Aug. 29, 1933. R. L. HARRISON 1,924,358

EARTH MOVING DEVICE

Filed May 5, 1930 2 Sheets-Sheet 1

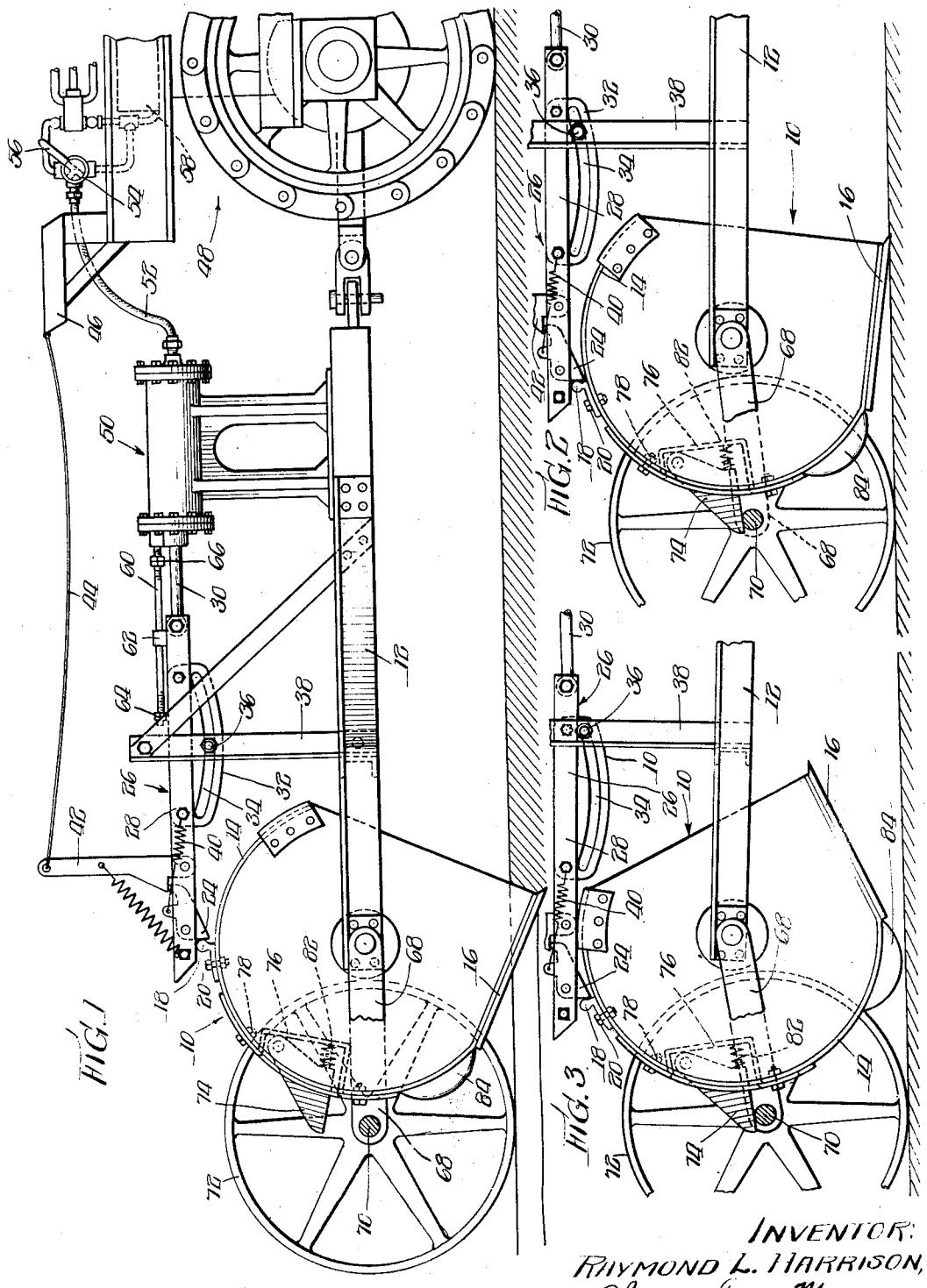


FIG. 1

FIG. 2

FIG. 3

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FIG. 4.

