No. 867,270. PATENTED OCT. 1, 1907.

J. O. HIMBLE.

EXCAVATOR.

APPLICATION FILED JAN. 25, 1907.

3 SHEETS—SHEET 1.

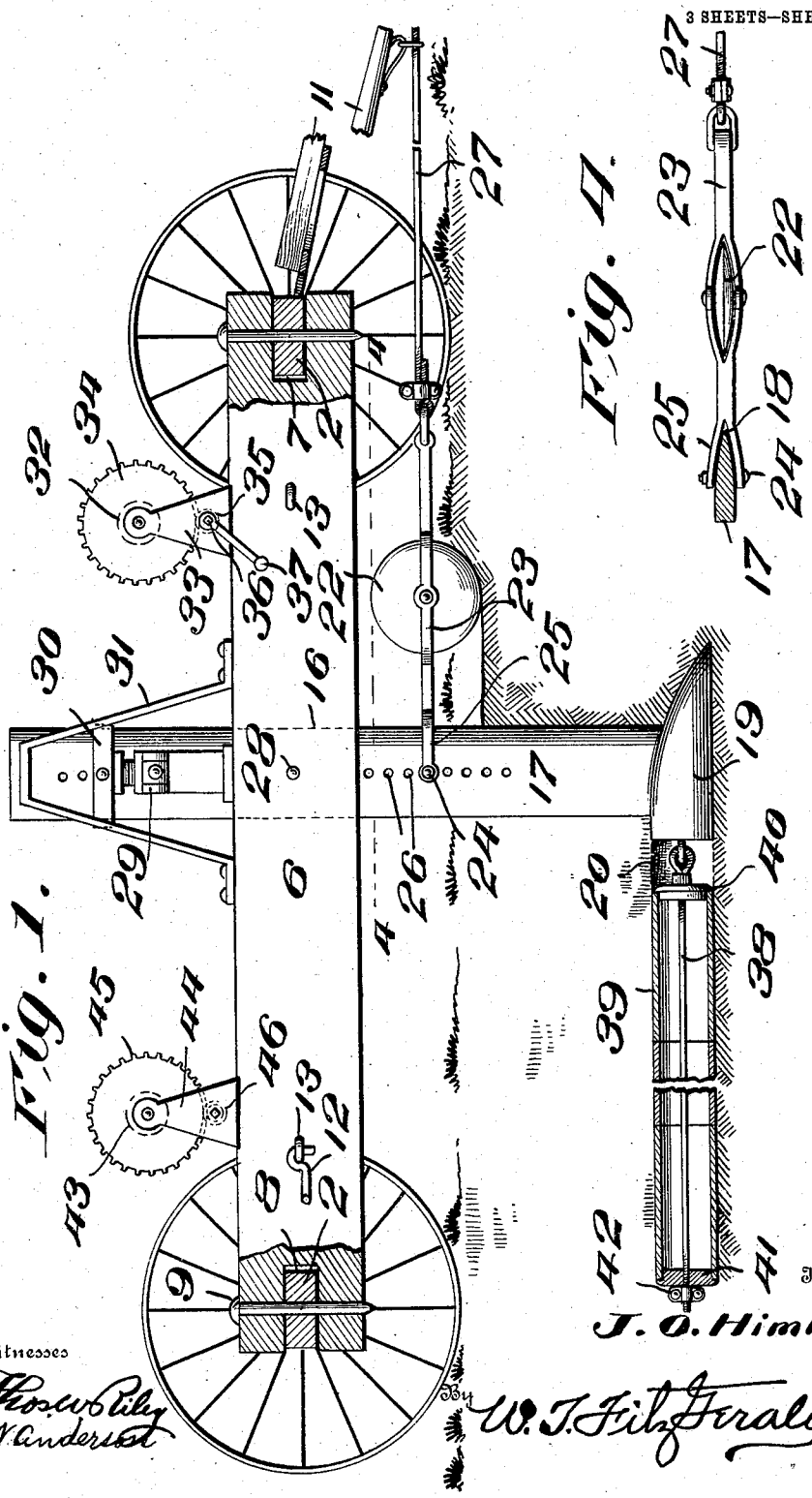

Fig. 1.



