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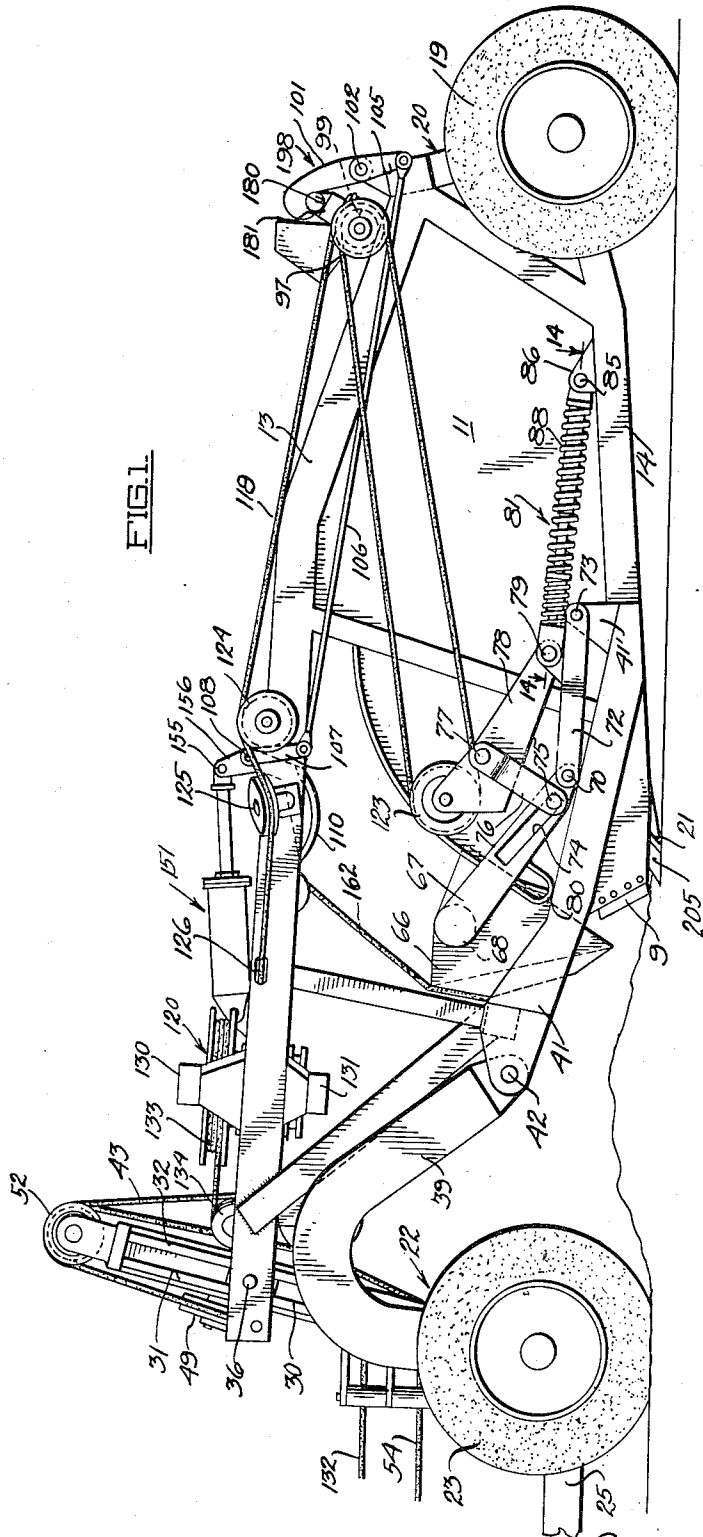
G. E. DANIELS

2,330,113

DIRT SCRAPING APPARATUS

Filed Dec. 2, 1938

5 Sheets-Sheet 1



BY

INVENTOR.
GORDON E. DANIELS

Fred M. Schwend
ATTORNEY.

Sept. 21, 1943.