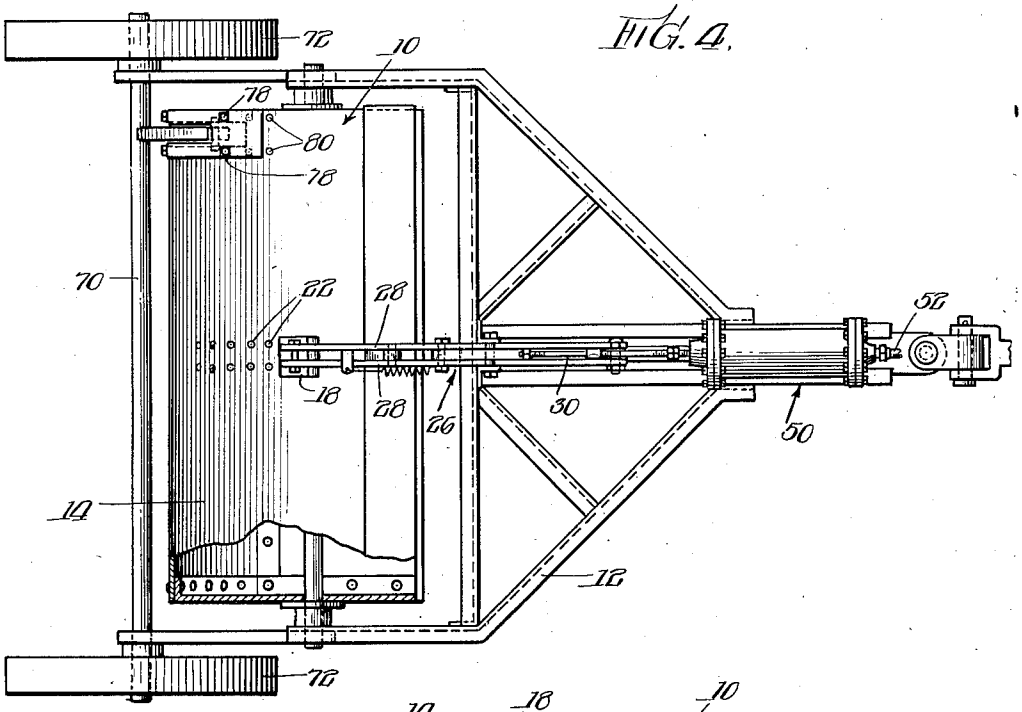


FIG. 5.

