Sept. 9, 1941. F. JOHNSON 2,255,062

EARTH SURFACING MACHINE

Filed July 8, 1940 5 Sheets-Sheet 1

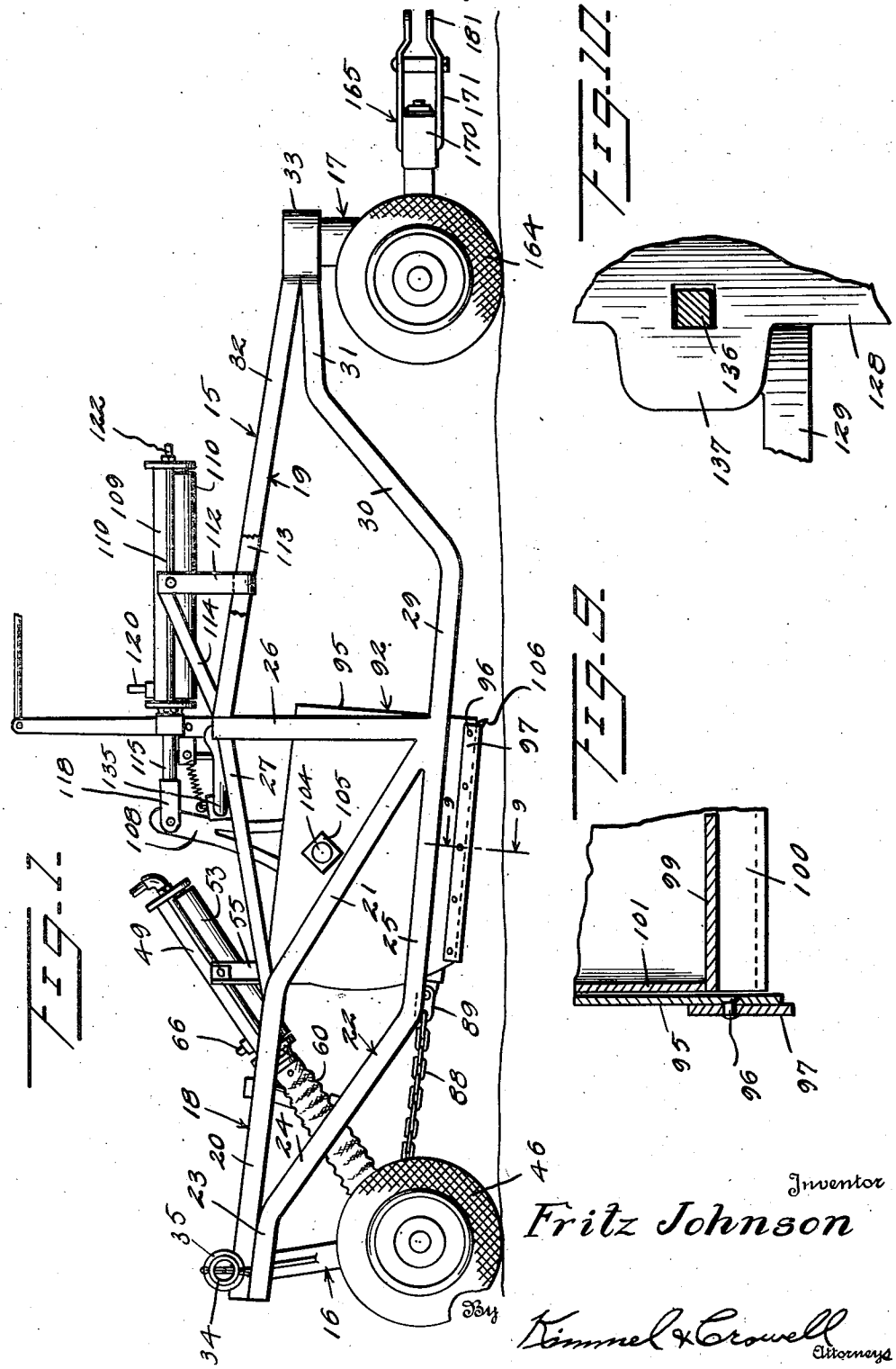


FIG. 1.

FIG. 2.

FIG. 3.

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EARTH SURFACING MACHINE

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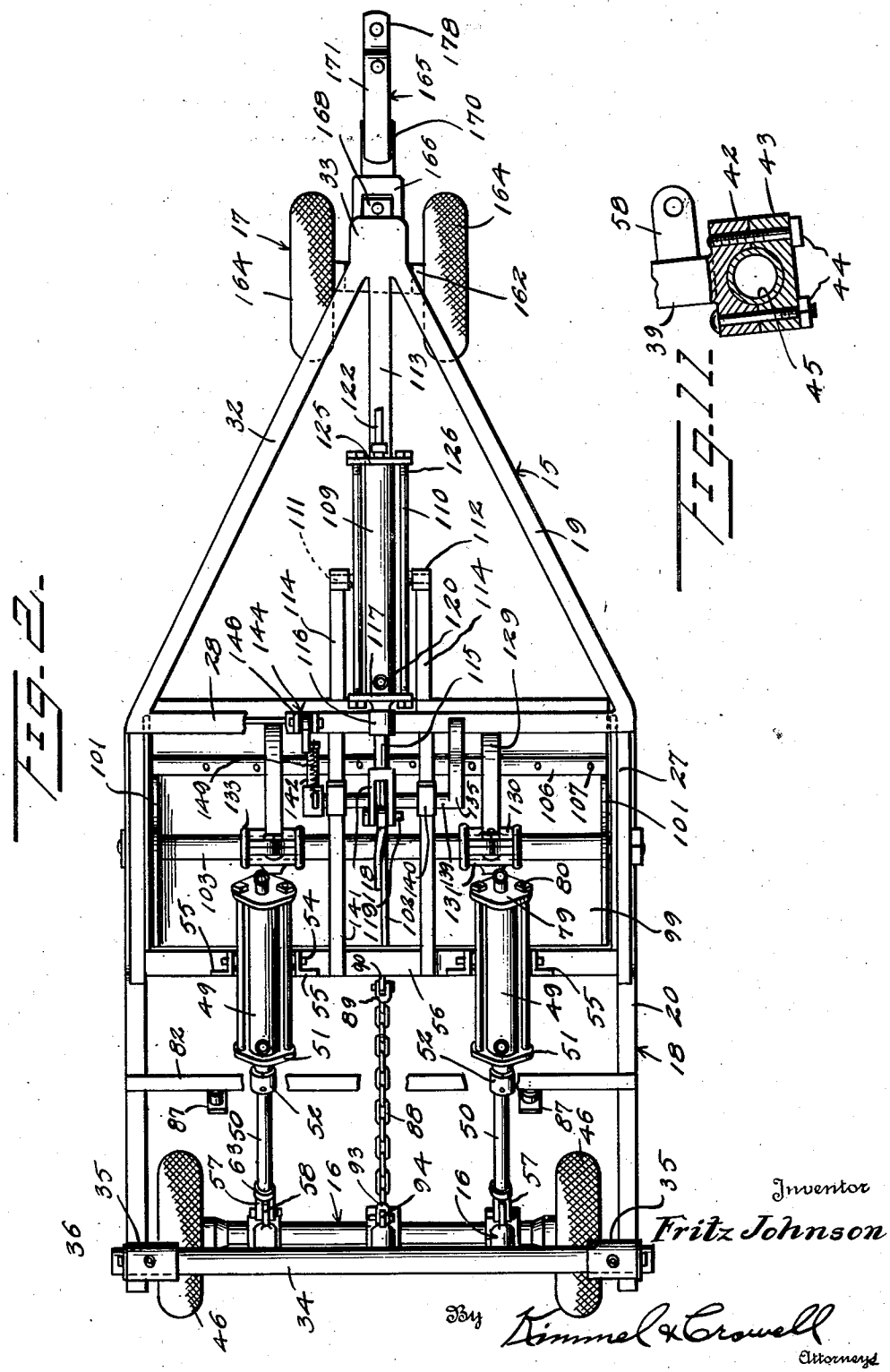


