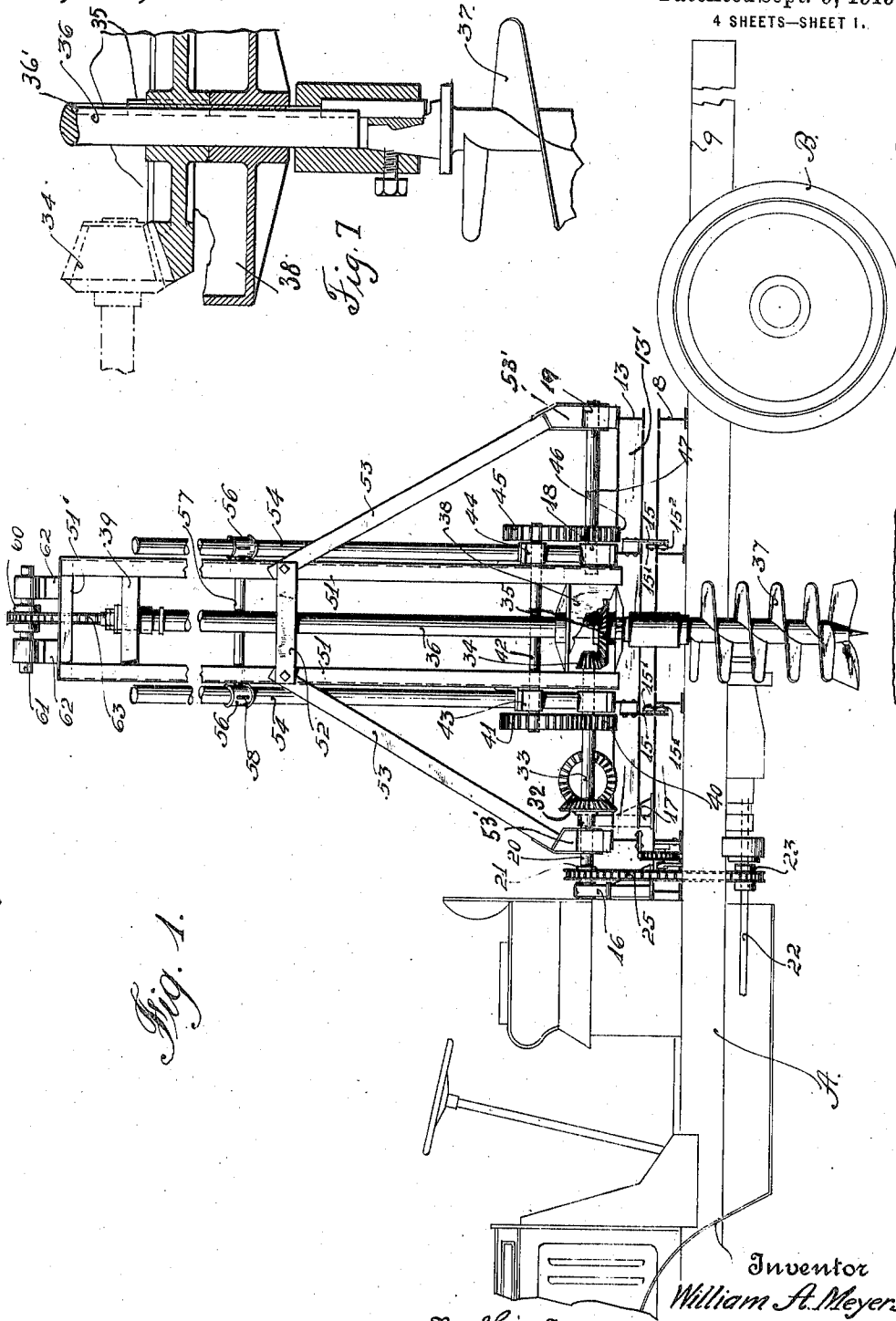


W. A. MEYERS.
EARTH BORING MACHINE.
APPLICATION FILED MAY 9, 1918.

1,315,565.

