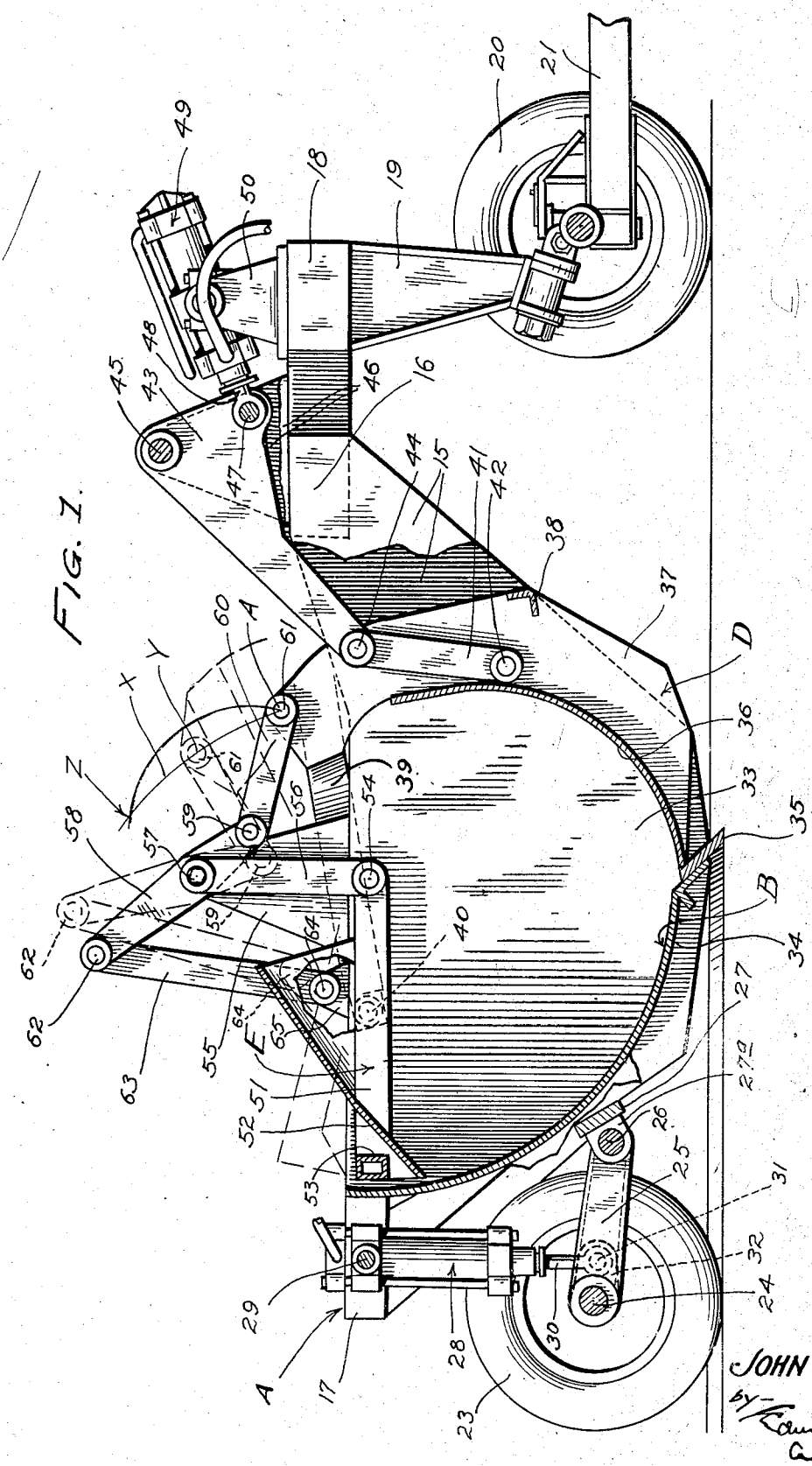
Dec. 1, 1942. J. J. LOW 2,303,650

CARRYING SCRAPER

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FIG. 1.



