

O. J. MARTINSON.

TRACTOR.

APPLICATION FILED MAR. 24, 1913.

1,101,459.

Patented June 23, 1914.

3 SHEETS-SHEET 1.

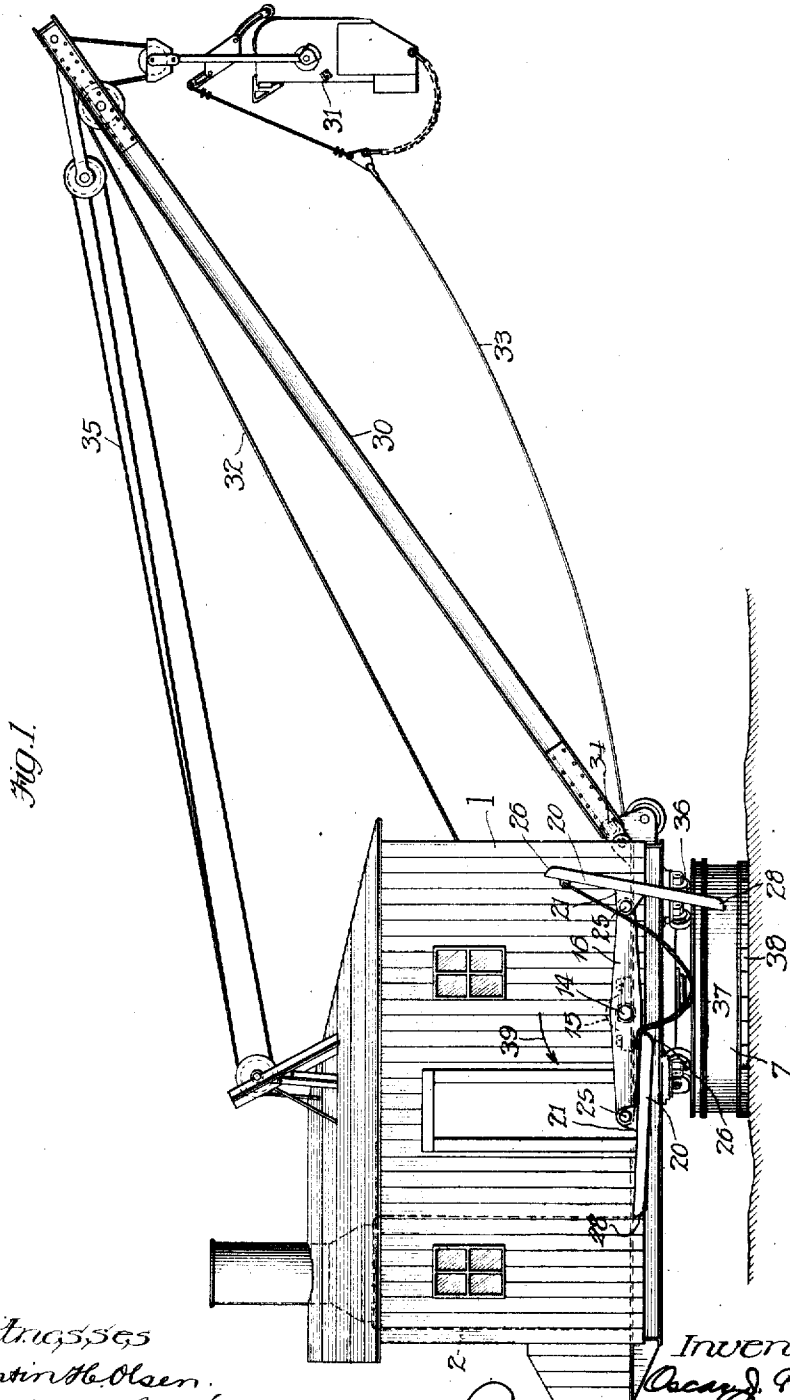


Fig. 1.

