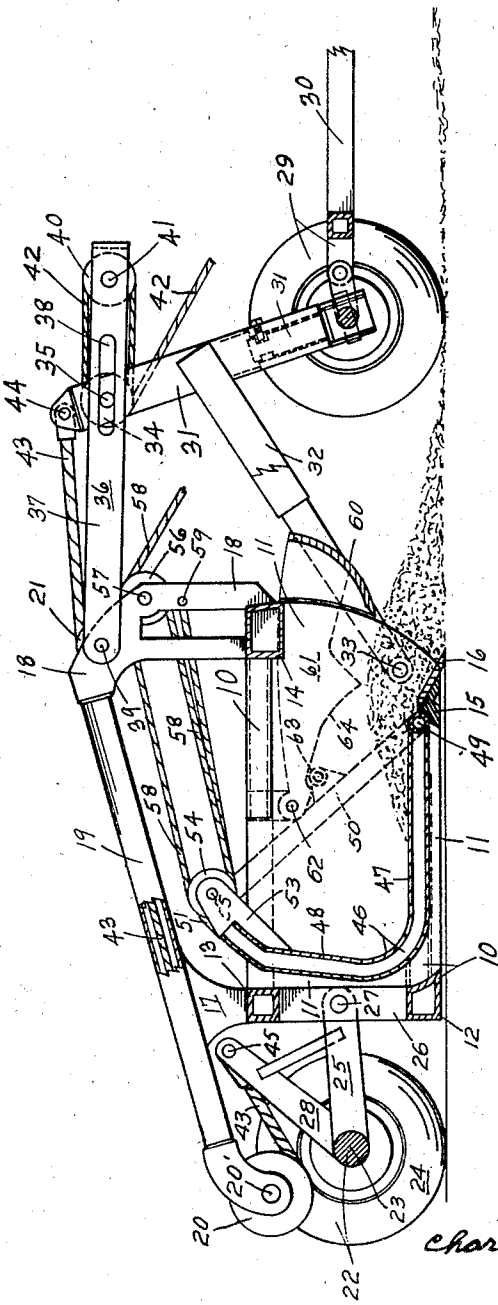
Dec. 3, 1940. C. LE BLEU 2,223,829

SCRAPER

Filed April 8, 1938 5 Sheets-Sheet 1

FIG. 1



INVENTOR.

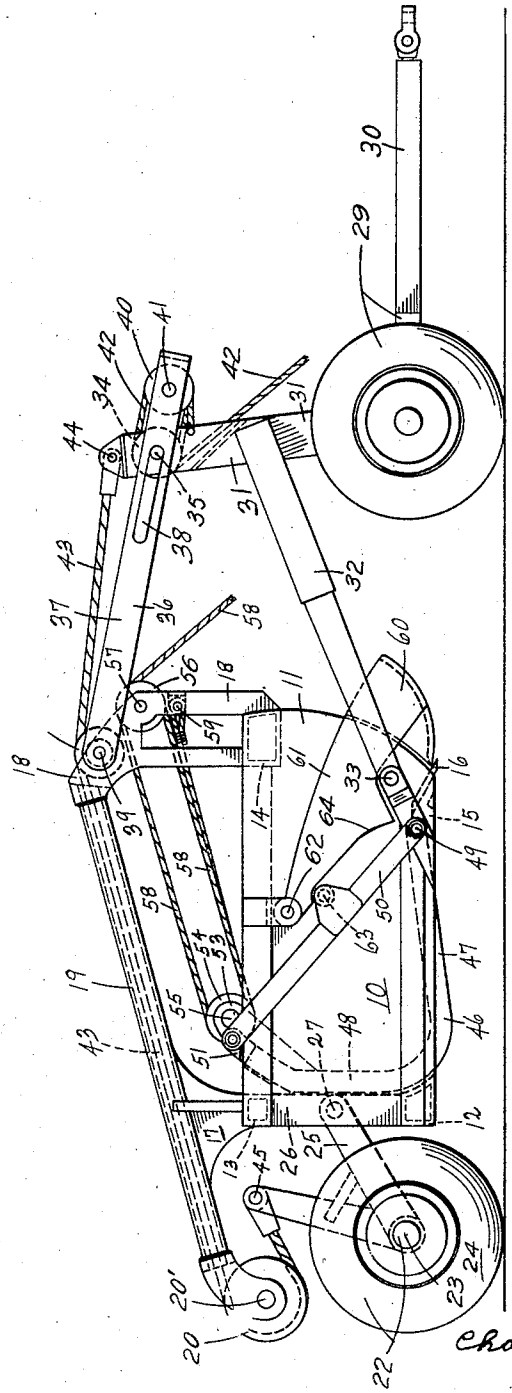
Charles Le Bleu

Dec. 3, 1940. C. LE BLEU 2,223,829

SCRAPER

Filed April 8, 1938 5 Sheets-Sheet 2

FIG. 2



INVENTOR.

