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EXCAVATOR.

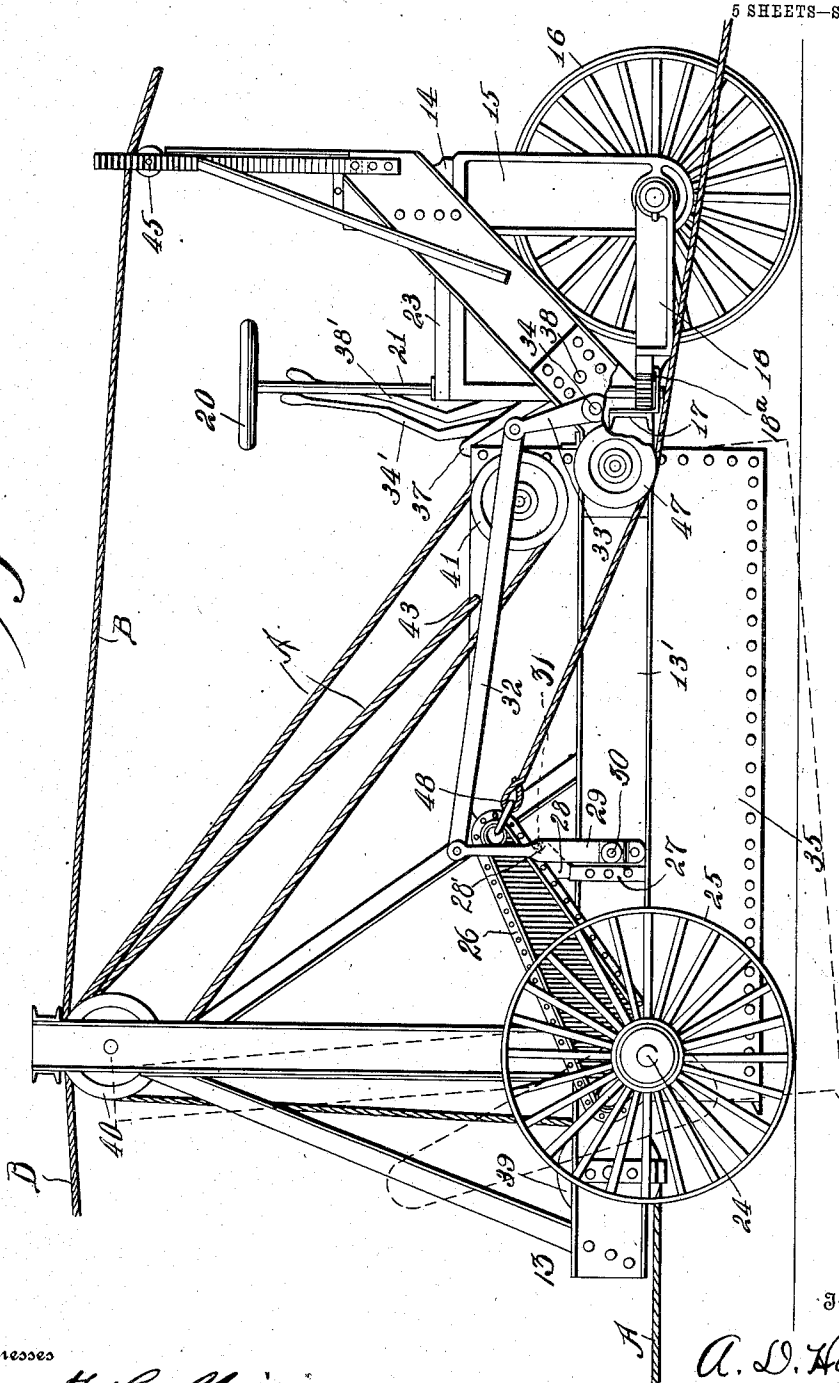
APPLICATION FILED APR. 29, 1909. RENEWED JULY 12, 1911.

1,015,488.

Patented Jan. 23, 1912.

5 SHEETS—SHEET 1.

Fig. 1.



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5 SHEETS—SHEET 2.