Patented Sept. 9, 1919.
4 SHEETS—SHEET 1.



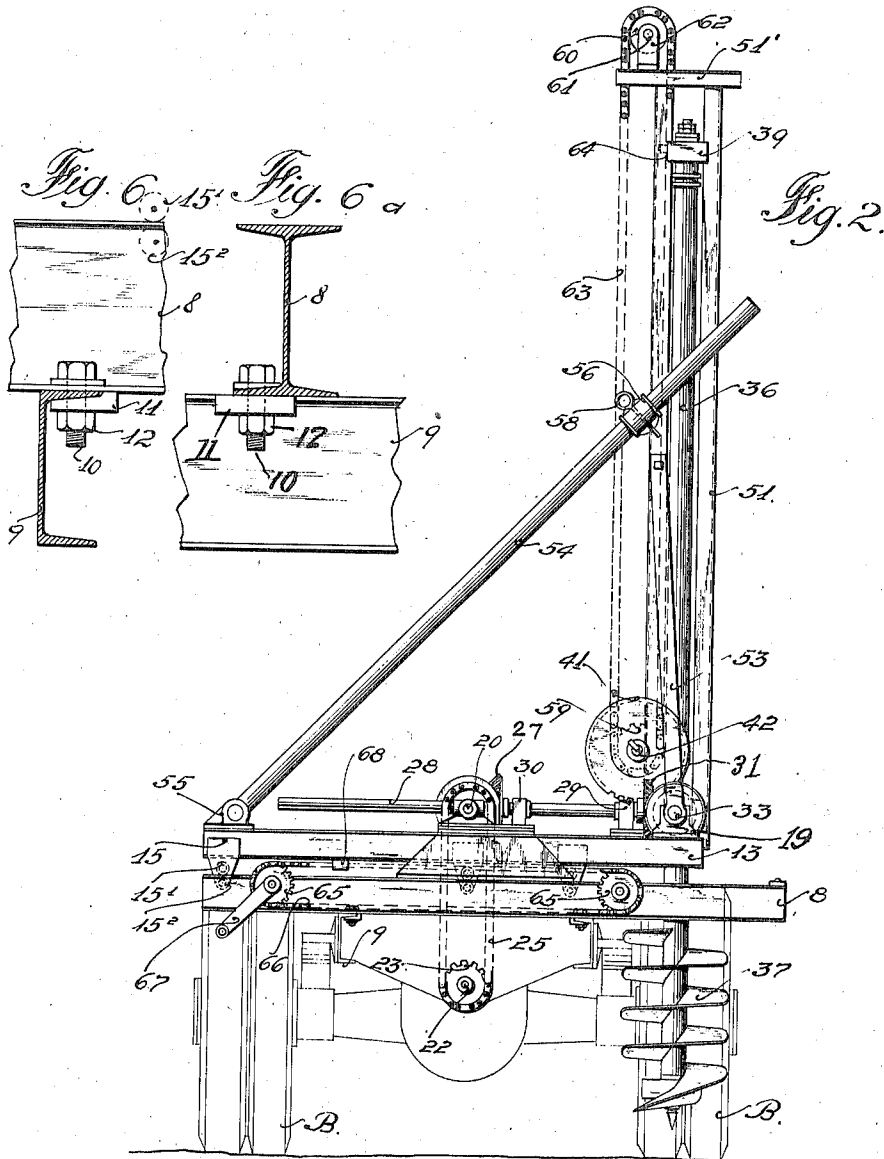
Inventor
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