Dec. 22, 1942. C. LE BLEU 2,306,066

SCRAPER

Filed Aug. 30, 1939 3 Sheets-Sheet 1

FIG. 1

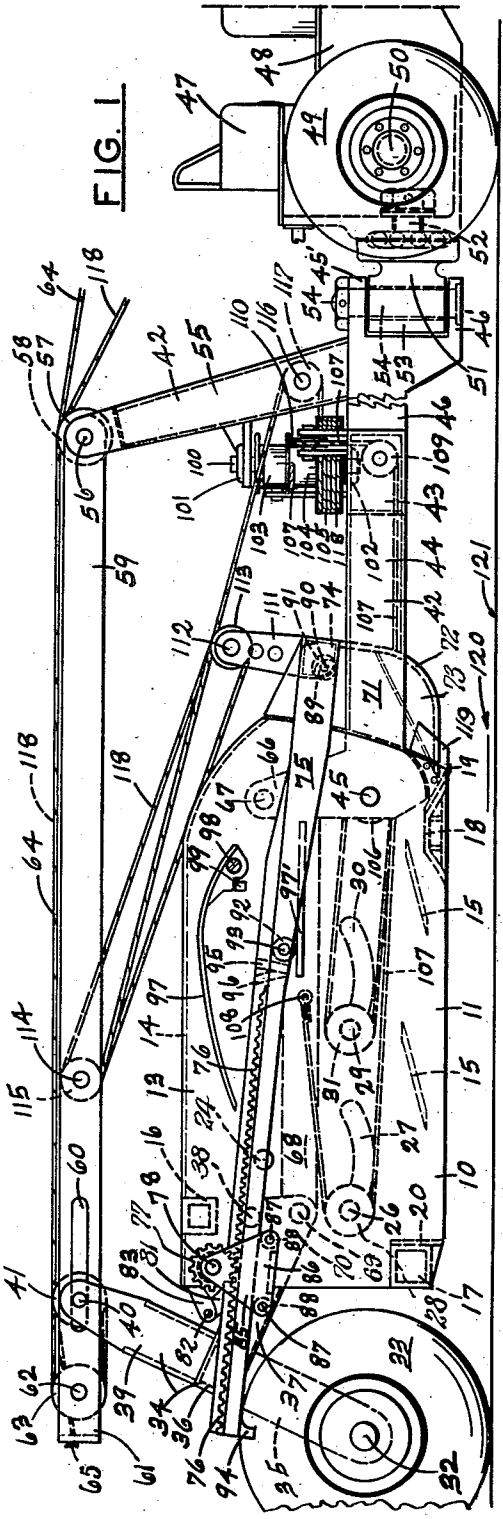
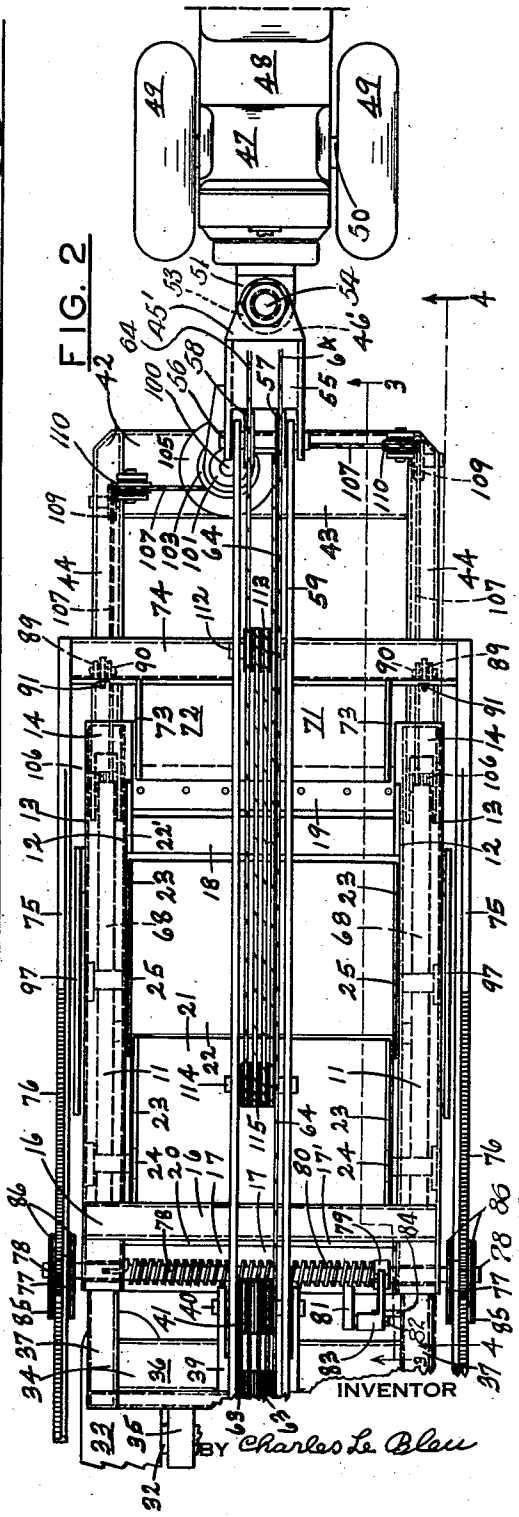


FIG. 2



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Filed Aug. 30, 1939 3 Sheets-Sheet 2