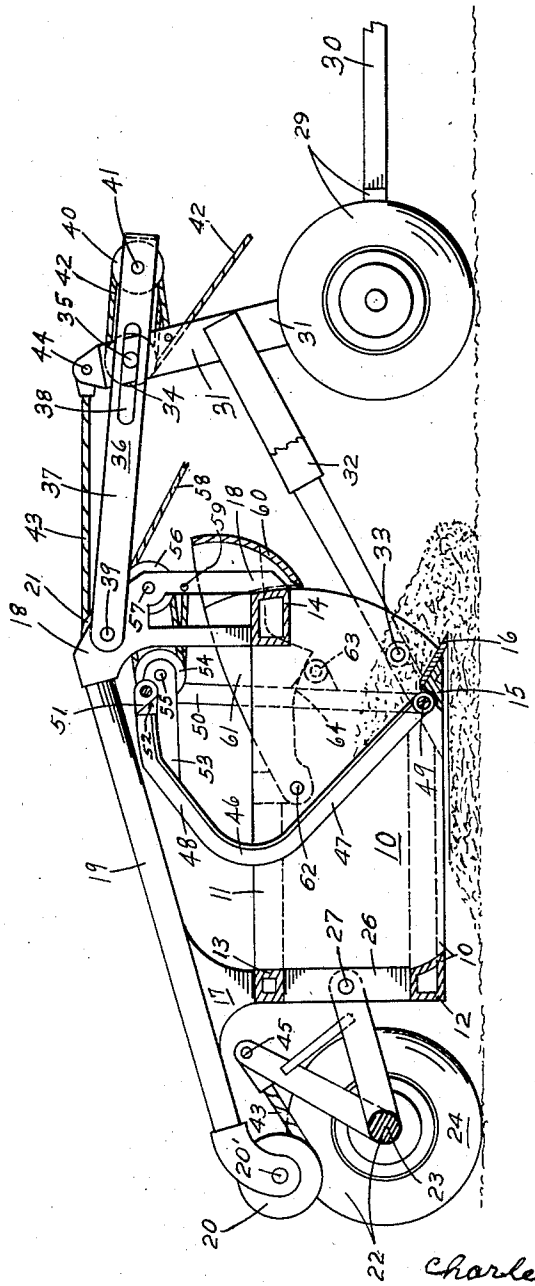
Charles Le Bleu

Dec. 3, 1940. C. LE BLEU 2,223,829

SCRAPER

Filed April 8, 1938 5 Sheets-Sheet 3

FIG. 3



INVENTOR.

Charles Le Bleu

Dec. 3, 1940. C. LE BLEU 2,223,829

SCRAPER

Filed April 8, 1938 5 Sheets-Sheet 4

FIG. 4.