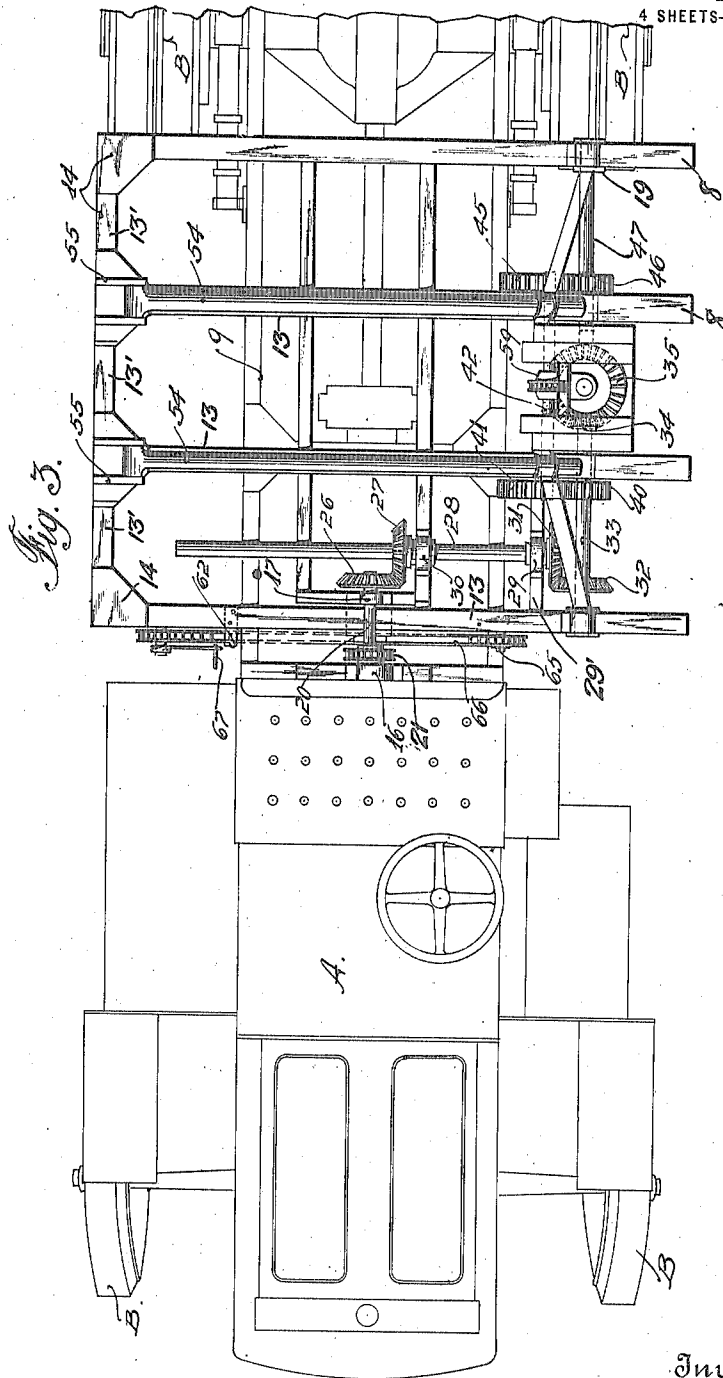
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Fig. 5.