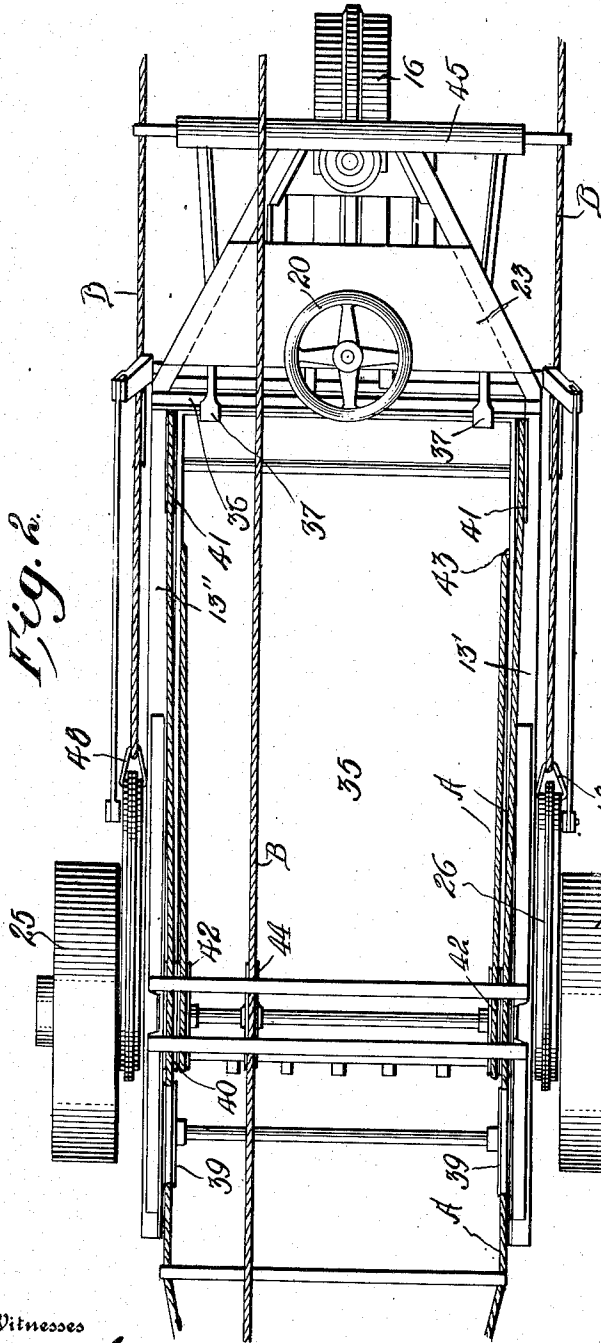


Fig. 5

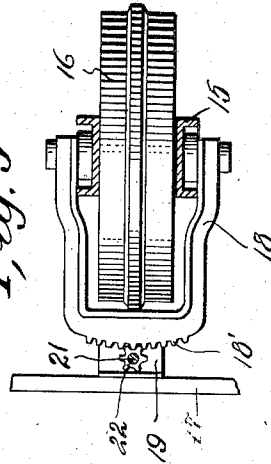


Fig. 6

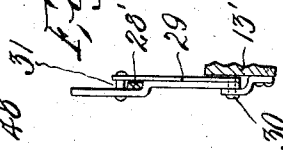
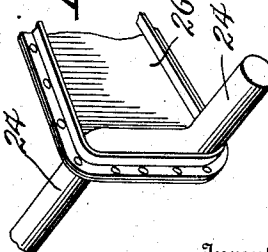


Fig. 7



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5 SHEETS—SHEET 3.

