coupled to said belt tightening means for actuating the same.

5. A post hole digging attachment for tractors having power take-off shafts comprising, a frame including a pair of guide bars, means adjustably securing said frame to a tractor for angular adjustment of said guide bars, a pair of slides mounted on said guide bars, a carriage fixed to said slides, a pair of link chains held stationary on said frame and disposed adjacent and parallel to said guide bars, a driven shaft rotatably supported by said carriage, a pair of sprockets carried by said driven shaft engaging said link chains, an auger rotatably supported by said carriage and movable therewith, a main drive shaft, means universally coupling said main drive shaft to the power take-off shaft, means connecting said auger to said main drive shaft for rotating the auger, and means operatively connecting said driven shaft to said main drive shaft for selectively rotating said driven shaft in either a clockwise or counter-clockwise direction.

6. A post hole digging attachment for tractors having power take-off shafts comprising, a frame including a pair of guide bars, means adjustably securing said frame to a tractor for angular adjustment of said guide bars, a pair of slides mounted on said guide bars, a carriage fixed to said slides, a pair of link chains held stationary on said frame and disposed adjacent and parallel to said guide bars, a driven shaft rotatably supported by said carriage, a pair of sprockets carried by said driven shaft engaging said link chains, an auger rotatably supported by said carriage and movable therewith, a main drive shaft, means universally coupling said main drive shaft to the power take-off shaft, means connecting said auger to said main drive shaft for rotating the auger, said main drive shaft including a reduced section and a main section universally coupled to each other, a pair of pulleys carried by the reduced section and rotatable therewith, a further pair of pulleys carried by said driven shaft, a first endless belt trained over one pulley on said reduced section and one pulley on said driven shaft, a further endless belt trained over the remaining of said pulleys on said reduced section and the remaining of said pulleys on said driven shaft and having its flights crossed, and a belt tightener selectively engageable with said endless belts for rotation of said driven shaft in either a clockwise or counter-clockwise direction.

7. The combination of claim 5 wherein said means adjustably securing said frame to a tractor includes a plurality of extendable braces.

WALTER RAGOSS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,315,565	Meyers	Sept. 9, 1919
1,478,824	Gehrandt	Dec. 25, 1923
2,217,300	Templeton	Oct. 8, 1940
2,239,024	Vance	Apr. 22, 1941
2,320,775	Garner	June 1, 1943
2,321,680	Houston	June 15, 1943

FOREIGN PATENTS

Number	Country	Date
220,790	Great Britain	Aug. 28, 1924