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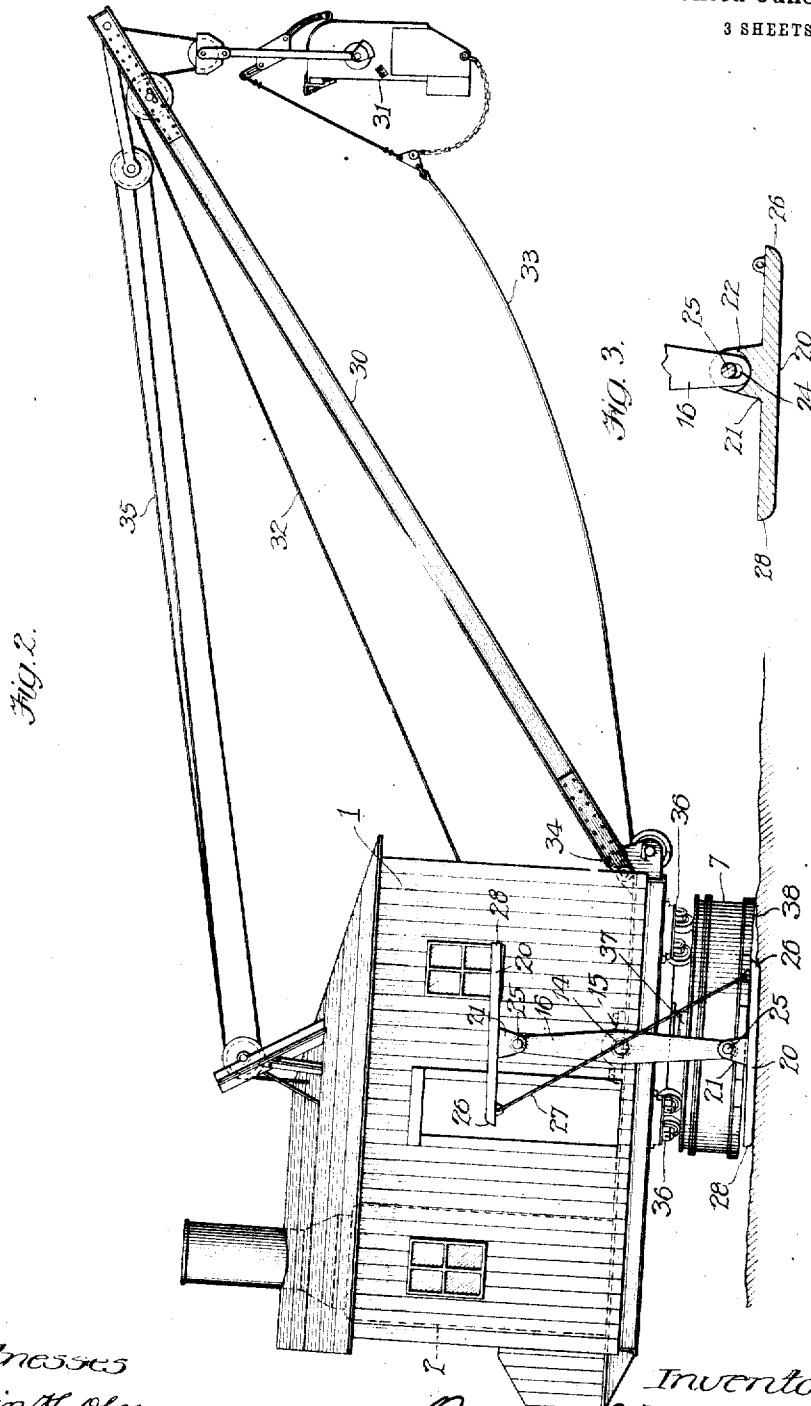
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Witnesses