FIG. 3

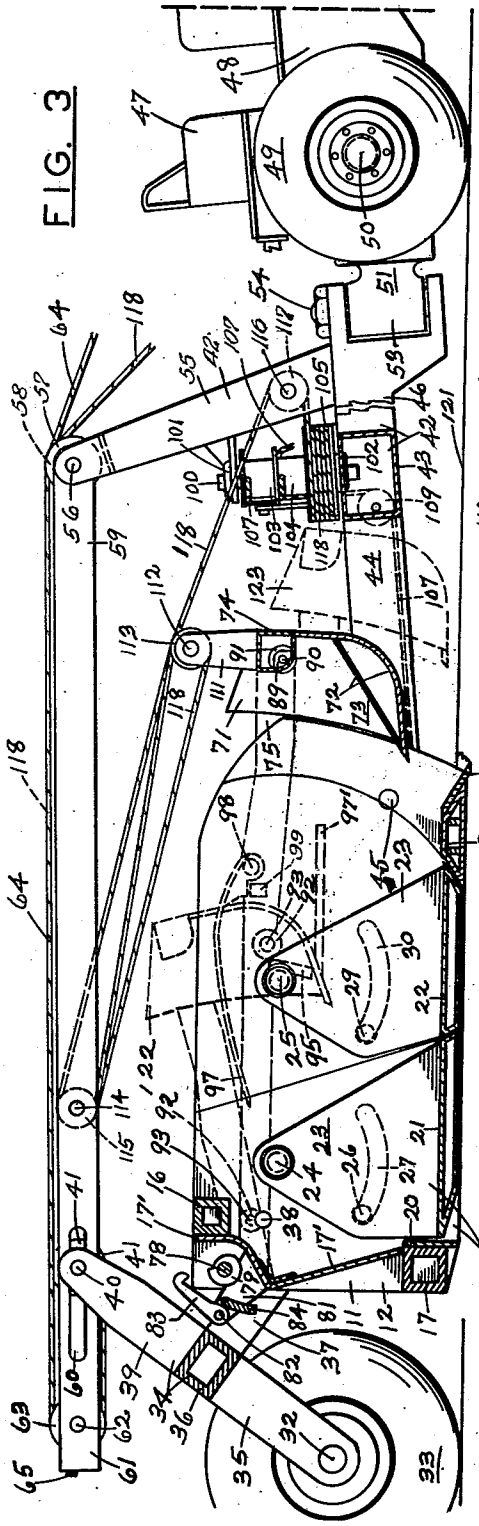
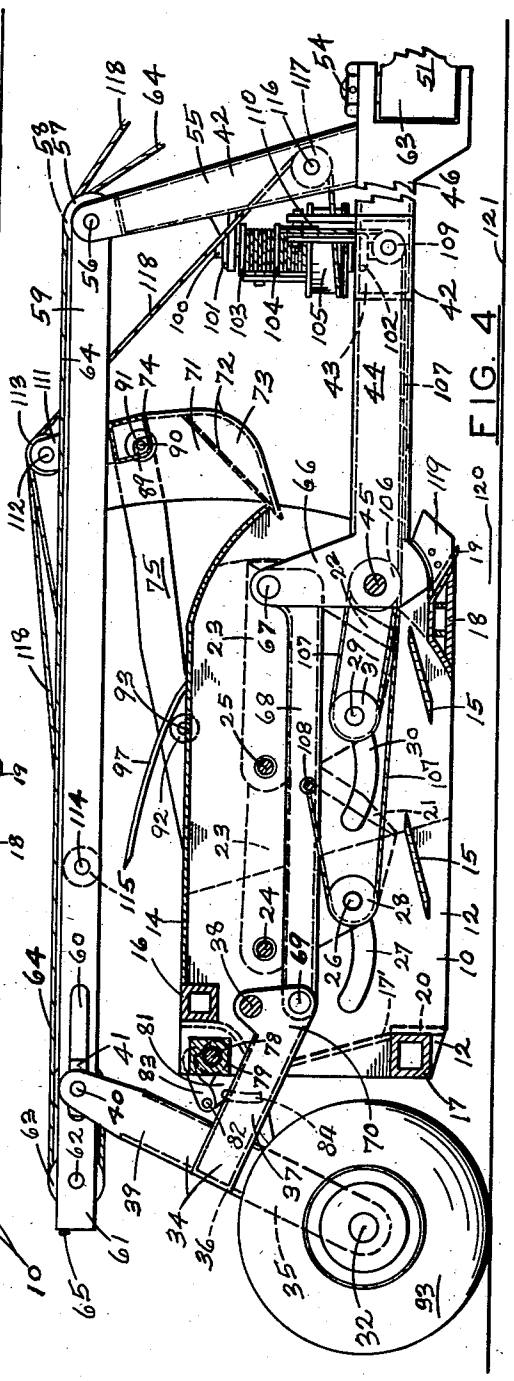


FIG. 4



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SCRAPER

Filed Aug. 30, 1939 3 Sheets-Sheet 3

FIG. 5

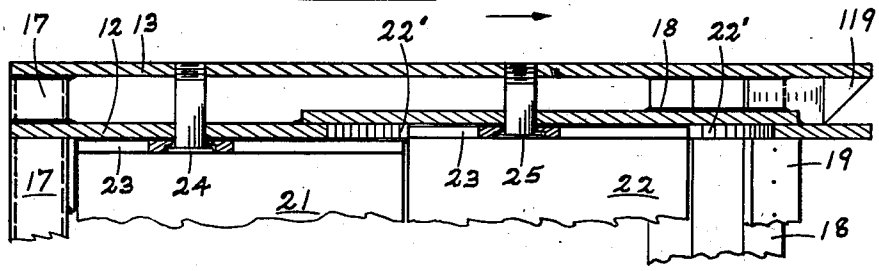


FIG. 6

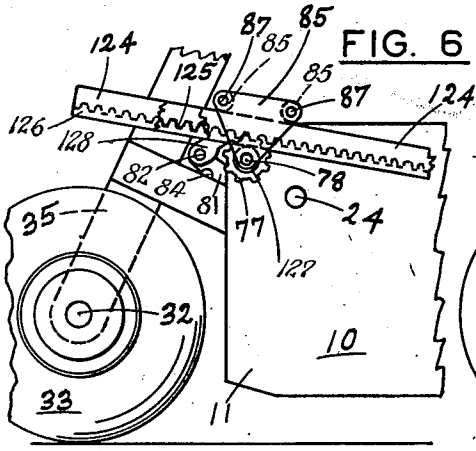


FIG. 7

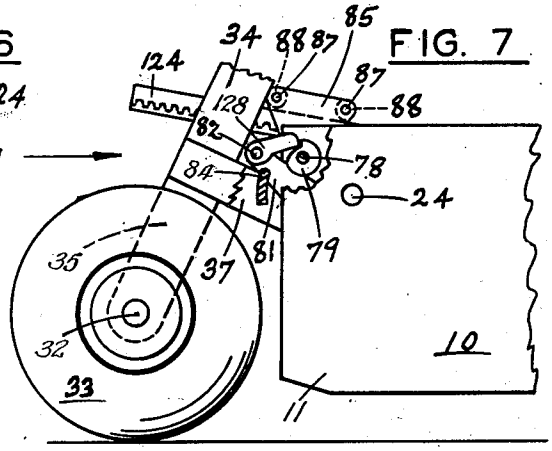
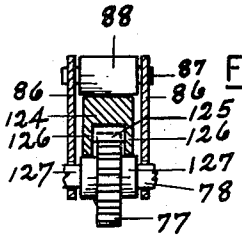