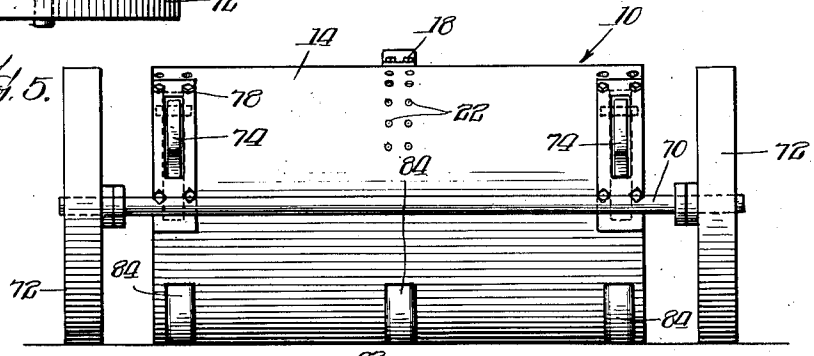
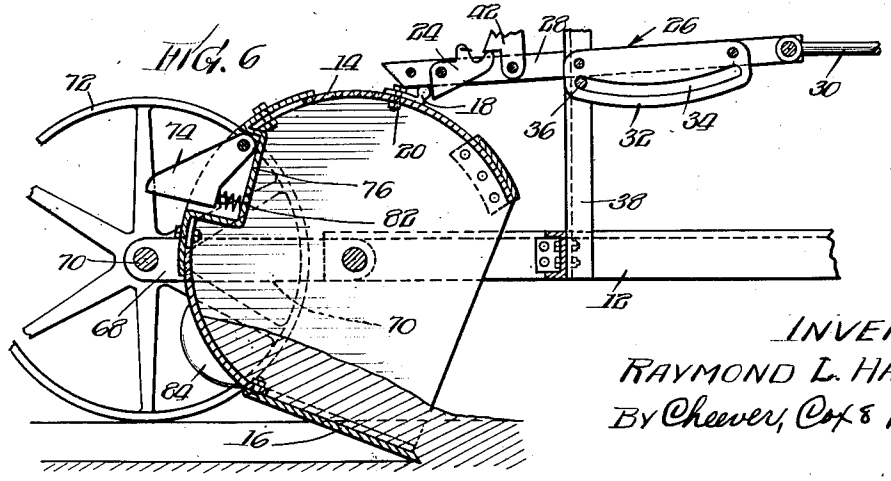


FIG. 6



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UNITED STATES PATENT OFFICE

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EARTH MOVING DEVICE

Raymond L. Harrison, Albuquerque, N. Mex.

Application May 5, 1930. Serial No. 449,911

19 Claims. (Cl. 37—140)

My invention relates generally to earth moving apparatus and particularly to devices of the fresno type which are adapted to be drawn across the ground.

This invention relates to the subject matter disclosed in my co-pending application, Serial No. 348,416, filed March 20, 1929, now Patent No. 1,846,592 but presents certain improvements over the structure disclosed in said co-pending application.

It is an object of my present invention to provide an earth moving device or bowl, which may be hydraulically shifted so as to vary the position of the earth receiving edge of said bowl, said hydraulic control being of simple and practical construction, having relatively few parts and conveniently controlled by an operator.

More specifically, it is an object of my invention to provide a shiftable member for engaging the peripheral section of the bowl, and means in conjunction therewith which will cause said engaging member to follow the contour of the bowl periphery during the shifting of said member.

Another object is to provide in combination with a tiltable earth carrying means or bowl having a substantially semi-cylindrical surface, a shiftable actuating member and an arcuate guiding means for causing said shiftable actuating member to follow the contour of the bowl surface.

Still another object of the invention is to provide in combination with a bowl rotatably or tiltably supported upon a frame, means for causing said bowl to be automatically raised when said bowl has been rotated a predetermined amount.

A further object is to provide a rotary fresno or bowl with lugs which are adapted to be variously positioned along the bowl periphery in accordance with the nature of the work to be done, thereby enabling said bowl to be shifted to various positions of adjustment by a shiftable actuating member.

These and numerous other objects and advantages will be apparent from the following detailed description when considered in connection with the accompanying drawings, wherein—

Figure 1 is a side elevational view, shown partly in section, of an earth moving mechanism embodying features of my present invention;

Figure 2 is a fragmentary view of the bowl frame and shiftable actuator of Figure 1, the same being shown in a shifted position for drifting;

Figure 3 is a fragmentary view similar to Figure 2, disclosing the shifted position occupied by the fresno when the lug and pivoted abutment are shifted to another position along the fresno periphery;

Figure 4 is a reduced plan view of the rear portion of the mechanism shown in Figure 1;

Figure 5 is a rear view of the device shown in Figure 4; and

Figure 6 is a vertical sectional view taken transversely of the bowl, showing the actuator shifted to its extreme position opposite to that shown in Figure 3.

