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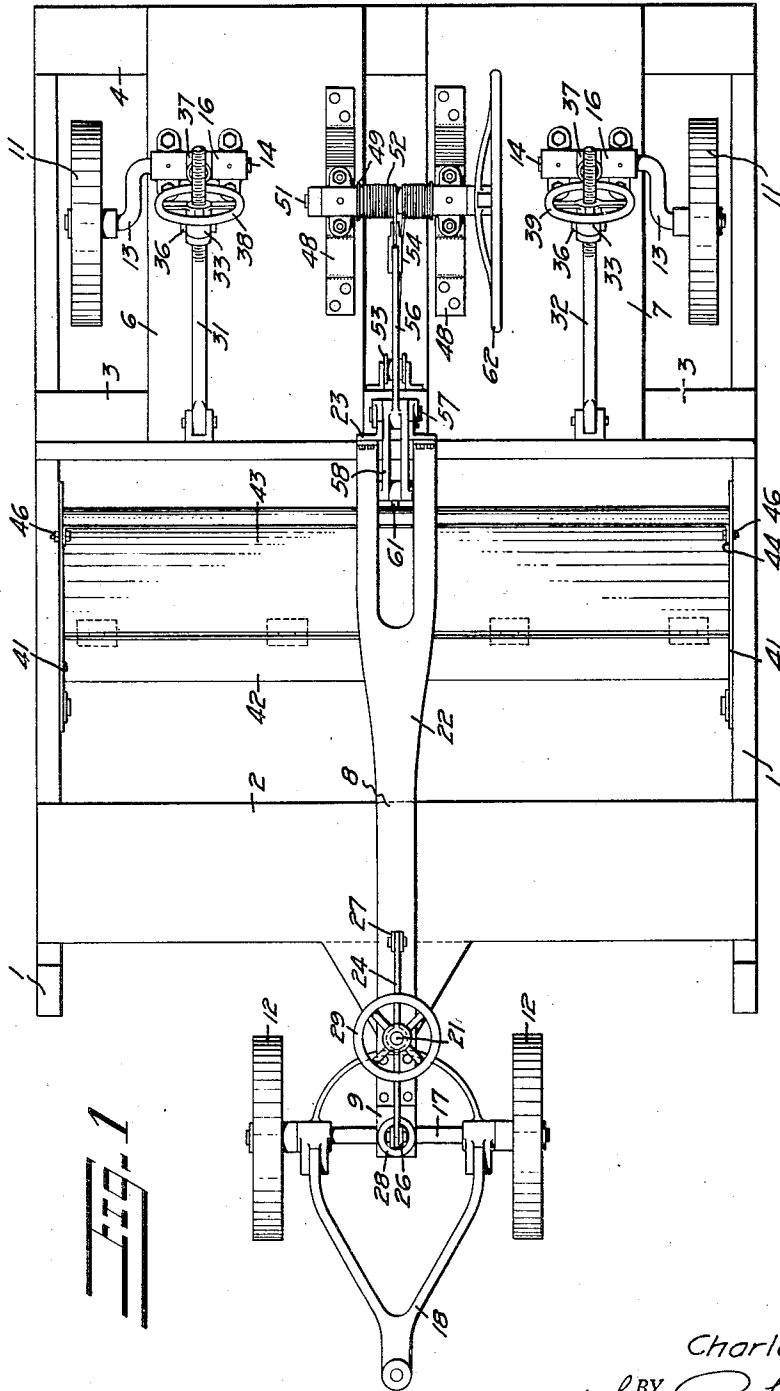
C. W. THARP