FIG. 8



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BY Charles Le Bleu

Patented Dec. 22, 1942 2,306,066

UNITED STATES PATENT OFFICE

2,306,066

SCRAPER

Charles Le Bleu, Los Angeles, Calif.

Application August 30, 1939, Serial No. 292,661

11 Claims. (Cl. 37—129)

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 machines, commonly termed scrapers, by means of which material may be scraped up and moved, and is an improvement upon the disclosures in my copending application, Serial No. 254,851, filed February 6, 1939, one of the objects of my invention being to provide a scraper adapted to scrape up and carry very large quantities of material and which may be constructed in a wide variety of sizes and capacities, say for example, from ten to one hundred cubic yards.

Broadly speaking, the problems of modern scraper construction consists of providing a machine adapted to scrape up and carry and discharge large quantities of material with the least expenditude of power.

Therefore, one of the objects of my invention is the provision in a scraper including earth-scraping and carrying means, of other means for positively moving material rearwardly into said earth-carrying means.

Another object of my invention is the provision in a scraper having earth-scraping and carrying means, of other means for positively moving the upper portion of material scraped up by the blade rearwardly into said earth-carrying means.

Another object of my invention is the provision in a scraper having earth-scraping and carrying means of other means for positively moving material accumulated in front of the blade rearwardly into said earth-carrying means.

Another object of my invention is the provision in a machine of the character described, an earth carrier, a scoop normally disposed forwardly of said carrier and confronting the same, and means whereby said scoop may be caused to move in a path having horizontally and vertically extending portions.

Another object of my invention is the provision in a machine of the character described, an earth carrier, a scoop normally disposed forwardly of said carrier and confronting the same, and means whereby said scoop may be selectively caused to travel a path rearwardly into said carrier or swing in a vertical plane in front of said carrier.

Another object of this invention is the provision in a machine of the character described, of an earth carrier, and a scoop normally disposed forwardly of said earth carrier and confronting the same, said scoop being arranged to travel a lower path rearwardly into said carrier and then an upper path forwardly to a position forwardly of said carrier.

Still another object of this invention is the provision of means for movably mounting the scoop so that forward or rearward movement of either end of the scoop will be transmitted to the opposite end of said scoop.

Still another object of this invention is the provision in a machine of the character described, of a main carrier, a scoop normally disposed forwardly of said carrier and mounted for movement rearwardly into said carrier and means for selectively permitting or preventing said rearward movement.

Another object of this invention is the provision of a novel carrier which may be dumped progressively so that the entire load need not be set into motion at one and the same time.

Still another object of this invention is the provision of novel means for supporting the carrier from the ground so that it may be readily raised, lowered and transported.

Still another object of this invention resides in the arrangement and construction of the side walls of the carrier and the arrangement of structure by means of which they are rigidly connected.

Still another object of my invention is the provision of novel means for connecting the forward end of a trailing vehicle to a front truck or self-propelled draft device.

Still other objects, features and advantages of my invention should be apparent to those skilled in the art upon a detailed perusal of the attached drawings and the following specifications, wherein I exemplify and describe my invention, but it is to be understood that my invention, as exemplified and described, is susceptible to modifications 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 of my invention disposed in transporting position.

Figure 2 is a fragmentary top plan view of my invention in transporting position.

Figure 3 is a side elevation of my invention in section taken on broken line 3—3 of Figure 2, all parts being in loading position.

Figure 4 is a side elevation of my invention in

section taken on broken line 4—4 of Figure 2, all parts being in the dumping position.

Figure 5 is an enlarged top plan view of one of the side walls of the carrier in section taken on a horizontal line extending through the pivots by which the bottoms are supported on the side walls.

Figure 6 is a fragmentary modified form of my invention.

Figure 7 is a fragmentary modified form of my invention.

Figure 8 is an enlarged view in cross section of the scoop arms showing their association with the toothed wheel.

Referring now to the drawings, a carrier 10 comprises rigidly connected parallel side walls 11, each of which, as shown, comprises spaced apart vertical plates 12 and 13 rigidly connected along their upper edges by a plate 14 and adjacent their lower edges by inclined braces 15. Spaced apart side walls 11 are rigidly connected at their rear ends by beams 16 and 17, and back wall 17', and at their forward ends by blade beam 18 to which a blade 19 is detachably secured. Particular attention is directed to the manner in which beams 16, 17, and 18 are connected to side walls 11. It is to be noted that beams 16, 17 and 18 each extend through each of the vertical plates 12 to a rigid connection at each of their ends with an adjacent vertical plate 13, and are also rigidly connected with vertical plates 12. Beam 17 is provided as shown with a spreader bar 20. A plurality of bottoms 21 and 22 are arranged between sidewalls 11 and are each provided with a hanger 23 at each of their ends, the hangers 23 attached to bottom 21 being pivotally connected to side walls 11 at 24, and the hangers 23 connected to bottom 22 being pivotally connected to side walls 11 at 25. It is perhaps best explained at this point that vertical plates 12 are formed with a depression 22' therein, see Figure 5, into which the hangers 23 of bottom 22 extend, bottom 22 being of such width from hanger to hanger that bottom 21 may swing in between the hangers of bottom 22 during the dumping operation. However, although bottom 22 is wider than bottom 21 the latter may be the heavier, the reasons for which will be explained later herein. Hangers 23 of bottom 21 are each provided with a laterally extending projection 26 rigid therewith and extending through slots 27, formed in plates 12, into the space enclosed by vertical plates 12 and 13, each of said projections being provided with sheave means 28 disposed between plates 12 and 13 and journaled on said projections. Hangers 23 of bottom 22 are each provided with a laterally extending projection 29 rigid therewith and extending through slots 30, formed in plates 12, into the space enclosed by plates 12 and 13, each of said projections being provided with sheave means 31 disposed between plates 12 and 13 and journaled on said projections.