Fig. 4

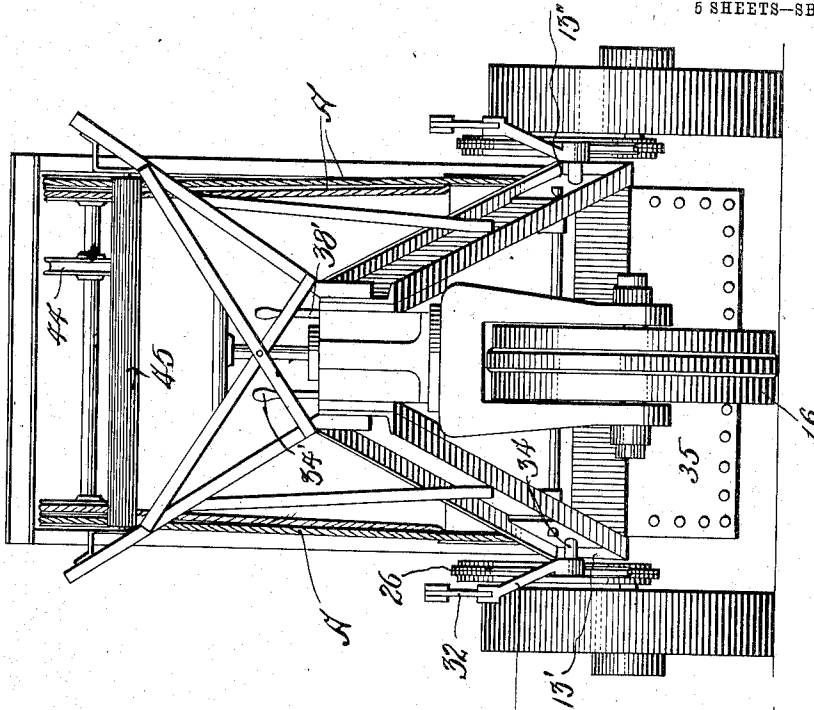
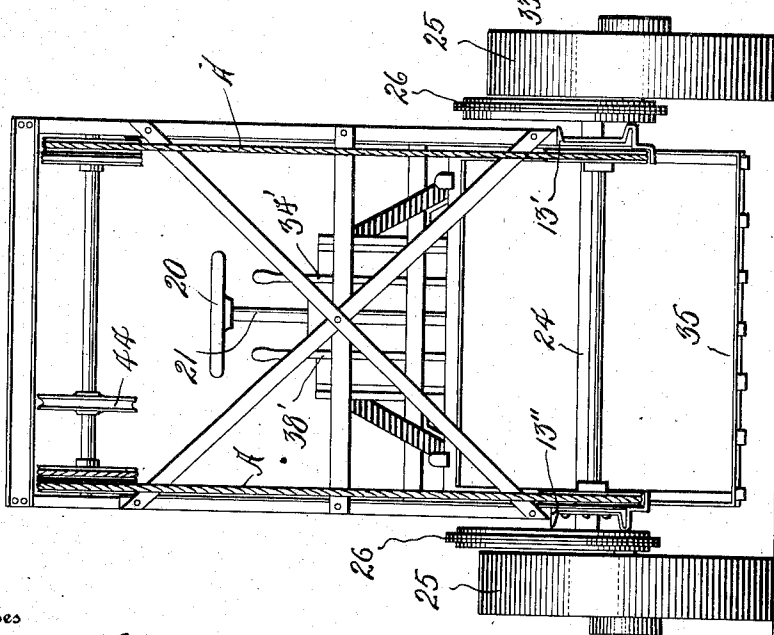


Fig. 3



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5 SHEETS—SHEET 4.

Fig. 8.

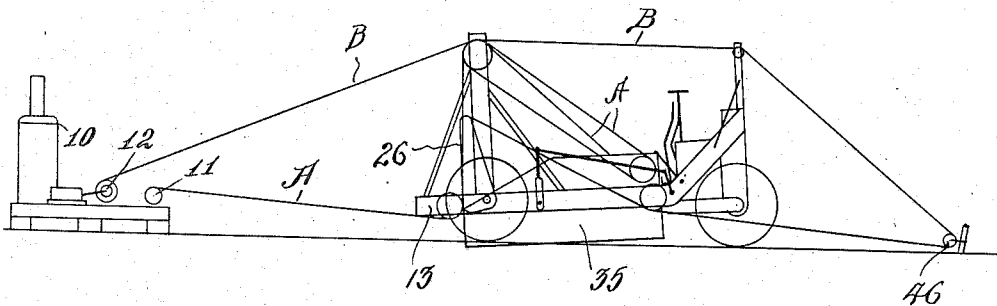


Fig. 9.