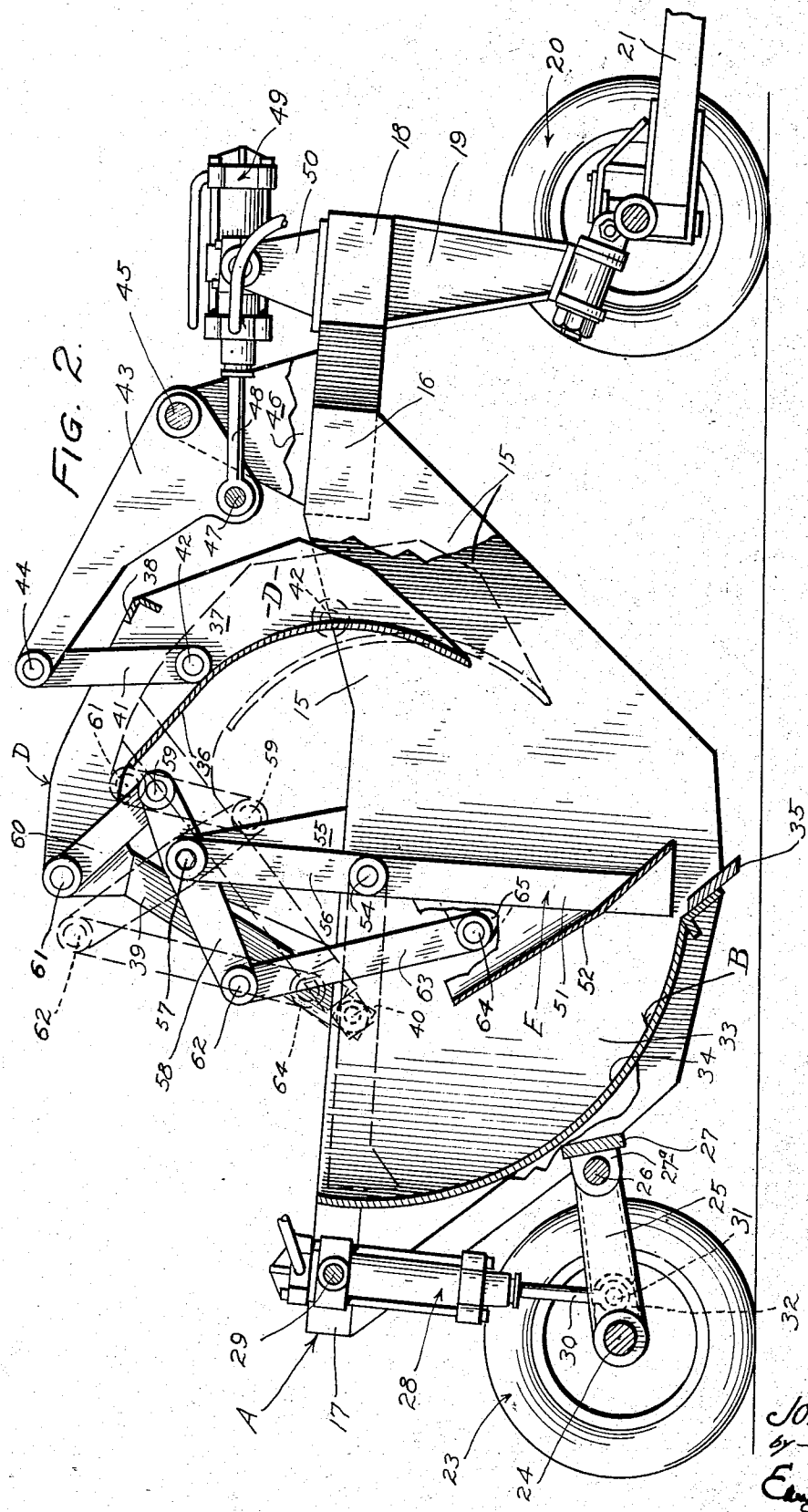
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FIG. 2.



