

L. P. CLUTTER.
EXCAVATING MACHINE.
APPLICATION FILED MAR. 3, 1909.

944,320.

Patented Dec. 28, 1909.

3 SHEETS—SHEET 1.

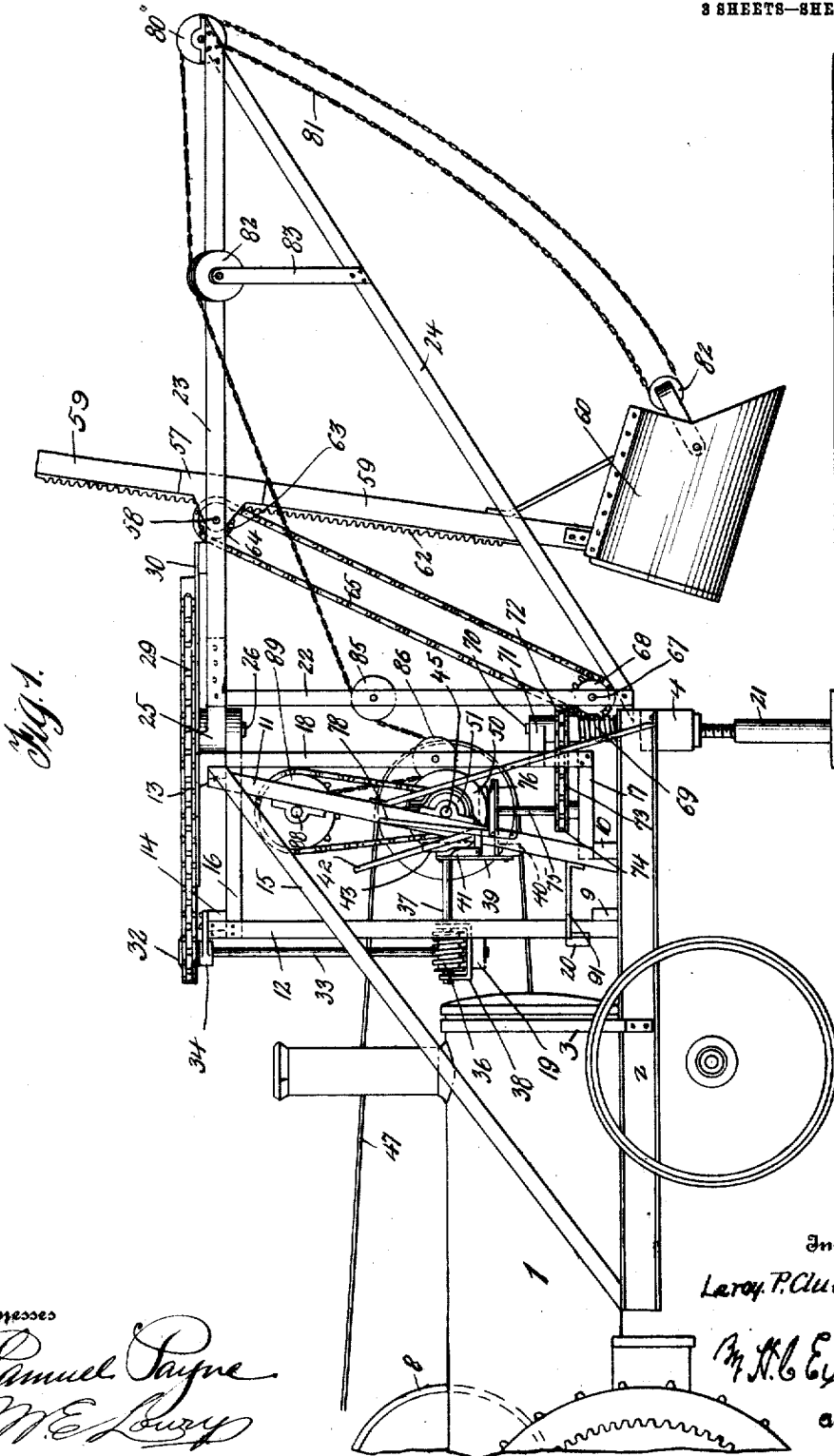


Fig. 1.

