Dec. 15, 1942. C. LE BLEU 2,305,481

SCRAPER

Filed April 5, 1941 5 Sheets-Sheet 1

FIG. 1

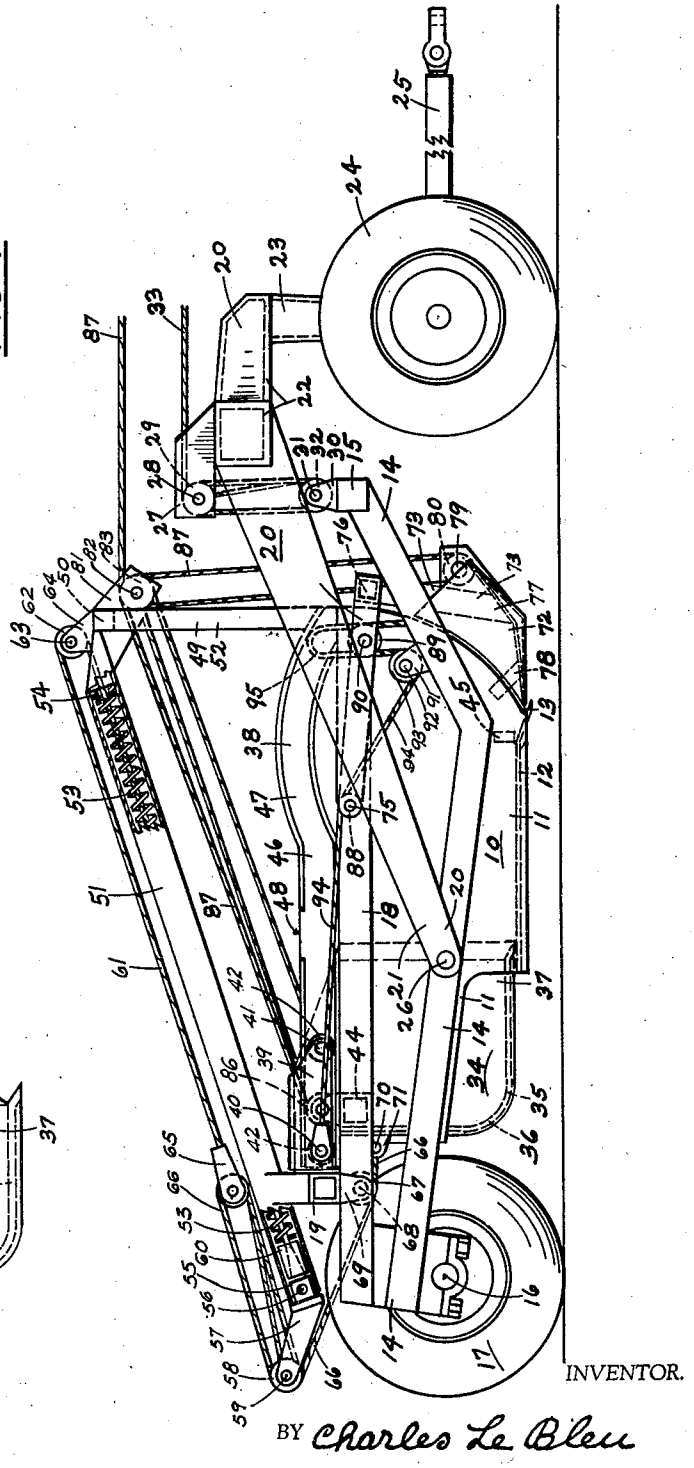
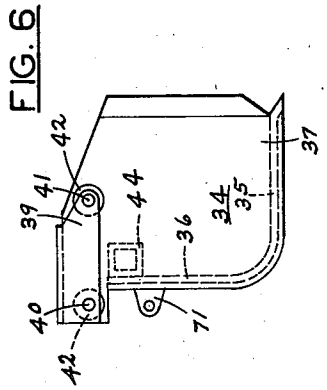


FIG. 6



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Dec. 15, 1942. C. LE BLEU 2,305,481