Referring now to the drawings more in detail, wherein like numerals have been employed throughout the various figures to designate similar parts, it will be seen that one embodiment of my invention includes a fresno or bowl 10, which is pivotally supported at each extremity upon a suitable frame 12. This bowl 10 includes a semi-cylindrical or arcuate casing 14 and an earth receiving plate 16 having an edge for engaging and digging into the ground.

A lug 18 is detachably secured to the outer surface of the casing 14 in any suitable manner, such as by means of bolts 20. A plurality of apertures 22, Figure 4, provided in the casing 14 are adapted to receive the bolts 20. The lug 18 is adapted to be engaged by a latch member 24, which is pivotally supported by a shiftable actuator 26.

This actuator 26 includes a pair of spaced bars 28, which are pivotally secured at one extremity to an actuator or piston rod 30. Secured between and depending from the bars 28 is a guide member 32, which is formed with an arcuate guideway or slot 34. A pin 36 extending through the slot 34 and carried by a vertically disposed frame member 38, provides a support for the actuator 26. The arcuate arrangement of the slot 34 is such that, when the pivoted latch 24 is shifted in response to the movement of the actuator 26, said latch will move along an arcuate path corresponding to the semi-cylindrical contour of the casing 14. In this manner the latch 24 will always engage the lug 18, regardless of the position which it occupies. Referring to Figures 1, 2, and 6, it will be seen that the latch is constantly in proper position to engage the lug 18. In order to maintain the latch in proper position, I employ a spring 40, which continually urges said latch in a clockwise direction, as viewed in Figures 1 to 3 inclusive.

A trip lever 42 is employed to control the counter-clockwise movement of the latch 24. If this lever is shifted to the right of the position shown in Figure 1, the latch 24 is free to swing upwardly, thereby rendering the same functionally in-

effective. The shifting of the trip lever 42 may be controlled by a flexible member or cord 44, which extends from said trip lever to the operator's seat 46 on a suitable propelling mechanism or tractor 48, as shown fragmentarily in Figure 1.

The longitudinal shifting of the actuator bars 28 is occasioned through the agency of a hydraulic actuator means 50. This actuator means 50 is supported by the frame 12 and is supplied with a fluid medium through a flexible conduit 52. A suitable valve 54, which is manually operable by a lever 56, Fig. 1, serves to control the delivery of fluid to the cylinder of the actuator means 50. This fluid is supplied from any suitable source on the tractor 48. When the handle 56 occupies the position shown in Figure 1, the fluid is locked within the cylinder of the actuator means 50, thereby preventing movement of the actuator 26 to the right, Figure 1. When the handle 56 is shifted in one direction, the fluid from the cylinder is free to fall into the supply reservoir 58, and when the handle is moved in the opposite direction, fluid is directed into the actuator cylinder. Thus, the movement of the actuator 26 may be conveniently controlled by the operator from the seat 46.

To adjust the stroke of the actuator 26, I provide a rod 60 which is carried by the cylinder of the actuator means 50. An abutment or collar 62 carried by the actuator bars 28, is slidable upon the rod 60 and at one end of the stroke said abutment is adapted to engage an adjustable stop or nut 64, and at the opposite extremity of its stroke said abutment will engage an adjustable stop or nut 66. These nuts 64 and 66 may be adjusted to vary the degree of stroke of the actuator bars.

Extending rearwardly from and pivotally mounted upon the frame 12 is a pair of side frames 68, which are connected at their rearward ends to a shaft 70. This shaft 70 carries wheels 72 at opposite ends thereof. The shaft 70 serves as an abutment for a pair of spaced pivoted members or fingers 74. Each finger is pivotally mounted within a housing 76, which is adapted to be secured in various positions along the periphery of the casing 14 by means of bolts 78. These bolts extend through apertures 80 which are spaced along the casing 14, Fig. 4. A spring 82 is interposed between the finger 74 and the housing 76, as clearly shown in Figure 6, to constantly urge said finger outwardly. The outer portion of the housing 76 provides a stop to limit the outward movement of the finger 74, as clearly shown in Figures 2, 3, and 4. When the finger 74 is carried into engagement with the shaft 70, as shown in Figures 2 and 3, the frame members 68 and the shaft 70 will be urged upwardly so as to elevate the entire earth carrying means or bowl 10. This provides a very convenient and automatic means for affecting the elevation of the bowl, it being only necessary for the operator to affect the rearward tilting of the bowl sufficiently to carry the finger 74 into engagement with the shaft 70.