From the foregoing description it is seen that the carrier 10 comprises spaced apart connected side walls having a plurality of earth supporting bottoms swingably mounted therebetween.

An axle 32 is disposed transversely of and behind the carrier 10 and is provided with rolling supports 33.

A rear frame 34 comprises spaced apart upstanding arms 35 supported at their lower ends on axle 32 and are rigid at their upper ends with a transverse beam 36. A pair of arms 37 disposed one directly behind each of the sidewalls 11 are rigidly attached at their rear ends to cross beam 36, the forward end of said arms extending forwardly into the spaces between plates 12 and 13 and are pivotally connected to plates 12 and 13 at 38. An upstanding arm 39 is rigid at its lower end with cross beam 36 and supports a horizontal pin 40 at its upper end and upon which are journaled vertical sheaves 41.

A front frame 42, comprises a cross beam 43 having arms 44 rigid one with each of its ends, said arms extending thence rearwardly into the spaces between plates 12 and 13 to a pivotal connection with plates 12 and 13 at 45. Frame 42 also includes a forwardly extending beam 46 rigid at its rear end with cross beam 43 and is adapted at its forward end to be articulately supported from the ground. As shown, the front end of beam 46 is provided with forwardly extending vertically spaced projections 45' and 46' having aligned vertical openings therethrough.

A draft device (or front truck) 47 comprises a body 48 and rolling supports 49 disposed at each side thereof and journaled thereon about a horizontal axis 50. The entire weight of draft device 47 is supported by rolling supports 49, and the forward portion of body 48 simply overhangs axis 50. Draft device 47 includes a hitch 51 which is mounted thereon for turning movement about a horizontal axis only, indicated at 52, said axis 52 extending at right angles to axis 50.

The vertical dimension of the rear portion 53 of hitch 51 is slightly less than the vertical spacing of projections 45' and 46', and is provided with a vertical opening in register with the openings in projections 45' and 46', and pin 54 pivotally connects the forward end of beam 46 to the hitch 51 for lateral swinging movement only. Thus it is seen that although body 48 is supported from the ground across the axis 50 by rolling supports 49 only, it is maintained in the plane of the axis of frame 42 by the novel means, above described, for connecting, one with the other, frame 42 and hitch 51, and yet draft device 47 may move forwardly, make right and left turns, and tilt transversely about axis 52 when the condition of the ground is such that axis 50 tilts with respect to rear axle 32.

Frame 42 also includes a rigidly attached upstanding portion 55 supporting a pin 56 upon which is journaled sheave means 57 and 58.

A thrust member 59 is pivotally mounted at its forward end on pin 56, and is provided toward its rear end with slots 60 through which pin 40 projects and thus member 59 is slidably mounted on pin 40. The overhanging portion 61 of thrust member 59 is provided with a horizontal pin 62 upon which is journaled sheave means 63.

A flexible member 64 is anchored at 65 to the rear end of thrust member 59 and extends thence back and forth about sheave means 41 and 63 and thence forward and downwardly about sheave 57 to a winding drum (not shown because of conventional design).

It will be noted that arms 44 include upstanding portions 66, at their rear ends, to the upper end of which is pivotally connected at 67, a horizontally extending rigid link, 68, the rear end of which is pivotally connected at 69 to the lower portion 70 of arms 37.

A scoop 71 is disposed forwardly of carrier 10 and confronting the same, scoop 71 comprising a bottom and back wall 72, and end walls 73, the upper portions of said walls being rigidly attached to a transverse beam 74 the ends of which project beyond side walls 11 to a rigid connection with rearwardly extending arms 75. It will be noted

that the spaced apart dimension of the end walls 73 of the scoop 71 is less than the spaced apart dimension of hangers 23 of bottom 22 so that the scoop 71 may move rearwardly between hangers 23.

Arms 75 are each provided with a plurality of uniformly spaced projections 76 which mesh with the projections of wheels 77, uniformly spaced about the circumference thereof, as shown, wheels 77 being rigid with a cross shaft 78 extending transversely of the rear end of carrier 10 and journaled thereon. The reason for mounting the rear ends of arms 75 as shown, or by some equivalent structure, is as follows: scoop 71 will often be unequally loaded so that when a force is applied thereto for moving the same rearwardly into carrier 10 the lighter loaded end of scoop 71 may tend to move in advance of the heavier loaded end, thus causing scoop 71 to swing laterally so that arms 75 may bind against adjacent structure. Again, when scoop 71 is in a position forwardly of carrier 10, other unbalanced forces acting upon scoop 71 could cause the same to swing laterally so that an end wall 73 would abut against the forward end of a side wall 11 thus interfering with the normal operation of scoop 71. I have therefore provided means which is supported and arranged with relation to arms 75 so that said means will operate in response to the movement of arms 75 whereby fore and aft movement of either of said arms will cause a like movement of the other of said arms, and thus maintain scoop 71 aligned with said carrier in its normal path of travel when subjected to forces tending to move the same out of said path.

Also rigid with shaft 78 is a stop 79. A coil spring 80, encircles shaft 79 and is attached at one of its ends to the relatively stationary structure of carrier 10, and is attached at its other end to the stop 79 rigid with shaft 78 so that as shaft 78 rotates in a clockwise direction spring 80 will be wound up to empound a force therein tending to rotate shaft 78 in a counterclockwise direction.

A bracket 81 is rigidly attached to carrier 10 and is provided with a laterally projecting trunnion 82 upon which is journaled a latch bar 83, the free end of latch bar 83 being arranged and adapted to engage or disengage stop 79 carried by shaft 78 so as to selectively permit or prevent rotation of shaft 78.

