Feb. 1, 1949. E. OKLEJAS 2,460,764

EARTH MOVING MACHINE

Filed Oct. 15, 1945

3 Sheets-Sheet 1

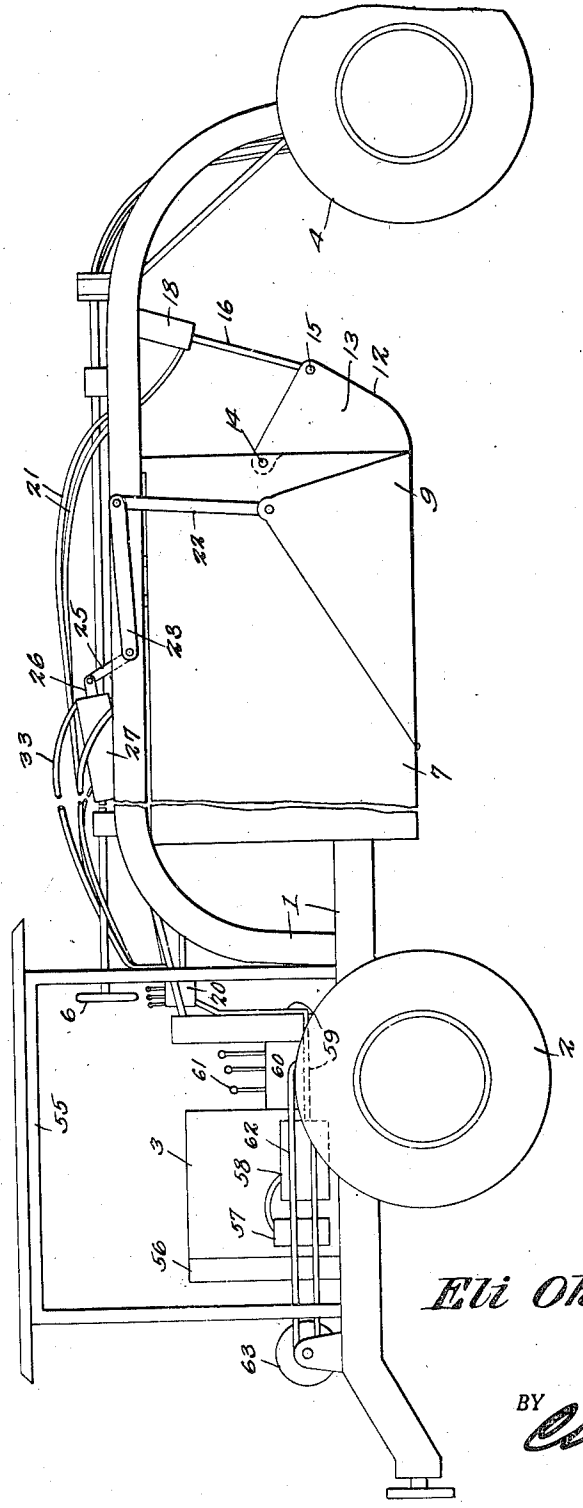


Fig. 1.

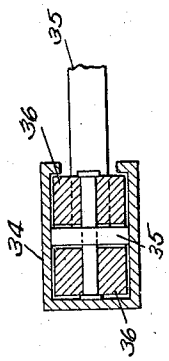


Fig. 4.