Consider, for example, the position of the bowl shown in Figure 1. In this position the bowl is adapted to make a cut in the ground surface, and after a load has been taken into the bowl, the operator, by simply manipulating the control handle 56, will cause the actuator 26 to be moved rearwardly so as to rotate the bowl and bring the finger 74 into engagement with the shaft 70. This causes the bowl to be raised to the position shown in Figure 2. This position might be referred to as a "drifting position", which is a term commonly employed by those familiar with excavation work, etc. By drifting I mean moving the earth carrying means or bowl 10 along the surface without taking a greater load within the bowl, but carrying the material piled up in front of the bowl along the surface of the ground. If it is desired to effect the complete raising of the bowl from the ground after a load has been taken on thereby, it is only necessary to position the lug 18 and the finger 74, as shown in Figure 3. When these parts occupy the positions shown in that figure, the rearward positioning of the actuator 26 will cause the bowl to be raised from the ground and the earth receiving plate 16 thereof raised at inclined position, whereby the earth may be retained within the bowl during the shifting thereof. The arrangement shown in Figure 3 also has a practical application in instances where it is desirable to move the bowl from one place to another without causing the same to engage the surface of the ground.

To facilitate the dragging of the bowl along the surface of the ground, I provide a plurality of shoes 84. In instances where it is not desirable to employ the wheels 72, these shoes will serve as runners in dragging the fresno across the ground. By having the fingers 74 pivotally mounted, as shown in the drawing, the fresno may be rotated along the ground, and as the finger reaches the shaft 70 it will click past said shaft.

From the foregoing it will be apparent that by means of my simple yet efficiently operable fresno control device. I am able to adapt said fresno for any particular type of earth moving work. Each job presents a different problem. That is to say, in some instances it is desirable to have the earth receiving plate 16 inclined at a considerable angle during the operation of the fresno, while in other instances it is only desirable to have a slight inclination thereof. Likewise, in some instances it is desirable to have the cutting edge of the fresno drive along the surface of the ground, as shown in Figure 2, while in other cases it is advantageous to have the cutting edge raised from the ground and the plate 16 tilted, as shown in Figure 3. The lugs 18 and the fingers 74 may be shifted to any position along the surface of the fresno, in accordance with the particular needs incident to its use. The hydraulic mechanism provides a very effective means for shifting the actuator and is very conveniently controlled by the operator. If it is desired to render the fresno or bowl 10 freely rotatable, it is only necessary for the operator to pull on the cord 44, thereby releasing the latch 24 so as to permit the lug 18 to be forced past said latch. The arcuate arrangement of the slot 34 insures the proper positioning of the latch with respect to the lug by reason of the fact that said latch is moved along an arcuate path, which corresponds to the circumferential surface of the casing 14.

While I have disclosed a specific structural arrangement of my invention, it will be apparent that many changes and modifications may be made without departing from the spirit and scope thereof, and said invention should be limited only by the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an earth moving device adapted to be

moved across the surface of the ground, the combination with a tiltable earth carrying bowl having a material receiving edge, of hydraulically operable means for adjustably controlling the position of said material receiving edge with respect to the surface of the material with which the bowl is associated, means for pivotally supporting said bowl, an abutment on the outer portion of said bowl adapted to be engaged by said hydraulically operable means, a second abutment carried by said bowl, and means adapted to be engaged by said second abutment whereby to effect the upward shifting of the bowl.