Fig. 4.

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3 SHEETS—SHEET 2.

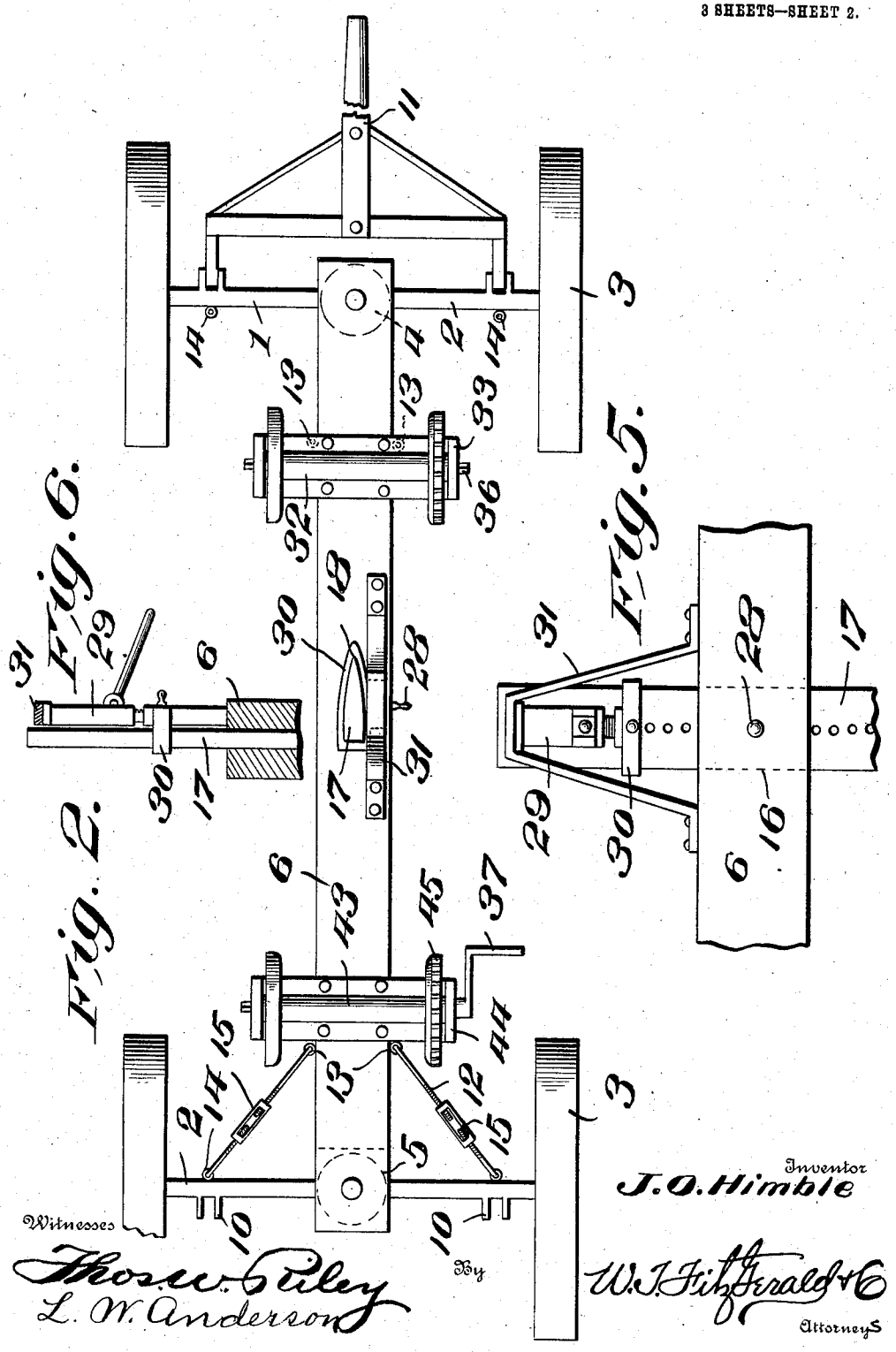


Fig. 2.