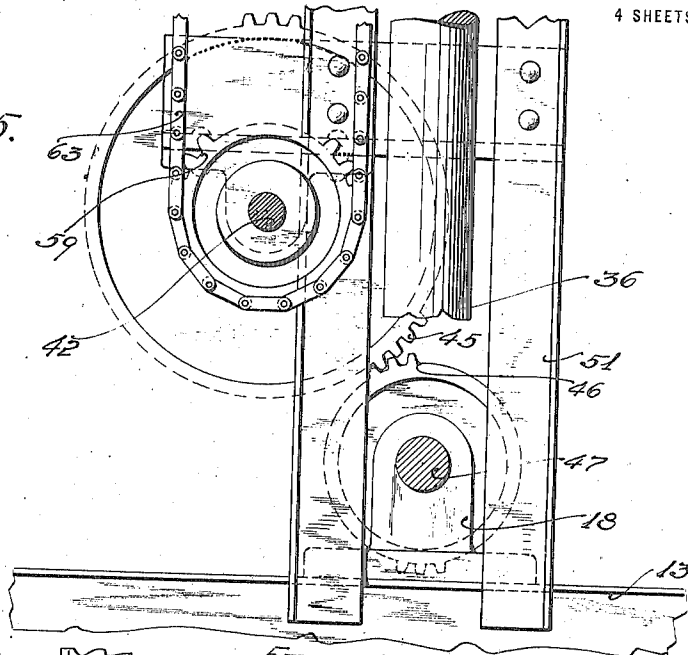
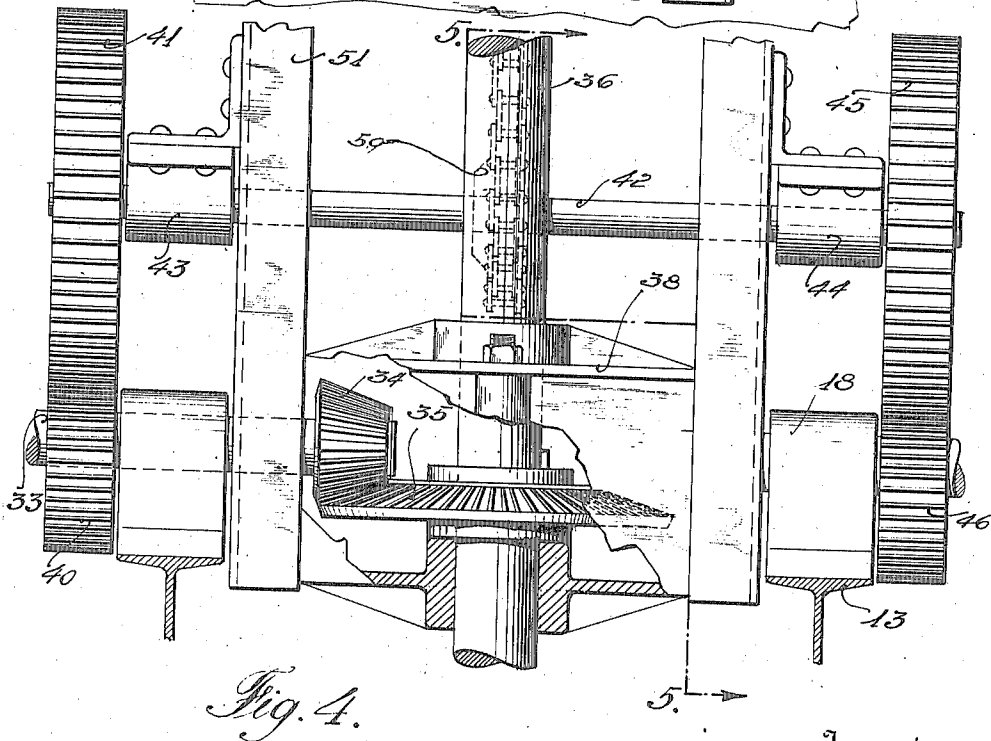