SCRAPER

Filed April 5, 1941 5 Sheets-Sheet 2

FIG. 2

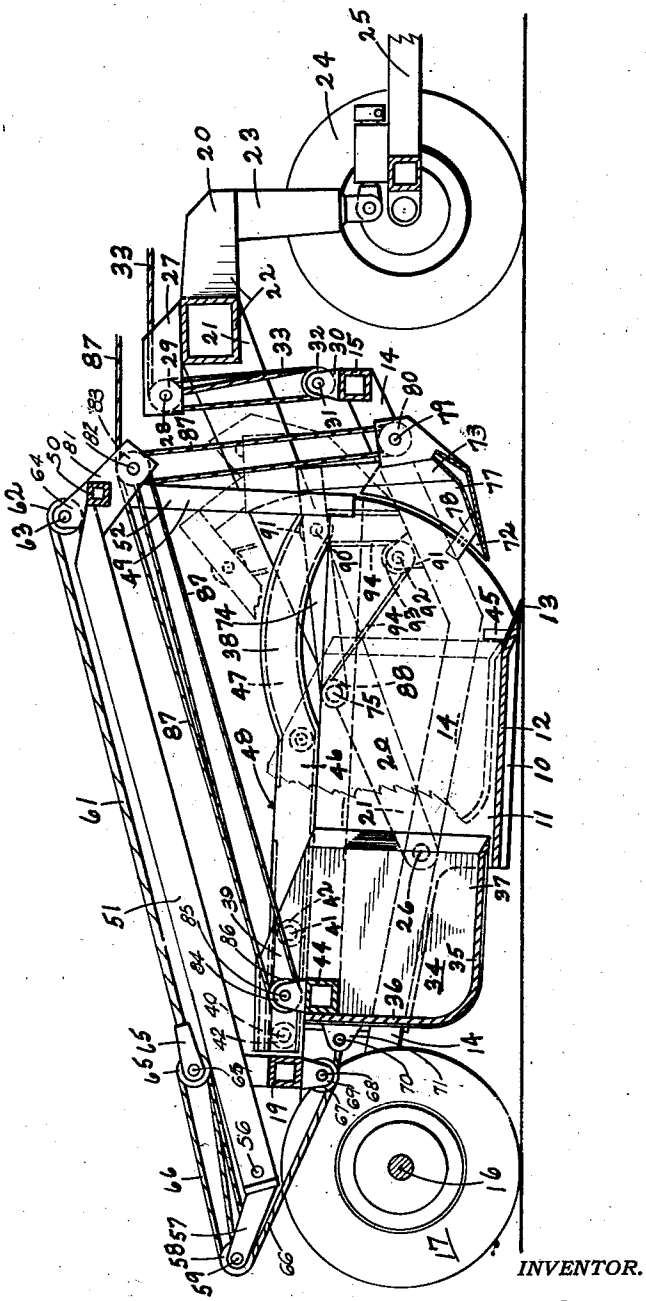
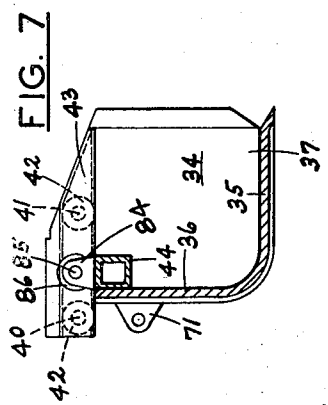


FIG. 7



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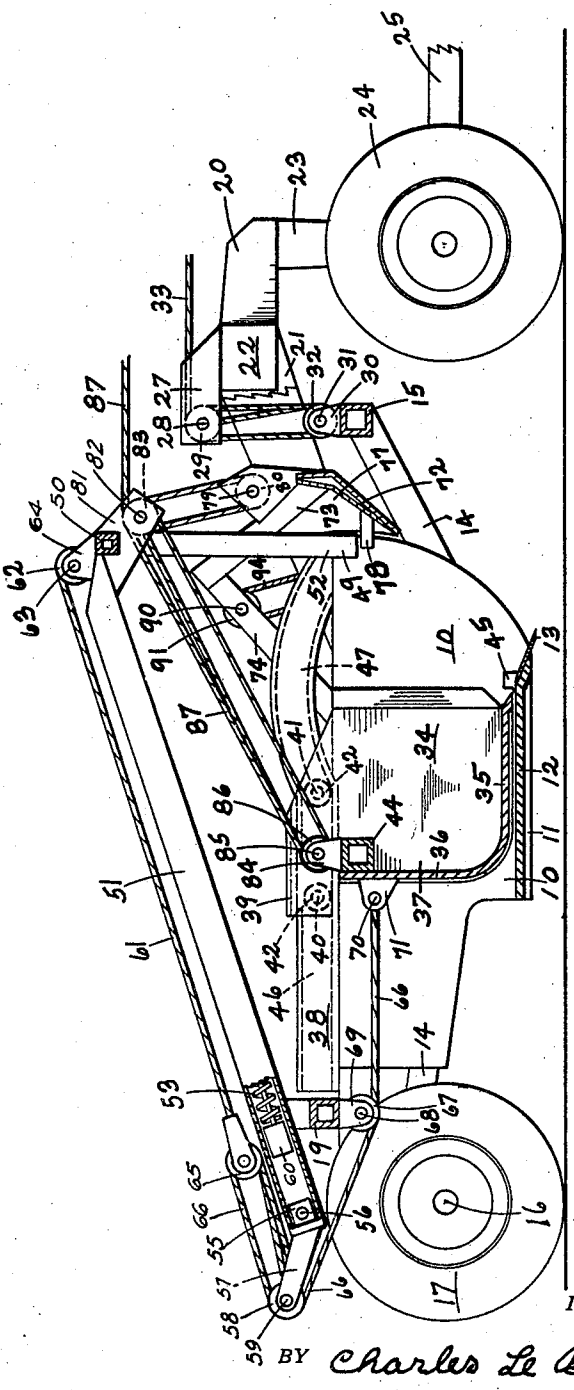
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Dec. 15, 1942. C. LE BLEU 2,305,481