Witnesses
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Inventor
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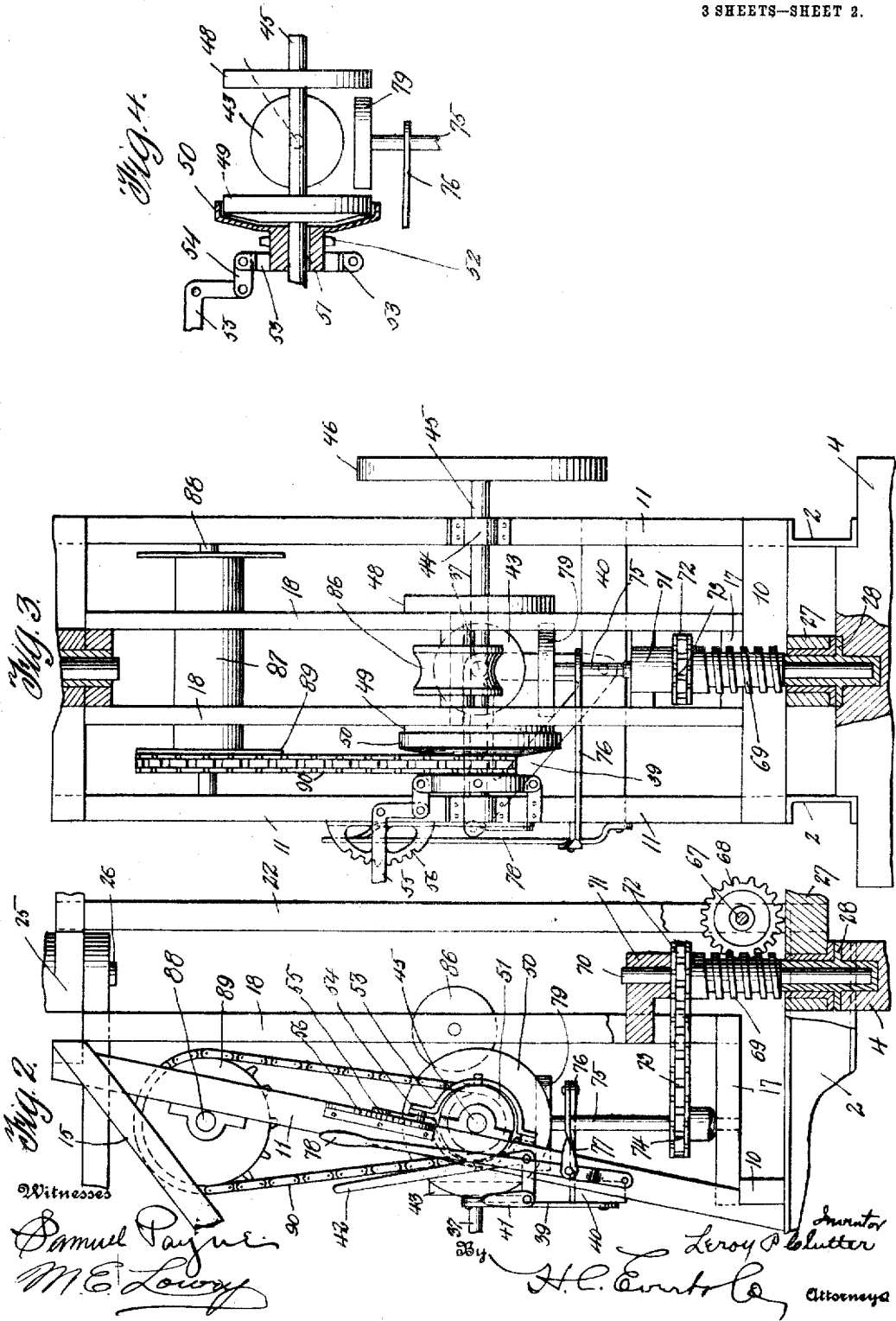
M. H. Everett
Attorneys

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3 SHEETS—SHEET 3.