Fig. 2.

Fig. 7.

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EARTH SURFACING MACHINE

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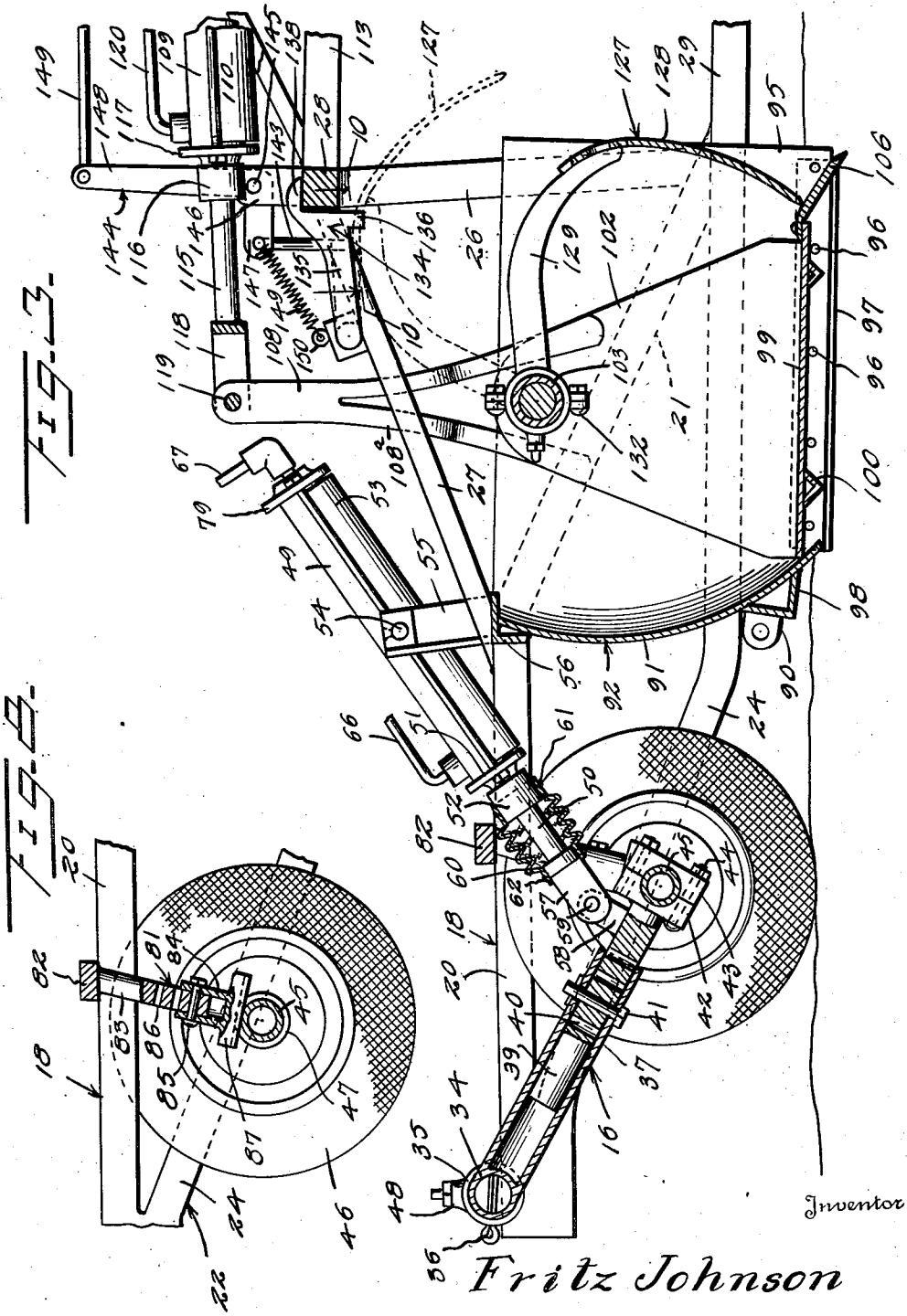


Fig. 3.

Fig. 4.

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EARTH SURFACING MACHINE

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Fig. 7.