SCRAPER

Filed April 5, 1941 5 Sheets-Sheet 3

FIG. 3



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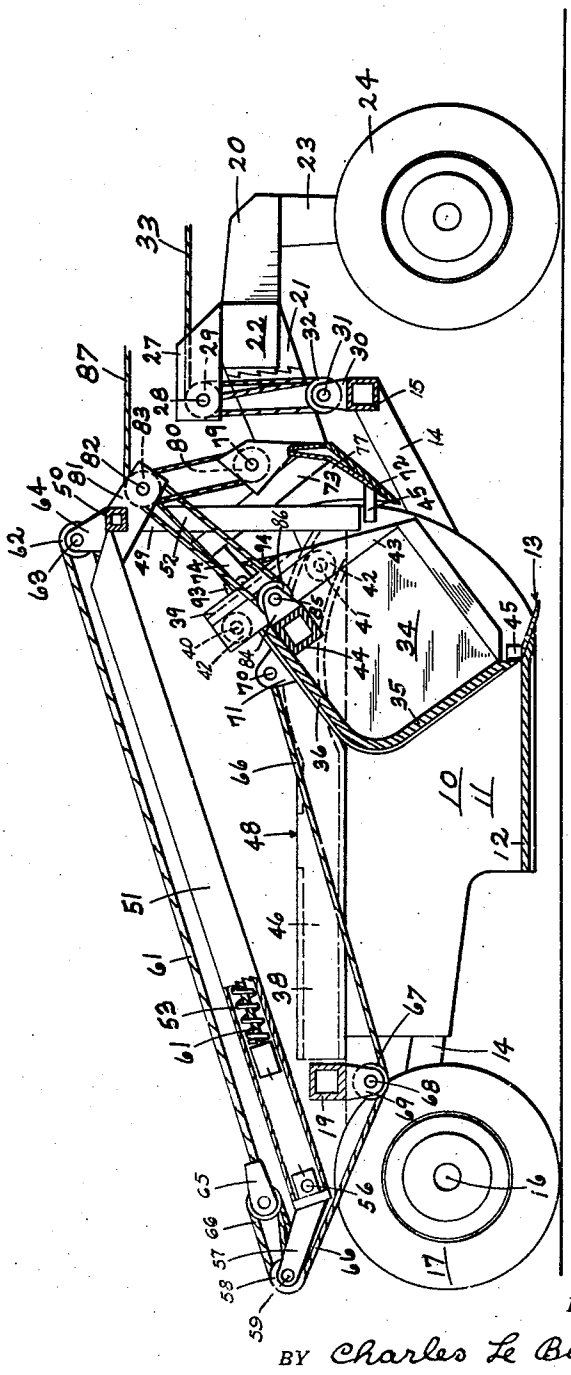
BY Charles Le Bleu

Dec. 15, 1942. C. LE BLEU 2,305,481

SCRAPER

Filed April 5, 1941 5 Sheets-Sheet 4

FIG. 4



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Dec. 15, 1942. C. LE BLEU 2,305,481

SCRAPER

Filed April 5, 1941 5 Sheets-Sheet 5

FIG. 5

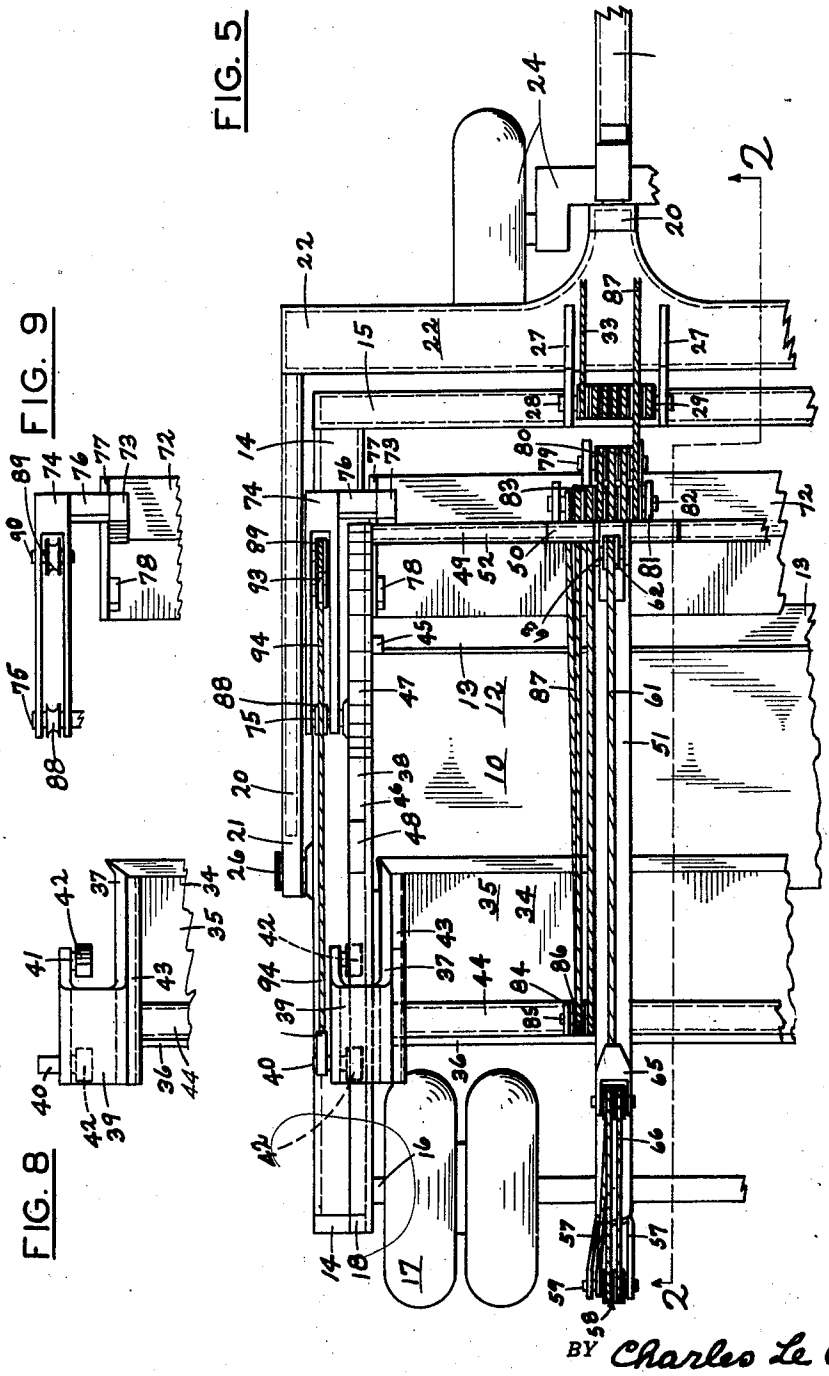


FIG. 9

FIG. 8

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UNITED STATES PATENT OFFICE

2,305,481

SCRAPER

Charles Le Bleu, Los Angeles, Calif.