Fig. 5.

Fig. 6.

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3 SHEETS—SHEET 3.

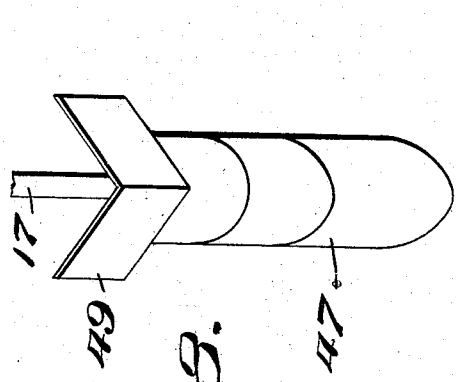


Fig. 8.

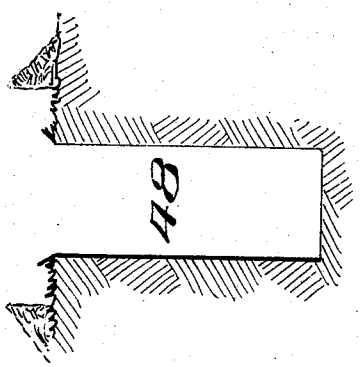


Fig. 9.

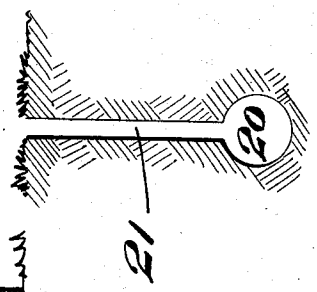


Fig. 7.

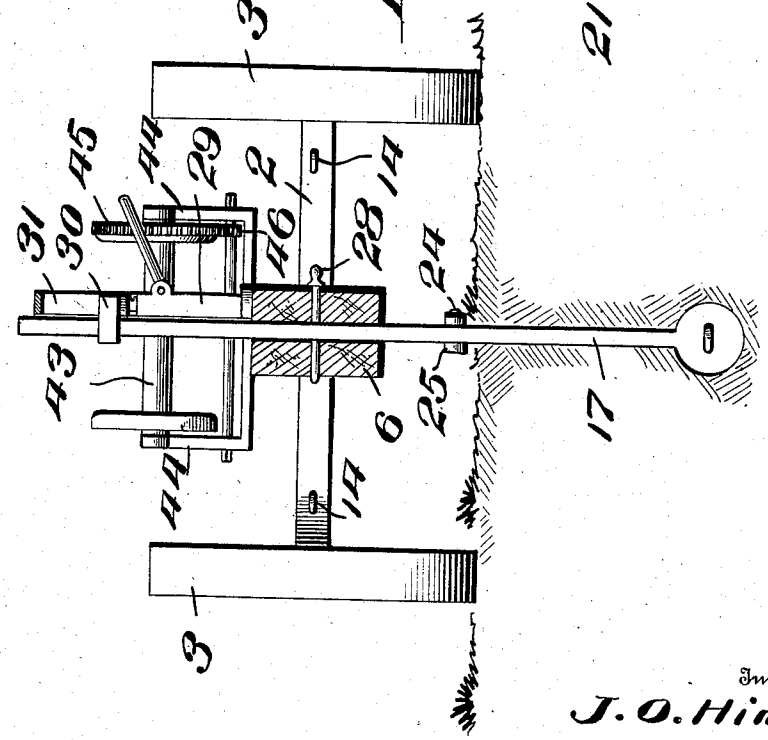


Fig. 3.

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# UNITED STATES PATENT OFFICE.

JOHN O. HIMBLE, OF BOSWELL, PENNSYLVANIA.

## EXCAVATOR

No. 867,270. Specification of Letters Patent. Patented Oct. 1, 1907.

Application filed January 25, 1907. Serial No. 354,059.