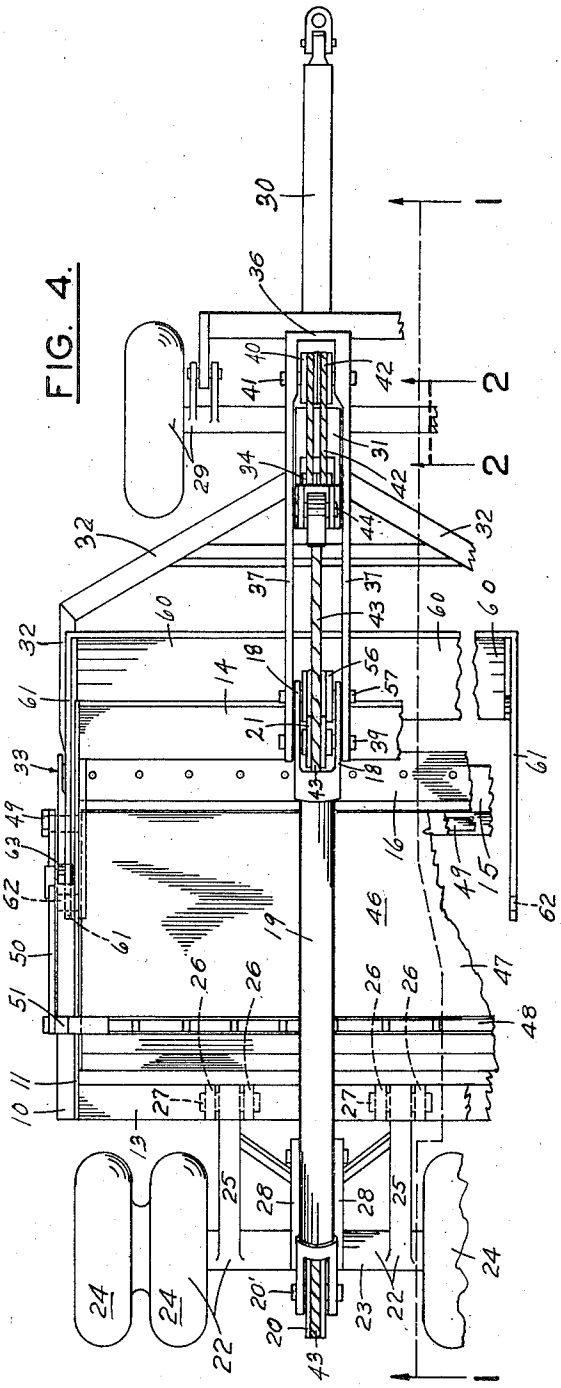


FIG. 7

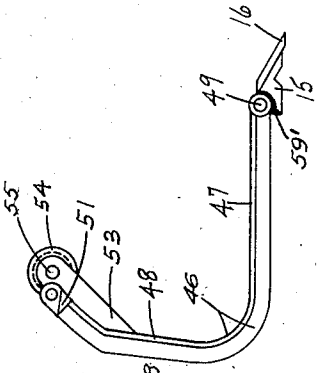


FIG. 6

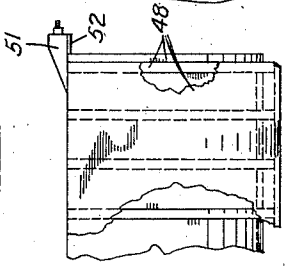
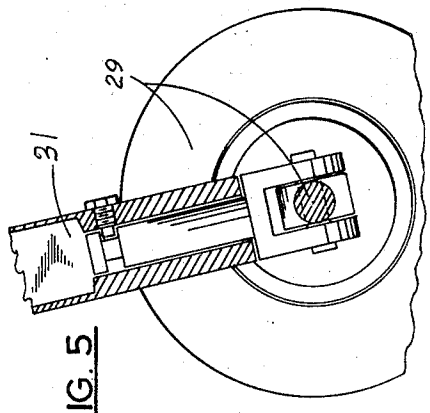


FIG. 5



INVENTOR.

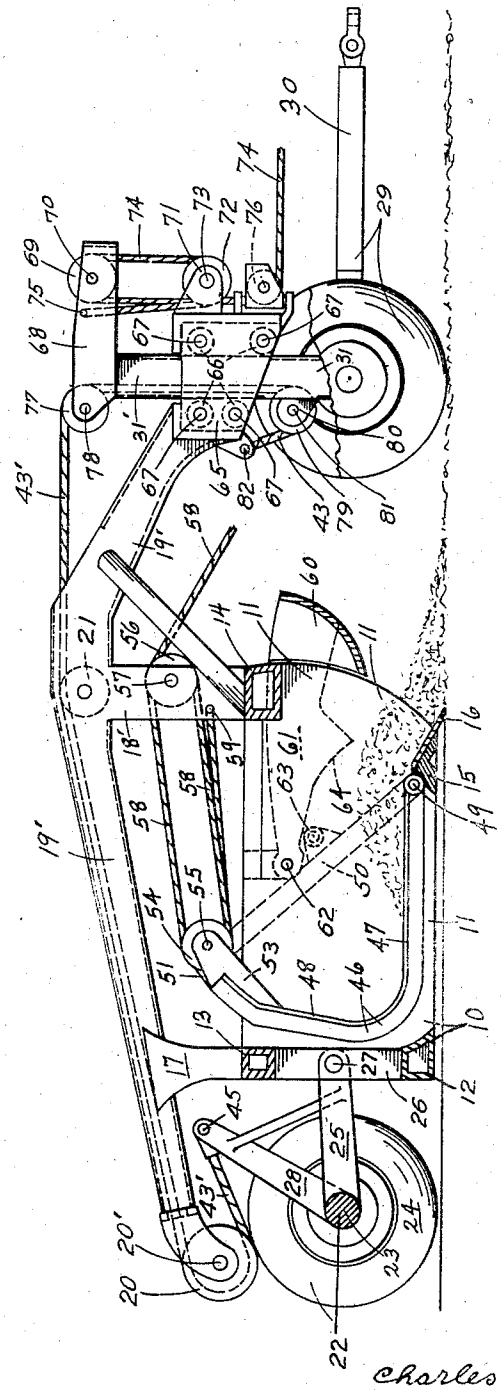
Charles Le Bleu

Dec. 3, 1940. C. LE BLEU 2,223,829

SCRAPER

Filed April 8, 1938 5 Sheets-Sheet 5

FIG. 8



INVENTOR.
Charles Le Bleu

Patented Dec. 3, 1940 2,223,829

UNITED STATES PATENT OFFICE

2,223,829

SCRAPER

Charles Le Bleu, Los Angeles, Calif.