Application April 5, 1941, Serial No. 387,023

16 Claims. (Cl. 37—126)

This invention relates to improvements in material handling devices of the type commonly known as scrapers which are used for excavating and transporting materials, the objects of the present invention including the provision of a relatively stationary bowl, a movable rear bowl mounted for telescoping movement in connection with said stationary bowl and initially forwardly movable to eject material from said main bowl and thereafter tiltable to dump the load in said movable bowl, an auxiliary bowl arranged at the forward end of the main bowl to be loaded in conjunction therewith and operable to open and close the front end of the main bowl, and mechanisms for operating the movable and auxiliary bowls and for raising and lowering the main bowl.

Yet another object of my invention is the provision of a main bowl open at both ends, a movable bowl normally disposed in a retracted position extending rearwardly from said main bowl, and means supporting said movable bowl for advancing movement from said retracted position to an advanced position in said main bowl and for tilting movement relative to said main bowl when in said advanced position.

Another object of my invention is the provision in a scraper, a rear bowl, an auxiliary bowl arranged forwardly of said rear bowl and confronting the same, both bowls being operable to discharge materials at their confronting ends, and control means for said bowls adapted when actuated to cause said bowls to operate concurrently to discharge materials only after predetermined initial movement of said auxiliary bowl.

More particularly, it is an object of my invention to provide, in a scraper of the character described, control means for a movable and an auxiliary bowl initially operable when actuated to move the auxiliary bowl from a closed to an intermediate position exclusive of said movable bowl and thereafter operable upon continued actuation of said control means to move both bowls concurrently in a direction discharging the load from a relatively stationary main bowl and said auxiliary bowl directly onto the ground at their adjacent ends, said control means being thereafter operable to cause said movable bowl to discharge.

Still another object of my invention is the provision in a scraper, a bowl, an auxiliary bowl, both bowls being adapted to discharge materials directly onto the ground, a common operating cable applied to said bowls to cause the discharging of same, and other operating means applied to both bowls and cooperating with said common operating cable, said common operating cable being initially operable to move said auxiliary bowl from a closed to an intermediate position exclusive of said bowl and thereafter operable in conjunction with said other operating means to move both bowls concurrently in a direction discharging materials. For a broader view of this type of bowl control reference is made to applicant's prior co-pending application Serial No. 378,047, filed February 8, 1941, and upon which the present invention is an improvement.

A further object of this invention is the provision of a spring actuated retracting means for the movable bowl.

And yet another object is the provision of means for raising and lowering the scraper so as to selectively dispose the same in a loading or in a load transporting position.

Still other objects and advantages of my invention should be apparent to those skilled in the art upon a detailed perusal of the following specifications and the accompanying drawings, and it is to be understood that my invention is susceptible to numerous modifications in the combination, correlation and construction of parts, members and features and may have wide application in the design, construction and use of scrapers without departing from the spirit of the invention as defined in the annexed claims.

In the drawings:

Figure 1 is a side elevation of my invention with all parts disposed in a load transporting or carrying position, the spring housing being shown partly in section.

Figure 2 is a side elevation in section taken on broken line 2—2 of Figure 5 and shows the scraper disposed in loading position, the initial loading positions of the rear movable and auxiliary bowls being indicated in broken lines.

Figure 3 is a side elevation in section taken on line 2—2 of Figure 5, and shows the rear movable bowl in its advanced position in the relatively stationary main bowl, the auxiliary bowl being shown in dumping position.

Figure 4 is a side elevation in section, also taken on broken line 2—2 of Figure 5, and shows the rear movable bowl in its advanced tilted position for discharging the load therefrom.

Figure 5 is a fragmentary top plan view of my scraper, all parts being in carrying position.

Figure 6 is a side elevation of the movable bowl detached from the scraper.

Figure 7 is a side elevation in section of the movable bowl detached from the scraper.

Figure 8 is a fragmentary top plan view of one

end of the movable bowl detached from the scraper.

Figure 9 is a fragmentary top plan view of the auxiliary bowl detached from the scraper and showing one of the supporting arms and the sheaves carried thereby.

Reference is now made to drawings of the present preferred construction and arrangement of the parts, members and features of my invention in which a relatively stationary main bowl 10 comprises spaced apart side walls 11 rigidly connected at their lower edges by a horizontally disposed bottom wall 12 which is provided at its forward edge with a transversely extending scraper blade 13 detachably secured thereto.

Each of the sidewalls 11 is rigidly secured to an adjacent frame beam 14 which overhangs sidewalls 11 in both a forwardly and a rearwardly direction, the forward ends of said beams 14 being rigidly secured to a transversely extending beam 15. The overhanging rear ends of frame beams 14 are supported on a transversely extending axle 16 provided with rolling supports 17. A reinforcing beam 18 extends with each of the sidewalls 11 and is rigid therewith, the forward ends of beams 18 terminating with sidewalls 11, the rear ends thereof being rigidly secured to frame beams 14, as shown, said beams 18 being rigidly connected by means of a transversely extending beam 90.

Thus, main bowl 10 together with beams 14, 15, 18 and 19 constitute a rigid frame and bowl structure supported for vertical tilting movement about rear wheels 17 as an axis.

A draft and control frame 20 comprises a pair of spaced apart arms 21 extending along opposite sides of the rigid frame and bowl structure to a rigid connection at their forward ends with a transverse frame structure 22 provided on its forward side with a downwardly extending arm 23 articulately supported at its lower end, as shown, on a pony truck 24 which is provided with a draft tongue 25 adapted at its forward end for connection to a draft device the rear ends of arms 21 being pivotally connected at 26 to said rigid frame and bowl structure some distance above bottom 12 and adjacent the rear end thereof.