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EARTH MOVING MACHINE

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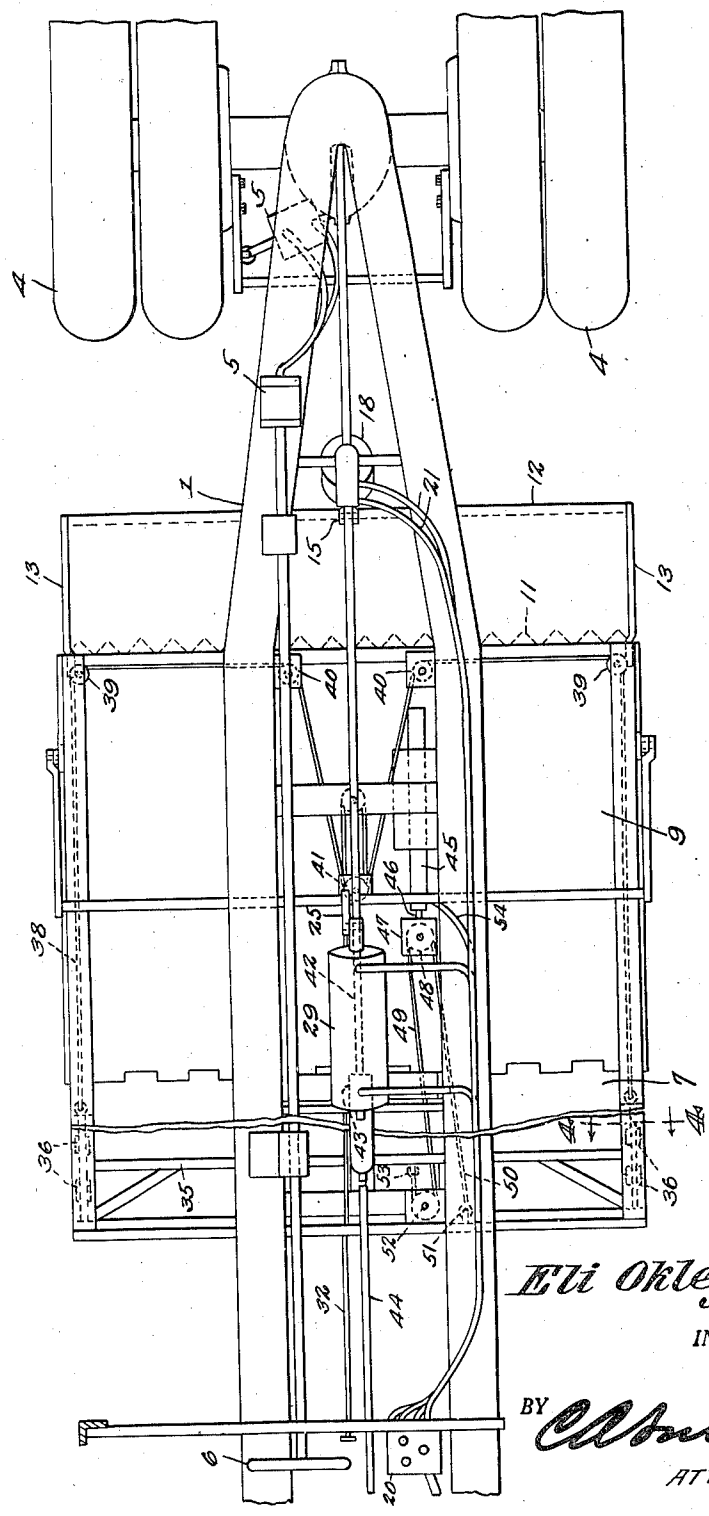


Fig. 2.

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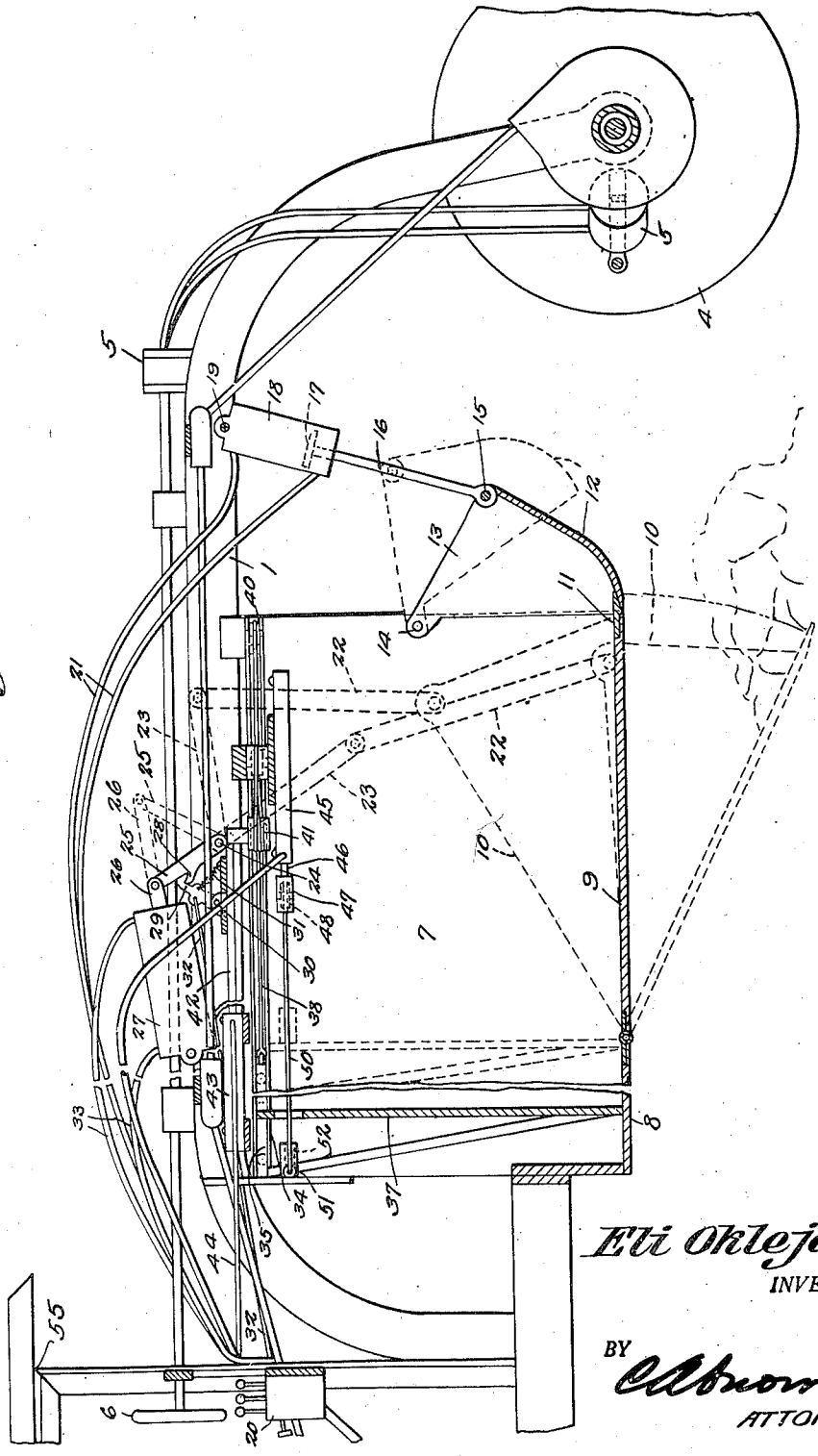
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Feb. 1, 1949. E. OKLEJAS 2,460,764