Application April 8, 1938, Serial No. 200,919

12 Claims. (Cl. 37—126)

This invention relates generally to material digging, scraping, leveling and transporting machines for use in leveling ground, building roads, excavating, grading, and transporting materials, and particularly to that class of material handling machines commonly known as "scrapers" by means of which materials may be scraped up and moved, and is an improvement upon my co-pending application Serial No. 111,884 filed November 20, 1936, in which I disclose a bowl support having a bowl tiltably mounted thereon, and means for tilting said support about the rear wheels as an axis for raising and lowering the same. This invention is also an improvement upon my Patent 2,103,588 issued December 28, 1937, wherein I disclose spaced apart parallel side walls rigidly connected by beams, a bottom and a scraper. An end gate is pivotally suspended from the side walls to swing lengthwise of the bucket for unloading the same. However, it has been found that this method of unloading the bucket requires an excessive application of power which is objectionable. It is therefore an object of the present invention to overcome this objection by eliminating the swinging gate and rigid bottom, and substituting therefor a tilting bowl as hereinafter described, the rigidly connected side walls of my patent becoming the bowl support of the present invention.

Still another object of this invention is the provision in a machine of the class described of a bowl support comprising spaced apart parallel side walls; beams rigidly connecting said side walls and a bowl tiltably disposed adjacent its forward end between said side walls, said side walls serving as side closures for said bowl and also as a support therefor, and means applied to said support for raising the same vertically, substantially without tilting it.

Still another object of this invention is the provision in a machine of the class described of a bowl supporting structure and control means applied to the front and rear ends thereof for collectively raising the same vertically, substantially without tilting it, said control means including ground wheels by means of which the bowl support is supported from the ground.

Another object of this invention is the provision in a machine of the class described of a bowl support, and means applied to the front and rear ends thereof for collectively raising the same.

In a machine of the class described as usually constructed wherein the bowl is raised and lowered by tilting its supporting structure about the rear wheels as an axis, or by tilting the bowl itself about a rear pivot on the supporting structure, the bowl cannot be supported with its bottom in a horizontal position during the loading operation without sacrificing clearance between the lower rear end thereof and the ground under the same when the bowl is in transporting position.

In my co-pending application above referred to, I disclose structure wherein the bottom of the bowl inclines downwardly toward its rear end when disposed in the loading position and yet may be disposed in a horizontal position when the bowl is in transporting position. This arrangement has exceptional merit in that the material need not be forced up an upwardly inclined bottom during the loading operation and yet may be so disposed in the transporting position that clearance between the rear end of the bottom and the ground thereunder is not sacrificed, but this arrangement of structure is objectionable in that the weight of the rear end of the loaded bowl is supported by the control mechanism during transportation thereof from the place of loading to the place where the material is to be discharged, and it is one of the objects of this invention to overcome this objection without materially affecting the operating efficiency of the machine.

Another object of this invention is the provision in a machine of the character described of a bowl support and a bowl tiltably mounted thereon, the bottom of said bowl being normally disposed in a horizontal position in loading position of said bowl and inclined downwardly toward its rear end in carrying position of said bowl.

Still another object of this invention is the provision in a machine of the class described of a bowl support, a main bowl tiltably mounted adjacent its forward end thereon, and an auxiliary bowl disposed forwardly of and confronting the main bowl, said auxiliary bowl being mounted for up and down movement for opening and closing the front end of the main bowl, the bottom of said main bowl normally extending rearwardly and downwardly from its pivotal mounting in closed position of the auxiliary bowl.

In my co-pending application above referred to, I disclose a bowl comprising an integral bottom and rear wall tiltably disposed between spaced apart parallel side walls, said side walls serving as side closures for said tiltable bowl, and plates which I termed braces connecting said bottom and rear wall. It is objectionable to have these braces confined between the side walls where they interfere with the passage of material. It is therefore an object of this invention to pro-

vide brace means for the bowl disposed outside the space confined by said side walls.

Another object of this invention is the provision of simple and efficient mechanism for operably associating the main bowl and the auxiliary bowl, and whereby the weight of the auxiliary bowl is in all normal positions thereof, applied to the main bowl in a direction tending to swing the same downwardly.

Still other objects, features and advantages of this invention will be apparent to those skilled in the art upon detailed perusal of the attached drawings and the following specifications, wherein I describe and exemplify my invention, but it is to be understood that my invention as herein exemplified and described is susceptible to modification in the combination, correlation and construction of parts, members and features without departing from the spirit of the invention as defined in the annexed claims.

These objects are accomplished by the embodiment of my invention illustrated in the accompanying drawings in which:

Figure 1 is a side elevation in section taken on the broken line 1—1 of Figure 4, all parts being in loading position.

Figure 2 is a side elevation of my invention disposed in transporting position.

Figure 3 is a side elevation of Figure 1 in section also taken on broken line 1—1 of Figure 4 showing parts in dumping position.

Figure 4 is a fragmentary plan view of Figure 1.