Transverse frame 22 is provided with brackets 27 overhanging the same in a rearwardly direction and provided with a pin 28 upon which sheaves 29 are journaled.

Beam 15 is provided with brackets 30 carrying pin 31 upon which sheaves 32 are journaled, sheaves 32 being arranged relative to sheaves 29.

A cable 33 is anchored in any suitable conventional manner and is then reaved back and forth about sheaves 32 and 29 and may extend thence to a winding drum, (not shown because of conventional design).

It will be readily understood that cable 33 may be pulled or slackened to tilt the rigid frame and bowl structure upwardly or downwardly respectively at its forward end about rear wheels 17 as an axis.

A movable or telescoping rear bowl 34 is arranged between side walls 11 and comprises an integral bottom and rear wall indicated at 35 and 36 respectively, provided at each end thereof with a sidewall 37 which is rigid therewith and extends upwardly beyond beams 18, said upper extensions of sidewalls 37 being formed as an overhanging inverted U bracket each of which straddles a channel rail 38 carried by the rigid frame and relatively stationary bowl structure, the overhanging and downwardly extending portions 39 of these U brackets each being provided with laterally projecting trunnions 40 and 41 which project inwardly of channel rails 38, each of the trunnions 40 and 41 having a wheel 42 journaled thereon to roll within channel rails 38. The upwardly extending and overhanging portions of sidewalls 37 are each reinforced by a beam 43, see Figures 5, 7 and 8, which is rigid therewith and also with a transverse beam 44 which extends along the upper edge of back wall 36 to which it is rigidly attached.

Thus it is seen that a movable bowl 34 is mounted for movement lengthwise of and in the relatively stationary main bowl 10 from a rear or retracted position in which the movable bowl overhangs the rear end of the main bowl, constituting in effect an extension thereof, to an advanced or forward position in which the front edge of said movable bowl is disposed at substantially the forward edge of the main bowl, the forward edges of bottom wall 35 and sidewalls 37 being arranged and adapted to cooperate with sidewalls 11 and bottom wall 12 of the main bowl.

The advanced position of movable bowl 34 is defined by stops 45 which are shown as being rigid with sidewalls 11 of the main bowl, and it is provided that movable bowl 34 is tiltable about its forward edge as an axis, when in said advanced position, to dump materials therefrom. Therefore, channel rails 38 include a horizontal portion 46 which extends parallel to bottom wall 12 of the main bowl, and an arcuate portion 47 which extends as a segment of a circle the focal point of which is the axis about which movable bowl 34 tilts when in advanced position. Thus, the front wheels 42 of the movable bowl travel the arcuate portion 47 of rails 38 as said bowl tilts, and the rear wheels 42 of movable bowl 34 escape cooperative confinement in channel rails 38 through slots 48, provided in the upper leg of each of the channel rails 38, as bowl 34 tilts forwardly to dump materials.

An inverted A frame structure 52 projects upwardly from the scraper at the forward end of main bowl 10 and comprises a pair of legs 49 each of which is rigid at the lower end thereof with an adjacent sidewall 11, said legs 49 converging toward their upper ends to a rigid connection with a short horizontal beam 50.

A hollow beam 51 is arranged above the scraper and is rigid at its forward end with the A frame 52, said beam 51 being rigidly supported adjacent its rear end, as shown, on transverse beam 19.

A compression spring 53 is disposed within hollow beam 51, the forward end thereof bearing against a fixed block 54.

The rear end of beam 51 supports therein a plug 55 detachably secured in place by pin 56, said plug 55 being provided with rearwardly extending laterally spaced arms 57 between which sheaves 58 are disposed and journaled on a pin 59 carried by arms 57.

A block 60 is slidably disposed in beam 51, between plug 55 and the rear end of spiral spring 53. A cable 61 is anchored in sliding block 60 and passes in a forward direction through spiral spring 53 and fixed block 54, thence upwardly about a sheave 62 journaled on pin 63 carried by brackets 64 which are rigid with beam 50. Cable 61 extends thence rearwardly and is provided at its rear end with sheave block 65. A cable 66 is anchored about pin 59 and is then reaved back and forth about sheave block 65 and sheaves 58

from which it extends to a guide sheave 67 journaled on a pin 68 carried by brackets 69 which are supported by beam 19. From guide sheave 67 cable 66 extends to a pivotal connection with a pin 70 carried by brackets 71 which are rigidly attached to movable bowl 34.

The spiral spring 53 is always under compression in both the advanced and retracted positions of movable bowl 34. As bowl 34 advances from a retracted position the pressure in spring 53 will build up as the same compresses, but the extent of this build up is greatly minimized through the block and tackle application of cable 66 to cable 61 so that the required compressive movement of spring 53 is much less than the corresponding movement of bowl 34 which brings about said compression.

An auxiliary bowl 72 is arranged to swing at the forward end of main bowl 10 so as to cooperate therewith, said auxiliary bowl being mounted on the rigid frame and bowl structure as follows; auxiliary bowl 72 is provided at each end thereof, inwardly of beams 14, with an upstanding arm 73. An arm 74 is arranged above each of the beams 14, each of said arms 74 being pivotally supported at their rear ends on the rigid frame and main bowl assembly as shown at 75. The forward ends of arms 74 and the upper ends of arms 73 are rigidly connected by short horizontal beams 76 which extend crosswise of beams 14 above the same. Thus, the auxiliary bowl 72 is mounted to swing about pivots 75 as an axis.