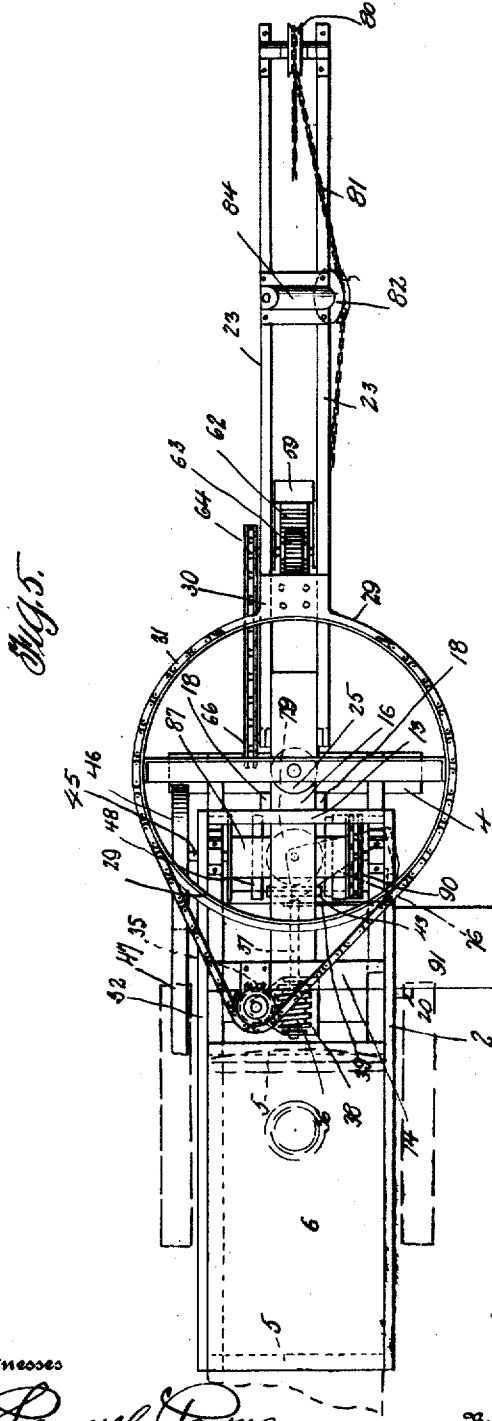


Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

LEROY PARKER CLUTTER, OF DEER LICK, PENNSYLVANIA.

EXCAVATING-MACHINE.

944,320.

Specification of Letters Patent. Patented Dec. 28, 1909.

Application filed March 3, 1909. Serial No. 481,042.

To all whom it may concern:

Be it known that I, LEROY PARKER CLUTTER, a citizen of the United States of America, residing at Deer Lick, in the county of Greene and State of Pennsylvania, have invented certain new and useful Improvements in Excavating-Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to excavating machines, particularly designed for use on land and commonly known as a "steam shovel."

My invention aims to provide a portable excavating machine for all kinds of excavating and rehandling of material. The machine can be used for loading cars, for widening cuts or embankments, cutting down grades, cleaning ditches, digging canals, building up railroad embankments, and so on, through the constantly multiplying variety of uses.

The invention further aims to provide an attachment for an ordinary traction engine such as is used for threshing and contract work. It is a well known fact that a large number of traction engines are merely used for threshing or fodder shredding five or six weeks in a year, and it is in view of this fact that I intend to utilize a traction engine in connection with my invention for grading streets, ditching, making shallow cuts, and working in confined places where ordinary machines could not be used with any success.

To this end, I have devised a portable machine, wherein positive and reliable means are employed for manipulating the shovel or scoop of the machine as though the same were manually handled, said means being compactly arranged and within easy reach of an operator positioned at a safe location upon the machine.

My invention embodies certain novel details of construction that will be hereinafter described and then specifically pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of my machine, Fig. 2 is an enlarged elevation of a portion of the machine partly broken away and partly in section, Fig. 3 is a front elevation of the same partly broken away and partly in section, Fig. 4 is a detail sectional view of a clutch forming part of the operating mechanism of the machine, and Fig. 5 is a plan of the machine as illustrated in Fig. 1.