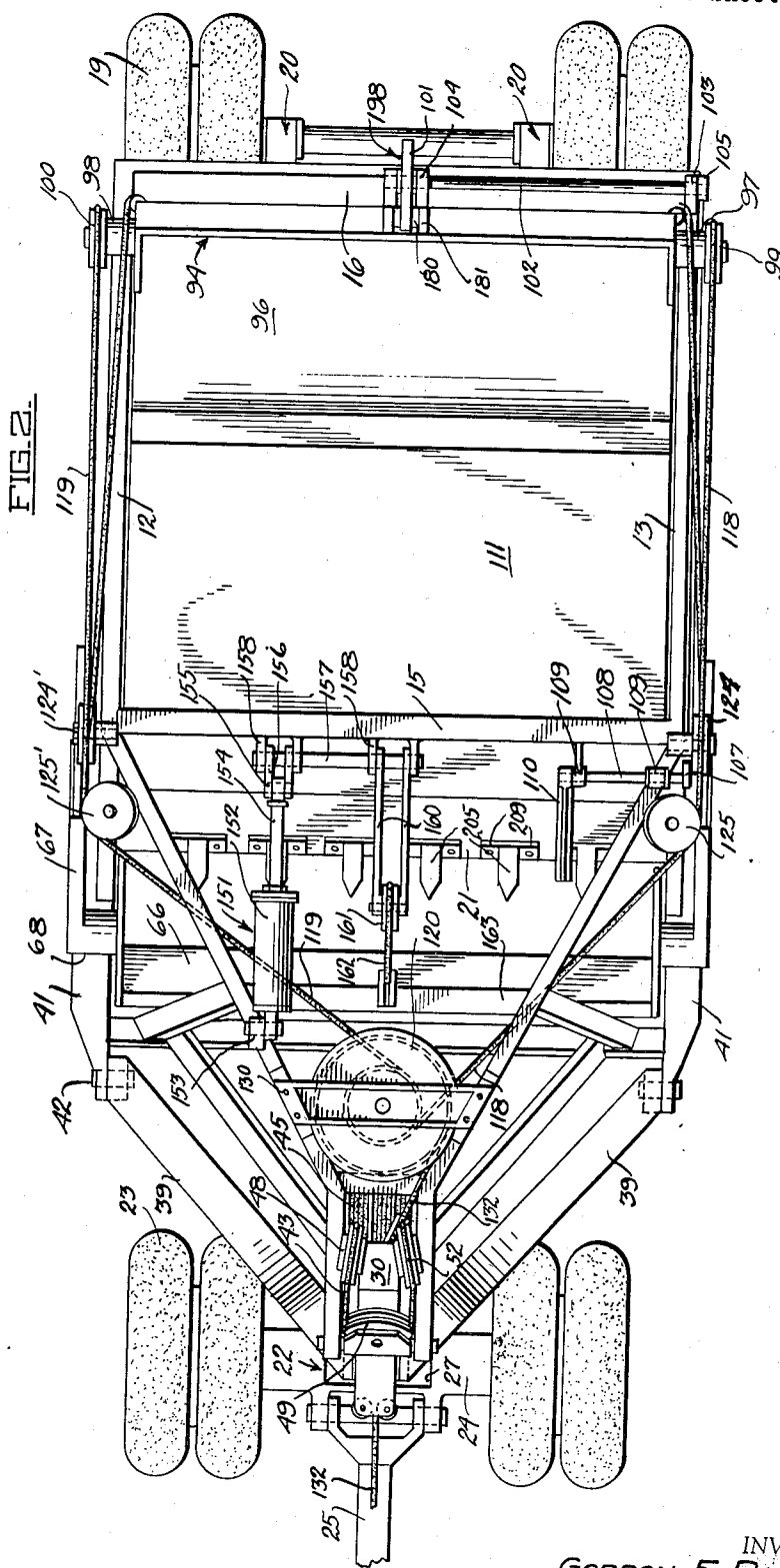
G. E. DANIELS

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DIRT SCRAPING APPARATUS

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BY

INVENTOR.
GORDON E. DANIELS
Fred M. Schward
ATTORNEY.

Sept. 21, 1943.

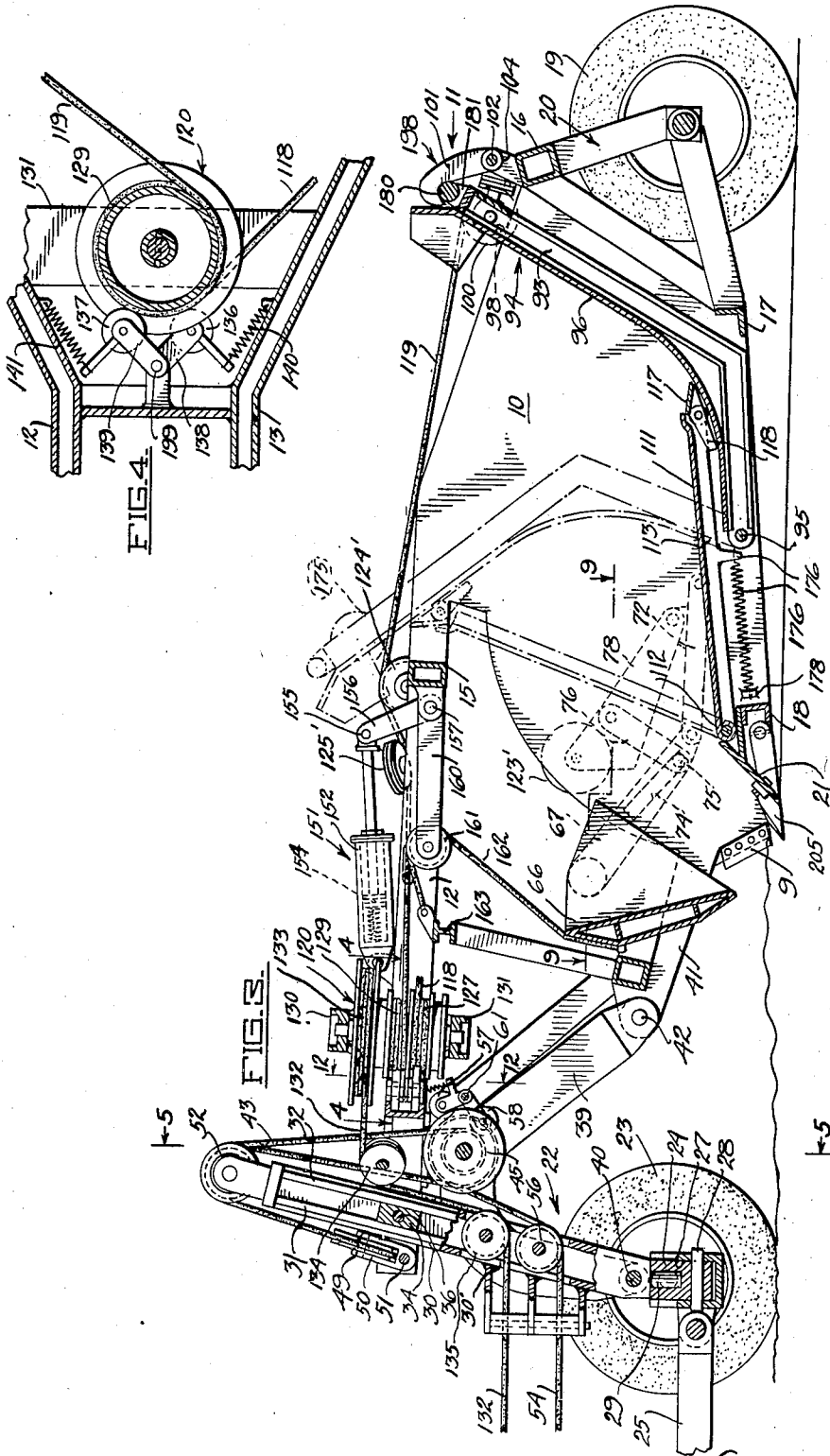
G. E. DANIELS

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DIRT SCRAPING APPARATUS

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INVENTOR.
GORDON E. DANIELS

BY

Fred W. Schwend
ATTORNEY.

Sept. 21, 1943.