*To all whom it may concern:*

Be it known that I, JOHN O. HIMBLE, a citizen of the United States, residing at Boswell, in the county of Somerset and State of Pennsylvania, have invented certain new and useful Improvements in Excavators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to new and useful improvements in irrigating devices and more particularly to that class adapted to be used for making underground passages in marshy or swampy land and the advantages will be hereinafter referred to and more particularly pointed out in the claims.

In the accompanying drawings which are made a part of this application, Figure 1 is a side elevation of my improved machine partly in section and showing the same in operation. Fig. 2 is a top plan view thereof. Fig. 3 is a transverse vertical sectional view through the machine. Fig. 4 is a detail sectional view as seen from line 4—4 Fig. 1. Fig. 5 is a detail elevation showing the manner of directing the conduit former into the earth under pressure. Fig. 6 is an edge elevation thereof, partly in section. Fig. 7 is a sectional view of the conduit. Fig. 8 is an elevation of attachments employed in making an open conduit, and, Fig. 9 shows a conduit formed by the attachments disclosed in Fig. 8.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 and 2 indicate support axles which are provided at each end with supporting wheels 3 and are enlarged at their central portions to form fifth wheels 4 and 5 respectively.

The axles 1 and 2 are mounted in the ends of a reach bar 6, said reach bar being provided with slots 7 and 8 in which are disposed the fifth wheels 4 and 5 respectively, and in order to retain the reach bar into engagement with the axles, king bolts or the like 9 are directed through registering bores in the ends of the reach bar and the fifth wheels thereby pivotally securing the axles to the reach bar.

Each of the axles 1 and 2 is provided with ears 10 which are preferably arranged in pairs and at opposite ends of the axles, said ears being adapted to receive and support a guide tongue 11 and it is my object to use the tongue in connection with either axle so that when it is desired to move the device in the opposite direction without turning the same, the tongue 11 may be disengaged from one of the axles and connected to the opposite axle so that the device can be readily propelled in the opposite direction without turning the same from end to end.

I have also provided means for holding the axle not in engagement with the tongue, at right angles to and rigid with the reach bar and to this end I have provided stay-rods 12, one for each side of the reach bar and are secured thereto by means of eyes 13 while the opposite ends of said stay-rods are secured to the axles by similar eyes 14 so that when said rods are connected to the respective eyes, the axle so engaged will be held rigid with the reach bar.

The stay-rods are preferably formed in two sections and threaded to receive turn-buckles 15 so that the rods may be readily and quickly adjusted to compensate for any wear. Directed vertically through the reach bar 6 and substantially in the central portion thereof is an opening 16 through which is disposed a beam 17, one edge 18 of said beam being tapered or wedge-shaped so that when the beam is drawn forwardly through the earth it will cut and readily separate the same.

Secured to the lower end of the beam 17 is a head 19 which is cylindrical at one end and pointed at the opposite end, the pointed end of the head being coincident with the tapered edge of the beam. The head 19 is greater in diameter than the thickness of the beam 17 so that an enlarged opening or conduit 20 will be formed by the head while the beam 17 forms a narrow path 21 through the earth.

When the machine is being used upon earth having a solid upper surface or sod covering I employ a colter 22 which is adapted to travel directly in front of the beam 17 and sever the upper surface of the earth and said colter is retained in juxtaposition to the beam by means of a supporting bar 23, one end of which is bifurcated and extended into engagement with the beam 17 and is secured thereto by means of a bolt or the like 24, said bolt extending through registering bores in the end of the bifurcated section 25 and through one of a series of bores 26 in the beam 17 while to the forward end of the supporting bar 23 is secured a cable 27, said cable being of sufficient length to extend beyond the outer end of the tongue 11 and to this cable is secured the draft animals and it will be seen that by extending the cable a sufficient distance beyond the end of the tongue any number of draft animals may be hitched thereto.

The bores 26 are placed at intervals substantailly the full length of the beam 17 and the beam is fixed to the reach bar 6 by disposing a pin 28 through the reach bar 6 and one of the bores 26 so that said beam may be adjusted to any suitable height.