A projection 84 is arranged relative to latch bar 83 and beneath the same and rigidly attached to an arm 37 of frame 34 so that as frame 34 swings relative to carrier 10 about pivots 38 the projection 84 wil be moved to engage the underside of latch bar 83, or will be moved away from such engagement depending upon the direction of the swinging movement of frame 34, the reasons for which and the particular time at which projection 84 either engages or disengages latch bar 83 will be explained elsewhere.

It will be noted that the projections 76 of arms 75 are maintained in mesh with the projections of wheels 77 by means of a hanger 85 for each of arms 75, each of said hangers comprising a pair of plates 86 disposed one on each side of arm 75 and pivotally suported from shaft 78, the lower ends of plates 86 being provided with horizontal pins 87 upon each of which is journaled a roller 88 upon which arms 75 are slidably supported.

Beam 74 is provided adjacent the forward end of each of side walls 11 with laterally spaced brackets 89 carrying horizontal pins 90 upon which rollers 91 are journaled.

Side arms 75 are each provided intermediate their ends with rollers 92 disposed between the confronting sides of side walls 11 and arms 75 and journaled upon pins 93 detachably secured to arms 75.

Arms 75 are each provided at their rear ends with a stop member 94.

Each of side walls 11 are provided with a laterally projecting stop 95 arranged to co-operate with rollers 92. As indicated at 96, stops 95 may be disposed in any desired position and then secured to side walls 11.

A rail 97 is disposed with each of side walls 11 and is pivotally connected thereto as shown at 98. A stop 19 is secured to each of the side walls 11 rearwardly of pivot 98 and upon which rails 97 rest so as to limit downward movement thereof about pivots 98.

A stop bar 97' is secured to each of the side walls 11 and arranged with relation to rollers 92, carried by arms 75, and serves to limit downward movement of arms 75, and consequently, scoop 71.

A vertical shaft 100 is journaled in bearings 101 and 102 carried by front frame 42 and is provided with winding drums 103, 104 and 105 rigid therewith.

Each of the pivot pins 45, by which the forward frame 42 is pivotally connected with side walls 11, is provided with a plurality of sheaves 106, journaled thereon. A pair of flexible members 107 are disposed one within each of the side walls 11 and anchored as shown at 108 and pass thence rearwardly to and about sheaves 28, thence forwardly to sheaves 106, thence back and forth about sheaves 29 and 106 and thence forwardly within arms 44, to and about suitable direction change sheaves 109 and 110 as shown, one of said flexible members 107 being wound about and anchored to winding drum 103, the other of said flexible members 107 being wound about and anchored to winding drum 104, so that as winding drums 103 and 104 rotate about axis 100 both flexible members 107 will be wound up or both will be unwound from drums 103 and 104 depending upon the direction of rotation.

The cross beam 74 is provided with spaced apart brackets 111 supporting at their upper ends a removable pin 112 upon which are journaled sheaves 113.

Thrust member 59 carries a horizontal pin 114 upon which is journaled a plurality of sheaves 115.

Upstanding portion 55 of forward frame 42 is provided with a horizontal pin 116 upon which a sheave 117 is journaled.

A flexible member 118 is anchored in any suitable conventional manner to and wound about winding drum 105 and passes forwardly to and then rearwardly about sheave 117, thence back and forth about sheaves 113 and 114, thence forwardly to and about sheave 58 and may extend thence to a winding drum (not shown because of conventional design).

It will be noted that each of sidewalls 11 are provided at their lower forward ends with a side cutter 119 detachably mounted between vertical plates 12 and 13, and that the upper portion of side cutters 119 and the rear lower portions of arms 44 conform to circles, the focal point of which is the pivotal connection of arms 44 with side walls 11 thus preventing the entrance of oncoming material into the side walls 11 between vertical plates 12 and 13, in any angular position of arms 44 relative to side walls 11.

Before explaining my invention in operation

it is perhaps best to point out that the path traveled by blade 19, as it is lowered from its extreme raised position to its extreme lower position or as it is raised from its extreme lower position to its extreme raised position, may be viewed as being divided into three parts or positions. Viewing Figure 1, a line 120 will be found directly below the blade 19 and above the ground line 121, and any position of blade 19 above line 120 is termed the spreading position because the blade is then sufficiently above the ground line 121 to allow a conglomerate of materials discharged in front of blade 19 to pass thereunder, and any position of blade 19 below ground line 121 is termed the scraping position of said blade because the blade is in contact with the ground and will scrape up materials therefrom as the machine advances, and any position of blade 19 in that portion of the path of travel extending from line 120 to line 121 is termed the intermediate position of blade 19 because, practically speaking, it is not sufficiently above the ground to allow for the passage thereunder of rocks, large pieces of dirt and wet sticky material, and is not in contact with the ground to the extent that sufficient quantities of materials can be scraped up therefrom. It is therefore seen that blade 19 passes through an intermediate position as it moves from spreading to scraping position, and from scraping to spreading position, that is, from one effective position to another.

In operation the machine moves across the surface of the ground in response to a pulling force applied thereto by the self-propelled draft device 47. Being in the position of Figure 1, a slackening of pressure on cable 64 will allow the pivots 40 and 56 to move toward each other, the adjacent ends of frames 34 and 42 together with carrier 10 moving downwardly to the position of Figure 3, which is the scraping position. It should be noted that the upstanding portion 66 of the rear end of frame 42, the downwardly extending portion 70 of frame 34 and the link 68, are so arranged and associated that movement of either of said frames will impart a similar movement to other of said frames, and further, that the mechanical value of the same is such that the front and rear ends of carrier 10 will be affected to substantially the same degree so that it can be said that carrier 10 is raised and lowered substantially without tilting it.

Attention is also directed to the fact that as carrier 10 moves downwardly and arms 37 swing upwardly relative thereto, stop 84 contacts the under side of latch bar 83 and moves the forward end of same from engagement with stop 79, carried by shaft 78, as blade 19 moves through the intermediate position, thus freeing shaft 78 for rotation when blade 19 is disposed in the position of Figure 3.