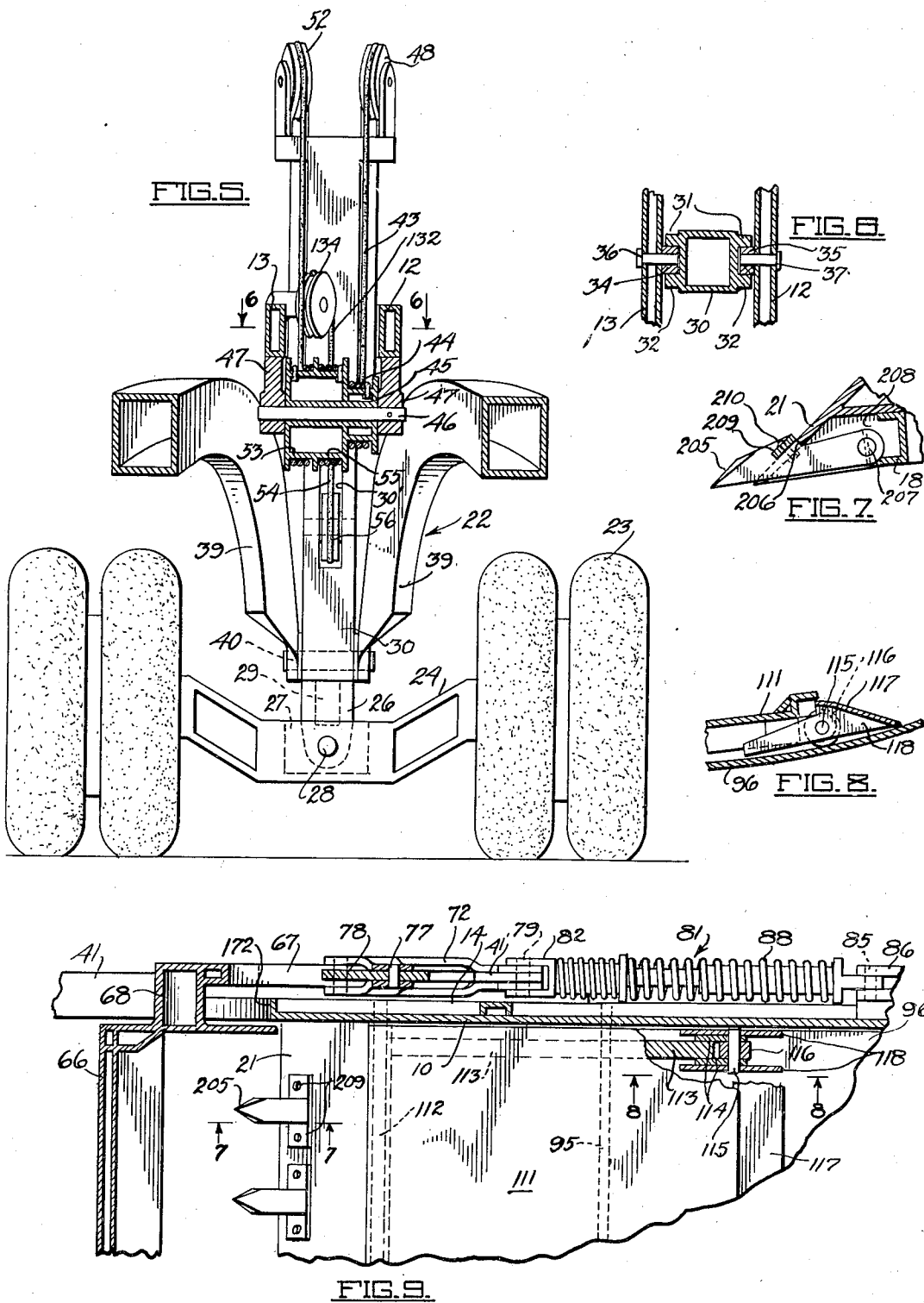
G. E. DANIELS

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DIRT SCRAPING APPARATUS

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5 Sheets-Sheet 4



INVENTOR.
GORDON E. DANIELS

BY

Fred N. Schwend
ATTORNEY.

Sept. 21, 1943.

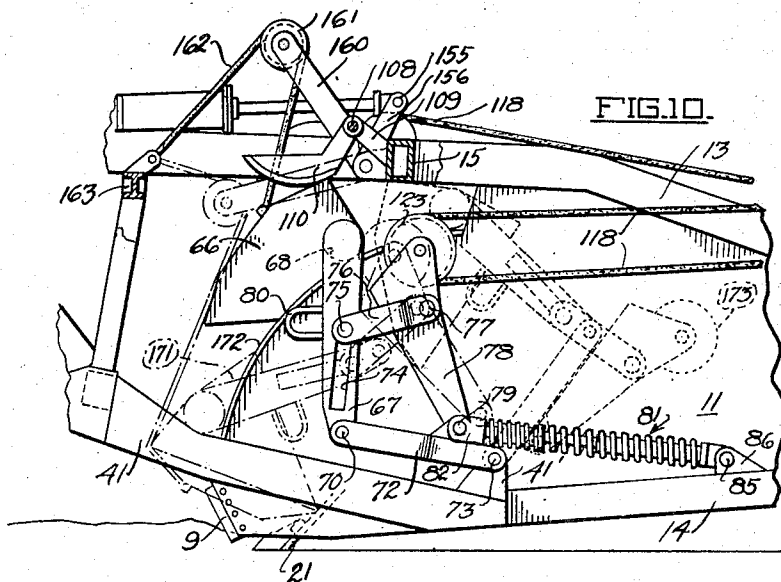
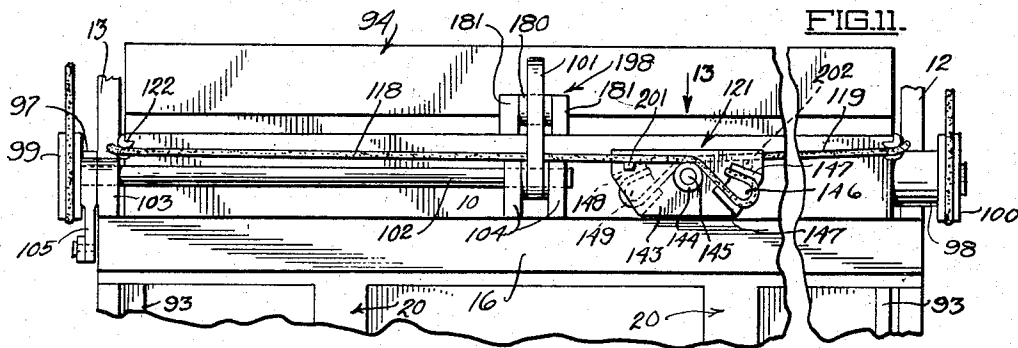
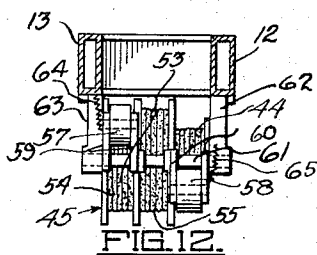
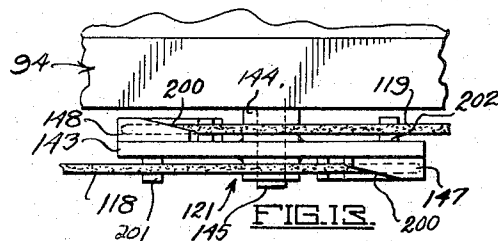
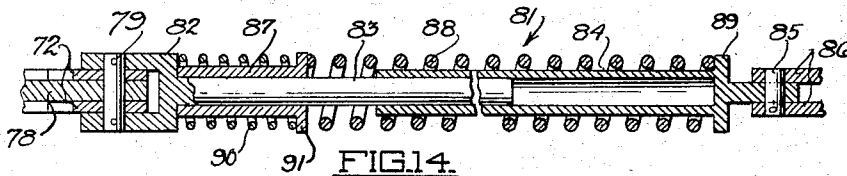
G. E. DANIELS

2,330,113

DIRT SCRAPING APPARATUS

Filed Dec. 2, 1938

5 Sheets-Sheet 5



INVENTOR.
GORDON E. DANIELS
BY
Fred M. Schwend
ATTORNEY.