EARTH MOVING MACHINE

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Fig. 3.



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Patented Feb. 1, 1949

2,460,764

UNITED STATES PATENT OFFICE

2,460,764

EARTH-MOVING MACHINE

Eli Oklejas, Monroe, Mich.

Application October 15, 1945, Serial No. 622,320

7 Claims. (Cl. 37—126)

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This invention relates to a machine designed for excavating and conveying earth, one of the objects being to provide a machine with a carrier in the form of an elongated pan or receptacle which is equipped at one end with means for loading the same during the movement of the machine in one direction, while the other end is equipped with an ejecting means by which the contents of the carrier can be expelled forcibly when desired.

Another object is to provide the carrier with a door at its receiving end, the operation of which is constantly under the control of the operator.

A still further object is to utilize hydraulic jacks for controlling the operation of the working parts, the controls for the jacks being positioned where they are readily accessible at all times by the operator.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawings, the preferred form of the invention has been shown.

In said drawings,

Figure 1 is a side elevation of the machine, an intermediate portion of the carrier and parts associated therewith being broken away and both the scoop and the door being shown in their normal or closed positions.

Figure 2 is a top plan view, an intermediate portion of the machine being broken away as indicated.

Figure 3 is a central longitudinal section through the loading and carrying portion of the machine, one position of the scoop, door and ejector being indicated by full lines and other positions being indicated by broken lines.

Figure 4 is an enlarged section on line 4—4, Figure 2.

Referring to the figures by characters of reference, 1 designates an elongated chassis suitably constructed to meet the requirements and which can be mounted on any desired number of wheels 2 for receiving power through suitable mechanism from an engine 3 while steering wheels 4 can be suitably connected to the other end of the machine, and are shiftable preferably by hydraulic mechanism indicated generally at 5 which is controlled by a steering wheel 6. No

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claim is made for the specific construction of this mechanism and, therefore, the same has not been illustrated or described in detail.

Secured to the chassis 1 and suspended fixedly thereunder is an elongated pan or carrier 7 which can be of any desired size. In the drawing, a large portion of this carrier has been broken away for the purpose of shortening the illustrations. It is intended to provide a pan having a large capacity and this pan, which can be made of strong sheet metal, is open at the top, front and back. To the front edge of the bottom 8 of the pan is hinged a scoop 9 in the form of a stiff plate of steel or the like having segmental side wings 10 which lap the other surfaces of the sides of the carrier. To the forward edge of the scoop 9 is secured a cutting bar 11 and when the scoop 9 is in its normal or raised position, at which time it is preferably aligned with the bottom 8, the cutting bar rests upon the lower edge portion of a downwardly and rearwardly curved door 12 having segmental sides 13 which are hingedly connected at 14 to the sides of the carrier at the forward end thereof.