It is to be noted that auxiliary bowl 72 includes, at each end thereof, a sidewall 77, and that the confronting edges of sidewalls 77 and 11 are each formed as a segment of a circle, the focal point of said circles being the axis 75 about which the auxiliary bowl swings.

It will be further noted that the bowl 72 is provided with stops 78 which are arranged to engage the lower ends of legs 49 so as to limit upward swinging movement of bowl 72.

The means by which movable bowl 34 and the auxiliary bowl 72 are controlled will now be described.

Auxiliary bowl 72 is provided with a horizontal pin 79 upon which sheaves 80 are journaled. Short horizontal beam 50 of the A frame 52 is provided with brackets 81 carrying a pin 82 upon which is journaled sheaves 83, and beam 44, which extends along the upper edge of back wall 36 of movable bowl 34, is provided with brackets 84 carrying pin 85 upon which is journaled sheaves 86. A single cable 87 is anchored about pin 85 and passes thence back and forth about sheaves 83 and 86 so as to provide a block and tackle effect therebetween. Cable 87 then passes back and forth about certain other of the sheaves 83 and the sheaves 80 carried by the auxiliary bowl 72. Cable 87 may extend thence to a cable winding drum, not shown because of conventional design.

Now obviously, a pulling force applied to cable 87 would be transmitted to both the bowls 34 and 72 simultaneously, but due to the retractive force applied to bowl 34 by spring 53 the auxiliary bowl 72 would swing upwardly until stops 78 engaged the lower ends of legs 49, which is the full discharge position of the auxiliary bowl, after which the movable bowl 34 would move forwardly. However, it is desirable to have movable bowl 34 begin its forward movement before auxiliary bowl 72 has reached a discharge position.

The reason for this lies in the fact that if the scraper is so constructed that the auxiliary bowl moves to its uppermost limits of travel before the main bowl begins to discharge the load released by the auxiliary bowl will, in some conditions, have disappeared under the blade before the load in the main bowl begins to discharge leaving a gap or depression in the load as it is spread by the advancing movement of the blade. Therefore I have provided other operating control means to cooperate with cable 87 so as to predetermine and limit relative movement between the bowls, and said other control means will now be described.

Each of the arms 74 comprises spaced apart parallel bars, see Figures 5 and 9, between which sheaves 88 and 89 are disposed, sheaves 88 being journaled on the trunnions indicated at 75, sheaves 89 being journaled on pins 90 carried by arms 74 as shown. Brackets 91 are arranged below each of the arms 74 and are supported on beams 14, said brackets being provided with pins 92 upon each of which a sheave 93 is journaled. A pair of cables 94 are disposed along opposite sides of the scraper and pivotally connected at their rear ends to an adjacent projecting trunnion 40 and are connected at their forward ends to beam 14, the intermediate portions of cables 94 passing, in a forwardly direction, over sheaves 88, under sheaves 93 and over sheaves 89.

Referring to Figure 1, it will be seen that when bowl 34 is in retracted position and auxiliary bowl 72 is in closed position there is slack in cable 94 as shown at 95, so that when a pulling force is applied to cable 87 the auxiliary bowl will move upwardly, exclusive of bowl 34, until the slack is removed from cable 94, see Figure 2, after which both bowls move concurrently in a direction discharging materials. Thus, cables 94 may properly be viewed as a collapsible connection between the movable and auxiliary bowls to predetermine and limit relative separating or extending movement therebetween.

In the operation of the scraper the same is caused to move across the surface of the ground to scrape up a load therefrom, and to transport the load to a place where the materials are then discharged.

Assuming the bowls to be loaded and in the carrying position shown in Figure 1, to discharge said load, a pulling force is applied to cable 87 with the results that auxiliary bowl 72 will move upwardly, exclusive of bowl 34, to the position, relative to main bowl 10, shown in Figure 2, in which position of the auxiliary bowl 72 sheaves 89 have moved to the upper limits of slack loops 95 in cable 94 thus removing the slack therefrom so that thereafter, as the pull on cable 87 is continued, both bowls move concurrently to the positions shown in Figure 3, in which position the auxiliary bowl 72 is in a position to discharge material while movable bowl 34 has moved to the advanced position ejecting the load in main bowl 10. Now, being in the position shown in Figure 3, if the pull on cable 87 is continued, movable bowl 34, having engaged stops 45, will be caused to tilt forwardly about its lower forward edge as an axis to the position, shown in Figure 4, dumping the load therefrom.

Having discharged the load, cable 87 may be allowed to run slack and due to the retractive effort of spring 53 on bowl 34, bowl 34 will tilt downwardly at its rear end, exclusive of the auxiliary bowl 72, to again assume the position of Figure 3. Cable 87 may then be arrested and held stationary to maintain the bowls in the positions shown in Figure 3, in which positions of the bowls the scraper may be drawn to the place where a load is to be gathered. Cable 33 is then

allowed to run slack to bring blade 13 into scraping engagement with the ground. As the scraper advances dirt moves across the blade into movable bowl 34 and when the same has become loaded cable 87 is allowed to run slack so that bowl 34 is caused to move rearwardly to the retracted position in response to pressure in spring 53, while, concurrently therewith, auxiliary bowl 72 moves downwardly, both bowls then being in the position shown in Figure 2, and as the advance continues dirt moves over the blade into the main bowl 10 until the same is loaded after which dirt moves upwardly against the load in the main bowl and falls forwardly into the auxiliary bowl 72 to load the same. Cable 87 is then allowed to run slack so as to allow the auxiliary bowl to move downwardly and come to rest closing the forward end of the main bowl. Cable 33 is then pulled, raising the scraper to the carrying position shown in Figure 1.