UNITED STATES PATENT OFFICE

2,330,113

DIRT SCRAPING APPARATUS

Gordon E. Daniels, Los Angeles, Calif.

Application December 2, 1933, Serial No. 243,562

25 Claims. (Cl. 37-126)

This invention relates to dirt scraping apparatus, and has particular reference to apparatus of the type disclosed and claimed in my co-pending application, Serial No. 163,540, filed September 13, 1937, for "Dirt scraper" (and since matured into Patent No. 2,172,672, issued on September 12, 1939) wherein a dirt accumulating body, having a transversely extending scraping edge associated with the bottom thereof, is dragged over the ground to be scraped. During the forward movement of the body the dirt is directed therein.

One object of the present invention is to reduce the force necessary to move scraped material in a scraper body. This is accomplished by applying a rolling motion to the dirt instead of bodily moving the dirt from one end to the other in the body.

Another object is to prevent damage to scraper operating mechanism due to breakage of a part of such mechanism.

Another object is to simplify the construction of scraper apparatus.

The manner in which the above and other objects of the invention are accomplished will be readily understood on reference to the following specification read in conjunction with the accompanying drawings wherein:

Fig. 1 is an elevation view of the scraper apparatus embodying the present invention and is shown in digging position;

Fig. 2 is a plan view of the scraping apparatus;

Fig. 3 is a sectional longitudinal elevation view of the scraping apparatus;

Fig. 4 is a sectional plan view of the differential load drum and is taken along the line 4-4 of Fig. 3;

Fig. 5 is a transverse sectional view, taken along the line 5-5 of Fig. 3;

Fig. 6 is a sectional view of the truck post and is taken along the line 6-6 of Fig. 5;

Fig. 7 is a sectional view showing the mounting of one of the cutting teeth and is taken along the line 7-7 of Fig. 9;

Fig. 8 is a fragmentary sectional view of the sealing edge assembly for the floor member and is taken along the line 8-8 of Fig. 9;

Fig. 9 is a sectional plan view, partly broken away, and is taken along the line 9-9 of Fig. 3;

Fig. 10 is an elevational view, partly broken away and partly in section, illustrating different positions of the crowder mechanism;

Fig. 11 is a rear view, partly broken away, and is taken in the direction of the arrow 11 of Fig. 3;

Fig. 12 is a transverse sectional view showing

the hoist drum and is taken along the line 12-12 of Fig. 3;

Fig. 13 is a plan view of the safety anchor and is taken in the direction of the arrow 13 of Fig. 11;

Fig. 14 is a longitudinal sectional view through one of the crowder moving springs and is taken along the line 14-14 of Fig. 1.

Referring to the drawings, the side walls 10 and 11 of the scraper body are connected at their upper ends to longitudinally extending beams 12 and 13, respectively, and at their lower ends to longitudinally extending beams 14. These side walls 10 and 11 are held in spaced relation by transversely extending beams 15, 16, 17, and 18.

The rear of the scraper is supported by pneumatic tired wheels 19, the axle of which is supported by brackets 20 extending from the beams 16 and 17.

A scraping or cutting blade 21, comprising the scraping edge, is supported from the transverse beam 18 in an inclined position. The cutting edge of blade 21 extends below the remainder of the scraper body. Side cutter blades 9 are also provided on the forward lower edges of sides 10 and 11.

The forward end of the scraper is supported for vertical movement on a truck, generally indicated at 22, mounted on pneumatic tired wheels 23. The axle 24 for the wheels 23, has pivotally secured thereto a tongue 25 which is adapted to be drawn by a suitable tractor (not shown). A bearing block 26 (Figs. 3 and 5) is mounted within a well 27 formed centrally in the axle 24 and is movable about a horizontal transversely extending pin 28. Block 26 has a vertically extending socket formed therein to journal a depending bearing stud 29 formed on the bottom of a post 30.

As shown in Fig. 6, post 30 is substantially square in cross-section, having a pair of spaced guide rails 31 and 32, formed on opposite sides thereof. These rails have slidably fitted therein, a pair of slide blocks 34 and 35, pivotally mounted on pins 36 and 37, respectively, secured in the beams 13 and 12, respectively, at the forward ends thereof. It will thus be seen that blocks 34 and 35 form a sliding, rocking, bearing connection between the post 30 and the forward portion of the scraper body.

A pair of arcuately shaped links 38 are pivotally supported at their forward ends on opposite sides of the lower portion of the post 30 by a transversely extending pin 40 and are pivotally supported at their rear ends to forward extensions 41 of the bottom body beams 14 by coaxial pins 42.

The forward end of the scraper body is raised and lowered along the post 30 by means of a cable 43 wrapped around and anchored to a small diameter section 44 of a differential hoist drum 45 (Fig. 5). Drum 45 is journaled on a transversely extending shaft 46 supported by brackets 47 depending from the beams 12 and 13. Cable 43, after leaving the small diameter section 44 passes around a pulley 48 rotatably mounted on a bracket at the top of post 30 and is then led around a pulley 49 rotatably mounted in a pulley block 50. Block 50 is pivotally mounted on a pin 51 extending between the beams 12 and 13. On leaving pulley 49, cable 43 is passed over a pulley 52, also rotatably mounted at the top of post 30 and is thence wrapped around and anchored to a large diameter section 53 of the drum 45. A second cable 54 is wrapped around and anchored to a second large diameter section 55 of drum 45 and thence passes under a pulley 56 rotatably mounted in an opening 30' extending through post 30. The cable 54 is preferably operated by a power driven winch provided on the tractor and under control of the tractor operator. When the cable 54 is drawn by the winch the drum 45 will be rotated so as to cause a differential action upon the cable 43 to shorten the length of the same and thus draw the scraper body upwardly along the post 30.