Figure 5 is a side elevation in section of the pony truck taken on a line 2—2 and shows the articulate mounting of the upstanding arm on the pony truck.

Figure 6 is a fragmentary rear elevation of the main bowl.

Figure 7 is a side elevation of the main bowl of modified construction.

Figure 8 is a side elevation of a modified form of my invention in loading gathering position.

Referring now more particularly to the drawings, a bowl support 10 comprises a pair of spaced apart parallel side walls 11. Side walls 11 are rigidly connected by transverse beams 12, 13, 14 and 15. Transverse beam 15 is adapted to support a scraper 16 which is detachably secured thereto. The bowl support 10 also includes brackets 17 and 18 rigid at their lower ends respectively with beams 13 and 14. Brackets 17 and 18 rigidly support on their upper ends a longitudinally extending hollow member 19, which overhangs the rear end of the bowl support 10 and is provided at its rear end with a vertical sheave 20, as shown at 20', operably arranged relative to the opening through said hollow member 19. A vertical sheave 21 is operably mounted upon brackets 18 adjacent the forward end of member 19 and is also operably arranged relative to the opening therethrough.

A wheeled truck 22 is disposed rearwardly of the bowl support 10 and comprises an axle 23 having ground wheels 24 journaled thereon. Axle 23 is provided with forwardly extending arms 25. The front end of arms 25 are disposed one between each of two pairs of brackets 26 and pivotly connected thereto as shown at 27, brackets 26 being rigid at their upper and lower ends respectively with transverse beams 13 and 12. Arms 28 are rigid with and upstanding from the wheeled truck 22. Thus a wheeled truck 22 is disposed rearwardly of the bowl support 10 and is mounted thereon as shown at 27 for swinging movement in a vertical plane.

A swivel pony truck 29 is disposed forwardly of the bowl support 10 and is provided with a tongue 30 adapted at its forward end as shown for connection to a draft device.

An upstanding arm 31 is articulately, see Figure 5, mounted on and upstanding from the pony truck 29 and is provided intermediate its ends with rearwardly extending arms 32 rigid at their forward ends with said upstanding arm 31 and pivotly connected at their rear ends to the bowl support 10 as shown at 33. Thus arms 32 operably associate said upstanding arm 31 and the forward end of bowl support 10, and it will readily be understood that swinging movement of the upstanding arm 31 in a direction extending longitudinally of the machine may impart up and down movement to the front end of the bowl support 10 depending on which direction said arm is swinging. Means for so swinging the upstanding arm 31 are provided as follows.

Upstanding arm 31 is provided adjacent its upper end with vertical sheaves 34 disposed between the side walls of upstanding arm 31 and journaled on a pin 35 carried thereby as shown, said upstanding arm being open at its front and rear sides adjacent its upper end. A thrust device 36 comprises a pair of beams 37 disposed one on each side of upstanding arm 31 and provided each with a slot 38 through which the pin 35 projects for slidably supporting the thrust device on said upstanding arm, the rear end of said thrust device being pivotly connected to the bowl support 10 as shown at 39. Disposed between the forwardly projecting ends of beams 37 are vertical sheaves 40 journaled on pin 41 carried by said beams 37, vertical sheaves 40 being operably arranged relative to vertical sheaves 34 carried by upstanding arm 31. A control cable 42 is anchored at an end to upstanding arm 31 as shown, and passes thence back and forth about sheaves 34 and 40 and thence forwardly to a winding drum on the tractor (not shown because of conventional design). It will readily be seen that cable 42 may be operated to swing the upper end of arm 31 forwardly thus raising the rear ends of arms 32 to which the bowl support 10 is pivotly connected at 33 and at the same time apply a force to said bowl support 10 at 39 in a direction tending to raise the front end of said bowl support.

Means are provided for swinging the rear truck 22 as follows; a cable 43 is pivotly connected to the upper end of upstanding arm 31 as shown at 44 and passes thence rearwardly about sheaves 21 and 20 respectively to a pivotal connection with the upper end of upstanding arms 28 as shown at 45.

Thus it will readily be seen that the forward swinging movement of upstanding arm 31 for raising the front end of bowl support 10 will, through the action of cable 43, impart simultaneous downward swinging movement to the wheeled truck 22 for raising the rear end of bowl support 10, and thus it is seen that operation of cable 42 will result in simultaneously raising both ends of bowl support 10, and since the extent of the action of wheeled truck 22 as translated into vertical movement of the rear end of bowl support 10 may be substantially equal to the vertical movement imparted to the forward end of bowl support 10 by the swinging action of upstanding arm 31 and the consequent swinging movement of rearwardly extending arms 32.

it is seen that cable 42 may be operated to raise the bowl support 10 vertically substantially without tilting it. However, it will be readily understood that the effective relative length of arm 28 may vary from that shown, resulting in imparting some tilting movement to the bowl support as it is raised and lowered collectively, without departing from the spirit of the invention as defined in the claims.