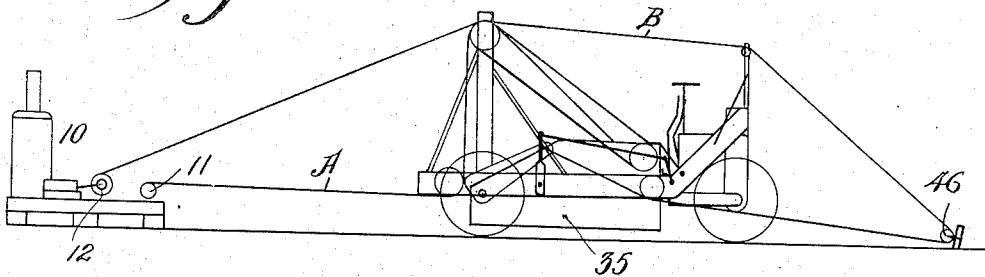
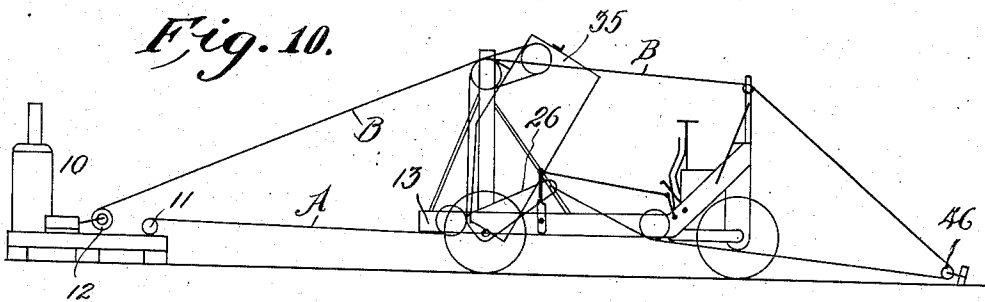


Fig. 10.



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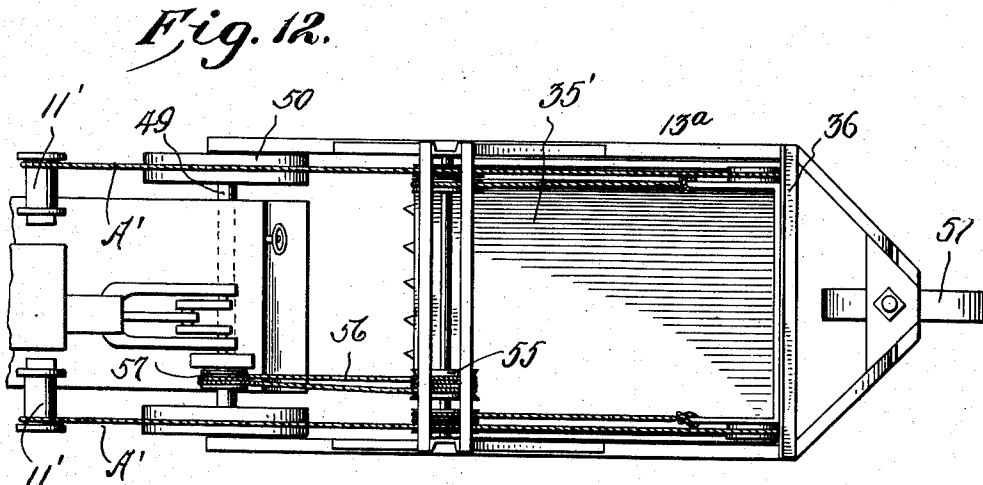
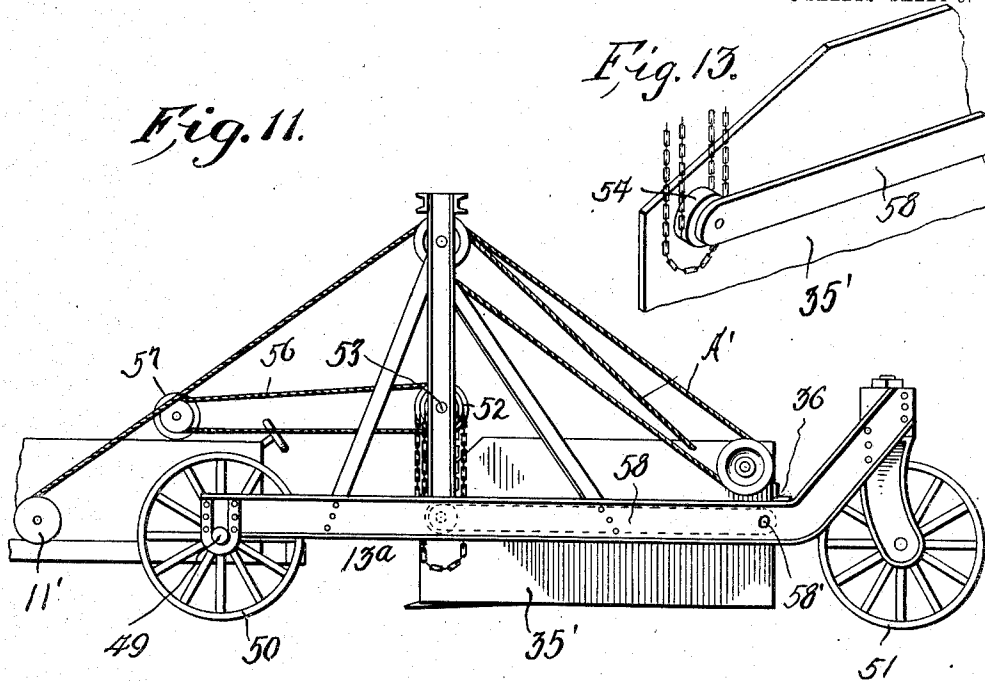
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