As shown in Figs. 3 and 12 the two ends of the cable 43 are retained on their respective sections of the drum 45 by rollers 57 and 58 rotatably mounted at the ends of double lever arms 59 and 60, respectively. Arms 59 and 60 are independently journaled on a shaft 61 supported from the beams 12 and 13 by brackets 62 and 63. Tension springs 64 and 65 are connected between the arms 59 and 60, respectively, and the brackets 62 and 63, respectively, to urge the rollers 57 and 58 into contact with the peripheries of the respective drum sections 53 and 44.

The above mentioned novel arrangement of the post 30, links 39 and rocking slide bearings 34 and 35 permits the post to remain in substantially the same relative position for different elevated positions of the scraper body.

Referring to Figs. 1, 3, 9, and 10, the crowding mechanism will now be described.

A crowding member comprising a crowder apron 66 is located at the forward end of the scraper body and is movable into various positions adjacent and past the scraping edge 21. A pair of spaced arms 67 extending rearwardly from the apron 66 are integrally connected thereto by short cylindrical projections or bosses 68 and project along the scraper sides 10 and 11. Bosses 68 are adapted, in certain positions of crowder apron 66, to rest on the forward beam extensions 41, and are also adapted to ride along convex guiding surfaces 172 defining the forward edges of the scraper sides 10 and 11. Arms 67 are pivotally secured at their rear ends by means of coaxial pins 70 to the forwardly extending ends of link members 72, the rear ends of which are pivotally mounted by coaxial pins 73 on brackets 41' projecting upwardly from the forward extensions 41. Each of the arms 67 has a longitudinally extending slot 74 therein along and in which is adapted to ride a pin 75 mounted on a link member 76. The other end of the link 76 is pivotally connected at 77 to an arm 78 which, in turn, is pivotally connected by a pin 79 to a bracket formed on the link 72 intermediate its ends. A U-shaped bar 80 is suitably secured to the under-surface of each arm 67 intermediate its ends and is positioned so as to rest on the top of the respective

forward continuation 41 of the beams 14, as in the position shown in Fig. 1.

The entire crowder mechanism is resiliently urged by a compression spring arrangement generally indicated at 81 into the position of Fig. 1, when tension on a crowder operating cable system (to be described hereinafter) is released. The details of the spring arrangement 81 are shown in Fig. 14 wherein a clevis member 82, also fitted on the pin 79, has a rod 83 extending therefrom and slidably received in a telescoping tube 84, the opposite end of which is formed into a head journaled on a pin 85 carried on a bracket 86 extending upwardly from the respective lower body beam 14. A sleeve 87 is slidably mounted on the rod 83 and is engaged by a compression spring 88 extending therebetween and the flange 89 of the head of tube 84. A second but weaker spring 90 is inserted between the flanged end 91 of sleeve 87 and the head of clevis member 82. The combination of the two springs 88 and 90, the function of which will be described hereinafter, urges the link member 72 in a counter-clockwise direction about the pin 73.

Referring now to Figs. 2 and 3, the rear wall 94 of the scraper comprises spaced, substantially L-shaped structural members 93, the longer legs of which incline rearwardly. Members 93 are pivoted at their forward ends on a transverse shaft 95 extending between the side walls 12 and 13. A metal sheet 96 forming the rear wall extends over the structural members 93 from a point adjacent the shaft 95 to the upper ends thereof. A pair of coaxially extending tubular projections 97 and 98 extend outwardly from the upper ends of members 93 and form bearing supports for pulleys 99 and 100, respectively. These projections 97 and 98 are also adapted to rest on the upper edges of the upper body beams 12 and 13, respectively, to support the rear wall in the full line position shown in Fig. 3.

Wall 94 is retained in the full line position shown by a latch device generally indicated at 108. Latch device 108 comprises a bar 100 supported on the top of the wall 94 by spaced brackets 101 which bar is adapted to be engaged by a latch member 101, secured on a transverse shaft 102 journaled within bearings 103 and 104 (Figs. 2 and 11). These bearings are provided on brackets extending upwardly from the transversely extending beam 16 of the scraper body. As shown in Figs. 1 and 11 a crank lever 105, suitably keyed to shaft 102, is pivotally secured at the lower end thereof to a flexible rod 106. Rod 106 is pivotally secured at the other end thereof to a second crank lever 107. Lever 107 is fixed to one end of a stub shaft 108 (Fig. 2) journaled in bearings 109 supported on transverse body beam 15. A trip lever 110 (Figs. 2 and 10) is fixed to shaft 108 and has an arcuately shaped under-surface adapted to be engaged by the upper edge of crowder apron 66 when the crowder is moved into an upper position.

Referring to Figs. 3 and 9 a floor member or bottom 111 is provided at the bottom of the scraper body and is hinged on a shaft 112 extending between the scraper sides 10 and 11 at a point directly behind the scraping blade 21 for movement about a transverse axis. A pair of parallel spaced beams 113 support the floor 111 and each has a pair of coextensive brackets 114 at the rear ends thereof, which brackets carry stub shafts 115, on which are rotatably mounted rollers 116. These rollers 116 rest on the arcuately shaped rear wall sheet 96 to carry the rear

end of floor member 111. A transverse sealing member 117 is provided having depending guides 118 at opposite ends thereof. Guides 118 are journaled on the coaxial shafts 115. These guides extend on opposite sides of the shaft 115 and engage the sheet 96 at either of the ends thereof so as to maintain the rear edge of sealing member 117 substantially in sliding contact with sheet 96 throughout the entire length of travel of floor member 111. This arrangement, while preventing any dirt from falling between the rear wall 93 and floor member 111 also acts to remove or scrape any material clinging to the sheet 96.

The rear wall 93 is movable into the dotted line position shown in Fig. 3, in which position the floor member 111 is moved about the shaft 112 into a substantially vertical position to expel any dirt within the scraping body. It should be noted that movement of wall member 93 and floor member 111 from their full line positions to their dotted line positions causes more or less of a rolling motion to be imparted to the dirt during the expelling operation instead of a pure bodily movement thereof thus permitting the dirt to be moved with much less force than would otherwise be required. This action, as well as movement of the crowder member 66, is accomplished by a pair of cables 118 and 119 actuated by a differential drum 120.