A bowl 46 comprises an integral bottom 47 and rear wall 48 disposed between side walls 11 facing longitudinally therewith and slidably cooperates at its sides with side walls 11 whereby side walls 11 may serve as side closures for bowl 46. Bowl 46 is pivotally mounted adjacent its forward end behind beam 15 and scraper 16 as shown at 49 for swinging movement in a vertical plane.

Brace bars 50 are disposed one on the outside of each of side walls 11 and are pivotally mounted at their lower ends about pivot 49. The upper end of rear wall 48 is provided at each of its sides with a laterally projecting member 51 which members overhang side walls 11 and to the projecting ends of which the upper ends of brace bars 50 are secured, said members 51 also being adapted as indicated at 52, see Figure 6, to rest on side walls 11 in carrying position of bowl 46, see Figure 2, for supporting the rear end of the loaded bowl thereon during transportation thereof.

Transversely spaced brackets 53 are secured to the upper edge of rear wall 48, and vertical sheaves 54 are journaled thereon as shown at 55. Vertical sheaves 56 are journaled on brackets 18 as shown at 57 in operating alignment with sheaves 54. A cable 58 is anchored at an end to bracket 18 as shown at 59 and passes thence back and forth about sheaves 54 and 56 and may extend thence forwardly to a winding drum on the tractor (not shown because of conventional design). Thus it is readily seen that cable 58 may be operated to impart tilting movement to bowl 46 about pivot 49.

In Figures 1, 2, 3 and 4, I have shown beam 15 and scraper 16 as being rigid with side walls 11. However, as shown in Figure 7 at 59' beam 15 carrying scraper 16 may be rigid with the forward end of bottom 47, preferably welded thereto as indicated at 59', without departing from the spirit of my invention.

An auxiliary bowl 60 is disposed forwardly of the main bowl 46 and scraper 16 and arranged relative to said scraper whereby as the main bowl becomes loaded earth will tumble forward into the auxiliary bowl so that the auxiliary bowl may be loaded in common with the main bowl, said auxiliary bowl being also adapted to open and close the forward end of the main bowl. A pair of arms 61 are disposed one along the outside of each of side walls 11 and to the front end of which the auxiliary bowl 60 is secured, the rear ends of arms 61 being pivotly mounted on side walls 11 as shown at 62. Thus the auxiliary bowl 60 is mounted on the bowl support 10 for up and down movement about the pivot 62.

Means are provided for operably associating the main bowl 46 and the auxiliary bowl 60 as follows. Brace bars 50 are provided with rollers 63 arranged to contact the lower edges 64 of arms 61, the lower edges 64 being formed and arranged relative to said rollers 63 whereby tilting movement of the main bowl 46 will impart swinging movement to arms 61, and whereby the weight of the auxiliary bowl 60 in any normal position thereof, is applied to the main bowl in a direction tending to swing the same downwardly about its pivotal mounting 49.

In operation, the machine being in the position of Figure 2, to load the bowls, the main bowl 46 is swung upwardly, by suitable manipulation of cable 58, from the inclined position of Figure 2 to the horizontal position of Figure 1, resulting at the same time in disposing the auxiliary bowl 60 in the open position of Figure 2. The scraper 16 is then lowered to the desired scraping contact with the ground by suitable manipulation of cable 42. The dirt first passes from the scraper 16 into the main bowl 10 and when the main bowl is full the dirt will move upwardly against the dirt therein and tumble forwardly into the auxiliary bowl 60. When both bowls are loaded, suitable manipulation of cable 58 will result in disposing said bowls in the position of Figure 2, and suitable manipulation of cable 42 will result in raising the bowl support 10 to the transporting position of Figure 2 and in this position the machine is drawn to the place where the dirt is to be discharged.

When the place of discharge has been reached, suitable manipulation of cable 58 will result in tilting the main bowl 46 upwardly and forwardly to the dumping position of Figure 3, while at the same time, the auxiliary bowl 60 will be swung upwardly also to the position of Figure 3, in which positions the dirt may tumble from both bowls onto the ground.

When the dirt has been discharged, cable 58 may again be manipulated to dispose the bowls in either the positions of Figure 1 or the positions of Figure 2, in either of which, but preferably the positions of Figure 1, the machine may be drawn to the place where another load is to be gathered.

Figure 8 is a modified form of my invention in which the various structures are substantially identical with that of Figures 1, 2, 3, 4, 5, 6, and 7, the bowl support 10 and bowl 46 comprising a material supporting structure, except for the manner in which the upstanding arm 11 is associated with the balance of the structure. Identical structure therefore carries the same reference characters and therefore only such structure as has been modified will be explained in detail.