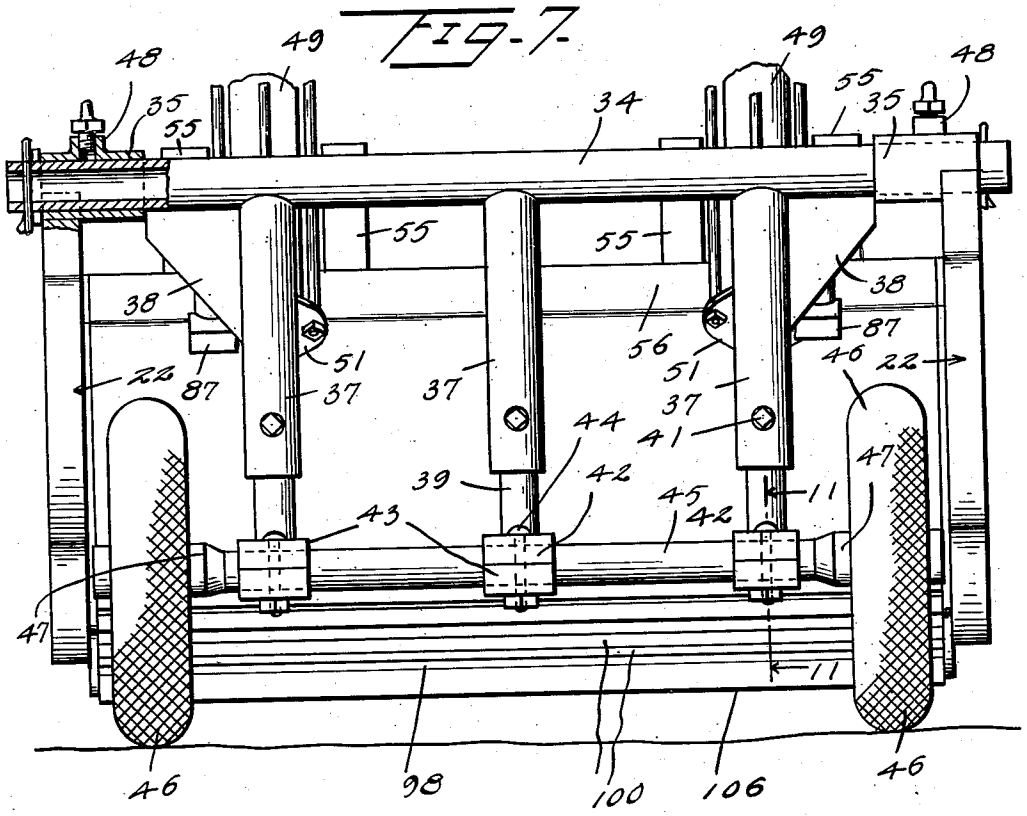
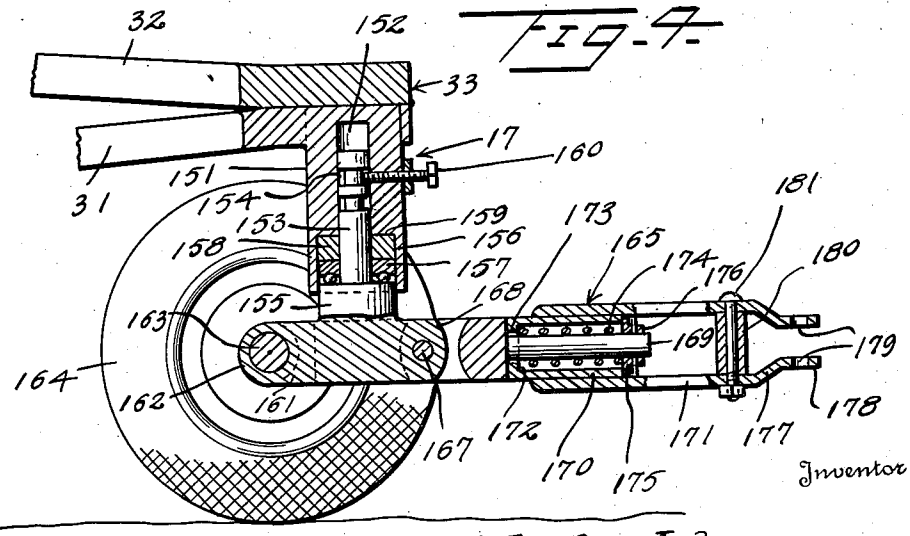


Fig. 4.



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Fig. 5.

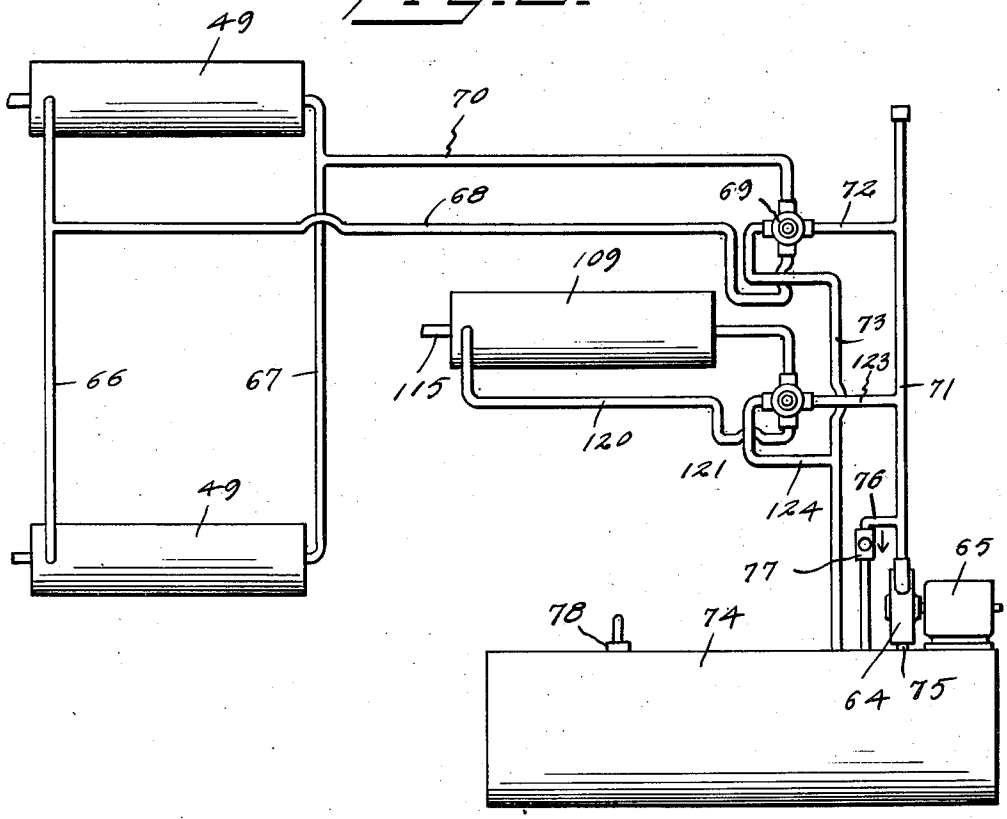
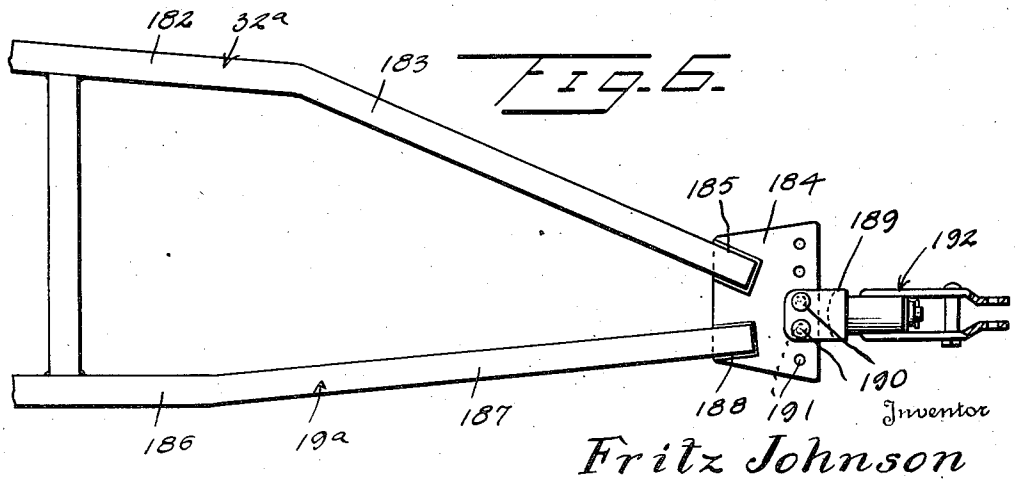