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM A. MEYERS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO INTERNATIONAL EARTH-BORING MACHINE COMPANY, A TRUST, OF CHICAGO, ILLINOIS.

EARTH-BORING MACHINE.

1,315,565.

Specification of Letters Patent.

Patented Sept. 9, 1919.

Application filed May 9, 1918. Serial No. 233,602.

To all whom it may concern:

Be it known that I, WILLIAM A. MEYERS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented a certain new and useful Earth-Boring Machine, of which the following is a specification.

This invention is an earth boring machine adapted, more particularly, for boring holes for installing telegraph and telephone poles, fence posts and for analogous purposes.

Speaking generally, the invention embodies a machine which can be detachably mounted on the chassis of an ordinary motor truck, and its operating mechanism coupled to the engine shaft of the auto motor, thereby enabling the drilling operation to be effected by means of power derived from the motor car engine.

Speaking more specifically, the invention, from a structural standpoint, embodies several novel features, among which may be mentioned the following. A fixed frame or platform which may be secured to the chassis of the motor car, and thus form the base or support of the boring machine; a movable platform or support, upon which the operating mechanism of the boring machine is directly mounted, and which is movable relative to the stationary platform, whereby the boring tool may be placed in a wide range of positions; improvements in a pivotally mounted tower in which the boring tool and its shaft are mounted, whereby the tool may be operated at any desired angle; improved means for adjusting the angle of inclination of the tower; improved means for raising and lowering the boring tool and its shaft; and mechanism for adjusting the countershaft with reference to the main driving shaft of the boring machine to compensate for the different positions of the slidable platform with reference to the stationary platform.

Features of the invention, other than those adverted to, will appear from the hereinafter detailed description, read in conjunction with the accompanying drawings.

The drawings illustrate the preferred, practical embodiment of the invention, but this construction is to be understood as illustrative, only, and, therefore, not exclusive

of the different embodiments of which the invention may partake.

Referring to the drawings, Figure 1 shows the machine, in front elevation, mounted on the chassis or frame of an auto-truck;

Fig. 2 is a side elevation of the same;

Fig. 3 is a top plan view;

Fig. 4 is a fragmentary plan of the gearbox and its associated parts;

Fig. 5 is a section on line 5—5, Fig. 4;

Figs. 6 and 6^a are detail views showing the manner of securing the machine to the chassis; and

Fig. 7 is a detail showing the slidable connection between the auger shaft and its driving gear.

Referring to the drawings, and particularly to Figs. 1, 2 and 3, A designates the outlines of a motor car, the wheels thereof being shown at B. A plurality of I-beams 8, positioned transversely with reference to the channel beams 9, forming the side members of the chassis of the motor vehicle A, constitute a stationary frame or platform. The ends of I-beams 8 are secured to the channel beams 9 through the medium of bolts 10, clamps 11 and nuts 12, said bolts extending through the upper flanges of the channel irons 9 constituting the side frame of the chassis, as clearly appears, in detail, in Figs. 6 and 6^a.

Superimposed on the stationary frame described is a movable frame or platform embodying a plurality of I-beams 13 positioned above and extending in alinement with I-beams 8, and the further set of I-beams 13' extending at right angles to beams 13 and secured thereto by gusset pieces 14, see Fig. 3, thereby forming a rectangular frame. Two of the I-beams 13 of the movable platform are provided with legs 15, in each of which are journaled rollers 15' and 15², the rollers 15' riding on the upper face of the flanges of I-beams 8, and the rollers 15² on the under face thereof (see Figs. 1, 2 and 6), whereby the movable frame may be reciprocated with reference to the stationary frame by mechanism, hereinafter described.

Journaled in standards 16, 17, extending upwardly from the fixed frame, is the main or driving shaft 20 of the boring mecha-

nism. Shaft 20 is driven from the engine shaft 22 or shaft from the reversible transmission gear through the medium of gear 21 on shaft 20, gear 23 on the engine shaft and the sprocket chain 25 which meshes with said gears.

Fixed to the shaft 20 (see Fig. 3) is a miter gear 26 cooperating with another miter gear 27 mounted on a counter-shaft 28 journaled in bearings 29 and 30 positioned on the movable and fixed platforms respectively. Secured to the forward end of shaft 28 is a miter gear 31 meshing with a miter gear 32 fixed to shaft 33, whereby the latter is driven.

In order that shaft 28 may accommodate itself to different positions of the movable platform without disturbing the operative relation of gears 26 and 27, said shaft 28 is adjustably slidable through its bearing 30 and miter gear 27, thereby permitting the movable table to be shifted to different positions without changing the positions of gears 26 and 27. When the table has been placed in its operative position for drilling, the gear 27 may be fixedly secured to shaft 28 in any suitable way. The bearing 29 is supported from any suitable crossing 29' which connects two adjacent parts 13, as shown in Fig. 3.