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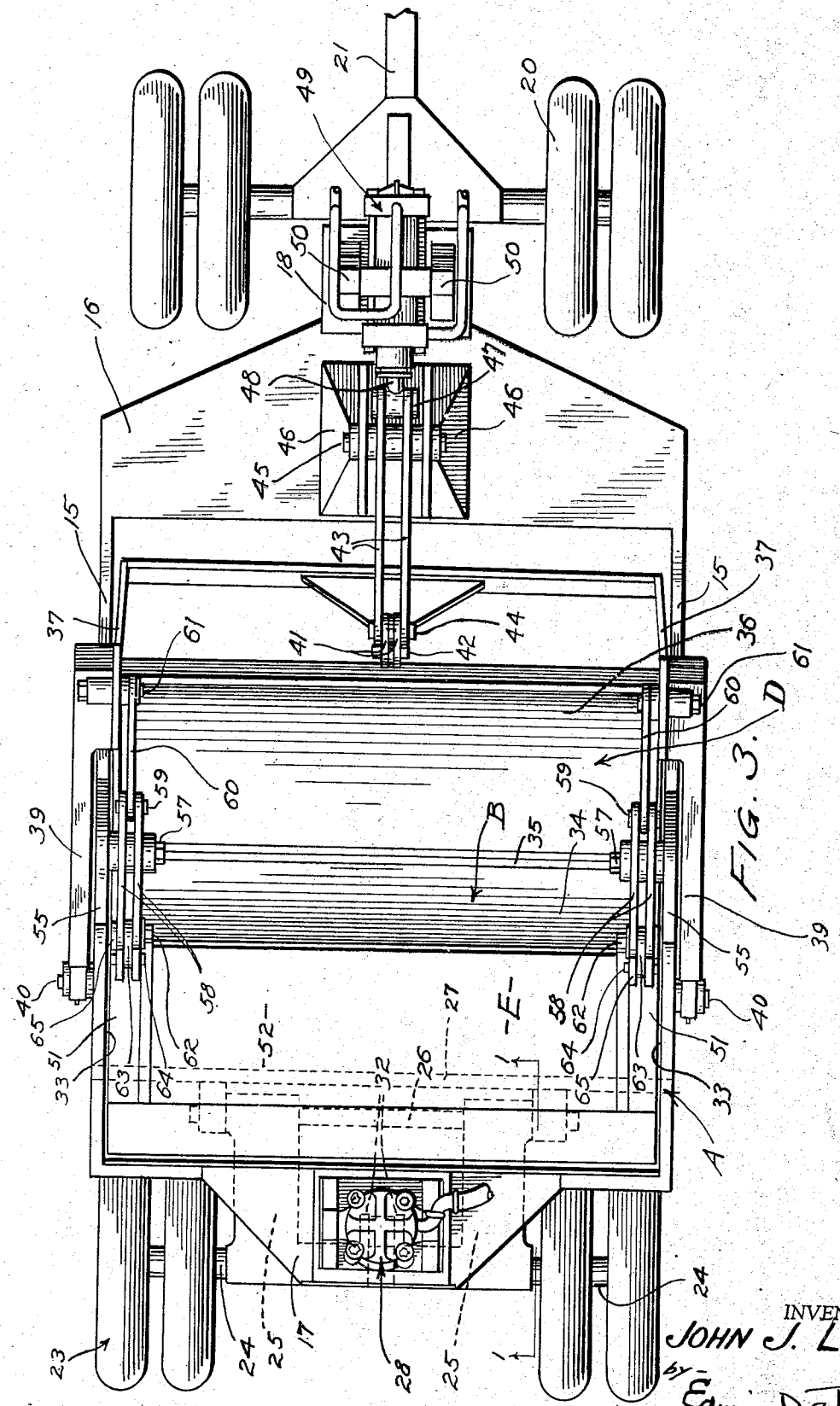


FIG. 3.