To put my invention into practice, I provide a suitable frame work with a pivoted jib or crane having a movable shovel or bucket. The frame work is adapted to be attached to the forward end of a traction engine and the mechanism for swinging the jib or crane raising or lowering the shovel or bucket thereof, and for dragging said shovel or bucket, to scoop up a load is operated by the traction engine and controlled by an attendant thereof.

In order that my invention can be clearly understood, the detail construction entering into the same will be described under the following captions: The attachment and the frame work thereof, Jib or crane and the operating mechanism thereof, Shovel or bucket, and the operating mechanism thereof, and The general operation of the excavator.

The attachment and the frame work thereof.—The attachment comprises longitudinal channel bars 2 connected by a lower sill 4. The bars 2 are adapted to be connected to a traction engine 1 by a strap 3. Mounted upon the bars 2 adjacent to the forward ends thereof are transverse beams 9 and 10. Connected to the beams 9 and 10 are two sets of uprights 11 and 12 having the upper ends thereof connected by transverse braces 13 and 14 respectively. The sets of uprights 11 and 12 are tied together by angularly disposed side stringers 15, having the lower ends thereof fixed upon the rear ends of the bars 2. The transverse braces 13 and 14 are connected by a longitudinal central bearing 16, and the beam 10 is provided with a forwardly extending central bearing 17, said bearings 16 and 17 being connected by vertical frames 18. The uprights 12 are connected by transverse braces 19 and 20, for a purpose that will hereinafter appear. In connection with the attachment, suitable jacks 21 and anchors, (not shown) can be used for fixing the attachment and engine to a roadbed or truck upon which it travels, whereby the attachment can be tilted when the excavator is in operation.

Jib or crane and the operating mechanism thereof.—The jib or crane comprises a mast made of two uprights 22, a boom made of two beams 23, and diagonally disposed beams 24, connecting the outer ends of the beams 23 to the lower ends of the uprights 22, said uprights and beams providing a tri-

angular structure of sufficient rigidity to withstand the strains and stresses to which it is subjected when the excavator is in operation. The upper end of the mast is provided with a bearing block 25 fixed between the upper ends of the uprights 22 and the rear ends of the beams 23. This bearing block is connected to the forward end of the bearing 16 by a pin 26. The lower end of the mast is fitted with a bearing block 27, said block being secured between the lower ends of the beams 24. In the sill 4 is mounted a socket bearing 28 and loosely mounted upon said bearing and surrounding a socket portion thereof is a bearing block 27, serving functionally as a king bolt to pivot a jib or crane. To swing the jib or crane in a horizontal plane, I provide the bearing block 25 with a large horizontal wheel 29, said wheel being fixed to the boom of the jib, as at 30. Secured to the periphery of the wheel 29 and adjacent to the boom of a crane are the ends of a sprocket chain 31, said chain extending rearwardly over a sprocket wheel 32, mounted upon a vertical shaft 33, journaled in a bearing 34 carried centrally of the brace 14, said shaft also being journaled in a brace 19. Upon the shaft 33 at the lower end thereof is mounted a gear wheel 35 adapted to mesh with a worm 36 mounted upon the longitudinal shaft 37 journaled in a bearing 38 swiveled upon the brace 19. The forward end of the shaft 37 is journaled in a bearing 39 fulcrumed upon a transverse brace 40 carried by the uprights 11. The bearing 39 is pivotally connected by a link 41 to a bell crank lever 42, which is pivotally connected to the upright 11. By moving a lever 42 the rear end of the shaft 37 can be moved, and this rear end of the shaft is provided with a friction clutch wheel 43 adapted to be driven, as will hereinafter appear, for swinging the jib or crane in a horizontal plane. The forward sides of the uprights 11 are provided with transverse alining bearings 44 for a main operating shaft 45, said shaft having a belt wheel 46 for a belt 47, this belt being driven by the belt wheel of the engine 1. Mounted upon the shaft 45 are two clutch wheels 48 and 49, adapted to be engaged by a frictional clutch wheel 43, for swinging the jib or crane. The latter clutch wheel 49 is adapted to be engaged by a clutch member 50 mounted upon the inner end of a spool 51, said spool being slidably mounted upon the shaft 45 and adapted to rotate therewith. The spool 51 is provided with a sprocket wheel 52 and with a loosely held band 53 for shifting said spool upon the shaft 45, said band being connected by means of a link 54 to a bell crank lever 55, pivoted upon the uprights 11 at the right hand side of the machine. This particular upright is provided with a rack 56 for lock-

ing the lever 55 and either holding the clutch member 50 in or out of engagement with the clutch wheel 49.