Fig. 6.



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Patented Sept. 9, 1941 2,255,062

UNITED STATES PATENT OFFICE

2,255,062

EARTH SURFACING MACHINE

Fritz Johnson, Burley, Idaho

Application July 8, 1940, Serial No. 344,428

10 Claims. (Cl. 37—126)

This invention relates to earth surfacing machines and is an improvement over the structure embodied in my copending application for Earth surfacing machines, Serial No. 338,651, filed June 3, 1940.

An object of this invention is to provide an earth surfacing or working machine including fluid operated means for elevating or lowering the bucket.

Another object of this invention is to provide in a machine of this type a shiftable bucket bottom, which is so arranged that the material in the bucket may be dumped in a manner to distribute the material.

A further object of this invention is to provide in a machine of this type a swingable gate at the front of the bucket and releasable latching means for locking the gate in open position to permit the filling of the bucket and the subsequent locking of the material in the bucket, the mounting means for the gate being so constructed as to automatically lock the gate in open position when the bucket bottom has been swung to a dumping position.

A still further object of this invention is to provide a machine of this character wherein the bucket bottom is formed with a rear wall which is fixed relative to the frame and with a swingable combined bottom wall and digging blade, the rear bucket wall constituting a combined material spreading member and depth gauge.

A further object of this invention is to provide in a machine of this type an improved adjustable carrier for the front of the machine.

A further object of this invention is to provide in a machine of this type hydraulic means for raising or lowering the bucket and for regulating the dumping of the bucket, the hydraulic means including an improved controlling means for regulating the operation of the bucket and the operation of the dumping structure.

A further object of this invention is to provide an improved adjustable means for limiting the lowering of the bucket.

Embodying the aims aforesaid and others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically described and illustrated in the accompanying drawings, wherein are shown embodiments of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed:

In the drawings:

Figure 1 is a detail side elevation of an earth surfacing and material distributing machine constructed according to an embodiment of this invention.

Figure 2 is a top plan partly broken away of the machine.

Figure 3 is a fragmentary longitudinal section taken substantially through the center of the machine.

Figure 4 is a fragmentary vertical section of the front truck or dolly.

Figure 5 is a diagrammatic view showing the hydraulic pressure circuit.

Figure 6 is a fragmentary side elevation partly in section of a modified form of draft structure.

Figure 7 is a fragmentary rear elevation partly in section of the device.

Figure 8 is a fragmentary sectional view showing the limiting means for the wheel frame.

Figure 9 is an enlarged fragmentary sectional view taken on the line 9—9 of Figure 1.

Figure 10 is a fragmentary sectional view taken on the line 10—10 of Figure 3.

Figure 11 is a fragmentary sectional view taken on the line 11—11 of Figure 7.

Referring to the drawings, the numeral 15 designates generally a bucket frame, the numeral 16 designates generally a wheel frame which is carried by the rear of the bucket frame 15 and the numeral 17 designates generally a truck or dolly structure disposed at the front of the bucket frame 15.

The bucket frame 15 comprises a rear section 18 and a front section 19. The rear section 18 includes a pair of upper side bars formed with an upper straight part 20 and a downwardly and forwardly inclined part 21. The rear section 18 also includes a pair of lower bars 22 which are formed at their rear ends with a rear upper part 23 engaging beneath the rear of the upper bar 20 and secured thereto as by welding or the like. The lower side bars 22 also include a downwardly and forwardly inclined intermediate part 24 which at its forward end is provided with an obtusely and forwardly projecting part 25. The downwardly inclined part 21 of the upper side bar comprising the two sections 20 and 21, is welded or otherwise fixed to the forward end of the lower side bar 25. An upright side member 26 is secured at its lower end to the forward end of the side bar 25 and extends upwardly above the upper side bar member 20, being connected to the side bar 20 by means of a brace 27.

The brace 27 is welded or otherwise fixed at its

forward end to the upright member 26 and is welded or otherwise fixed at its rear end to the junction between the two side bar members 20 and 21. A transverse bar 28 is welded or otherwise fixed between the upper ends of the two uprights 26. The lower side bars 25 are continued forwardly of the uprights 26 as at 29 and are then bent inwardly and upwardly as at 30 and terminate in a forward obtusely disposed extension 31. A pair of forward draft bars 32 are disposed above the draft bar comprising the bar sections 29, 30 and 31 and these two draft bars 32 as shown in Figure 2 are disposed in forwardly convergent relation and are welded or otherwise fixed at their rear ends to the uprights 26 and to the opposite ends of the horizontal connecting bar 28. The forward ends of the extensions 31 and the convergent ends of the draft bars 32 terminate in a head 33 forming part of the truck structure 17.

The wheel frame 16 comprises an upper horizontal bar 34 of tubular construction which forms a rock shaft extending transversely between the side members 20. The side members 20 at their rear ends are each provided with a bushing or sleeve 35 which is fixed thereto as by welding or the like and which constitutes a bearing for the shaft 34. The shaft 34 is rockable in the two bearings 35 and is held against endwise movement by cotter pins 36 or other suitable holding devices. The rock shaft 34 has fixed thereto a plurality of dependent tubular members 37 and the outermost of the tubular members 37 are braced relative to the shaft 34 by bracing webs 38 which are welded to the outer sides of the tubular members 37 and the underside of the shaft 34.