As shown in Figs. 1, 2, and 11, one end of the cable 118 is secured at the rear end of the scraper body on a safety anchor generally indicated at 121 and is layed around a corner guide 122 and over the tubular projection 97 carrying the pulley 99. Cable 118 thence passes around a pulley 123, rotatably supported at the upper end of the arm 78, around pulley 99, over pulleys 124 and 125, rotatably mounted on the upper side beam 13, and thence passes through an aperture 126 in side beam 13 and is wrapped around a small diameter section 127 (Fig. 3) of drum member 120, the end thereof being suitably anchored to section 127. One end of the other cable 119 is also secured at the rear end of the scraper body to the safety anchor 121. Cable 119 thence passes over the projection 98, carrying the pulley 100, and around a plurality of pulleys 123', 124', and 125' (Fig. 3), identical in position and size with the pulleys 123, 124, and 125. The other end of cable 119 is wrapped around and anchored to a second small diameter section 129 of drum member 120. Member 120 is journaled at the top and bottom thereof in bearings provided in beams 130 and 131 extending across and secured to the longitudinally extending beams 12 and 13. A driving cable 132 is wrapped around and anchored to a large diameter section 133 of drum 120 and passes over a pulley 134 rotatably mounted on a bracket carried by the side beam 13 and thence under a second pulley 135 rotatably mounted in the slot 30' extending through the post 30. Cable 132 is preferably actuated by a suitable winch carried on the tractor and under the control of the tractor operator.

Referring to Fig. 4 a pair of rollers 136 and 137 carried on arms 138 and 139, respectively, are provided to maintain the cables 118 and 119 on their respective sections of the drum 120. Both arms are pivoted at 199. This arrangement is similar in construction to the arrangement shown in Fig. 12, the rollers 136 and 137 being resiliently urged against the cables 118 and 119 by springs 140 and 141, respectively.

Referring now to Figs. 11 and 13 the safety anchor 121 comprises a vertical plate 143 having

a hub 144 integrally formed centrally thereof. Hub 144 is rotatably fitted over a bearing stud 145 extending outwardly from the rear wall assembly 94. The cable 118 extends over the hub 144 on one side of plate 143 and wraps around a wedge 146. Wedge 146 is wedged between a pair of converging lugs or bosses 147 which are integrally formed on the plate 143 to lock the end of cable 118 therein. The end of cable 119 extends over hub 144 on the opposite side of plate 143 and is locked between a pair of converging lugs 148 provided on the opposite side of plate 143 by a wedge 149. As shown in Fig. 13, each of the upper lugs is beveled as at 200. Projections 201 and 202, integrally formed on the plate 143, engage the cables 118 and 119, respectively.

In the event of breakage of either of the cables 118 or 119 when under tension the remaining cable will rotate the plate 143 toward that cable and cause that cable to ride over the corresponding beveled edge 200 of its set of lugs and, because of this action, withdraw the respective wedge from between the lugs, permitting that cable to be released. This feature prevents damage to both the crowder and the ejector mechanism in the event of breakage of either cable.

For the purpose described hereinafter, I provide a dash pot arrangement generally indicated at 151 to prevent the crowder 66 from dropping abruptly when the cable 132 is released. Dash pot 151 comprises a cylinder 152 hinged at 153 to the side beam 12. A plunger 154 (Fig. 3) movable in the cylinder 152 has the rod thereof pivoted at 155 to a crank arm 156 suitably keyed to a stub shaft 157 journaled in bearings 158 supported from cross beam 15 extending between the side beams 12 and 13. A second crank arm 159 is also keyed to the shaft 157 and rotatably carries a pulley 161 at the forward end thereof. Pulley 161 engages an intermediate portion of a short cable 162 secured at one end thereof to a point on the crowder 66 and at the other end thereof to a cross beam 163 forming part of the scraper body frame.

Referring to Figs. 2, 7, and 9, it will be noted that a plurality of regularly spaced cutting teeth 205 are provided along the cutting blade 21. Each of these cutting teeth extends through a notch 206 in the blade 21 and is supported at its rear end on a pin 207 suitably anchored to a wall section 208. A pair of lugs or bosses 209 formed on each tooth 205 rest on the upper surface of blade 21 and are secured thereto by bolts 210, thus providing spaced supporting means for each tooth. Teeth 250 are seen to be easily removable in the event it is desired to use only the blade 21, as when particular kinds of dirt or other material are being scraped.

The operation of the scraping apparatus is as follows. While transporting the scraper body to the point where the scraping operation is to be performed the cable 54 is drawn by the tractor winch to elevate the forward end of the scraper body along the post 30 to a position where the scraping edge or blade 21 and teeth 205 extend above the ground. At the point where the scraping is to occur cable 54 is released until the scraping edge 21 and teeth 205 sink into the ground an amount which is determined by the type of dirt being scraped. At this point, or before, the cable 132 is released allowing the compression springs 81 to force the per surfaces of the extensions 41 of beams 14, forward ends of links 72 (Fig. 1) against the up-

resulting in the bar 80, also resting against the upper surface of extension 41 with the crowder 66 positioned above and forwardly of the scraping edge 21. The scraper is then in "digging" position permitting the teeth 205 to break up the dirt and allow the same to be moved, to some extent, into the scraper body due to the forward motion of the body. As the dirt builds up on the floor 111 behind edge 21 it increases the resistance to rearward movement of further scraped dirt within the body and thereafter causes the scraped dirt to roll forwardly over the scraping edge 21. When this condition is reached the crowder 66 is moved through a crowding path to urge the dirt rearwardly in the body. This is accomplished by drawing the cable 132 (and consequently the cables 118 and 119) forwardly which, due to the locked condition of the rear wall member 93 by latch device 198, causes a rearward pull against the coaxial pulleys 123 and 123' mounted on the link 78. Since section 133 of drum 120 is of larger diameter than sections 127 and 129 thereof, a greater force will be exerted on cables 118 and 119. This action causes the links 76 to draw the respective arms 67 of the crowder 66 upwardly first into the position shown by the dot and dash lines 171 of Fig. 10. During this travel the crowder apron 66 rocks about the U-shaped bars 80 and thereafter about the cylindrical projections 68. At this point, projections 68 engage convex guiding surfaces 172 at which the respective sides 10 and 11 terminate. Further movement of the coaxial pulleys 123, 123' by the cables 118 and 119 into the extreme rearward position as indicated by the dotted lines 173 causes the projections 68 to ride along the convex guiding surfaces 172 while the link 72 is moved about pivot pin 73. This movement causes the crowder 66 to move through an arcuate path and impart a rolling motion to the scraped dirt to move the same rearwardly in the scraper body. When the rearward position 173 of the crowding mechanism is reached the cable 132 is released permitting the spring 81 to return the same to the original digging position shown in Fig. 3. Due to the action of dash pot 151, the crowder apron 66 will descend slower than link 72 thus permitting the same to first assume a position similar to the full line position of Fig. 10 before lowering. That is, the forward end of link 72 will first strike the beam extension 41 and, thereafter the crowder 66 will pivot about pin 70 during its descent. Therefore, the crowder 66 will be sure to clear any dirt in the body. As the dirt again piles up over, and in front of, the edge 21 the above cycle is again followed. It will be noted that when the crowder mechanism is in the dotted line position 173 the spring arrangement 81 will be compressed a maximum amount. In this condition, the light spring 90 will be compressed until sleeve 87 engages clevis member 82 thereby allowing the full force of the heavy spring 88 to be exerted on the link 72. This insures sufficient force to be exerted to start the crowder mechanism back toward the original digging position shown in Fig. 3. However, during the travel of the crowder member 66 from a position substantially that shown by the dot and dash lines 171 of Fig. 10 to the digging position of Fig. 3 the light spring 90 will come into effect.