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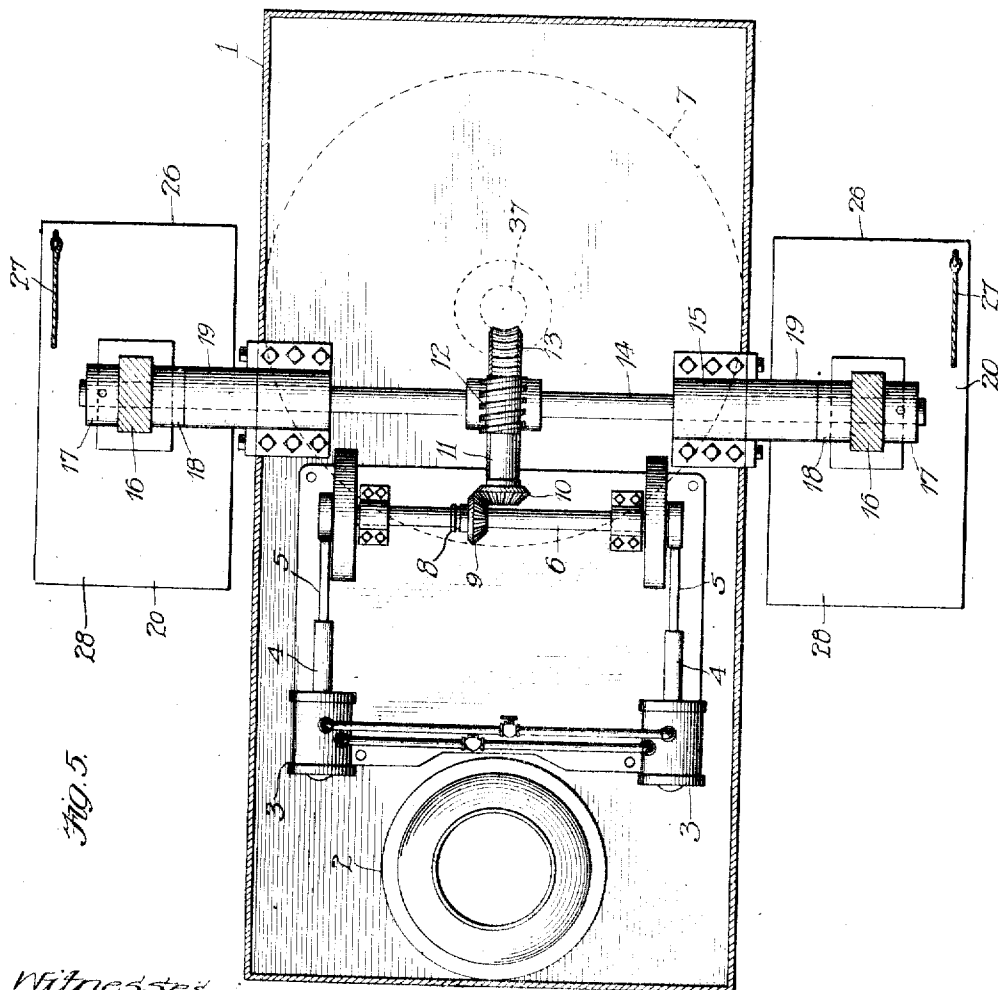
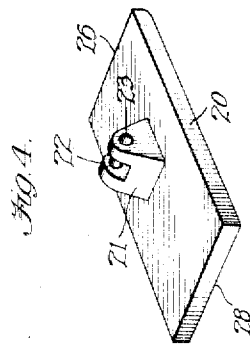
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3 SHEETS-SHEET 3.