Each tubular member 37 has telescoping thereinto an axle adjusting member 39 which is formed with a plurality of spaced apart openings 40. A locking pin 41 engages through the tubular member 37 and through a selected opening 40 so as to provide a means whereby the wheel frame 16 may be extended or retracted in order to regulate the degree of raising or lowering of the bucket frame 15. Each axle adjusting member 39 is provided at its lower end with one part 42 of an axle clamp and a second or removable axle clamp 43 is adapted to be detachably secured to the fixed clamp 42 by clamping bolts 44 or the like.

An axle 45 engages through the clamping members comprising the clamping jaws 42 and 43 and is provided at the opposite ends thereof with wheels 46 which are rotatably mounted on the axle 45. The axle 45 adjacent the wheels 46 is formed with bosses or collars 47 which are adapted to limit the inward movement of the wheels 46 and form abutments against which the wheels 46 are adapted to rotatably engage. In order to provide a means whereby the shaft 34 may be lubricated in the bearings 35, I have provided lubricating fittings 48.

In order to provide a means whereby the wheel frame 16 may be rocked relative to the truck frame 15 so as to elevate or lower the truck frame 15, I have provided a pair of hydraulic cylinders 49, each of which is formed with a piston slidable therein and each of which has a piston rod 50 extending through a rear head 51. A gland 52 is carried by the rear head 51 and engages about the rod 50 so as to prevent the fluid in the piston 49 from leaking about the piston or plunger rod 50. Each cylinder 49 is carried by a cradle 53 of substantially semi-cylindrical configuration in transverse section and the cradle 53 is provided intermediate the ends thereof with a pair of trunnions 54 which are rockable in a pair of upright trunnion supporting members 55.

The trunnion supporting members 55 are fixed to a transversely disposed angle bracing member 56 which is secured between the side members 20 at substantially the forward ends of the side members 20. The rear ends of the plunger rods 50 are formed with a pair of spaced ears 57 which engage on opposite sides of an ear or lug 58 which is fixed to the forward side of the outermost pair of wheel frame members 39. A pin or pivotal member 59 engages through the ears 57 and 58 so as to pivotally connect the ears 57 with the ears 58. A collapsible dust protector 60 is disposed about each plunger rod 50 being connected at its forward end as at 61 to the gland member 62 and connected at its rear ends as at 62 to an enlarged collar 63 formed on the rear end of each rod 50.

Fluid pressure is communicated to the cylinders 49 from a pressure pump 64 which is disposed forwardly of the cylinders 49 and preferably the pressure pump 64 is mounted on a tractor or the like which is connected to the truck frame 17 as will be hereinafter described. A power member 65 is connected to and operates the pump 64. The power member shown in Figure 5 is shown as an electric motor but it will be understood that the pump 64 may be provided with any suitable power means and if desired may be operatively connected with the tractor engine by a suitable transmission device.

The two wheel frame operating cylinders 49 are connected together at their rear ends by a pipe 66 and at their forward ends by a pipe 67. The pipe 66 has one end of a pressure line 68 connected thereto and the opposite end of the pressure pipe line 68 is connected to a four-way valve 69. The connecting pipe 67 has one end of a pressure line 70 connected thereto and the opposite end of the pipe or duct 70 is also connected to the multiple valve 69. The pressure side of the pump 64 has one end of a pipe 71 connected thereto and the pipe 71 has a branch 72 which connects the pipe 71 with the valve 69. The valve 69 is a conventional four-way valve and the fourth side of the valve 69 is connected by means of a return pipe 73 to a fluid reservoir or tank 74. The suction side of the pump 64 is connected by a pipe 75 to the fluid reservoir or tank 74.

A pressure relief pipe 76 is connected at one end to the pressure line 71 and at the opposite end is connected to the reservoir 74. A conventional relief valve 77 is interposed in the by-pass pipe line 76 so that the pressure in the pipe 71 may be relieved by by-passing the fluid on the pressure side of the pump 64 back to the reservoir 74. It will be understood that the tank or reservoir 74 may also be provided with a safety valve 78 by means of which excessive pressure in the tank 74 may be dissipated.

Each cylinder 49 is provided with a rear head 79 and cylinder supporting bolts 80 engage through the two heads 51 and 79 and secure the cylinders 49 in the cradles 53. The rear connecting pressure line 67 extends through the rear heads 79 as shown in Figure 3.

In order to provide a means whereby the wheel frame 16 may be limited in its upward swinging movement, I have provided a pair of wheel frame stop members generally designated as 81. A transversely disposed horizontal bar 82 is fixed

to the upper frame members 20 forwardly of the bearings 35 and a pair of depending and rearwardly extending rods 83 are fixed at their upper ends to the supporting member 82. A sleeve or tubular member 84 telescopes about a depending rod or member 83 and is held in adjusted position relative to a member 83 by means of a retaining bolt or pin 85. The pin 85 extends through a sleeve 84 and through a selected opening 86 which is formed in the depending member 83.

The lower end of the sleeve 84 has fixed thereto a shoe 87 which is adapted to engage a collar 47 when the wheel frame is rocked upwardly to the position shown in Figure 3. In order to provide a means whereby the wheel frame 16 may be prevented from swinging downwardly and rearwardly to too great an extent, I have provided a chain or flexible member 88 which at its forward end is formed with a clevis 89 engaging an ear 90 which is carried by the rear wall 91 of a bucket structure generally designated as 92. The rear end of the chain 88 has a rear clevis 93 secured thereto which engages an ear or lug 94 carried by the central member 39.

In practice the wheel frame 16 is limited to substantially the position shown in Figure 1 in which position the wheel frame is inclined forwardly with respect to the vertical plane of the rock shaft 34. The bucket 92 comprises the rear wall 91 which as shown in Figure 3 is of arcuate configuration in vertical section. The rear wall 91 is fixed at its upper end as by welding or the like to the transverse supporting member or brace 56 and the rear wall 91 at its opposite ends has fixed thereto a pair of side walls 95. The side walls 95 are welded or otherwise fixed to the inner sides of the frame members 21, 25 and 26 and each side wall 95 at its lower edge has secured thereto as by fastening devices 96, a wear plate 97. The plate 97 projects slightly below the lower edge of the side wall 95 so that the wear plate 97 will take up the wear of the lower edge of the bucket and when the plates 97 become unduly worn, they may be replaced.