Now, either before carrier 10 is lowered, at the same time it is lowered, or after it is lowered, a pulling force may be applied to cable 118 to swing scoop 71 to the position of Figure 3, and as scoop 71 swings upwardly about gear 77 as an axis, rollers 92 carried by arms 75 move upwardly along the front faces of stops 95. It will be noted that stops 95 prevent rearward movement of arms 75 and scoop 71 until they have moved upwardly a predetermined extent.

Now it is perhaps best stated at this time that although the purpose of cable 118 is to control bottoms 21 and 22 and also scoop 71, the sequence in which these elements operate, upon manipulation of cable 118, is not left to chance. Bottom 21 is heavier than bottom 22 and bottom 22 is heavier than scoop 71 so that when a pulling force is applied to cable 118, scoop 71 will move upwardly first, followed by bottom 22, and when bottom 22 has reached the limit of its movement, bottom 21 will then move. However, the same results may be obtained by making bottoms 21 and 22 and scoop 71 all the same weight and then providing a greater number of windings of cable 107 about sheaves 31 and 106 than is provided about sheaves 28 and 106. That is, the same results can be obtained by varying the value of the power application. But still again the same results can be obtained by simply mounting sheave 28 closer to pivot 24.

As the machine moves across the surface of the ground while disposed in the position of Figure 3, scraper 19 scrapes up material which moves thence rearwardly into carrier 10 until a considerable quantity is piled up therein after which the oncoming materials move upwardly against the load already in the carrier and moves forwardly into the scoop 71. When scoop 71 becomes loaded, a pulling force may be applied to cable 118, in response to which scoop 71 will swing upwardly, until rollers 92 clear stops 95, thence rearwardly until rollers 91 contact plates 14 of side walls 11, after which scoop 71 continues to move rearwardly to the position indicated at 122, and as scoop 71 moves to position 122, rollers 92 engage the under side of rail 97 and swing the same upwardly about pivot 98, and as rollers 92 move past the rear ends of rails 97 said rails swing downwardly back to normal position, rollers 92 then being disposed slightly above the rear ends of said rails. It is perhaps as well to explain at this time that scoop 71 travels rearwardly into carrier 10 along a path materially above the bottom thereof, because if an attempt were made to move the lower edge of scoop 71 rearwardly substantially in contact with bottoms 21 and 22 the entire load in the carrier would move requiring an excessive application of power, and furthermore, when the lower rear portion of the load reached back wall 17' it would be impractical, if not impossible, to push it further thus leaving the upper rear portion of carrier 10 vacant, but as shown, I have provided means for pushing the upper portion of the load in the forward end of carrier 10 rearwardly so that it will tumble or slide into the vacant space between the load and backwall 17', and for this reason the carrier of my invention may be of much greater capacity and still be loaded with the same power application required to load the carriers of much smaller capacity which are used at the present time. Now simultaneously with the above described action of scoop 71, shaft 78 will have been rotated in a clockwise direction by reason of the association of toothed arms 75 with toothed wheel 77, and a force will have been created in spring 80 tending to rotate shaft 78 in a counterclockwise direction. Thus, it is seen that scoop 71 has been moved rearward into carrier 10 a substantial distance above the bottom of said carrier for the purpose of moving the upper part of the load therein to the rear end of said carrier, and during this operation the scraper continues to scrape up material so that a considerable quantity will have accumulated in front of the blade. Therefore, the function of rail 97 is to guide scoop 71 along an upper path to a position forwardly of the materials accumulated in front of blade 19

during the travel of scoop 71 toward the rear end of the carrier. Consequently upon a slackening of pressure on cable 118, spring 80 will rotate shaft 78 in a counterclockwise direction thus moving scoop 71 forwardly, roller 92 traveling along the upper edge of rail 97 and off the forward end thereof, at which time stop 94 will contact rollers 88 and scoop 71 will drop downwardly to the position indicated at 123, the lower edge of said scoop having traveled the path indicated by heavy broken lines C.

Scoop 71 being in the position indicated at 123, a pulling force may again be applied to cable 118 to move scoop 71 rearwardly, against material accumulated in front of blade 19, and thence upwardly to repeat the operation of pushing the upper part of the load in carrier 10 rearwardly therein until the same is loaded, after which scoop 71 should be allowed to come to rest with the rear edge of same disposed adjacent scraper 19 so as to close the front end of carrier 10. Suitable manipulation of cable 64 is then resorted to for swinging the adjacent ends of frames 34 and 42 upwardly thus raising carrier 10 to the position of Figure 1, stop 84 carried by frame 34 moving downwardly with respect to carrier 10 so as to permit the forward end of latch bar 83 to engage stop 79 as blade 19 passes through the intermediate position, thus latching shaft 78 against clockwise rotation when blade 19 is in spreading position.

Now being loaded with all parts disposed in position of Figure 1, the machine is moved to the location where the materials are to be discharged and a pulling force may be applied to cable 118 for first swinging scoop 71 to the position indicated in Figure 4, the material spilling outwardly therefrom onto the ground in front of blade 19. It is well to remember at this point that shaft 78 is latched against clockwise rotation and scoop 71 cannot move rearwardly but can only move upwardly in response to a pulling force applied to cable 118. It is also apparent, from viewing Figure 4, why rail 97 is pivotally attached to side walls 11. A continued application of a pulling force to cable 118 after scoop 71 has reached its uppermost limits of movement will result in unwinding cable 118 from drum 105 and thus causing shaft 100 together with drums 103, 104 and 105 to rotate in a direction winding up cables 107, thus first swinging bottom 22 forwardly and upwardly about pivots 25 to the position shown in Figure 4, and when bottom 22 has reached its limit of movement, bottom 21 will swing forwardly and upwardly about pivots 24 to the position shown in Figure 4, both bottoms 21 and 22 dumping material therefrom at their rear ends, blade 20 spreading said material as the machine advances. It will be noted that the load in the carrier is thus discharged without the necessity of setting the entire load into motion at one and the same time. A slackening of cable 118 will then result in returning the bottoms 21, 22, and scoop 71 to the position of Figure 1 in the order named.