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EXCAVATOR.

1,015,488.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed April 29, 1909, Serial No. 492,815. Renewed July 12, 1911. Serial No. 638,211.

To all whom it may concern:

Be it known that I, ALVAH D. HADSEL, a citizen of the United States, residing at Wilkes-Barre, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Excavators, of which the following is a specification.

This invention relates to power excavators and has especial reference to certain improvements in this class of invention whereby the same are rendered more easy and certain of manipulation and hence of greater capacity for the conveyance of earth.

The invention consists in certain novel details of construction which will be hereinafter fully described and claimed and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the invention; Fig. 2 is a plan view of the same; Fig. 3 is a front elevation and Fig. 4 is a rear elevation of the same; Fig. 5 is a detail of the steering mechanism; Fig. 6 is a detail of the catch hereinafter described; Fig. 7 is a perspective detail of parts described below; Figs. 8, 9, and 10 are diagrams illustrating three different positions of the machine; Figs. 11 and 12 illustrate a modification, and Fig. 13 is a detail of a part of the machine shown in Figs. 11 and 12.

Throughout the following description and on the several figures of the drawings similar and corresponding parts are referred to by corresponding reference characters.

In the form of the invention illustrated in Fig. 1 *et seq.* there is used a distant power device in the form of an engine 10, suitably located at any desired stationary position and having independently operated drums 11 and 12. The excavator proper includes a frame 13 comprising a pair of channel beams 13' and 13'', the major portions of which are parallel and substantially horizontal while the other portions thereof extend upwardly at one end and converge at their extreme rear ends where they receive therebetween the journal or head 14 for the steering fork 15 in which is mounted the steering wheel 16. A transverse channel bar 17 is secured rigidly between the main channels 13' and 13'' approximately at the angles between the horizontal and inclined portions thereof. This member 17 serves to brace and strengthen this portion of the frame and for

other purposes to be hereinafter noted. A yoke 18 embraces the lower end of the fork 15 and the axle for the wheel 16 is connected thereto as well as to the fork 15. The front edge of the yoke 18 is provided with gear teeth 18' and on its lower surface the yoke is provided with a rib 18^a parallel to the row of teeth 18'. Secured rigidly to the rear face of the transverse beam 17 is a bracket 19 which extends downwardly therefrom and then rearwardly, the rear end thereof embracing said rib 18^a of the yoke, whereby the yoke is maintained in proper operative relation to the main frame of the machine. A steering wheel 20 is carried by a shaft 21 suitably journaled in bearings in the frame including a bearing in the horizontal portion of said bracket 19. Rigidly connected to said shaft 21 and meshing with the rack 18' is a pinion 22, whereby the yoke 18 may be operated to steer the machine. The wheel 20 is located in easy reach of an operator on the platform 23.