Rearwardly extending arms 32 have been omitted and a box-like structure 65 surrounds an upstanding arm 31' intermediate its ends and is provided with rollers 66 disposed therein at the front and rear sides of arm 31' and journaled upon pins 67 carried by said box-like structure 65. Thus the box-like structure 65 is mounted for vertical movement on arm 31'. Instead of terminating member 19, which is a part of bowl support 10, at bracket 18 as first shown and described, a similar member 19' is substituted therefor and carried forward to a rigid connection with the box-like structure 65, and thus the front end of bowl support 10 is mounted for vertical movement on upstanding arm 31'. Means for imparting said vertical movement are provided as follows; the upper end of arm 31' is provided with a pair of transversely spaced arms 68 overhanging arm 31' at its front and rear sides. Vertical sheaves 69 are journaled between the forward portions of arms 68 as shown at 70. Box-like structure 65 is provided on its forward side with a pair of transversely spaced brackets 71 having vertical sheaves 72 journaled therebetween as shown at 73. A cable 74 is anchored at an end thereof to an arm 68 and passes thence back and forth about vertical sheaves 69

and 72, and thence downwardly and then forwardly about a direction change sheave 76 to a winding drum (not shown).

A vertical sheave 77 is disposed between the rear ends of arms 68 and is journaled thereon as shown at 78. An opening is provided in the rear wall of arm 31' adjacent its lower end through which a vertical sheave 79 projects, said sheave 79 being disposed between a pair of transversely spaced brackets 80 carried by said arm 31', said vertical sheave 79 being journaled therebetween as shown at 81. A cable 43' extends downwardly about sheave 77 and thence rearwardly about sheave 79 to a pivotal connection with the forward end of member 19' as shown at 82, the opposite end of cable 43' extending rearwardly from sheave 77 to a pivotal connection with arm 28 as shown at 45.

Thus it is readily seen that by proper manipulation of cable 74 the forward end of the material supporting structure comprising bowl support 10 and bowl 46 may be raised, and because of the association of cable 43' with the forward end of bowl support 10, upstanding arm 31' and rear truck 22, the rear end of the material supporting structure will also be raised, and since the action of wheeled truck 22 as translated into vertical movement of the rear end of bowl support 10 is substantially equal to the vertical movement of the forward end of bowl support 10 on arm 31', it is readily seen that cable 74 may be operated to raise the material supporting structure vertically substantially without tilting it.

From the foregoing description it will be seen that I have exemplified and described such a device as substantially fulfills the objects of the invention as set forth herein.

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

1. A machine of the character described comprising, a bowl support, a bowl tiltably mounted thereon, a wheeled truck disposed behind said support and mounted thereon for swinging movement in a vertical plane, a pony truck disposed forwardly of said support and adapted for connection to a draft device, an arm mounted on and upstanding from said pony truck, rearwardly extending arms rigid at their forward ends with said upstanding arm and pivotably connected at their rear ends to said support, sheave means carried by said support, a cable connected at its forward end to said upstanding arm and passing thence rearwardly about said sheave means to a connection with said wheeled truck behind said support, and means applied to said upstanding arm and said support for raising said support collectively.

2. A machine of the character described comprising a rigid bowl support, a bowl tiltably mounted thereon, a wheeled truck disposed behind said support and pivotly connected thereto for swinging movement in a vertical plane, a pony truck disposed forwardly of said support and adapted for connection to a draft device, an arm mounted on and upstanding from said pony truck, rearwardly extending arms rigid at their front ends with said upstanding arm and pivotly connected at their rear ends with said support, sheave means carried by said support, a cable connected at its forward end to said upstanding arm and passing thence rearwardly about said sheave means to a connection with said wheeled truck behind said support, and means applied to said upstanding arm and said support for raising said support vertically substantially without tilting it.

3. A machine of the character described comprising, a bowl support; ground wheels mounted on the rear end of said support for up and down movement relative thereto; a pony truck disposed forwardly of said bowl support and adapted for connection to a draft device; an arm mounted on and upstanding from said pony truck; means mounting the forward end of said bowl support for up and down movement on said arm; means operably associating the forward end of said bowl support, said upstanding arm and said ground wheels behind said support; and means applied to the forward end of said support and said upstanding arm for raising said support.

4. A machine of the character described comprising, a bowl support; a bowl tiltably mounted thereon; a wheeled truck disposed behind said support and pivotly connected thereto for swinging movement in a vertical plane; a pony truck disposed forwardly of said bowl support and adapted for connection to a draft device; an arm mounted on and upstanding from said pony truck; means mounting the forward end of said bowl support for vertical movement on said arm; flexible means operably associating the forward end of said bowl support, said upstanding arm and said swingably mounted ground wheels behind said support; and flexible means operably applied to the forward end of said support and said upstanding arm for raising said support collectively.