A modified form of my invention is exemplified in Figures 6, 7 and 8 in which arms 124, similar to arms 75 hereinbefore described, are provided with a plurality of uniformly spaced projections 125 on the under side thereof, which projections mesh, as shown, with toothed wheel 77, the arms 124 being formed as a channel having the projections 125 formed between the legs 126 thereof which legs extend downwardly beyond the lower limits of projections 125 and ride the hub 127 of toothed wheel 77, hangers 85 simply being swung upwardly to an inverted position. Stop 79 is mounted in reverse arrangement on shaft 78 and a latch bar 128, adapted to receive a thrust load, has been substituted for latch bar 83, spring 80 should then be wound about shaft 78 in a direction the reverse of the winding shown in Figure 2.

From the foregoing description it will be seen that I have exemplified and described such a device as substantially fulfills the object of my invention as set forth, and what I claim as new and useful and desire to secure by Letters Patent is:

1. In a scraper, a carrier including spaced apart sidewalls and a blade and a plurality of bottoms arranged one behind the other rearwardly of said blade to rceive and support a load which is scraped up by said blade, each of said bottoms being adapted to discharge directly onto the ground, means for raising and lowering said carrier to selectively dispose the same in a loading or a carrying position, a scoop normally disposed forwardly of said carrier and confronting the same to be loaded in conjunction therewith, means mounting said scoop for both vertical swinging movement relative to said carrier and for sliding movement rearwardly into said carrier for pushing the load toward the rear end of said carrier in loading position thereof, means to prevent said rearward sliding movement of said scoop in carrying position of said carrier so as to adapt said scoop to swing vertically at the forward end of said carrier to discharge the load therefrom, and common operating means applied to said scoop and to said bottoms to control rearward movement of said scoop into said carrier and also to control the discharging of said scoop and said bottoms successively.

2. In a scraper, a carrier including spaced apart sidewalls and a blade and a bottom arranged to receive and support a load which is scraped up by said blade said carrier being operable to discharge said load directly onto the ground, means for raising and lowering said carrier so as to dispose the same in a loading or a carrying position, a scoop normally disposed forwardly of said carrier and confronting the same to be loaded in conjunction therewith, arms secured to said scoop, means supporting said arms relative to said carrier, so that said scoop may have both vertical swinging movement relative to said carrier and substantially horizontal sliding movement rearwardly into said carrier along a path materially above the bottom thereof for pushing the load toward the rear end of said carrier in loading position thereof, means to prevent said rearward sliding movement of said scoop in carrying position of said carrier so as to adapt said scoop to swing vertically at the forward end of said carrier to discharge the load therefrom, and common operating means applied to said scoop and to said carrier to control rearward movement of said scoop into said carrier and also to control the discharging of said scoop and said carrier successively.

3. In a scraper, a carrier including spaced apart sidewalls and a blade and a bottom arranged to receive and support a load which is scraped up by said blade a portion of which moves rearwardly onto said bottom in response to pressure from oncoming materials and some of which piles up in front of said blade, said carrier being operable to discharge materials directly onto the ground, means for raising and low-

ering said carrier so as to selectively dispose the same in a loading or a carrying position, a scoop adapted to be disposed on the forward side of materials piled up in front of said blade and confronting said carrier to be loaded in conjunction therewith, means mounting said scoop relative to said carrier so that said scoop may have both vertical swinging movement relative to said carrier and substantially horizontal sliding movement rearwardly therein for pushing materials toward the rear end of said carrier in loading position thereof, means to prevent said rearward sliding movement of said scoop in carrying position of said carrier so as to adapt said scoop to swing vertically at the forward end of said carrier to discharge the load therefrom, and common operating means applied to said scoop and to said carrier to control rearward movement of said scoop into said carrier and also to control the discharging of said scoop and said carrier successively.

4. In a scraper; a carrier including spaced apart sidewalls and a blade and a bottom arranged to receive and support materials which are picked up by said blade said carrier being adapted to discharge materials; means for disposing said carrier in a loading or a carrying position; a scoop normally disposed forwardly of said carrier and confronting the same; means mounting said scoop for both vertical and horizontal movement relative to said carrier, said means comprising arms secured to said scoop and having a plurality of uniformly spaced projections formed longitudinally thereof, means slidably confining said arms relative to said carrier, a rotatable cross shaft supported with relation to said arms, wheels rigid with said cross shaft and having a plurality of uniformly spaced projections arranged about the circumference thereof and in mesh with said projections formed on said arms to maintain said scoop in its normal alignment with said carrier; control means for causing said scoop to move rearwardly into said carrier for pushing materials toward the rear end of said carrier in loading position thereof; means to prevent rearward movement of said scoope into said carrier in carrying position of said carrier so as to adapt said scoop to swing vertically at the forward end of said carrier for dicharging materials from said scoop; said control means being also adapted to control the discharging of said scoop and said carrier successively.

5. In a scraper; a carrier including spaced apart sidewalls and a blade and a bottom arranged to receive and support a load which is picked up by said blade, said carrier being operable to discharge material directly onto the ground; means for raising and lowering said carrier so as to selectively dispose the same in a loading or a carrying position; a scoop normally disposed forwardly of said carrier and confronting the same to be loaded in conjunction therewith; means mounting said scoop for both vertical and horizontal movement relative to said carrier, said means comprising arms secured to said scoop and having a multiplicity of uniformly spaced projections arranged longitudinally thereof, a rotatable cross shaft supported with relation to said arms, means supporting said arms from said cross shaft for both swinging and sliding movement relative thereto, wheels rigid with said cross shaft and having a plurality of uniformly spaced projections arranged about the circumference thereof and in mesh with said projections formed on said arms so that said shaft is rotated as said arms slide and said scoop moves rearwardly into said carrier for pushing the load toward the rear end thereof, means to secure said cross shaft against rotation so as to adapt said scoop to swing vertically at the forward end of said carrier for discharging the load in said scoop; and common operating means applied to said scoop and to said carrier to control rearward movement of said scoop into said carrier and also to control the discharging of said scoop and said carrier successively.