2. In an earth carrying device of the class described adapted to be drawn across the surface of the ground, an earth carrying means having a material receiving edge, a frame pivotally supporting said earth carrying means, and means for tilting said earth carrying means about its pivotal support including a shiftable member, one extremity of which is adapted to extend over and engage the upper portion of said earth receiving means, an arcuate way associated with said shiftable member, and supporting means extending within said way, whereby the extremity of said shiftable member may be moved along an arcuate path during the shifting thereof.

3. In an earth carrying device of the class described adapted to be drawn across the surface of the ground, an earth carrying means having a material receiving edge, a frame pivotally supporting said earth carrying means, and means for tilting said earth carrying means about its pivotal support including a shiftable member, one extremity of which is adapted to extend over and engage the upper portion of said earth receiving means, an arcuate way associated with said shiftable member, whereby the extremity of said shiftable member may be moved along an arcuate path during the shifting thereof, and a shiftable latch member carried at the extremity of said shiftable actuating member.

4. In an earth moving device of the class described adapted to be drawn across the surface of the ground, an earth carrying means having a material receiving edge, a frame pivotally supporting said earth carrying means, a shiftable actuator member adapted to extend over said earth carrying means, latching means carried by said shiftable member and adapted to engage the outer portion of said earth carrying means in response to the shifting of said actuating member, an arcuate way associated with said actuating member, and supporting means extending within said way whereby said latch member will be moved along an arcuate path during the shifting of said actuating member.

5. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a tiltable earth receiving means having a material receiving edge, a frame for pivotally supporting said earth receiving means, a shiftable actuating member, one extremity thereof adapted to extend over and engage the outer portion of said earth carrying means, and a hydraulic mechanism including an actuator piston connected to the opposite extremity of and positioned in substantial alinement with said shiftable actuating member.

6. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a tiltable earth receiving means having a material receiving edge, a frame for pivotally supporting said earth receiving means, an actuating member shiftable transversely of said tiltable earth receiving means, one extremity thereof adapted to extend over and engage the outer portion of said earth carrying means, and means for adjustably limiting the stroke of said actuator member in either direction.

7. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a tiltable earth receiving bowl having a material receiving edge, a frame pivotally supporting said earth receiving means, a shiftable actuating member adapted to extend over and engage said tiltable earth receiving means, conveyor means pivotally connected with said frame, and means carried by said earth receiving bowl for engaging said conveyor means in response to the tilting of the bowl whereby said bowl may be elevated.

8. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a tiltable earth receiving bowl having a material receiving edge, a frame pivotally supporting said earth receiving means, a shiftable actuating member adapted to extend over and engage said tiltable earth receiving means, conveyor means pivotally connected with said frame, and a member pivotally carried by said bowl and adapted to engage said conveyor means in response to the tilting of the bowl whereby to effect the elevating of said bowl.

9. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a tiltable earth receiving bowl having a material receiving edge, a frame pivotally supporting said earth receiving means, a shiftable actuating member adapted to extend over and engage said tiltable earth receiving means, conveyor means pivotally connected with said frame, and a member pivotally supported and adjustably positioned upon said earth receiving bowl, said pivoted member being adapted to engage the conveyor means in response to the tilting of the bowl whereby to effect the elevating of said bowl.

10. In an earth carrying device of the class described adapted to be drawn across the surface of the ground, an earth carrying means having a material receiving edge, a frame pivotally supporting said earth carrying means, a member shiftable in a given direction for effecting the tilting of said earth carrying means about its pivotal support, said shiftable member being adapted to cooperate with the outer portion of said earth carrying means, an abutment adapted to be engaged by said shiftable member, and guiding means imparting a movement to said shiftable member transverse to the first mentioned direction whereby to cause the portion of said member adjacent the earth carrying means to move in an arcuate path.