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CARRYING SCRAPER

John J. Low, Los Angeles, Calif., assignor to Kay-Brunner Steel Products, Inc., a corporation of Delaware

Application March 15, 1941, Serial No. 383,625

6 Claims. (Cl. 37—126)

My invention relates to carrying scrapers of the character disclosed in my co-pending application Ser. No. 254,021, filed February 1, 1939, since issued as Patent No. 2,239,967, wherein is embodied a bowl, an apron on the front of the bowl, an ejector for ejecting earth from the bowl, and a mechanism operatively connecting the ejector to the apron by which actuation of the ejector is effected in such manner that its movement from a retracted position at the rear of the bowl to an advanced position at the front of the bowl to eject earth from the latter, is initiated only after the apron has reached such an open position that it does not obstruct or interfere with discharge of earth from the bowl by the ejector.

When using a mechanism as embodied in my aforesaid application, it has been found that when dealing with earth that is sufficiently free flowing to partially gravitate from the bowl and completely gravitate from the apron when the latter is in open position, the degree to which the apron is opened before advance movement of the ejector is initiated, is sufficient to allow the earth in the apron to gravitate therefrom in quantity adequate to permit the remaining earth in the bowl to be ejected therefrom by advance movement of the ejector. However, when dealing with earth which is not free flowing such as sticky adobe, clay, or the like, before the ejector can be advanced the apron must be opened to a still wider position in order to cause gravitation of earth from the apron before advance movement of the ejector is initiated, otherwise, the ejector in its advance movement will be so resisted by the earth retained in the apron as to either prevent such advance movement, or break the parts of the mechanism connecting the ejector with the apron.

It is a purpose of my invention to provide a carrying scraper embodying a mechanism by which advance movement of the ejector in the bowl is delayed until the apron reaches an open position in which earth that is not free flowing can gravitate from the apron, thereby allowing advance movement of the ejector to completely clear the bowl of earth, and without imposing any breaking strains on the mechanism.

In the accompanying drawings:

Fig. 1 is a vertical longitudinal sectional view taken on the line 1—1 of Fig. 3, showing one form of carrying scraper embodying my invention, and wherein the apron is in closed position and the ejector in retracted position.

Fig. 2 is a view similar to Fig. 1 showing the apron in fully open position and the ejector in completely advanced position in the bowl.

Fig. 3 is a view showing the carrying scraper in top plan and with the apron closed and the ejector retracted.

Similar reference characters refer to similar parts in each of the several views.

Referring specifically to the drawings, the carrying scraper comprises a frame A having side members 15, 15, a front end member 16, and a rear end member 17. The front member 16 is relatively wide to provide a platform, and projecting forwardly therefrom is an extension 18 from which depends a standard 19 connected to a swivel wheel truck 20 having a draw bar 21 adapted for connection to a tractor.

A rear wheel truck 23 including a rear axle 24 is pivotally connected to the rear of the frame A through a pair of links 25 pivoted on the axle 24 and on a shaft 26 carried by ears 27a fixed to a cross beam 27. A hydraulic ram 28 is pivoted as at 29 in the rear frame member 17 with the piston rod 30 thereof pivotally connected to a pin 31 carried by ears 32 of the links 25.

Manifestly, the mounting of the ram 28 and its operative connection with the links 25 is such that through operation thereof the links can be actuated to elevate and lower the frame A to effect a corresponding movement of a bowl B carried by the frame.

The bowl B includes side walls 33 and a curved rear and bottom wall 34, with a scraping blade 35 at the forward edge of the bottom wall, which engages the earth when the bowl is lowered to the position, shown in Fig. 1, whereby under forward movement of the scraper the filling of the bowl with earth can be effected.

In the front of the bowl B and between the sides 33 thereof is situated an apron D, it being understood that the function of the apron is to coact with the blade 35 in filling the bowl with earth under forward movement of the scraper, and to confine the earth within the bowl once the latter is filled so that such earth may be transported by the scraper and subsequently discharged. The apron D includes a wall 36 curved in the manner illustrated in Fig. 1, and projecting forwardly from this wall are a pair of flanges 37 connected by a cross beam 38. These flanges 37 extend upwardy above the frame A where they have fixed thereto a pair of arms 39 which extend rearwardly and have their rear ends pivoted on the frame A at the points indicated at 40.