Again viewing Figures 1 and 2 especially, it should be noted that auxiliary bowl 72 may properly be viewed as having closed, loading or intermediate, and dumping positions, the closed position being shown in Figure 1, the loading position being shown in full lines in Figure 2 in which position the auxiliary bowl is disposed to receive and support a load which moves upwardly against the load in the main bowl and falls forwardly into the auxiliary bowl. The dumping position of the auxiliary bowl being shown in Figures 3 and 4 and also in broken lines in Figure 2.

Viewing Figures 2, 3 and 4 it will be seen that the movable bowl 34 may be viewed as having, a retracted position shown in Figure 2, an advanced position shown in Figure 3, and a tilted position shown in Figure 4.

Applicant's invention is a marked improvement upon telescoping scrapers of prior design in which the rear movable bowl is not provided with an integral bottom and rear wall, as in applicant's invention, but instead the rear bowl is open at both ends and provided with a forwardly movable endgate for ejecting the load in the movable bowl, which arrangement requires means mounting the rear bowl for forward movement in the main bowl and also means mounting the endgate for advancing movement into the rear bowl. This is a duplication of mounting means when compared with applicant's rear movable bowl having integral bottom and rear walls. Thus applicant's invention has fewer moving parts and is simpler to make.

From the foregoing description it will be seen that I have provided a scraper that substantially fulfills the objects of the invention as set forth.

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

1. In a scraper, a relatively stationary main bowl open at both its forward and rear ends, a movable bowl normally disposed in a retracted position projecting rearwardly from said main bowl, means supporting said movable bowl for movement from said retracted position to an advanced position in said main bowl and for tilting movement relative to said main bowl when in said advanced position, and control means to first advance said movable bowl and then tilt the same while in said advanced position.

2. In a scraper, a relatively stationary main bowl open at both its forward and rear ends, a movable bowl including bottom and rear walls and normally disposed in a retracted position projecting rearwardly from said main bowl, means supporting said movable bowl for movement to an advanced position in said main bowl and thereafter movable while in said advanced position to discharge a load from said movable bowl, an auxiliary bowl arranged in front of said main bowl to be loaded in conjunction therewith and operable to discharge material, control means for said movable and auxiliary bowls to cause the discharging of said bowls, and still other operating means interconnecting said movable and auxiliary bowls so as to cause said bowls to operate concurrently only after initial movement of said auxiliary bowl.

3. In a scraper, a relatively stationary main bowl open at both its forward and rear ends and including a bottom wall, a movable bowl including an integral bottom and rear wall and normally disposed in a retracted position projecting rearwardly from said main bowl, means supporting said movable bowl for movement parallel to said main bottom from said retracted position to an advanced position in said main bowl and for tilting movement relative to said main bowl when in said advanced position, control means to first advance said movable bowl and then tilt the same while in said advanced position, and resilient means applied to said movable bowl and operable to return the same to said retracted position.

4. In a scraper, a relatively stationary main bowl open at both its front and rear ends, a movable bowl normally disposed in a retracted position projecting rearwardly from said main bowl, means supporting said movable bowl for movement from said retracted position to an advanced position in said main bowl and for tilting movement relative to said main bowl when in said advanced position, and control means to first advance said movable bowl and then tilt the same while in said advanced position, and other means applied to said movable bowl for returning the same to said retracted position.

5. In a scraper, a relatively stationary main bowl open at both its forward and rear ends, a movable bowl including an integral bottom and rear wall and normally disposed in a retracted position projecting rearwardly from said main bowl, means supporting said movable bowl for movement from said retracted position forwardly to an advanced position in said main bowl and for tilting movement relative to said main bowl when in said advanced position, and control means to first advance said movable bowl and then tilt the same.

6. In a scraper, a relatively stationary main bowl open at both its forward and rear ends and including a bottom wall, a movable bowl including an integral bottom and rear wall and normally disposed in a retracted position projecting rearwardly from said main bowl, means supporting said movable bowl for movement parallel to said main bottom from said retracted position to an advanced position in said main bowl and for forward vertical tilting movement relative to said main bowl when in said advanced position, control means to first advance said movable bowl and then forwardly tilt the same, and other means for returning said movable bowl to said retracted position.

7. In a scraper, a main bowl open at both its forward and rear ends, a movable bowl normally disposed in a retracted position extending rearwardly from said main bowl, means supporting said movable bowl for movement from said re-

tracted position to an advanced position in said main bowl to eject a load from said main bowl and thereafter movable while in said advanced position to discharge a load from said movable bowl, an auxiliary bowl arranged in front of said main bowl to be loaded in conjunction therewith and operable to discharge materials, and control means applied to said movable bowl and said auxiliary bowl to control the discharging of said bowls, said control means comprising in combination means interconnecting said bowls to limit relative separating movement therebetween and operating means for said bowls, said control means being adapted to function when actuated to move said auxiliary bowl from a closed to an intermediate position exclusive of said movable bowl and thereafter operable to move both bowls concurrently in a direction discharging materials.

8. In a scraper, a relatively stationary main bowl open at both its forward and rear ends, a movable bowl normally disposed in a retracted position projecting rearwardly from said main bowl, means supporting said movable bowl for movement from said retracted position to an advanced position in said main bowl to eject the load in said main bowl and for tilting movement relative to said main bowl when in said advanced position to dump the load in said movable bowl, an auxiliary bowl arranged in front of said main bowl to be loaded in conjunction therewith and adapted to discharge materials, and control means applied to said movable bowl and said auxiliary bowl to control the discharging of said bowls, said control means comprising in combination means interconnecting said bowls to limit relative separating movement therebetween and operating means for said bowls, said control means being adapted to function when actuated to move said auxiliary bowl from a closed to an intermediate position exclusive of said movable bowl and thereafter operable to move both bowls concurrently in a direction discharging materials.