Witnesses
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UNITED STATES PATENT OFFICE.

OSCAR J. MARTINSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO MONIGHAN MACHINE CO.,
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TRACTOR.

1,104,459.

Specification of Letters Patent.

Patented June 23, 1914.

Application filed March 24, 1913. Serial No. 756,473

To all whom it may concern:

Be it known that I, OSCAR J. MARTINSON, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Tractors, of which the following is a specification.

The main objects of the invention are to combine with an excavating machine, land dredge, or other machine which must be moved over rough ground, a suitable propelling mechanism which is operative by the engine or motor of the excavating machine to cause the latter to make step by step movements in any direction, while so located and arranged as not to interfere with the normal digging operation or the rotation of the machine on its support; and to provide a propelling mechanism for the entire machine which is mounted on the rotatable part of the machine.

A further object of the invention is to provide suitable propelling mechanism for excavating machines, etc., which is capable of moving the machine over comparatively rough surfaces, and requiring the simple operation of connecting its motor with the propelling mechanism and turning the machine on its platform in the direction desired.

A further object of the invention is to provide improved walking mechanism for excavating machines including pairs of rotating feet with automatic mechanism for causing the bottom of the feet to properly engage the earth.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Figure 1 is a side elevation of an excavating machine equipped with tractor mechanism constructed according to this invention. Fig. 2 is a side elevation similar to Fig. 1 but shows the machine as it would appear when being propelled over the ground. Fig. 3 is a detail in section of one of the propelling shoes. Fig. 4 is a perspective view of one of the propelling shoes. Fig. 5 is a plan view partly in section of the excavating machine showing the relation between its engine, propelling mechanism, and supporting platform.

With excavating machines of the general type shown including steam shovels, land dredges, etc., as at present constructed, much

difficulty and loss of time is encountered in moving the machines over the ground as required when the machines are at work. Sometimes they are provided with wide rimmed wheels for supporting the machines which necessitate the placing of planks in order to move the machine along soft or muddy ground, and makes it extremely difficult to move the machine along uneven ground, often requiring much manual labor and loss of the use of the machine for a great part of the time. Some excavating machines rest upon flat platforms which necessitate planking and rollers for moving the machine over the surface of the earth, or they may be provided with pairs of shoes or rails alternately serving to support the machine while it is moved along the same, or one pair of shoes is moved forward relatively to the machine.

In the excavating machine herein shown, propelling shoes are mounted on the body part of the machine which in turn is rotatably mounted on a suitable base. The machine may be quickly turned in any direction under its own power, and then its driving mechanism may be clutched to the propelling mechanism and the machine moved forward as desired, and the propelling mechanism is so designed that by it the machine may be lifted over irregular surfaces.

Referring to the drawings, the numeral 1 indicates a suitable housing for the operating machinery and controlling devices. This operating machinery includes a boiler 2, engine cylinders 3, and the pistons 4, connected through pitmen 5 to driving shaft 6. The drive shaft as usual may be connected to drive various drums for operating the usual boom, hoist, and loading lines, or it may be connected to rotate the housing 1 and contained machinery on the supporting base 7. These connections being usual in machines of this class no specific showing of them is made in the drawings.

The drive shaft 6, by means of a clutch 8, may be connected rigidly with a pinion 9 which is journaled on the drive shaft, and meshes with a pinion 10 fast to a shaft 11 suitably journaled in the frame of the machine. Rigid on the shaft 11 is a worm 12 meshing with a worm wheel 13 fast to a shaft 14 journaled in bearings 15 bolted to the frame of housing 1. Fast on each end of shaft 14 outside of the housing 1 is an

arm 16. The arms 16 are suitably positioned on shaft 14 by collars 17 and 18, and a further support or bearing 19 bolted to the frame of housing 1. The arms 16 are secured to shaft 14 about midway of their ends and pivoted to each end of the levers is a foot 20. Each foot 20 is provided with an ear 21 cut away at 22 to receive an end of one of the arms 16. Passing through holes 23 in the ears and slots 24 in the arms 16 are pins or short shafts 25. The diametrically opposite heels 26 of each pair of feet are connected together by a flexible cable or chain 27, and the opposite or free ends 28 of these feet are heavier than the connected ends 26 because the ears 22 are located closer to the ends 26 than to the ends 28. The flexible link connection between the heels of the feet 20, and the greater weight on the forward ends of the feet, results in the latter flatly engaging the ground upon the rotation of shaft 14, as explained farther on. Fig. 3 shows how the pivotal movement of the feet 20 is limited by reason of the shape of the cuts 22 in ears 21.

The usual boom for supporting a drag bucket is indicated by the numeral 30, and the bucket 31 is hung from the end of the boom by the hoisting line or fall 32. The loading line, by means of which the bucket is dragged along the excavation when being filled, is indicated by the numeral 33. The boom, which is pivoted at 34, is raised and lowered by the usual tackle 35. These lines lead to various drums under control of the operator within housing 1. Roller bearings 36 are secured to the bottom platform of housing 1, and rest on circular tracks or runways on the base 7. A center bearing 37 is also provided between the housing 1 and base 7, and serves to assist in supporting the machine and also to prevent relative lateral movement between it and the base. Securely fastened to the bottom of base 7 is some heavy planking 38 for taking the wear and keeping the iron parts free from the ground. In operation the boom 30 may be swung to any angle with respect to the base 7 by rotating the housing on its bearings. The rotation of the machine on its base is usually effected by gear connections between the engine and the base, or could be effected manually.