Shovel or bucket and the operating mechanism thereof.—The beams 23 of the crane boom support a guide 57, said guide being loosely mounted on a pivot pin 58 journaled transversely of the beams 23. Movably mounted in the pivoted guide 57 is a shovel or bucket arm 59 and to the lower end of this arm is secured a shovel or bucket 60 of the ordinary and well known type, having a trip drop bottom 61. The arm 59 is provided with a rack 62 adapted to mesh with a pinion 63 mounted upon the pin 58. One end of the pin is provided with a sprocket wheel 64 and over this sprocket wheel passes an endless sprocket chain 65, said chain also passing over the sprocket wheel 66 mounted upon the end of the shaft 67, journaled in the mast of the crane. Upon the shaft 67, between the uprights 22 of the crane mast is a gear wheel 68 adapted to mesh with a worm 69 mounted upon a vertical shaft 70, journaled in the socket bearing 28 and the bearing 71 carried by the frames 18. Upon the shaft 70 is mounted a sprocket wheel 72 and over this sprocket wheel extends a sprocket chain 73, which also passes over a sprocket wheel 74, mounted upon a vertical shaft 75 having the lower end thereof loosely journaled in the bearing 17. The upper end of the shaft 75 is journaled in a pivoted bearing 76, carried by a transverse brace 40. This pivoted bearing 76 is connected by a link 77 to a lever 78 pivotally mounted upon the upright 11 at the right hand side of the machine. The upper end of the shaft 75 is provided with a frictional clutch wheel 79 adapted to engage either of the clutch wheels 48 or 49.

The jib or crane head is provided with a revoluble sheave 80, and attached to said head is a chain or cable 81 extending downwardly around a sheave 82, carried by the shovel or bucket 60. This chain or cable extends upwardly over the sheave 80 and over a revoluble sheave 82 supported at one side of the jib or crane by bearings 83 and 84. The chain or cable extends rearwardly over a sheave 85 journaled in the uprights 22 of the crane mast. The chain or cable then passes under a sheave 86 journaled between the frames 18 and upwardly to a drum 87, mounted upon a shaft 88, journaled upon the uprights 11. The chain or cable is attached to this drum and is adapted to wind thereon for dragging the shovel or bucket 60. One of the heads of the drum 87 conforms to a sprocket wheel 89 and over this sprocket wheel and the sprocket wheel 52 is mounted an endless sprocket chain 90.

General operation. From the foregoing description, it will be observed that the le-

vers 42, 55 and 78 are located upon the right hand side of the machine, and in order that these levers can be easily manipulated, the uprights 11 and 12 are provided with an outwardly extending platform 91 upon which an operator or machine attendant stands for moving the jib or crane and the shovel or bucket carried thereby. Assuming that the engine 1 has been placed in operation, the rotary movement will be imparted to the shaft 45. When the lever 55 is moved to place the clutch member 50 in engagement with the clutch wheel 49, the drum 87 will be rotated to wind the chain or cable 81 thereon and drag the shovel or bucket 60 into the material to be scooped up or excavated. Simultaneous with this movement, the shovel or bucket can be raised or lowered. This is accomplished by manipulating the lever 78 to shift the bearing 39 and place the wheels 79 into frictional engagement with the clutch wheel 49 and 48. After the shovel or bucket has been loaded and raised to clear the cut or pile from which the material has been removed, the jib or crane is swung to place the shovel or bucket over a dump or a car for receiving the contents of said shovel or bucket. This is accomplished by moving the lever 42 to shift the bearing 39 and place the wheel 43 in frictional engagement with either of the clutch wheels 48 or 49, according to the direction in which the jib or crane is to be swung.