Secured to the inner end of shaft 33 is a pinion 34 which meshes with a gear 35, fixed to the auger or jack shaft 36, to the bottom of which shaft is detachably secured, in any suitable manner, (see Fig. 7) the auger or boring tool 37. The pinion 35 and gear 34 are housed within a gear-box 38, which forms a bearing for the auger shaft 36 (see Figs. 1 and 4). Fixed to the upper end of shaft 36 is a cross-head 39, slidably mounted in a suitable frame or tower, hereinafter to be described, for the purpose of raising and lowering the auger and its shaft.

Pinion 34 and gear 35 are fixedly mounted in the gear box 38, and this construction necessitates, of course, that the auger shaft 36 be slidably mounted relative to gear 35, in order that said shaft may be reciprocated therethrough. This slidable movement may be effected in any suitable manner, as by providing the shaft 36 with a key-way as 36', and the gear 35 with a feather 35^a that fits therein, (see Fig. 7) thereby coupling the shaft and gear for rotation, but permitting of a sliding or reciprocating movement of the shaft relative to the gear.

Secured to shaft 33 is a gear 40 which meshes with a gear 41 fixed to the end of shaft 42, which shaft is supported in bearings 43, 44 (see Fig. 1) mounted on the tower in a manner hereinafter to be described. To the opposite end of shaft 42 is fixed a gear 45 which meshes with a gear 46 secured to shaft 47, mounted in bearings 18, 19, on the movable platform. It will,

thus, be seen that power may be transmitted from shaft 33 through shaft 42 and associated gearing to shaft 47.

The tower, hereinbefore referred to, embodies any suitable form of supporting structure, such as angle irons 51, the upper ends of which are connected by a tie member 51', and the lower ends of which are connected by cross-pieces, pivotally mounted on shafts 33 and 47, thereby providing for a tiltable movement of the frame, for the purposes hereinafter specified. This tower may be reinforced by means of a cross-piece 52, from which extend inclined members 53, the lower ends of which are provided with forked members 53' which pivotally straddle shafts 33 and 47, laterally of bearings 19, thereby enabling the bracing members 51 to partake of the movements of the tower, whereby the tower and its reinforcing members may be inclined at such angle as to transport it effectively, but, more particularly, to enable the auger to be presented to the surface to be drilled, whether horizontal or inclined, at any desired angle.

The tower may be securely held in its vertical or inclined positions by means of pipes 54, pivoted at their lower ends, as at 55, to the movable platform. The inclination of the tower is effected by means of slidable sleeves 56 on pipes 54, said sleeves being connected by a tie member 57. Pipes 54 and sleeves 56 are provided with registering openings, thereby permitting the sleeves to be locked in any desired position on the pipes by pins 58.

The mechanism for raising and lowering the auger shaft embodies a gear 59 fixed to shaft 42 (see Figs. 2, 3, 5 and 6) and this cooperates with a gear 60 mounted on a shaft 61 journaled in housings 62, extending upwardly from the top of the tower. The endless chain 63 cooperates with gears 59, 60; and the cross-head 39, heretofore described, is provided with a tooth or lug 64 secured to the chain, whereby the cross-head partakes of the movement of the chain, thereby lifting or lowering the auger shaft and auger in synchronism therewith.

The movable platform, carrying the drilling machine, is reciprocated on the fixed platform by the mechanism now to be described. Fixedly mounted on one of the I-beams 8 are gear wheels 65 on which travels the endless chain 66, movement being imparted to said chain through the medium of crank 67 which directly drives one of the gear wheels. Depending from the adjacent beam 13 of the movable platform is a tooth or lug 68 which has a fixed connection with chain 60, whereby said movable platform may be reciprocated in either direction depending upon the direction of motion imparted to crank 67.

It is usually desirable, in order to give the

boring mechanism an extended range of operation, to provide for extending that portion of the movable frame carrying the boring tool somewhat beyond the side bar of the chassis. There are various ways in which this might be accomplished as is obvious or a simple way is shown in Fig. 2, wherein the I-beams 8, on which the rollers 15, 15' of the movable frame ride, are extended laterally.