An L-shaped bracing member 98 is welded or otherwise fixed to the lower rear side of the back wall 91 and in practice the ear 90 is welded to the bracing member 98. The bracing member 98 is welded along its free edges to the rear side of the rear or back wall 91 as shown in Figure 3.

The bucket 92 also includes a bottom wall 99 which on its underside has secured thereto a pair of L-shaped bracing members 100. The bracing members 100 are secured along their free edges to the underside of the bottom wall 99 so as to form a pair of V-shaped ribs or bracing members extending transversely across the bottom wall 99. The bottom wall 99 at the opposite sides thereof has secured thereto a pair of upwardly extending side walls 101 which are of substantially triangular configuration with the base thereof lowermost. The bottom wall 99 also has secured thereto an intermediate plate 102 which is of substantially triangular configuration. A tubular rock shaft 103 is fixed to the upper ends of the side walls 101 and also extends through and is fixed to the intermediate plate or partition 102.

The rock shaft 103 is rockably mounted on a fixed shaft 104 which is fixed relative to the outer side walls 95 of the bucket. The shaft 104 may be fixed by means of a nut 105 or other fastening means to the side walls 95. The bottom wall at its forward edge has secured thereto a digging blade 106 which is secured to the forward edge of the bottom wall 99 by fastening devices 107. The intermediate plate or partition 102 has fixed thereto an upwardly extending arm 108 which is formed with a pair of downwardly divergent extensions 108a which engage on opposite sides of the plate 102 and are fixed thereto by means of welding or other suitable fastening means.

A bottom wall operating member comprising a hydraulic cylinder 109 is mounted at the rear of the draft section 19. The cylinder 109 is fixed in a rockable cradle 110 which is formed intermediate the ends thereof with trunnions 111. The trunnions 111 are rockable in an upstanding U-shaped support 112 which is fixed to a forwardly extending support or bracing bar 113. The bracing bar 113 is secured at its rear end to the transverse member 26 and extends forwardly and downwardly and is secured at its forward end to the head 33. The free arms of the U-shaped member 112 are braced by means of a pair of bracing members 114 which are fixed as by welding or the like at their forward upper ends to the upper ends of the parallel legs of the trunnion supporting member 112 and are welded or otherwise fixed at their rear ends to the transverse member 26.

The cylinder 109 has a plunger slidable therein and a plunger rod 115 is slidable through a gland 116 carried by the rear head 117 of the cylinder 109. The rod 115 has formed on the rear end thereof a bifurcated coupling member 118 which is pivotally secured as by a pivot member 119 to the upper end of the arm or lever 108. A rear pressure pipe line 120 is connected to the rear end of the pressure cylinder 109 and is also connected to one side of a multiple or four-way valve 121. A forward pressure line 122 is connected at one end to the forward end of the cylinder 109 and is also connected to the valve 121. The valve 121 is also connected by means of a branch 123 to the pressure line 71. A return branch or pipe 124 is connected to the return side of the valve 121 and the return line 124 communicates with the return line 73. The forward pipe 122 extends through the head 125 at the forward end of the cylinder 109. The two heads 117 and 125 are secured by means of bolts 126 within the cradle 110.

The bucket 92 also includes a forward rock wall or gate generally designated as 127. The gate 127 includes a front wall 128 of arcuate configuration in vertical section which in its lowered position is adapted to rest on its lower edge upon the digging blade 106. The front wall 128 has fixed thereto a pair of longitudinally arcuate arms 129, the arms 129 being fixed to the rear side of the front wall 128 by welding or other suitable fastening means. Each arm 129 at its rear end has secured thereto one part 130 of a bearing structure and a cap 131 coacts with the bearing member 130 in rockably mounting an arm 129 on the rock shaft 103. The two bearing members 130 and 131 are secured together by means of fastening devices 132.

Each bearing structure including the bearing members 130 and 131 is held against endwise movement relative to the rock shaft 103 but permitted rotary movement by means of a pair of collars 133 which are fixed to the rock shaft 103 and engage on opposite ends of the arm bearing structure including the bearing members 130 and 131.

The front wall 128 is adapted to be held in an

upper inactive position, which is the position shown in dotted lines in Figure 3 by means of a latching device generally designated as 134. The latching device 134 includes a lever 135 which at its forward end is formed with a depending latching lug 136 which is adapted to engage in a keeper 137 formed on the upper edge of the front wall 128. A hook 138 is carried by the forward end of the arm or lever 135 and as shown in Figure 3, the hook 138 is adapted to engage over the transverse bar 28 so as to limit the downward swinging of the lever 135. When the hook 138 engages the bar 28, the latch member 136 is disposed in latching position. The latching lever 135 is fixed to one end of a rock shaft 139 which is rockably mounted through a pair of bearings 140 carried by a pair of supporting bars 141. The supporting bars 141 are fixed to the transverse bracing member 56 and also to the transverse bar 28 and are disposed in parallel relation on opposite sides of the lever 108.

The shaft 139 has fixed to the opposite end thereof, an arm 142 which extends forwardly of the shaft 139 and one end of a link 143 is pivotally connected to the forward end of the arm 142. A bell crank 144 is rockably mounted on a shaft 145 carried by a bearing structure 146 fixed to the transverse bar 129 and one arm 147 of the bell crank 144 is pivotally connected to the link 143. The other arm 148 of the bell crank 144 extends upwardly and has one end of an operating member 149 connected thereto.

The operating member 149 may be in the form of an elongated operating rod which extends forwardly of the bucket frame structure 15 and in a position convenient to the operator of the tractor sitting on the tractor forwardly of the bucket frame 15. The latching lever 135 is constantly urged to a latching position by means of a spring 149 which at one end is connected with the link structure 143 and at the opposite end is connected to an eye 150 carried by the rear end of the arm 142.

The truck structure or dolly 17 comprises a depending housing 151 which is secured to the head 33 and is formed with a spindle socket or bore 152. A spindle 153 is adapted to rotatably engage in the socket 152 and the spindle 153 is formed with a pair of peripheral grooves 154 adjacent the upper end thereof. The spindle 153 has formed on the lower end thereof, an annular head 155 engaging in a bore 156 formed in the lower end of the housing 151. An anti-friction bearing 157 engages about the spindle 153 and against the upper side of the head 155. A shim 158 engages about the spindle 153 and at its lower end engages against the upper side of the anti-friction bearing 157. The upper end of the shim 158 engages against a shoulder 159 formed by the thrust bearing bore 156 at its upper end. The spindle 153 is rotatably or swivelly retained in the bore 152 by means of a retaining bolt 160 which is threaded through the housing 151 and engages in one of the grooves 154.