I reserve the right to provide the engine 1 with a suitable canopy for protecting the engine and the operating mechanism of the machine.

While in the drawings forming a part of this application, there is illustrated the preferred embodiments of my invention, I would have it understood that the details of construction can be varied or changed as to the shape, proportion and manner of assembly without departing from the spirit of the invention.

Having now described my invention, what I claim as new, is:—

1. In an excavating machine, the combination with an engine, of a frame work carried by said engine, a jib pivotally supported by said frame work and adapted to be swung in a horizontal plane, an arm movably supported by said jib, a shovel carried by the lower end of said arm, a main shaft journaled transversely of said frame work and adapted to be driven by said engine, clutch wheels mounted upon said shaft, movable bearings supported by said frame work, an auxiliary shaft journaled in each of said movable bearings and each having a wheel for frictionally engaging one of said clutch wheels, a sprocket chain driven through the medium of one of said friction wheels for raising and lowering said shovel

arm, a sprocket chain driven through the medium of the other of said friction wheels for swinging said jib in a horizontal plane, a movable clutch member for engaging one of said clutch wheels, a drum revolvably supported by said frame work and driven through the medium of said clutch member, and a chain or cable attached to said drum and extending over the outer end of said jib and connecting with said shovel for raising said shovel and a supporting arm thereof, substantially as described.

2. In an excavating machine, the combination with an engine, a frame work carried thereby, a horizontal movable jib pivotally supported by said frame work, an arm movably supported by said jib, and a shovel carried by said arm, of a mechanism for moving said jib, said arm, and said shovel, said mechanism comprising a revoluble main shaft supported by said frame work, clutch wheels mounted upon said shaft, movable bearings supported by said frame work, auxiliary shafts journaled in said bearings, friction wheels mounted upon said auxiliary shafts for engaging said clutch wheels, a sprocket chain actuated through the medium of one of said friction wheels for swinging said jib in a horizontal plane, a sprocket chain actuated through the medium of the other of said friction wheels for raising and lowering said shovel arm, a clutch member adapted to engage one of said clutch wheels, a drum revolvably supported by said frame work and adapted to be actuated through the medium of said clutch member, and a chain connecting with said shovel and extending upwardly through the outer end of said jib and connecting with said drum for moving said shovel, and means located at one side of said machine for shifting said movable bearings and said clutch member.

3. In an excavating machine, the combination with an engine, a frame work carried thereby, a horizontal movable jib pivotally supported by said frame work, an arm movably supported by said jib, and a shovel carried by said arm, of a mechanism for moving said jib, said arm and said shovel, said mechanism comprising a revoluble main shaft supported by said frame work, clutch wheels mounted upon said shaft, movable bearings supported by said frame work, auxiliary shafts journaled in said bearings, friction wheels mounted upon said auxiliary shafts for engaging said clutch wheels, a sprocket chain actuated through the medium of one of said friction wheels for swinging said jib in a horizontal plane, a sprocket chain actuated through the medium of the other of said friction wheels for raising and lowering said shovel arm, a clutch member adapted to engage one of said clutch wheels, a drum revolvably

supported by said frame work and adapted to be actuated through the medium of said clutch member, and a chain connecting with said shovel and extending upwardly through
5 the outer end of said jib and connecting with said drum for moving said shovel.

4. In an excavating machine, the combination with a portable frame work, a jib supported thereby and adapted to swing in
10 a horizontal plane, a shovel arm movably supported by said jib, and a shovel carried by said arm, of means for moving said jib and shovel arm, said means including a driven shaft, clutch wheels carried thereby,
15 frictional wheels adapted to be placed in

engagement with said clutch wheels, a mechanism actuated by one of said friction wheels for moving said jib, mechanism actuated by the other of said friction wheels for moving said shovel arm, a clutch member adapted to engage one of said clutch wheels and a mechanism actuated by said clutch member for moving said shaft.

In testimony whereof I affix my signature in the presence of two witnesses.

LEROY PARKER CLUTTER.

Witnesses:

MARTIN E. EALY,
WILLIAM S. DAY.