From the foregoing description, the mode of operation of the machine will be readily understood, but it may be briefly described as follows. The motor car having been driven to the desired vicinity, and the boring tool properly centered for its work, by suitably adjusting the movable platform, power is then imparted to the main driving shaft 20 of the boring mechanism, whereupon the boring tool is forced to its work by the mechanism described. Upon reaching the desired depth, the transmission gear of the motor engine is reversed whereupon the boring tool is withdrawn, carrying with it the loosened earth. Any suitable means, which it is not deemed necessary to illustrate, may be employed for readily throwing shaft 20 out of operative engagement with the engine shaft.

The machine is particularly speedy and efficient in operation and requires no special skill in its operation. Moreover, it is adaptable, or can be readily made adaptable, for use on any special or standard motor car.

It will be understood that slight changes may be made in the mechanism described, such as the substitution of equivalents, or a change in location of the boring mechanism with respect to the motor car engine, without departing from the spirit or substance of the invention, the scope of which is commensurate with the appended claims.

Having, thus, fully described by invention, what I claim as new, and desire to secure by Letters Patent, is:

1. An earth boring machine embodying a stationary frame adapted to be attached to the chassis of a motor car, a movable frame mounted for reciprocal movement on the stationary frame, earth boring mechanism mounted on the movable frame, means for driving said boring mechanism from the power shaft of the motor car and means for compensating for the different positions of the movable platform without disturbing the positions of the power shaft of the motor car or its immediately driven elements of the boring mechanism.

2. In an earth boring machine, a stationary frame adapted to be attached to a motor chassis, a movable frame mounted on the fixed frame for reciprocating movement, earth boring mechanism mounted on the movable frame with its main driving shaft journaled in said fixed frame, means connecting said driving shaft with the motor

shaft of the motor car, means for varying the position of the boring mechanism and means for compensating for the different positions of said boring mechanism without disturbing the operative relations of the motor shaft and the main driving shaft of said boring mechanism.

3. In an earth boring machine, a stationary frame adapted to be attached to a motor chassis and extend laterally thereof, a movable frame mounted on the fixed frame for reciprocating movement laterally of the chassis, earth boring mechanism mounted on the movable frame with its main driving shaft journaled in said fixed frame, means connecting said driving shaft with the motor shaft of the motor car, means for varying the position of the boring mechanism and means for compensating for the different positions of said boring mechanism without disturbing the operative relations of the motor shaft and the main driving shaft of said boring mechanism.

4. In a machine of the class described, a truck provided with a motor, longitudinally disposed sills mounted on said truck, beams secured transversely of said sills, a movable frame mounted to run longitudinally of said beams and means, provided with an adjustable driving mechanism, connected to the motor and mounted on said movable frame for digging a hole.

5. In a machine of the class described, a motor truck with longitudinally disposed sills, beams fixed to said sills to form a fixed frame and a movable frame mounted so as to be shifted thereon, earth boring means mounted on said movable frame and adjustable mechanism for driving said earth boring means regardless of the position of the movable frame with reference to the fixed frame.

6. In a machine of the class described, a motor truck provided with a suitable motor and side sills, transversely mounted beams fixed to said sills, a movable frame carried by said beams and supported thereby, a pair of sprocket wheels mounted on one of said beams, a chain running over said wheels, means detachably connecting the movable frame to the chain, whereby said frame may be shifted by moving said sprocket wheels and earth boring mechanism mounted on the movable frame.

7. In a machine of the class described, a motor truck with a wheel base, a motor and longitudinally extending sills mounted on said truck, transversely disposed beams fixed to said sills and extending beyond the wheel base, a movable frame mounted on said beams, means for shifting the frame so that it may be placed at any desired position within the range of its movement, means for boring a hole mounted on said movable frame and transmission mechanism coöper-

ating with the motor and the hole boring means for operating the latter.