The main channels 13' and 13'' near their front ends are pierced by a peculiar axle 24 upon the ends of which are secured main supporting wheels 25. That portion of the axle upon which the main frame is supported is offset or eccentric to the axis of the wheels. By this means the main frame is susceptible of two distinct positions of adjustment. As shown in Fig. 1 in full lines the frame is held in its elevated position, the eccentric portion of the axle being above the axis of the wheels. By swinging the axle around so that the eccentric portion thereof will come to a lower position the frame will partake of a slight change of position with respect to the wheels as indicated in dotted lines in the same figure. One of the means which may be employed for controlling the position of the axle 24 consists of a pair of yokes 26, one on each side of the frame and having direct embracing connection with the shouldered portion of the axle. Each of said yokes extends approximately at a right angle to the said shouldered portion of the axle and rearwardly therefrom when the frame is elevated as shown in Fig. 1. A lug 27 is rigidly connected to each of the main frame channels and adapted to cooperate therewith is a stop 28 secured to the yoke 26. By this means the rearward movement of the yokes is limited. A pair of catches 29 are pivoted at 30 to the main channels 13' 110

and 13'' and carry cross pins 31 adapted to engage hooks 28' on the stops 28, whereby the yokes 26 are interlocked with the frame and thus preventing the front ends of the frame members from being lowered while said interlocking means are in engagement. A pair of links 32 connect the upper end of the catches 29 with a pair of cranks 33 connected to a rock shaft 34, operated by a lever 34' within reach of the operator on the platform. When the operator by this means withdraws the catches 29 from the hooks 28' the front end of the frame and the load carried thereby will gravitate downwardly swinging the axle through approximately ninety degrees and carrying the yokes 26 forwardly to a like extent, as indicated in dotted lines in Fig. 1.

The scoop 35 is swung at its front open end on the eccentric portion of the axle 24 between the main channel beams 13' and 13''. The depth of the scoop with respect to the axle on which it is hung is such that when the axle is elevated the cutting edge of the scoop will swing clear of the ground on which the wheels 25 are supported, but when the axle and frame are dropped said cutting edge of the scoop will engage and enter the earth beneath the bottom line of the wheels in order that the scoop may be filled when the machine is drawn toward the engine. The rear end of the scoop is supported on the upper edges of the main channel members by means of an angle bar 36 secured rigidly to the rear end of the scoop and projecting laterally beyond the sides thereof sufficiently far to engage the main framemembers. This angle bar 36 limits the downward movement of the scoop but does not prevent the elevation of the rear end thereof. A pair of hooks 37 are operatively connected to a rock shaft 38 journaled in the inclined portions of the main frame members and which is operated in turn by a lever 38' adjacent to the operator's platform. Said hooks 37 engage the upper edge of the rear end of the scoop to hold the same downwardly with the angle member 36 against the main frame members. This position of the hooks 37 is maintained during the filling operation of the scoop.

A rope A is connected to the drum 11 of the engine and adjacent to the excavator proper is divided into two parts, said parts being passed around or over a series of pulleys 39, 40, 41, and 42, the ends of the said rope members being connected to the upper edge of the scoop near its rear end at 43. The pulleys 41 are journaled on the rear end of the scoop and all the others are journaled on the frame. A second power rope B is connected to drum 12 of the engine and passes preferably over the top of the excavator over the pulleys 44 and 45, thence around the fixed pulley 46, thence it is di-

vided and the parts passed over or around direction pulleys 47 and their ends being connected to the upper ends of the yokes 26 by means of links 48.

When it is desired to load the scoop the rope B is slackened and the operator on the excavator withdraws the catches 29 from the hooks 28', permitting the frame to fall as previously described thus bringing the cutting end of the scoop into engagement with the earth. Power being applied to the rope A will cause the entire machine to be drawn toward the engine filling the scoop with earth. When the scoop is loaded the draft on the rope A may or may not be stopped but power is applied to the drum 12 to wind the rope B thereon at a relatively greater speed, whereby the yokes 26 will be drawn rearwardly with respect to the frame 13, thus elevating the frame and scoop to the carrying position indicated in full lines in Fig. 1. The operator will then cause the catches 29 to engage and hold the yokes in said position. When the machine thus loaded is drawn to the place of deposit the operator will disengage the hooks 37 from the rear end of the scoop permitting a continued draft on the rope A to elevate the rear end of the scoop to the dumping position indicated in the diagram of Fig. 10. The weight of the scoop will restore the same to its normal carrying position after being dumped.