For lifting the apron D from the closed posi-

tion shown in Fig. 1 to the fully open position shown in Fig. 2, or to any desired intermediate position, a pair of parallel links 41 are pivoted to the bowl, as at 42, and to the rear end of parallel bell crank levers 43, as at 44. The levers 43 are fulcrumed, as at 45, on a pair of upstanding ears 46 fixed to the frame member 16. Pivotally connected to the levers 43, as at 47, is the piston rod 48 of a hydraulic ram 49, such ram being pivotally supported upon ears 50 rising from the extension 18.

For discharging earth from the bowl an ejector E is provided and mounted in the bowl B to occupy a retracted position at the top of the bowl, as in Fig. 1, or an advanced position at the bottom of the bowl, as in Fig. 2, whereby during downward and forward movement of the ejector from the retracted to the advanced position it operates to sweep earth from the bowl. This ejector includes a pair of side arms 51 bridged by a partition 52 and reinforced by a cross beam 53. The arms 51 are pivotally mounted on the inner side walls 33 of the bowl, as at 54, such pivots being located substantially at the center of curvature of the rear and bottom wall 34 of the bowl.

The ejector E is adapted to be actuated to swing forwardly through the bowl, by elevation of the apron D and through the provision of a mechanism which comprises two sets of elements situated at opposite sides and above the bowl B. As the two sets of elements are identical in construction, a description of one will suffice for both.

A bearing standard 55 rises from the frame member 15, and is reinforced by a fixed brace bar 56. At the upper end of the standard 55 is a pin 57 which constitutes a fulcrum for a pair of parallel rocker arms 58. To the forward end of these arms 58 is pivotally connected, as at 59, a link 60, the forward end of such link being pivoted, as at 61, to the upper end of the corresponding flange 37. The rear end of the rocker arms 58 are pivoted, as at 62, to the upper end of a link 63, and the lower end of this link 63 is pivoted, as at 64, to ears 65 fixed to the corresponding side arm 51.

The operation of the ejector E and the apron D through the aforedescribed mechanism is as follows. With the apron in closed position, as shown in Fig. 1, the ejector occupies a retracted position at the top of the bowl, while the two sets of links 60 and 63, and the rocker ams 58 are in the solid line positions. Through operation of the ram 49 to move the piston rod 48 rearwardly, the bell crank lever 43 is actuated and the links 41 elevated to lift the apron D to any open position required. Because of the location of the apron pivots 40 in relation to the link pivots 59 the apron, in the first part of its opening movement, moves the links 60 rearwardly to rock the arms 58 so that the ejector E is slightly elevated to the dash line position shown in Fig. 1.

Such retrograde movement of the ejector, rocker arms and links, is merely incidental to the links 60 swinging upwardly about the pivots 59 as a center to the dash line position shown, and during which the pivots 61 describe the path defined by the curved line X. Were there no incidental movement of the arms 58 the path described by the pivots 61 would be defined by the line Y, the arc of which is such that it intersects the line X at the point Z. It is at this point Z that the pivots 59 return to their initial positions to restore the ejector to starting position.

Manifestly, the aforedescribed upward swinging movement of the links 60 is ineffective to advance the ejector downwardly through the bowl. Thus, assuming that the bowl and apron have been previously loaded with earth in the usual manner, the ejector is yet to be actuated to discharge earth from the bowl. However, with the upper ends of the links 60 at the point Z the apron is now in the open position shown in dash lines in Fig. 2. This open position is sufficient to allow earth that is not free flowing such as wet adobe, clay, or the like, to partially gravitate from both the bowl and the apron, and the quantity of earth thus discharged from the apron is such that the earth in the bowl is unobstructed by the earth in the apron so that the ejector can now be advanced to discharge the earth from the bowl. By further opening of the apron beyond the dash line position shown in Fig. 2 and to the maximum position in solid lines, the links 60 exert an upward pull on the forward ends of the arms 58 to lower the rear ends of the latter, and through the links 63 the ejector is now sprung downwardly and forwardly through the bowl.