8. In a machine of the class described, a motor truck having mounted thereon a motor and longitudinally extending sills, beams fixed to said sills and extending beyond the wheel base of the truck, a frame mounted to move on said beams, means for shifting said frame, earth boring mechanism, and adjustable means for driving the earth boring mechanism from said motor in any position of the movable frame.

9. In a machine of the class described, a motor truck provided with a suitable motor, a shaft running from the motor, a sprocket wheel mounted on said shaft, beams fixed to said truck and extending laterally thereof to form a fixed frame, suitable bearings rising from said beams carrying a shaft, a sprocket wheel on said shaft, a chain connecting said sprocket wheels, a bevel gear fixed to said last mentioned shaft, a second bevel gear engaging with the same, another bearing rising from said frame, a movable frame mounted on said transverse beams, a bearing extending from said movable frame, a shaft connecting said bearings and said last mentioned gear, boring mechanism mounted on said frame and means connecting said boring mechanism with said last mentioned shaft so that the latter may drive the former.

10. In a machine of the class described, a motor truck having a motor with a shaft on which is mounted a sprocket wheel, transversely disposed beams, mounted on the truck, a movable frame mounted on said beams, a second shaft mounted parallel to the engine shaft and supported from bearings, carried by said beams, a third shaft positioned laterally of the second shaft and supported from the movable frame and the beams by suitable bearings, bevel gears connecting said shafts, means for connecting the engine shaft with the shaft parallel therewith so that the former may drive the latter, a hole boring mechanism carried by the movable frame and means for connecting said boring mechanism with the transversely disposed shaft so that this shaft may properly drive the boring mechanism in any position which the movable frame may assume.

11. In a machine of the class described, a truck with a suitable motor, a shaft connected to said motor, a sprocket wheel on

said shaft, transversely disposed beams mounted on said truck, bearings carried by said beams, a second shaft mounted in said bearings, a sprocket wheel on said shaft, a chain connecting the two sprocket wheels so that the engine will drive the two shafts, a movable frame carried by said beams, a third shaft supported by two bearings, one of which is carried by the movable frame and the other by a beam, gears connecting the two driven shafts so that one shaft will drive the other in any position within the limits of movement of the frame, a boring mechanism and suitable means for driving the boring mechanism from said third shaft.

12. In a machine of the class described, a motor truck with transversely disposed beams fixed thereto and mounted thereon, a movable frame mounted on said transversely disposed beams, a tower mounted at one side of said movable frame, a boring mechanism and means for driving the same in any position the frame may be placed and in any position the tower may be made to assume and means for inclining the tower so that a hole may be bored at any desired position or angle within the range of operation of the apparatus.

13. In a machine of the class described, a motor truck provided with a motor and beams mounted on and transversely of the truck, a movable frame carried by said beams, a tower carried by said movable frame, a digging mechanism carried by said tower and frame and adjustable means for transmitting power from the motor of the truck to the digging mechanism without regard to the position that this mechanism is made to assume with reference to the truck.

14. In an earth boring machine, a motor car, a frame supported by the chassis and movable relative thereto, earth boring mechanism mounted on said movable frame and provided with a driving shaft, means connecting said driving shaft with the motor shaft of the motor car, means for varying the position of the boring mechanism and means for compensating for the different positions of said earth boring mechanism without disturbing the operative relations of the motor shaft from the driving shaft of the boring mechanism.

In testimony whereof, I have signed my name to this specification.

WILLIAM A. MEYERS.

DISCLAIMER.

1,315,565.—*William A. Meyers*, San Francisco, Calif. EARTH-BORING MACHINES.

Patent dated September 9, 1919. Disclaimer filed January 6, 1921, by the assignee, *International Earth Boring Machine Corporation*.

Enters this disclaimer of claims 1 to 14, both inclusive, of the above-entitled Letters Patent.

[*Official Gazette February 22, 1921.*]