The machine may be moved as a whole in any desired direction and short distances as required, as the work progresses in exceedingly short time requiring little or no interruption in the work. To propel the machine over the surface of the ground, clutch 8 is slid into connection with gear 9 thereby causing power from the engine to be transmitted through the shafts 6 and 11 and gearing to the shaft 14. When shaft 14 is at rest in its normal position, the feet 20 are at rest in substantially the angular posi-

tion indicated in Fig. 1, and when shaft 14 rotates in the direction indicated by the arrow 39 the left hand foot 20 (Fig. 1) first engages the earth, and when coming into contact with the earth lies in substantially a horizontal plane and therefore does not tend to dig into the same. Continued rotation of shaft 14 results in bodily lifting the entire machine until it is supported by the pair of shoes 20 in contact with the ground, and the rear end of base 7, as indicated in Fig. 2. The machine is then carried forward through the continued rotation of shaft 14, its center of gravity finally passing over the centers of the shoes on the ground, the machine again coming to rest on its base 7. During the forward movement of the machine the contact of the rear end of base 7 with the earth serves to steady the machine in its movement. That is, by having the center of gravity to the rear of shaft 14 rocking of the machine on this shaft is prevented. When the machine again comes to rest on its base 7, the feet 20, which are being maintained in a substantially horizontal position by contact with the ground, will, through the action of the cable or chain 27, rock the companion feet forward on their pivots 25 and thereby cause their heavy ends to swing forward on pivots 25, so that after the lower feet leave the ground the companion feet will have an angular position such as indicated in Fig. 1, and will therefore properly engage the ground through continued rotation of shaft 14.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. In a machine of the class described, the combination of a base, a machine rotatably mounted thereon, a horizontally disposed shaft movable with said machine, means for rotating said shaft, arms rigidly secured to the ends of said shaft and supporting at each side of the machine a pair of diametrically opposite feet at such distance from the shaft that when the latter is rotated the feet will engage the ground lifting the machine and propelling it forward, the center of gravity of said machine being so located that one side of said base will drag over the earth when the machine is being propelled.

2. In a machine of the class described, the combination of a base, a body rotatably mounted thereon, arms rotatable in vertical planes and mounted on said body, shoes pivoted to the ends of said arms adapted on rotation of said arms to engage the earth and thereby propel said base, means for lim-

iting pivotal movement between said shoes and arms, the heel end of said shoes being heavier than the toe end in order that their toe ends will not engage the earth first on rotation of said arms.

3. In a machine of the class described, the combination of a base, a body rotatably mounted thereon, arms pivoted at their centers to opposite sides of said body, means for rotating said arms, shoes pivoted to the ends of said arms, and a flexible connection between diametrically opposite ends of said shoes.

4. In a machine of the class described, the

combination of a base, a body rotatably mounted thereon, arms pivoted at their centers to opposite sides of said body, means for rotating said arms, shoes pivoted to the between diametrically opposite ends of said shoes, the free ends of said shoes being heavier than the connected ends.

Signed at Chicago this 20th day of March 1913.

OSCAR J. MARTINSON.

Witnesses:

EUGENE A. RUMMLER,
M. IRENE HUTCHINGS.

It is hereby certified that in Letters Patent No. 1,101,459, granted June 23, 1914, upon the application of Oscar J. Martinson, of Chicago, Illinois, for an improvement in "Tractors," errors appear in the printed specification requiring correction as follows: Page 2, line 110, for the word "rotataby" read *rotatably*; page 3, line 7, for the word "rotably" read *rotatably*; same page, line 18, after the article "the" insert the words *ends of said arms, and a flexible connection*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of July, A. D., 1914.

[SEAL.]

J. T. NEWTON,

Acting Commissioner of Patents.