By providing the shim 158, the spindle 153 may be adjusted lengthwise of the housing 151. In other words, with the shim 158 in the bore 156, the head 155 of the spindle will be in an extended position and the retaining bolt 160 will be engaged in the uppermost of the grooves 154 as shown in Figure 4. In the event it is desired to lower the forward end of the front section 19, the shim 158 may be removed and with the shim 158 removed the retaining bolt 160 will engage in the lowermost of the grooves 154.

The head 155 of the spindle 153 is fixed to an axle structure 161. The axle structure 161 includes a tubular housing 162 through which an axle 163 engages. A pair of truck wheels 164 are rotatably carried by the axle 163.

A hitch device generally designated as 165 is secured to the axle structure 161 and includes a bifurcated member or clevis 166 which is rockably mounted on a pin or shaft 167 engaging through a forwardly projecting ear 168 carried by the forward side of the axle structure 161. A shaft or spindle 169 is carried by the clevis 166 and slidably engages in a housing 170 which is fixed between a pair of draft arms 171. The housing 170 is formed with a rear wall 172 having an opening 173 through which the spindle or shaft 169 slidably engages. A spring 174 is disposed about the shaft or spindle 169 within the housing 170 and one end of the spring 174 bears against the rear wall 172 and the opposite or front end of the spring 174 bears against a washer 175 which is mounted on the spindle or shaft 169 and held by means of a retaining pin 176. The draft arms 171 are disposed in parallel relation and extend forwardly of the housing 170. The arms 171 are each formed adjacent the forward ends thereof with an obtusely bent extension 177 terminating in a horizontal ear 178 which is formed with an opening 179.

The two ears 178 are disposed in parallel relation and a securing member in the form of a pin or bolt is adapted to engage through the aligned openings 179 and also through a draft ear or lug which is carried by the rear of the tractor structure. A spacing block 180 is interposed between the forward end portions of the draft arms 171 and is secured therebetween by means of a bolt or fastening member 181. The block or spacing member 180 provides a means whereby the two arms 171 will be held in parallel relation and prevented from bending from the pull exerted on the draft device by the tractor.

In Figure 6, there is disclosed a slightly modified form of a front section of the bucket frame wherein the truck or dolly structure 17 has been eliminated. It will be understood that the frame structure shown in Figure 6 will include the bucket structure and the wheel frame structure shown in Figure 1. In the form shown in Figure 6, the draft bars 32^a are formed with a rear part 182 and a forward obtusely disposed and downwardly extending part 183. The upper draft bars 32^a are disposed in substantially V-shape, converging forwardly toward a vertically disposed draft plate 184. The forward ends of the forward parts 183 are secured on opposite sides of the draft plate 184 by welding 185 or the like. The lower draft bars of the forward section 19^a are formed with a rear part 186 and a forwardly and upwardly extending part 187 which is bent inwardly. There are two of these draft members comprising the parts 186 and 187 and these members are disposed in forwardly convergent relation, being secured as by welding 188 on opposite sides of the draft plate 184.

A U-shaped hitch attaching member 189 is secured to the draft plate 184 by means of a pair of fastening devices 190 which engage through selected pairs of holes 191 formed along the front portion of the plate 184. A hitch member 192 is carried by the attaching member 189 and is constructed in every detail similar to the hitch device 165.

In the use and operation of this device, when the device is moving over the ground with the bucket member 92 in an inoperative or inactive position, the bucket frame 15 will be disposed in the position shown in Figure 1 wherein the wheel frame 16 is at its rearmost position determined by the length of the chain 88. The hitch member 165 is adapted to be attached to the draft plate at the rear of a tractor and the pressure tank 74 together with the pump 64 and the power member 65 are adapted to be mounted at a suitable point preferably on the tractor. When it is desired to lower the bucket 62, the valve member 69 is operated to communicate the pressure lines 71 and 72 with the pressure line 68 and the connecting pipe 66 which is connected to the forward ends of the cylinders 49.

At the same time that the branch pressure line 72 is connected with the pipe line 68, the pressure line 70 will be in communication through the valve 69 with the return line 73. Pressure at the rear ends of the cylinders 49 will draw the piston rods or plunger rods 50 inwardly causing cylinders 49 to thereby raise the wheel frame 16 to substantially the position shown in Figure 3. The pressure of fluid in the cylinders 49 will raise the wheel frame 16 to the limit permitted by the stop members 81. The raising of the wheel frame 15 will effect a lowering of the bucket frame 16 to the position shown in Figure 3 so that the blade 106 will bite into the earth. When the blade 106 and the bottom 99 are in a digging position, which is the position shown in Figure 3, the gate 127 will be raised to the dotted line position shown in Figure 3.

The gate 127 is held in the upper inactive position by means of the latch structure 134. After the bucket 92 has been filled to the desired degree, the gate 127 may be released so that it will gravitatingly fall downwardly to a closed lower position so as to retain the material within the bucket 92. The bucket frame 15 may then be raised by turning the valve 69 to a position communicating the pressure line 70 with the pressure line 72. This will effect outward movement of the plunger rods 50 to the position shown in Figure 1 wherein the bucket 92 is in a raised and loaded position.

In the event it is desired to distribute a small quantity of the material in the bucket on the surface of the ground, the bottom member 99 may be rocked forwardly and upwardly to a slight degree so as to thereby form a space between the rear edge of the bottom member 99 and the forward lower edge of the rear wall 91. At this time the bottom wall 99 will be in an upwardly inclined position at its forward edge and the upward swinging of the bottom wall 99 will also swing the front wall 127 upwardly therewith.

However, in the event it is desired to dump the bucket in one operation, the valve 121 is operated to communicate the pipe line 122 with the pressure line 123 so as to swing the lever or arm 108 rearwardly to the limit of its movement and rock the bottom 99 forwardly and upwardly to its limit. At this time the front wall 127 will be in the dotted line position shown in Figure 3 and the latching dog 136 will be engaged with the keeper 137. After the material has been dumped from the bucket, the valve 121 may be turned to communicate the pressure line 120 with the pressure line 123. This will cause the plunger member 115 to be pulled forwardly so as to swing the bottom member 99 downwardly to the position shown in full lines in Figure 3. However, as the latching dog 136 has locked the front wall 127 in its upper inactive position, the front wall 127 will not swing downwardly with the bottom wall 99 so that the bucket 92 can be immediately lowered to a digging or active position.