In order to readily direct the beam and head into or out of the earth I employ a power jack 29 which may be of the usual or any preferred form and when the jack is employed to raise the beam, one end thereof is seated upon the upper surface of the reach bar 6 while the opposite end thereof is directed into engagement with a block 30 secured to the side of the beam 17. When, however, the jack is employed for directing the

beam and head into the earth, the jack is inverted and one end thereof disposed into engagement with a bracket 31 carried upon the reach bar 6 and when the jack is thus employed it engages the opposite side of the block 30 so as to direct downward pressure thereon, the position of the jack when employed for elevating the beam being shown in Fig. 1 of the drawings and the position of the jack when lowering the beam being shown in Fig. 5.

When the cable 27 is not in use as when the machine is being transported from place to place, said cable is wound upon a drum 32 which is mounted in suitable standards 33 on the forward end of the reach bar 6, said drum having a gear 34 at one end thereof with which meshes a pinion 35 mounted on a stub shaft 36, the outer end of said stub shaft being provided with a crank 37 by which means the drum is rotated.

When it is desired to place tile or the like in the cavity formed by the head 19 I secure to the cylindrical end of the head 19, a cable 38 upon which is disposed a plurality of tile 39 so that as the machine is moved forwardly the string of tile upon the cable will be drawn into the orifice 20, the tile being secured upon the cable by disposing disks 40 and 41 upon the cable and at opposite ends of the string of tile, the disk 40 being adjacent the head 19 and the disk 41 being held in position by means of a clamp 42 and as soon as the string of tile has been disposed within the conduit the head 19 is raised above the surface of the ground whereupon the forward end of the cable 38 is secured to a rope or cable which is then attached to a drum 43 at the rear end of the reach bar 6, and the clamp 42 is released said drum being carried in standards 44 similar to the drum 32 and the drum 43 is also provided with a gear 45 which meshes with a pinion 46 and motion is imparted to the drum 43 in like manner to the drum 32 and the cable 38 removed, for use again.

The device herein described is adapted more particularly to be used in swampy places where it would be impossible to dig a ditch in the usual manner and in operation the beam containing the head 19 is forced into the ground by means of the jack 29 after which the draft animals are driven forward, the head 19 forming a conduit and if it is desired to place tile within the conduit thus made a long string of tile is mounted upon the cable 38 and said cable is secured to the head 19 so that as the machine is moved forwardly the tile will be drawn into the conduit and by bringing the forward end of the head 19 and the forward edge of the beam 17 to a point it will be readily seen that the parts thereof will readily separate the soil as the machine is moved forward. It will further be seen that the path 21 formed by the beam 17 will readily close after the beam is passed therethrough. When it is desired to form an open ditch or conduit as shown in Fig. 9 of the drawing I employ a plurality of shovels or mold boards 47 which are secured to the beam 17 so that when said beam is moved forwardly the earth will be elevated and it is disposed to either side of the conduit 48, thus formed, by means of a V-shaped guard 49 placed at the upper end of the shovels 47 and it will be understood that by increasing or decreasing the number of shovels upon the beam 17 that the depth of the conduit 48 will be varied accordingly.

What I claim is:

1. In a device of the character described, the combination with a reach bar having an opening therethrough and supporting means at each end of said reach bar, of a vertically disposed beam extending through said opening, a power jack mounted on said reach bar, a bracket mounted on said reach bar, and a block secured to said beam, said power jack being reversible for use with said block for raising and lowering the beam.

2. In a device of the character described, the combination with a reach bar having an opening therethrough and supporting means at each end of said reach bar, of a vertically disposed beam extending through said opening, a power jack mounted on said reach bar, a bracket mounted on said reach bar, a block secured to said beam, said power jack being reversible for use with said block for raising and lowering the beam, and a head carried by the lower end of said beam and extending in advance thereof.

3. The combination with the vertically-movable beam, and a head at the lower end thereof, of a cable pivotally attached to said head, a disk at one end of said cable adjacent said head, a disk at the other end of said cable, and a clamp adjustable on said cable to engage said last-named disk, said disks being adapted to engage within opposite ends of a string of tile.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN O. HIMBLE.

Witnesses:
RUSSELL SCHMUCKER,
H. H. MAYER.