When the scraper body is filled and the dirt therein is to be transported to a different position the crowder member, after being released to assume "digging" position (Fig. 3) is drawn into

the position shown by the dot and dash lines 171 wherein the lower edge of the crowder 66 lies closely adjacent the scraping blade 21, substantially preventing the dirt from falling therebetween. In this condition, the scraper is hauled to the point where the dirt is to be dumped.

When the scraper dirt is to be expelled from the scraper body the crowder mechanism is again moved rearwardly toward the dotted position 173 of Fig. 10. Thereafter the cable 132 is quickly released permitting the springs 81 to move the links 72 in a counter-clockwise direction substantially into the position shown by the full lines in Fig. 10. During this movement the dash pot 152 acts to restrain the crowder 66 a sufficient amount against downward movement or, at least, to restrain the same from dropping until the link 72 has substantially reached the position shown in Fig. 10. At this time, the tubular extensions 68 will again engage the guiding surfaces 172. Due to the vertical position of the arm 67 the pin 75, slideable along the slot 74, will ride upwardly therealong into the extreme upper position adjacent the crowder 66. Thereafter, cable 132 is again drawn causing the crowder 66 to move upwardly and engage the trip lever 110 permitting consequent unlatching of the rear wall 93 by means of the latch 101. Further movement of the cable 132 causes the now unlatched wall 93 to pivot about the shaft 95 and move into the dotted line position 175 (Fig. 3), the floor 111, of course, moving into its dumping position 176. This action causes the dirt to be expelled forwardly over the scraping edge 21. During this forward movement of wall 93 the crowder will be held in its extreme upper position so as not to interfere with expulsion of the dirt.

After complete expulsion of the dirt from the scraper body the cable 132 is released, permitting a tension spring 176 extending between a bracket 176' depending from floor 111 and a bracket 178 extending from the side 10 to cause an initial movement of the floor and wall member in a clockwise direction past a certain point. Thereafter, these members will be moved into their full line positions by the action of gravity.

It is to be understood that, while I have herein described and illustrated a preferred form of my invention, it is not limited to the precise construction as herein described, but includes within its scope whatever changes fairly come within the spirit of the pending claims.

What I claim as new and desire to secure by Letters Patent is:

1. Scraping apparatus comprising the combination of a scraper body, a crowder for said body, a link, a pivotal connection between said link and said body, a second pivotal connection between said link and said crowder, means normally supporting said link substantially horizontally, and means for moving said link upwardly about said first mentioned pivotal connection, said last mentioned means being adapted to move said crowder member about said second pivotal connection.

2. Scraping apparatus comprising a scraper body, a crowder, a link pivotally connected at one end thereof to said crowder and at the other end thereof to said body, said crowder having a slot therein, a crowder moving member movable along said slot, means for operating said member to move said crowder, and means for selectively positioning said member along said slot whereby

to cause said member to follow different paths of movement.

3. Scraping apparatus comprising a scraper body, a crowder for said body, a link pivotally connected at one end thereof to said body and at the other end thereof to said crowder, said link normally lying in a substantially horizontal position, a crowder moving member, a movable connection between said member and said crowder whereby the point of attachment of said member may be varied along said crowder, and means for selectively positioning said member along said crowder.

4. Scraping apparatus comprising a body, a crowder adapted to move scraped material in said body, a link, a pivotal connection between one end of said link and said body, a second pivotal connection between the other end of said link and said crowder, means urging said link downwardly about said first mentioned pivotal connection, and means for raising said link about said first mentioned connection when said link and said crowder are each in a substantially lowermost position, said last mentioned means being adapted to raise said crowder about said second pivotal connection when said link is in its lowermost position and said crowder is substantially above said lowermost position.

5. Scraping apparatus comprising a body, a crowder adapted to move scraped material in said body, a link, a pivotal connection between said link and said body, a second pivotal connection between said link and said crowder, a crowder moving member, means forming a slideable connection between said crowder and said member, means urging said link downwardly and means for causing said crowder to move downwardly slower than said link whereby to change the position of said connection.

6. Scraping apparatus comprising the combination of a body, a crowder for said body, a link pivotally connected at one end thereof to said body and at the other end thereof to said crowder, an ejector for said body, means restraining said ejector from movement, a crowder moving member, a slideable connection between said member and said crowder whereby said member may be moved toward and away from said link, and means for shifting said member, said member being adapted to cause said crowder to move, through a crowding path in one position of said slideable connection and adapted to cause said crowder to release said restraining means in a different position of said slideable connection.

7. Scraping apparatus comprising the combination of a body, a crowder for said body, an arm on said crowder, a link, a pivotal connection between said link at one end thereof and said body, a second pivotal connection between said link at the other end thereof and said arm, a second link, a slideable connection between said second link at the one end thereof and said arm, a third link pivotally connected between said first mentioned link and said second link at the other end of said second link, and means for moving said third link about said first mentioned pivotal connection.

8. Scraping apparatus according to claim 7 comprising means for changing the position of said slideable connection.

9. Scraping apparatus comprising a scraper body adapted to contain scraped material, a wall member, means pivotally supporting said wall member at one end thereof in said body, a second wall member in said body, means pivotally

supporting said second wall member at one end thereof in said body with the other end thereof overlapping the pivoted end of said first mentioned wall member and adapted to be moved thereby, and means for moving said first mentioned wall member about said first mentioned means.