The form of the invention indicated in Figs. 11 and 12 is adapted for use in connection with a traction engine where long hauls are required, although it will be understood that this form of the invention is adapted for general operation. In this form of the invention the frame 13^a is connected directly and permanently to the main front axle 49 on which the main wheels 50 of the traction engine are journaled. The rear end of the frame is supported upon a caster wheel 51 of any suitable construction. The scoop 35' in this form of the invention is similar in all substantial respects to that previously described, and is supported at its rear end on the frame by an angle bar 36. The front end of the scoop is shown as being supported and elevated by differential pulley mechanism connected to the main frame. Said mechanism comprises a pair of differential hoists 52, the upper blocks of which are connected rigidly to a shaft 53 journaled in the upright portion of the frame. The lower blocks 54 of the hoists have direct connection to the front end of the scoop. Connected to the shaft 53 is a drum 55 around which is an endless rope 56 driven from a reversible winch 57 mounted on the engine. When the winch 57 is operated in one direction the differential hoists 52 will permit the front end of the scoop to be lowered. In order to maintain the scoop

in proper operative relation to the main frame 13^a and to prevent the rearward thrust thereof due to the engagement of the earth from pushing the scoop rearwardly, a pair of links or bars 58 are pivotally connected to the front end of the scoop at the points where the lower blocks 54 are connected and at their rear ends at 58' to the main frame members. This connection between the scoop and the frame will permit the scoop to be raised or lowered at its front end during the operation of filling and also the elevation of the rear end during the operation of dumping. Power ropes A' are connected to the scoop in a manner quite similar to the connection of the rope A in the previous example, and at their forward ends are connected to drums 11' carried by the engine and under the direct control of the engineer. These ropes A', however, are employed only for the purpose of dumping in this form of the invention.

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

1. An excavator comprising a frame including an upright, a plurality of pulleys carried by the upright, a scoop mounted within the frame, a pair of pulleys on the rear end of the scoop, means to support each end of the scoop so that it may be elevated independently of any movement of the other end of the scoop, a rope connected to the rear end of the scoop and passing thence over certain of the upright pulleys, thence over the scoop pulleys, and thence over other of the upright pulleys for the purpose of lifting the rear end of the scoop, and another rope serving to hoist the front end of the scoop.
2. In an excavator, the combination of an axle having an eccentric portion, supporting wheels connected to the concentric portion of the axle, a frame connected to the eccentric portion of the axle, a scoop supported at one end on the eccentric portion of the axle within the frame and rotatable on said eccentric portion independently of the frame, the other end of the scoop being supported on the frame, and means to swing

the axle above the axis of the wheels for the purpose of raising or lowering the frame and the scoop.

3. In an excavator, the combination of supporting wheels, an axle upon which certain of said wheels are mounted and having a portion eccentric to the axis of the wheels, a frame having members mounted on the eccentric portion of the axle, a scoop swung at one end on the eccentric portion of the axle and supported at its other end on the frame members, means to swing said axle about the axis of the wheels to raise and lower the proximate end of the scoop, and means to raise the opposite end of the scoop.

4. In an excavator, the combination of wheels, an axle on which certain of said wheels are mounted and having an eccentric portion, the eccentric and concentric portions of the axle having shouldered connections, a frame, a scoop mounted within the frame and pivotally connected at its front end to the eccentric portion of the axle, means mounted on the shouldered portions of the axle for controlling the position of the axle and the elevation of that end of the scoop mounted thereon, and means for elevating the rear end of the scoop independently of movement of the front end.

5. In an excavator, the combination of supporting wheels, an axle on which certain of said wheels are mounted and having a portion eccentric to the axis of said wheels, a frame, a scoop mounted within the frame and swung at one end on the eccentric portion of the axle, a pair of yokes cooperating with the axle to control the position thereof and thereby the elevation of that end of the scoop swung thereon, interlocking means between the yokes and the frame to maintain the yokes in one position, and means to elevate the opposite end of the scoop.

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

ALVAH D. HADSEL.

Witnesses:

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HILMA PETERSON.