11. In an earth carrying device of the class described adapted to be drawn across the surface of the ground, an earth carrying means having a material receiving edge, a frame pivotally supporting said earth carrying means, a member shiftable in a given direction for effecting the tilting of said earth carrying means about its pivotal support, said shiftable member being adapted to cooperate with the outer portion of said earth carrying means, an abutment adapted to be engaged by said shiftable member, and means for causing said shiftable member to move transverse to the first mentioned direction in an arcuate path during the shifting thereof.

12. In an earth carrying device of the class described adapted to be drawn across the sur-

face of the ground, an earth carrying means having a material receiving edge, said earth carrying means including an arcuate casing, shiftable actuating means for engaging the outer portion of said arcuate casing, an abutment adapted to be engaged by said shiftable actuating means, and means for slidably guiding said shiftable means so as to cause said shiftable means to move in an arcuate path corresponding to the peripheral contour of said arcuate casing.

13. In an earth carrying device of the class described adapted to be drawn across the surface of the ground, an earth carrying means having a material receiving edge, said earth carrying means including an arcuate casing, shiftable actuating means including a longitudinally shiftable bar supporting means for engaging the outer portion of said casing, means for slidably guiding said shiftable bar so as to cause the engaging means supported thereby to move in an arcuate path corresponding to the peripheral contour of said arcuate casing, and a lug carried by said casing which is adapted to be engaged by said shiftable actuating means.

14. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a tiltable earth receiving bowl having a material receiving edge, a frame pivotally supporting said earth receiving bowl, a shiftable actuating member adapted to engage the outer portion of said tiltable earth receiving bowl, conveyer means including a shaft and a wheel on said shaft, means pivotally connecting the conveyer means and frame, and means carried by the bowl adapted to engage the shaft in response to the tilting of the bowl whereby to effect the raising of said bowl.

15. In a scraper, a frame, a bowl revolubly mounted thereon having projections; a connecting bar having latch means for engagement with the projections, said latch means being normally urged into engagement with a projection, a cam on said connecting bar to cause said bar in its longitudinal movement to follow a projection in its travel; power actuated mechanism to cause said connecting bar to be moved longitudinally in one direction and when engaged with said bowl to revolve the latter; and manually operable control means for said power actuated mechanism to cause said connecting bar to travel longitudinally in said one direction a selected distance.

16. In a scraper, a frame, an earth carrying means revolubly mounted thereon having a stop, a connecting bar, a cam carried by one of said parts to cause said bar in its longitudinal movement to follow the stop in its travel, latch means for engagement with said stop, power actuated mechanism to cause said connecting bar to be moved longitudinally in a given direction to effect rotation of the earth carrying means when the latch is in engagement with said stop, and means for controlling the power actuated mechanism to cause said connecting bar to travel longitudinally in a given direction a selected distance.

17. In a scraper, a frame, a bowl revolubly mounted thereon having a projection; a connecting bar having latch means for engagement with the projection, manually operable means to release the latch with respect to the projection, a cam to cause said bar in its longitudinal movement to follow the projection in its travel; power actuated mechanism to cause said connecting bar to be moved longitudinally, and manually operable control means for said power actuated mechanism to cause said connecting bar to travel longitudinally a selected distance.

18. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a tiltable earth receiving bowl having a material receiving edge, a frame pivotally supporting said earth receiving means, a shiftable actuating member adapted to vary the position of said material receiving edge, rotary trailer means connected with said frame, and means carried by said bowl in a position for engaging the structure of said trailer means in response to the tilting of the bowl to effect the elevation thereof.

19. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a tiltable earth receiving bowl having a material receiving edge, a frame pivotally supporting said earth receiving means, a shiftable actuating member adapted to vary the position of said material receiving edge, rotary trailer means connected with said frame, a finger pivotally supported by the bowl, a stop for securing said finger against rotation in a given direction, and resilient means for urging said finger against said stop, said finger being adapted in response to the tilting of the bowl to engage the structure of said trailer means for effecting the elevation of said bowl.

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