The upper portion of the door 12 is pivotally connected at 15 to the slidable stem 16 of a piston 17 which is slidably mounted in a cylinder 18 pivotally supported by the chassis as indicated at 19. The operation of this piston is controlled by hydraulic means which includes a control box 20 having suitably located pipe connections 21 with the cylinder 18.

The wings or sides 10 of the scoop 9 are connected by links 22 to an arm 23 secured to and extending from a transverse rock shaft 24 and another arm 25 is secured to and extends from this shaft and is joined to the piston rod 26 extending from a pivotally mounted cylinder 27. Arm 25 has a lug 28 extending therefrom adapted to be engaged by a latch 29 which is pivotally mounted adjacent to the lever, as shown at 30 and has a spring 31 which serves to hold the latch normally in engagement with the lug 28. As long as the latch engages the lug, the scoop is secured in raised or closed position. However, by shifting the latch, as by means of a pull rod 32 or the like, the arm 25 can be released for actuation by fluid under pressure directed through pipes 33 from the control box 20.

Located along the inner surface of each side of carrier 7 at the top thereof is a rail 34 which can be in the form of a channeled strip, as shown for example in Figure 4 and extending between the two rails is a transverse carriage 35 having suitably located rollers 36 which travel within the

rails for the purpose of supporting the carriage for movement back and forth between the sides of the carrier.

An ejector in the form of a follower **37** is rigidly connected to and extends downwardly from the carriage and extends close to the bottom **8** and also to the sides of the carrier.

The sides of the carriage **35** are secured to the ends of a cable, chain or the like, indicated at **38**. This flexible connection is extended forwardly to guide sheaves **39** and thence laterally to guide sheaves **40**. The connection is looped between the sheaves **40** and extended partly around a movably supported sheave **41** connected to the piston rod **42** of a cylinder **43** adapted to be supplied with a fluid under pressure from the control box **20** through a pipe **44**. Another cylinder **45** is located adjacent to the top of the carrier and has a piston rod **46** connected to a block **47** having a sheave **48** which is engaged by the looped portion **49** of an operating cable, chain or other flexible connection **50**. One end of this cable is fixed to the rear portion of the carrier, as indicated at **51**. The other end portion of the cable is extended partly around a sheave **52** supported by the carrier and is then secured to the carriage **35**, as shown at **53**. The piston and cylinder **45** is adapted to be operated by fluid under pressure and is to be directed to and from the cylinder through a pipe **54** leading from the control box **20**.

The valve mechanism in the control box does not form any part of the present invention. It need only be stated that pressure can be directed at will through the various pipes to the different cylinders for the purpose of actuating the parts controlled thereby.

When the machine is driven forwardly for the purpose of excavating and carrying material, the door **12** is actuated so as to move to an open position as indicated by broken lines in Figure 3. This releases the cutting blade **11** so that the scoop **9** can then be lowered to bring the blade into engagement with the soil as indicated by broken lines in Figure 3. As the machine moves forwardly, this blade will cut into the soil and the loosened material will be directed upwardly by the advancing scoop and into the area **8**. At this time the ejecting follower **37** is located at the back end of the carrier so that the maximum space is provided for the purpose of receiving the excavated soil.

After a full load has been delivered into the carrier, the scope **9** is raised to closed position, the door **12** is closed thereunder as shown by full lines in Figure 3, and the entire machine is then moved to a point where delivery is to be made. On reaching that point the door **12** is opened and the pull cable **38** is drawn backwardly at the central or looped portion thereof by the piston in cylinder **43** so that the carriage is drawn forwardly with the result that ejecting follower **37** presses material in the path thereof toward the open end of the carrier and delivers it therefrom. During this operation the connection **50** is being paid out. Thereafter cable **50** is used as a pulling medium by directing fluid under pressure to cylinder **45** with the result that the carriage **35** is drawn rearwardly to the rear end of the carrier, which is its normal or initial position, and the machine is then ready to repeat the foregoing operation.