6. In a scraper, a carrier including spaced apart side walls and a blade and a bottom arranged to receive and support a load which is scraped up by said blade; a scoop normally disposed forwardly of said carrier and confronting the same; arms secured to said scoop and extending longitudinally with said carrier, said arms having a plurality of uniformly spaced projections arranged longitudinally thereof; a rotatable cross shaft supported with relation to said arms; means slidably confining said arms with relation to said cross shaft and said carrier; and wheels rigid with said cross shaft and having a plurality of uniformly spaced projections arranged about the circumference thereof and in mesh with said projections formed on said arms for maintaining said scoop in its normal alignment with said carrier; stops supported with relation to said arms; rollers carried by said arms for cooperating with said stops in cetain positions of said arms; means for moving said scoop from a lower forward position toward the rear end of said carrier until said rollers engage said stops, thence upwardly until said rollers clear said stops, and thence rearwardly into said carrier along a lower path of travel materially above the bottom thereof to push the upper portion of the load toward the rear end of said carrier; rails having supporting association with said arms in certain positions of said scoop; and means for moving said scoop forwardly along an upper path defined by said rails to a position forwardly of said carrier.

7. In a scraper, a carrier including spaced apart side walls and a blade and a bottom arranged to receive and support materials which are scraped up by said blade, a portion of which moves rearwardly onto said bottom in response to pressure from oncoming materials and some of which piles up in front of said blade said carrier being also adapted to discharge materials; means for disposing said carrier in a scraping or a spreading position, a scoop adapted to be disposed on the forward side of said materials piled up in front of said blade and confronting the same; means slidably mounting said scoop for movement longitudinally of said carrier, said means comprising arms secured to said scoop and means slidably confining the same with relation to said carrier and said arms having a plurality of uniformly spaced projections formed thereon; control means for causing said scoop to move from its forward position rearwardly into said carrier along a lower path of travel materially above the bottom thereof for pushing the upper portion of said materials toward the rear end of said carrier; rails having supporting association with said arms in certain positions of said arms; a rotable cross shaft supported with relation to said arms and wheels rigid with said cross shaft and having a plurality of uniformly spaced projections arranged about the circumference thereof and in mesh with said projec-

tions formed on said arms to maintain said scoop in its normal alignment with said carrier; other means for moving said scoop forwardly along an upper path of travel defined by said rails; means to prevent rearward movement of said scoop into said carrier in spreading position of said carrier so as to adapt said scoop to swing vertically at the forward end of said carrier for discharging the load in said scoop forwardly of said blade; said control means being also adapted to control the discharging of said scoops and said carrier in predetermined order.

8. In a scraper, a carrier including spaced apart side walls and a blade and a bottom arranged to receive and support materials which are scraped up by said blade, a portion of which moves rearwardly onto said bottom in response to pressure from oncoming materials and some of which piles up in front of said blade; a scoop adapted to be disposed on the forward side of said materials piled up in front of said blade and confronting the same; means slidably mounting said scoop for movement longitudinally of said carrier, said means comprising arms secured to said scoop and means slidably confining said arms with relation to said carrier, said arms having a plurality of uniformly spaced projections formed thereon; stops carried by said side walls; rollers carried by said arms for cooperating with said stops in certain positions of said arms; means for causing said scoop to move along the surface of the ground toward said blade until said rollers engage said stops, thence upwardly above said blade until said rollers clear said stops and thence rearwardly into said carrier along a lower path of travel materially above the bottom of said carrier for pushing the upper portion of said materials toward the rear end of said carrier; a rotatable cross shaft supported with relation to said arms; wheels rigid with said cross shaft and having a plurality of uniformly spaced projections arranged about the circumference thereof and in mesh with said projections formed on said arms so as to maintain said scoop in its normal alignment with said carrier; rails carried by said side walls and having supporting association with said rollers in certain positions of said arms; and means for rotating said cross shaft to cause said scoop to move forwardly along an upper path defined by said rails to a position forwardly of said materials piled up in front of said blade.

9. In a scraper, a carrier including spaced apart sidewalls and a blade and a bottom arranged to receive and support materials which are scraped up by said blade, said carrier being adapted to discharge materials, a scoop normally disposed at the forward end of said carrier to be loaded in conjunction therewith, operable means mounting said scoop with relation to said carrier so that said scoop may have both vertical swinging movement relative to said carrier and also sliding movement rearwardly therein for pushing materials toward the rear end of said carrier, means to selectively prevent said rearward sliding movement of said scoop so as to adapt the same to swing vertically at the forward end of said carrier to discharge the load therefrom directly onto the ground in front of said carrier, and common opeating means applied to said scoop and to said carrier to control rearward movement of said scoop into said carrier and also to control the discharging of said scoop and said carrier successively.

10. In a scraper, a carrier including spaced apart side walls and a blade and a bottom arranged to receive and support a load which is picked up by said blade; means for moving said carrier into scraping and spreading positions, there being an intermediate position between said scraping and spreading positions; a scoop normally disposed forwardly of said carrier and confronting the same; means mounting said scoop for movement from its forward position rearwardly into said carrier, said means comprising arms secured to said scoop and means slidably confining said arms with relation to said carrier; a rotatable cross shaft supported with relation to said arms and associated therewith so that said shaft is rotated as said arms slide and said scoop moves rearwardly into said carrier for pushing the load toward the rear end thereof; and operable means acting automatically as said blade moves through said intermediate position to release said shaft for rotation or to secure said shaft against rotation, depending upon the direction of movement of said blade.

11. In a scraper, a carrier including spaced apart side walls and a blade and a bottom arranged to receive and support a load which is picked up by said blade; means for moving said carrier into scraping and spreading positions, there being an intermediate position between said scraping and spreading positions; a scoop normally disposed forwardly of said carrier and confronting the same; means mounting said scoop for movement from its normal position rearwardly into said carrier, said means comprising arms secured to said scoop and means slidably confining said arms with relation to said carrier, said arms having a multiplicity of uniformly spaced projections arranged longitudinally thereof; a rotatable cross shaft supported with relation to said arms; wheels rigid with said cross shaft and having a multiplicity of projections arranged about the circumference thereof and in mesh with said projection carried by said arms; a stop carried by said cross shaft; and operable means mounted with relation to said stop, said operable means acting automatically as said blade moves through said intermediate position to engage said stop to prevent rotation of said shaft or to release said stop, depending upon the direction of movement of said blade.

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