10. Scraping apparatus comprising a scraper body adapted to contain scraped material, said body comprising a rear wall and a floor member, means for pivotally supporting said floor member at one end thereof for movement about a horizontal axis with the other end thereof overlapping said wall, means for pivotally supporting the overlapped end of said wall for movement about a horizontal axis, and means for moving said wall about said last mentioned means whereby to move said floor member, said wall and said floor member being adapted to eject said scraped material from said body.

11. In a scraping apparatus the combination of a scraping body comprising a rear wall and a floor member, means forming a scraping edge for said body adjacent the front end of said member, means pivotally supporting said wall at the lower end thereof, means pivotally supporting said front end of said member with the rear end thereof overlapping the pivoted end of said wall and adapted to be moved upwardly thereby, and means for moving said wall about said pivoted means therefor whereby to eject scraped material from said body over said edge.

12. Scraping apparatus comprising the combination of a scraping body, a material moving member associated with said body, means comprising a pair of cables for moving said member, means for anchoring the ends of said cables, and means for releasing the end of one of said cables when the other of said cables breaks.

13. In a scraping apparatus, the combination of a body structure, a material moving member adapted to move scraped material in said body structure, means movably supporting said material moving member in said body structure, a drum member comprising large and small diameter sections, means rotatably supporting said drum member on said body structure, a cable wrapped around said small diameter section and connected to said material moving member on one side thereof, a second cable wrapped around said small diameter section and connected to said material moving member on the opposite side thereof, a third cable wrapped around said large diameter section for rotating said drum member, and means for releasing one of said cables on breakage of the other of said cables.

14. Scraping apparatus comprising the combination of a scraping body, a material moving member associated with said body, a pair of cables secured to said member for moving said member, means for concurrently drawing said cables to move said member, and means responsive to breakage of one of said cables for releasing the other of said cables.

15. Scraping apparatus comprising a body, a crowder adapted to move scraped material in said body, a link, a pivotal connection between one end of said link and said body, a second pivotal connection between the other end of said link and said crowder, means urging said link downwardly about said first mentioned pivotal connection, and means for raising said link about said first mentioned connection for moving said crowder in a crowding path, said last mentioned means being adapted to move said

crowder about said second pivotal connection when said link is in its lowermost position and said crowder is substantially above its lowermost position and to thereafter raise said link about said first mentioned connection whereby to cause said crowder to move in a path other than said crowding path.

16. Scraping apparatus comprising the combination of a scraper body, a crowder for said body, a link, a pivotal connection between said link and said body, a second pivotal connection between said link and said crowder, means for raising said link about said first mentioned pivotal connection whereby to cause said crowder to crowd said material in said body, and means for lowering said link about said first mentioned pivotal connection comprising a pair of springs, and means whereby one of said springs is rendered effective and the other of said springs is rendered ineffective during a portion of said lowering movement, and whereby said other of said springs is rendered effective during another portion of said lowering movement.

17. Scraping apparatus comprising a scraper body adapted to contain scraped material, a wall member, means pivotally supporting said wall member at one end thereof in said body, a second wall member in said body, means pivotally supporting said second wall member at one end thereof in said body with the other end thereof overlapping the pivoted end of said first mentioned wall member and adapted to be moved thereby, means for moving said first mentioned wall member about said first mentioned pivotal means, and means on said second wall member forming a sealing edge adjacent said overlapping end thereof and substantially in contact with said first mentioned wall member.

18. Scraping apparatus comprising a scraper body adapted to contain scraped material, a wall member, means pivotally supporting said wall member at one end thereof in said body, a second wall member in said body, means pivotally supporting said second wall member at one end thereof in said body with the other end thereof overlapping the pivoted end of said first mentioned wall member and adapted to be moved thereby, means for moving said first mentioned wall member about said first mentioned pivotal means, a sealing member, means on said second wall member pivotally supporting said sealing member, and means for guiding said sealing member substantially in contact with said first mentioned wall member.

19. Scraping apparatus comprising a scraper body having a scraping blade associated therewith, a crowder device including a crowder adapted to crowd material scraped by said blade in said body, a link, a first pivotal connection between one end of said link and said body, and a second pivotal connection between the other end of said link and said crowder; and means for exerting a pull on said crowder device at one point thereof whereby to cause said second pivotal connection to lead said crowder to move the same toward said blade, and for exerting a pull on said crowder device at a second point spaced from said first mentioned point whereby

to cause said crowder to lead said second pivotal connection to move said crowder away from said blade.

20. Scraping apparatus comprising a scraper body having a scraping blade associated therewith, a crowder device including a crowder adapted to crowd material scraped by said blade in said body, a link, a first pivotal connection between one end of said link and said body, and a second pivotal connection between the other end of said link and said crowder; guide means for guiding said crowder in a predetermined path, and means for exerting a pull on said crowder device at one point thereof whereby to cause said second pivotal connection to lead said crowder to move the same toward said blade, and for exerting a pull on said crowder device at a second point spaced from said first mentioned point whereby to cause said crowder to lead said second pivotal connection to move said crowder away from said blade.

21. An earth mover comprising a main frame supported for movement over the ground, a main bowl on said main frame, a bottom pan included in and forming the bottom of said main bowl and mounted for pivotal movement to sweep through a portion of said main bowl, a pusher mounted to sweep through said portion of said main bowl, and means for interrelating the movements of said bottom pan and of said pusher.

22. An earth mover comprising a main bowl including side walls, a bottom pan forming the bottom of said bowl and movable between a portion of said side walls, a pusher closing one end of said bowl and movable between said portion of said side walls, and means for moving said bottom pan and said pusher in concert.

23. An earth mover comprising a main bowl including side walls, overlapping pivoted members forming the bottom and the rear of said bowl mounted on and movable between said side walls, and means for moving said members in concert.

24. An earth mover comprising a main bowl including earth confining side walls, an earth confining rear wall extending between said side walls, a cutting edge extending between said side walls, an earth confining bottom pan supported on said side walls for movement about a fixed pivotal axis adjacent said cutting edge, and means for moving said bottom pan between said side walls and about said axis with a sweeping motion with respect to said rear wall.

25. An earth mover comprising a main bowl including earth confining side walls, an earth confining rear wall extending between said side walls, a cutting edge extending between said side walls, an earth confining bottom pan supported on said side walls for movement about a fixed pivotal axis adjacent said cutting edge, means for moving said bottom pan between said side walls and about said axis with a sweeping motion with respect to said rear wall, and means on said bottom pan forming a sealing edge substantially in contact with said rear wall.

GORDON E. DANIELS.