Manifestly, from the foregoing operation of my actuating mechanism for the ejector, advance movement of the ejector through the bowl is delayed in relation to opening movement of the apron to such an extent that, even with earth that is not free flowing, a sufficient amount thereof will be caused to gravitate from the apron that when advance movement of the ejector is initiated, the mass of earth in the bowl will not be resisted by the earth in the apron as it is discharged from the bowl under the action of the ejector.

Although I have herein shown and described only one form of carrying scraper embodying my invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit of my invention and the spirit and scope of the appended claims.

I claim:

1. In a carrying scraper; a bowl; arms pivoted on the bowl; an earth ejector carried by said arms to swing forwardly through the bowl; an apron pivoted on the bowl; rocker arms fulcrumed on the bowl; links connected to said apron and to the rocker arms at one side of the fulcrum points of the latter; other links connecting the rocker arms at the other side of the fulcrum points of the latter to said arms between the pivots of the latter and said ejector; and means for moving the apron, whereby the links and rocker arms coact to actuate the ejector.

2. In a carrying scraper; a bowl; arms pivoted on the bowl; an earth ejector carried by said arms to swing forwardly through the bowl; an apron pivoted on the bowl; rocker arms fulcrumed on the bowl; links pivoted to said arms at points rearwardly of the arm pivots and to said rocker arms rearwardly of its fulcrums; other links pivoted to said apron forwardly of said rocker arms and pivoted to said rocker arms forwardly of its fulcrums; and means for moving the apron, whereby the links and rocker arms coact to actuate the ejector.

3. In a carrying scraper; a bowl; arms pivoted on the bowl; an earth ejector carried by said arms to swing forwardly through the bowl; an apron pivoted on the bowl; rocker arms fulcrumed on the bowl; links pivoted to said arms at points rearwardly of the arm pivots and to said rocker arms rearwardly of its fulcrums; other links pivoted to said apron forwardly of said rocker arms and pivoted to said rocker arms forwardly of its fulcrums; and means for ele-

vating the apron, whereby said other links are first caused to swing upwardly on said rocker arms without lifting the adjacent ends of the latter so as to allow the apron to reach a non-obstructing position to earth gravitating from said bowl, whereupon said other links are further elevated to actuate said rocker arms and thus swing said ejector forwardly through the bowl.

4. A carrying scraper, comprising; a bowl; an apron at the front of the bowl movable to occupy open and closed positions; an ejector movable in the bowl to or from a retracted position at the top of the bowl to or from an advanced position at the front of the bowl; and a mechanism operatively connecting the apron and the ejector for advancing or retracting the ejector according as the apron is open or closed, said mechanism including at least one set of elements comprising a rocker arm fulcrumed on the bowl, a link connected to the upper side of the ejector and to said rocker arm at the rear of its fulcrum, and another link connected to the apron forwardly of the ejector and to said rocker arm forwardly of its fulcrum.

5. A carrying scraper, comprising; a bowl, an apron at the front of the bowl movable to occupy open and closed positions; an ejector movable in the bowl to or from a retracted position at the top of the bowl to or from an advanced position at the front of the bowl; and a mechanism operatively connecting the apron and the ejector for advancing or retracting the ejector according as the apron is open or closed, said mechanism including at least one set of elements comprising a rocker arm fulcrumed on the bowl, a link connected to the upper side of the ejector and to said rocker arm at the rear of its fulcrum, and another link connected to the apron forwardly of the ejector and to said rocker arm forwardly of its fulcrum, the point of connection of the first mentioned link with said rocker arm being a greater distance from the fulcrum thereof than the point of connection of said other link with the rocker arm.

6. In a carrying scraper; a bowl; arms pivoted on the bowl; an earth ejector carried by said arms to swing forwardly through the bowl; an apron pivoted on the bowl; rocker arms fulcrumed on the bowl; links pivoted to said arms at points rearwardly of the arm pivots and to said rocker arms rearwardly of its fulcrums; other links pivoted to said apron forwardly of said rocker arms and pivoted to said rocker arms forwardly of its fulcrums; a bell crank lever mounted forwardly of the apron; a link connecting said lever to the apron; and means for operating said lever to lift the apron through said link, whereby the other links and rocker arms coact to swing the ejector forwardly through the bowl.

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