9. In a scraper, a relatively stationary main bowl open at both its forward and rear ends; a movable bowl normally disposed in a retracted position projecting rearwardly from said main bowl; means supporting said movable bowl for movement from said retracted position to an advanced position in said main bowl and for tilting movement relative to said main bowl when in said advanced position; an auxiliary bowl arranged in front of said main bowl to cooperate therewith and adapted to be disposed in a closed position closing the front end of said main bowl or in an intermediate position or in a dumping position; control means for said auxiliary bowl and said movable bowl comprising in combination means interconnecting said bowls to limit and predetermine relative separating movement therebetween and a common operating means applied to both bowls, said control means being adapted to function when actuated to move said auxiliary bowl from closed to said intermediate position exclusive of said movable bowl and thereafter operable to move both bowls concurrently in a direction discharging materials.

10. In a scraper; a relatively stationary main bowl open at both its forward and rear ends; a movable bowl normally disposed in a retracted position projecting rearwardly from said main bowl; means supporting said movable bowl for movement from said retracted position to an advanced position in said main bowl and for tilting movement relative to said main bowl when in said advanced position; an auxiliary bowl arranged in front of said main bowl to cooperate therewith and adapted to be disposed in closed position closing the front end of said main bowl or in an intermediate position or a dumping position; control means for said auxiliary bowl and said movable bowl comprising in combination means interconnecting said bowls to limit relative separating movement therebetween and a common operating means applied to both said bowls, said control means being adapted to function when actuated to move said auxiliary bowl from closed to said intermediate position exclusive of said movable bowl and thereafter operable to move both bowls concurrently in a direction discharging materials, said movable bowl moving from retracted to advanced position to eject the load in said main bowl as said auxiliary bowl moves from intermediate to dumping position, said control means being then operable upon continued actuation thereof to tilt said movable bowl while in said advanced position to dump materials therefrom.

11. In a scraper; a relatively stationary main bowl open at both its forward and rear ends; a movable bowl normally disposed in a retracted position projected rearwardly from said main bowl; means supporting said movable bowl for movement from said retracted position to an advanced position in said main bowl and for tilting movement relative to said main bowl when in said advanced position; an auxiliary bowl arranged in front of said main bowl to cooperate therewith and adapted to be disposed in closed position closing the front end of said main bowl or in an intermediate position or a dumping position; control means for said movable bowl and said auxiliary bowl comprising in combination collapsible means interconnecting said bowls to limit relative separating movement therebetween and a common operating means applied directly to both said bowls, said control means being adapted to function when actuated to move said auxiliary bowl from closed to said intermediate position exclusive of said movable bowl and thereafter operable to move both bowls concurrently in a direction discharging materials, said movable bowl moving from retracted to advanced position to eject the load in said main bowl as said auxiliary bowl moves from intermediate to dumping position, said control means being then operable upon continued actuation thereof to tilt said movable bowl while in said advanced position to dump materials therefrom.

12. In a scraper, a relatively stationary main bowl open at both its forward and rear ends; a movable bowl including an integral bottom and rear wall and normally disposed in a retracted position projecting rearwardly from said main bowl; means supporting said movable bowl for movement from said retracted position to an advanced position in said main bowl and for tilting movement relative to said main bowl when in said advanced position; an auxiliary bowl arranged in front of said main bowl to cooperate therewith and adapted to be disposed in closed position closing the front end of said main bowl or in an intermediate position or in a dumping position; control means for said movable bowl and said auxiliary bowl comprising in combination means interconnecting said bowls to limit relative separating movement therebetween and a common operating means applied to both said bowls, said control means being adapted to

function when actuated to move said auxiliary bowl from closed to intermediate position exclusive of said movable bowl and thereafter operable to move both bowls concurrently in a direction discharging materials, said movable bowl moving from retracted to advanced position to eject the load in said main bowl as said auxiliary bowl moves from intermediate to dumping position, said control means being then operable upon continued actuation thereof to tilt said movable bowl while in said advanced position to dump materials therefrom.

13. In a scraper, a rear bowl, an auxiliary bowl arranged forwardly of said rear bowl and confronting the same, both bowls being operable to discharge materials at their confronting ends, operating means applied to both said bowls to cause the discharging of same, and still other operating means interconnecting said bowls so as to cause said bowls to operate concurrently only after initial movement of said auxiliary bowl.

14. In a scraper, a rear bowl, an auxiliary bowl arranged forwardly of said rear bowl and confronting the same, both bowls being operable to discharge materials at their confronting ends, a common operating means applied to both said bowls to cause the discharging of same, and collapsible means interconnecting said bowls to limit relative separating movement therebetween so as to cause said bowls to operate concurrently only after initial movement of said auxiliary bowl.

15. In a scraper, a rear bowl, an auxiliary bowl arranged forwardly of said rear bowl and confronting the same, both bowls being operable to discharge materials at their confronting ends, a single pull cable applied to both said bowls and operable when said cable is pulled to cause the discharging of same, and other cable means interconnecting said bowls to limit relative separating movement therebetween so as to cause said bowls to operate concurrently only after initial movement of said auxiliary bowl.

16. In a scraper, a main bowl open at both its forward and rear ends, a movable bowl normally disposed in a retracted position extending rearwardly from said main bowl, means supporting said movable bowl for movement from said retracted position to an advanced position in said main bowl to eject a load from said main bowl and for forward vertical tilting movement relative to said main bowl while in said advanced position to dump a load from said movable bowl, and control means to first advance said movable bowl and then tilt the same.

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