The mechanism employed for driving the machine and the working parts thereof do not form any part of the present invention, but can be constructed and arranged to meet the requirements. It is preferred to provide a cab **55** at the rear or

control end of the machine housing a motor **3**, a radiator **56**, and pump **57**. This pump, which is actuated by the engine, serves to maintain oil or other fluid under pressure in a tank **58** from which the fluid, in turn, is directed to the control box by any suitable arrangement of pipes **59**. The usual gear casings for holding transmission mechanisms for the vehicle have been indicated at **60**, while the transmission control levers have been indicated at **61**. A suitable power take off mechanism has been indicated generally at **62** and serves to operate a winch **63**.

The carrier **7** can be of any desired length and capacity and in larger types of machines the number of wheels **2** can be increased and power transmitted to all of them by usual mechanisms.

What is claimed:

1. In an earth moving machine, a movably supported chassis, a carrier suspended thereunder and fixed relative thereto, a scoop constituting a bottom section of the carrier and mounted for swinging movement relative thereto, said scoop being normally in closed position against the carrier, said carrier being open at one end, a door hingedly connected to the open end of the carrier and normally positioned under one end of the scoop to constitute a support for said end, and separate hydraulically operated means under the control of an operator for opening the door to release the scoop and for lowering the scoop.

2. An earth moving machine including a movably supported chassis, a carrier fixedly joined to and extended from the chassis, said carrier being open at one end, a scoop constituting a closure for a portion of the bottom of the carrier and extending to said end, a cutting bar on the scoop at said end of the carrier, a door supported in front of and pivotally connected to the carrier and normally extended under the bar to support the scoop in closed position, and separate means under the control of an operator for actuating the door to release the scoop and for actuating the scoop to move into or out of normal position.

3. An earth moving machine including a movably supported chassis, a carrier fixedly joined to and extending from the chassis, said carrier having an open end, a scoop hingedly joined to the bottom of the carrier and normally positioned to close a portion of the carrier, a cutting bar extended across one end of the scoop, a door supported beyond the open end of the carrier and hingedly connected to said carrier, said door being normally positioned under the bar to support the scoop, a follower mounted for movement longitudinally of the carrier and extending transversely therein, and separate means under the control of an operator for shifting the door to release the scoop, and moving the follower toward or from the door.

4. In an earth moving machine a movably supported chassis, a carrier fixedly connected to and depending from the chassis, said carrier being open at one end, a scoop hingedly connected to the bottom of the carrier and normally positioned to close a portion of the carrier, a door hingedly connected to the open end of the carrier and normally supported beyond the carrier and under one edge portion of the scoop, to support the scoop in normal position, a rock shaft, separate arms extending therefrom, means under the control of an operator for actuating one of the arms, latching means for engaging said arm to hold it normally in one position, means for releasing the

latching means, and an operating connection between the other arm and the scoop.

5. In an earth moving machine a movably supported chassis, a carrier fixedly connected to and depending from the chassis, said carrier being open at one end, a scoop hingedly connected to the bottom of the carrier and normally positioned to close a portion of the carrier, a door hingedly connected to the open end of the carrier and normally supported beyond the carrier and under one edge portion of the scoop to support the scoop in normal position, a rock shaft, separate arms extending therefrom, means under the control of an operator for actuating one of the arms, latching means for engaging said arm to hold it normally in one position, means for releasing the latching means, and an operating connection between the other arm and the scoop, and means for shifting the door to release the scoop for actuation.

6. In an earth moving machine a movably supported chassis, a carrier fixedly connected to and depending from the chassis, said carrier being open at one end, a scoop hingedly connected to the bottom of the carrier and normally positioned to close a portion of the carrier, a door hingedly connected to the open end of the carrier and normally supported beyond the carrier and under one edge portion of the scoop to support the scoop in normal position, a rock shaft, separate arms extending therefrom, means under the control of an operator for actuating one of the arms, latching means for engaging said arm to hold it normally in one position, means for releasing the

latching means, and an operating connection between the other arm and the scoop, and means for shifting the door to release the scoop for actuation, a follower in the carrier, a carriage mounted for movement longitudinally of the carrier and joined to the follower, and means under the control of an operator for shifting the carriage toward or from the open end of the carrier, thereby to actuate the follower.

7. An earth moving machine including a chassis supported for movement, a carrier suspended from the chassis and open at one end, a scoop having its rear end hingedly connected to the carrier adjacent the rear end of the carrier, the front end of the scoop being swingable relative to the carrier, said scoop constituting a bottom section of the carrier and normally closing the bottom of the carrier, a door hingedly connected at its upper end to the open end of the carrier and normally supported beyond the carrier, the lower end of the door being normally positioned under the front end of the scoop to support the same, and means under the control of an operator for shifting the door to release the scoop for movement from normal position.

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