5. A machine of the character described comprising a bowl support; a bowl tiltably mounted thereon; a wheeled truck disposed behind said support and pivotly connected thereto for swinging movement in a vertical plane; a pony truck disposed forwardly of said support and adapted for connection to a draft device; an arm mounted on and upstanding from said pony truck; means mounting the forward end of said bowl support for vertical movement on said arm; a cable connected to the forward end of said bowl support and to said swingably mounted wheeled truck behind said bowl support, said cable being operably associated intermediate its ends with said upstanding arm whereby vertical movement of the forward end of said bowl support on said arm will impart vertical swinging movement to said rear truck; and means applied to the front end of said bowl support and said arm for moving the front end of said support vertically thereon.

6. A machine of the character described comprising, a bowl support, a bowl tiltably mounted thereon, a wheeled truck disposed behind said bowl support and pivotly connected thereto for swinging movement in a vertical plane, a pony truck disposed forwardly of said bowl support and adapted for connection to a draft device, an arm mounted on and upstanding from said pony truck, means mounting the forward end of said bowl support for vertical movement on said arm, a pair of vertically spaced sheaves carried by said arm, sheave means carried by said support, a rear arm mounted on and upstanding from said rear truck, a cable connected at its forward end to said bowl support and passing thence upwardly about the vertically spaced sheaves on said upstanding arm and thence rearwardly about said sheave means carried by said support to a connection to said rear arm whereby vertical movement of the forward end of said bowl support on

said upstanding arm will impart vertical swinging movement to said rear truck, and means applied to the front end of said bowl support and said upstanding arm for moving the front end of said bowl support vertically thereon.

7. A machine of the character described comprising; a bowl support; a wheeled truck disposed behind said support and pivotly connected thereto for swinging movement in a vertical plane; a pony truck disposed forwardly of said bowl support and adapted for connection to a draft device; an arm mounted on and upstanding from said pony truck; means mounting the forward end of said bowl support for vertical movement on said arm; and means operably associating the forward end of said bowl support, said upstanding arm and said wheeled truck behind said support whereby vertical movement of the forward end of said support on said upstanding arm for raising the front end of said support will impart vertical swinging movement to said wheeled truck behind said support in a direction to raise the rear end thereof.

8. A machine of the character described comprising; a material supporting structure, a wheeled truck mounted on the rear end of said supporting structure for up and down movement relative thereto; a pony truck disposed forwardly of said supporting structure and adapted for connection to a draft device; an arm mounted on and upstanding from said pony truck; means mounting the forward end of said supporting structure for vertical movement on said arm; means operably associating the forward end of said supporting structure, said upstanding arm and said wheeled truck behind said supporting structure, and means applied to the forward end of said supporting structure and said upstanding arm for raising said supporting structure collectively.

9. In a machine of the character described, a bowl support, a rear control applied to the rear end of said support for raising the rear end thereof, a front control applied to the front end of said support for raising the front end thereof, sheave means carried by said support, and a cable connected to said rear control and extending about said sheave means, said cable being operably arranged with relation to said front control so that operation of said front control for raising the front end of said support will cause a pulling force to be applied to said cable thereby causing said rear control to function and raise the rear end of said support.

10. In a machine of the character described, a rigidly constructed bowl support, a rear control applied to the rear end of said support for raising the rear end thereof, a front control applied to the front end of said support for raising the front end thereof, sheave means carried by said support, a cable connected to said rear control and extending about said sheave means, said cable being operably arranged with relation to said front control so that operation of said front control for raising the front end of said support will cause a pulling force to be applied to said cable thereby causing said rear control to function and raise the rear end of said support, and means to operate said front control.

11. In a machine of the character described, a bowl support, a rear control applied to the rear end of said support for raising the rear end thereof, a front control applied to the front end of said support for raising the front end thereof, pulley wheels carried by said support, a cable connected to said rear control and extending about said pulley wheels, said cable being operably arranged with relation to said front control so that operation of said front control for raising the front end of said support will cause a pulling force to be applied to said cable thereby causing said rear control to function and impart a similar movement to the rear end of said support, and means to operate said front control for raising said support substantially without tilting it.

12. In a machine of the character described, a bowl support including, spaced apart side walls and transverse beams rigidly connecting said side walls at their upper front and rear portions and a hollow beam disposed at right angles to said transverse beams and rigidly connected thereto; a wheeled truck disposed behind said support and pivotally connected thereto for swinging movement in a direction to raise the rear end of said support; sheave means carried by said hollow beam; a front control applied to the forward end of said support for raising the front end thereof; a cable connected to said wheeled truck at the rear end of said support and extending about said sheave means; means by which said cable is operably arranged with relation to said front control so that operation of said front control for raising the front end of said support will cause a pulling force to be applied to said cable thereby causing said wheeled truck to swing in a direction raising the rear end of said support; and means to operate said front controls.

CHARLES LE BLEU.