What I claim is:

1. An earth surfacing and distributing machine comprising a bucket supporting frame, a wheel frame at the rear of said bucket frame, means swingably securing said wheel frame to said bucket frame, wheels carried by said wheel frame, hydraulic means for swinging said wheel frame to thereby elevate or lower said bucket frame, a bucket carried by said bucket frame, and dependent means carried by said bucket frame disposed in the path of the wheel frame for limiting the swinging of the wheel frame in one direction, said dependent means including a supporting means, a pair of telescopically arranged members carried by said supporting means, and means adjustably holding one of said members relative to the other member to thereby limit the swinging of said wheel frame relative to said bucket frame.

2. An earth surfacing and distributing machine comprising a bucket supporting frame, a wheel frame at the rear of said bucket frame, means swingably securing said wheel frame to said bucket frame, wheels carried by said wheel frame, means for swinging said wheel frame to thereby elevate or lower said bucket frame, a bucket carried by said bucket frame, and dependent means carried by said bucket frame disposed in the path of the wheel frame for limiting the swinging of the wheel frame in one direction, said dependent means including a supporting means, a pair of telescopically arranged members carried by said supporting means, and means adjustably holding one of said members relative to the other member to thereby limit the swinging of said wheel frame relative to said bucket frame.

3. An earth surfacing and distributing device comprising a frame, means at one end of said frame supporting said frame in a manner whereby said frame may be raised or lowered, and a combined excavating and material distributing bucket carried by said frame, said bucket including fixed rear and side walls, a combined bottom wall and digging blade, means swingably supporting said bottom wall between said side walls, means for swinging said bottom wall from a lower digging position to an upper dumping position, a front wall for said bucket, means swingably supporting said front wall, said front wall being engageable at its lower rear edge with the forward portion of said bottom wall whereby upward swinging of said bottom wall will swing said front wall upwardly, and a spring-pressed latching means carried by said frame engageable with said front wall for releasably latching said front wall in an upper inactive position.

4. An earth surfacing and distributing device comprising a frame, means at one end of said frame supporting said frame in a manner whereby said frame may be raised or lowered, and a combined excavating and material distributing bucket carried by said frame, said bucket including fixed rear and side walls, a combined bottom wall and digging blade, means swingably supporting said bottom wall between said side walls, hydraulic means for swinging said bottom wall from a lower digging position to an upper dumping position, a front wall for said bucket, means

swingably supporting said front wall, said front wall being engageable at its lower rear edge with the forward portion of said bottom wall whereby upward swinging of said bottom wall will swing said front wall upwardly, and a spring-pressed latching means carried by said frame engageable with said front wall for releasably latching said front wall in an upper inactive position.

5. An earth surfacing and distributing device comprising a frame, means at one end of said frame supporting said frame in a manner whereby said frame may be raised or lowered, and a combined excavating and material distributing bucket carried by said frame, said bucket including fixed rear and side walls, a combined bottom wall and digging blade loosely disposed between said side walls, an upstanding arm carried by said bottom wall, means carried by said frame engageable with said arm for swinging said bottom wall from a lower digging position to an upper dumping position, a front wall for said bucket disposed between said side walls, means swingably supporting said front wall, said front wall being engageable at its lower rear edge with the forward portion of said bottom wall whereby upward swinging of said bottom wall will swing said front wall upwardly, and a spring-pressed latching means carried by said frame engageable with said front wall for releasably latching said front wall in an upper inactive position.

6. An earth surfacing and distributing machine, comprising a bucket frame, a bucket carried by said frame, a wheel frame, and means swingably mounting said wheel frame on said bucket frame, said wheel frame comprising an upper horizontal bar, a plurality of parallel tubular members dependingly fixed to said bar, an axle parallel with said upper bar, a plurality of axle adjusting members telescoping said tubular members, means locking said axle adjusting members in adjusted position relative to said tubular members, an axle clamping element fixedly carried by the lower end of each axle adjusting member, a second axle clamping element, and means securing said elements together to thereby removably secure said axle adjusting members on said axle.

7. An earth surfacing and distributing machine comprising a bucket frame, a bucket carried by said frame, an extensible wheel frame including upper and lower telescoping members, means locking said members in adjusted position relative to each other, an upper horizontal bar fixed to said upper members, means swingably mounting said bar on said bucket frame, an axle, means detachably clamping said lower members on said axle, means carried by said bucket frame for swinging said wheel frame to thereby elevate or lower said bucket, and means carried by said bucket frame for limiting the swinging of said wheel frame in one direction.

8. An earth surfacing and distributing machine comprising a bucket frame, a wheel frame at one end of said bucket frame and a bucket carried by said bucket frame, said bucket comprising rear and side walls fixed relative to said bucket frame, a transversely disposed stationary shaft carried by said side walls, a bottom wall, a tubular rock shaft carried by said stationary shaft, a pair of bottom wall suspending plates fixed to said tubular shaft and said bottom wall, an intermediate plate fixed to said bottom wall and said tubular shaft, a digging blade carried by the forward edge of said bottom wall, an upwardly extending arm fixed to said intermediate plate, and a bottom wall operating member carried by said bucket frame and connected to said arm.

9. An earth surfacing and distributing machine comprising a bucket frame, a wheel frame at one end of said bucket frame and a bucket carried by said bucket frame, said bucket comprising rear and side walls fixed relative to said bucket frame, a transversely disposed stationary shaft carried by said side walls, a bottom wall, a tubular rock shaft carried by said stationary shaft, a pair of bottom wall suspending plates fixed to said tubular shaft and said bottom wall, an intermediate plate fixed to said bottom wall and said tubular shaft, a digging blade carried by the forward edge of said bottom wall, an upwardly extending arm fixed to said intermediate plate, a bottom wall operating member carried by said bucket frame and connected to said arm, a front wall, supporting arms fixed to said front wall, means pivotally mounting said arms on said tubular shaft, a keeper carried by said front wall, and a spring-pressed latch carried by said bucket frame engageable with said keeper for releasably holding said front wall in an upper inactive position.

10. In an earth surfacing machine including a mobile frame, a bucket supported by said frame and comprising opposite side walls, a rear wall fixed to said side walls, a bottom wall and excavating member disposed loosely between said side walls, means swingably supporting said member between said side walls, a front wall between said side walls, means swingably supporting said front wall between said side walls whereby said front wall when in a lower hopper forming position will engage said member, and releasable latching means carried by said frame for latching said front wall in an upper position spaced from said member.

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