1,901,936

LEVELER

Filed Jan. 25, 1930

4 Sheets-Sheet 1



INVENTOR.
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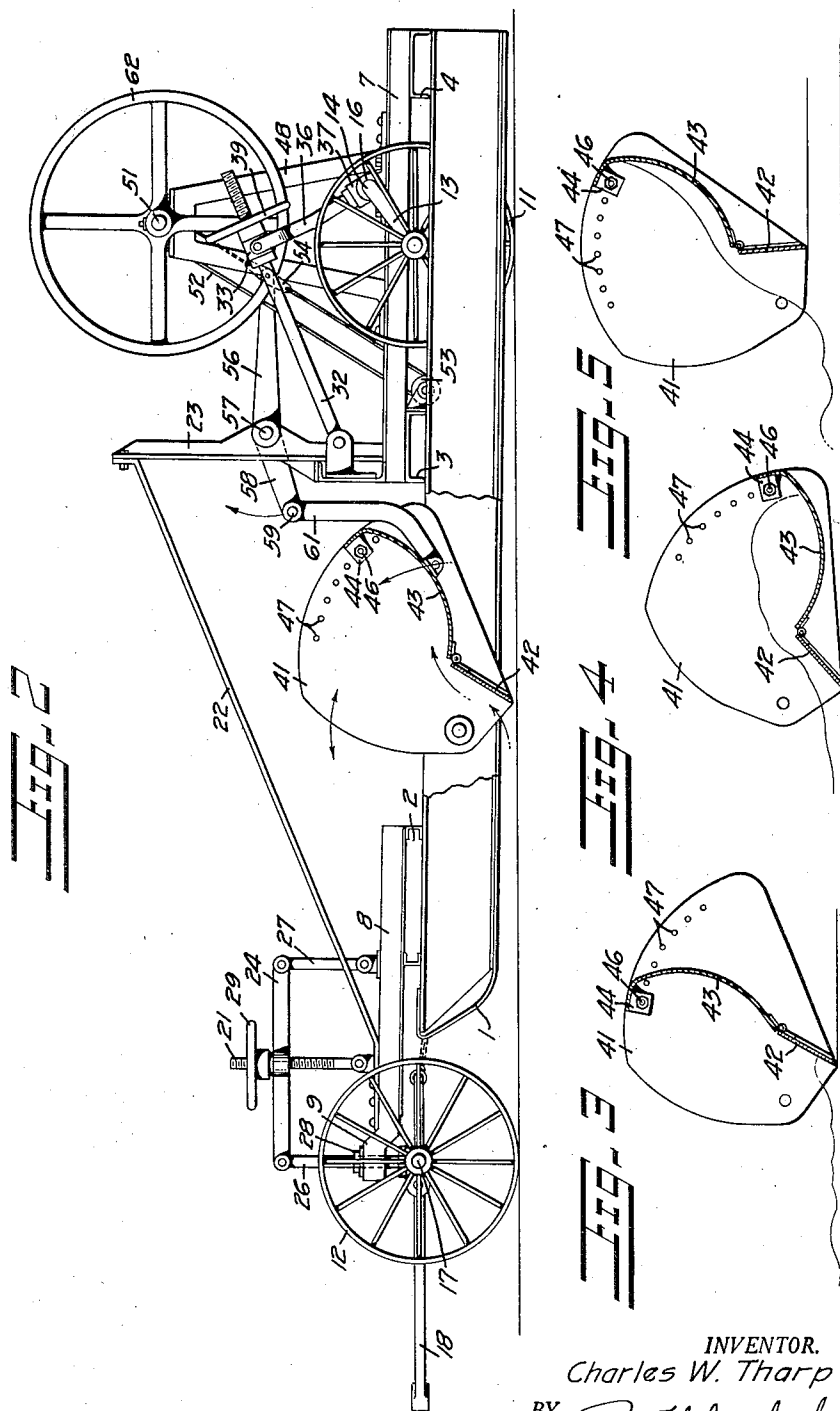
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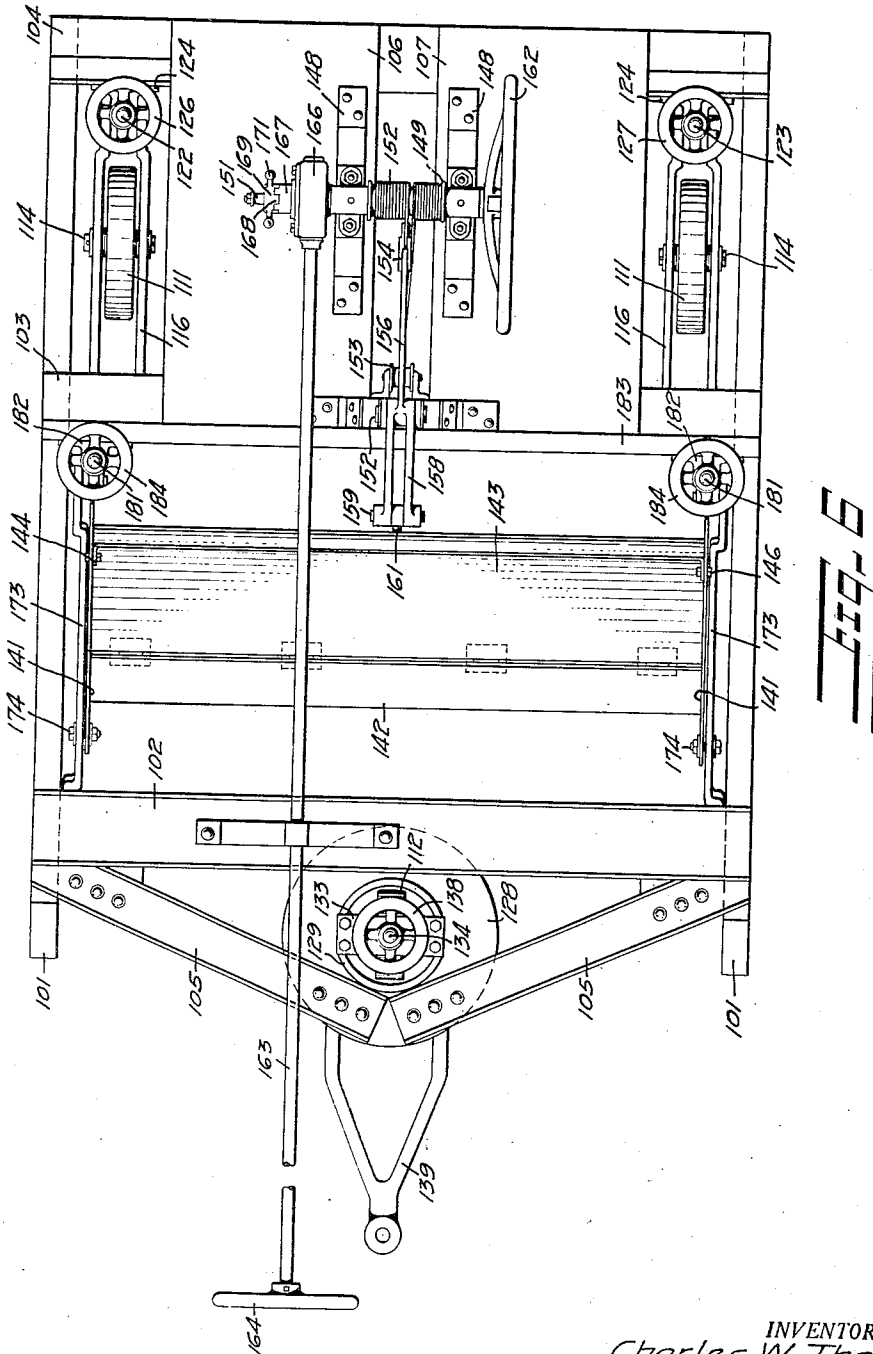
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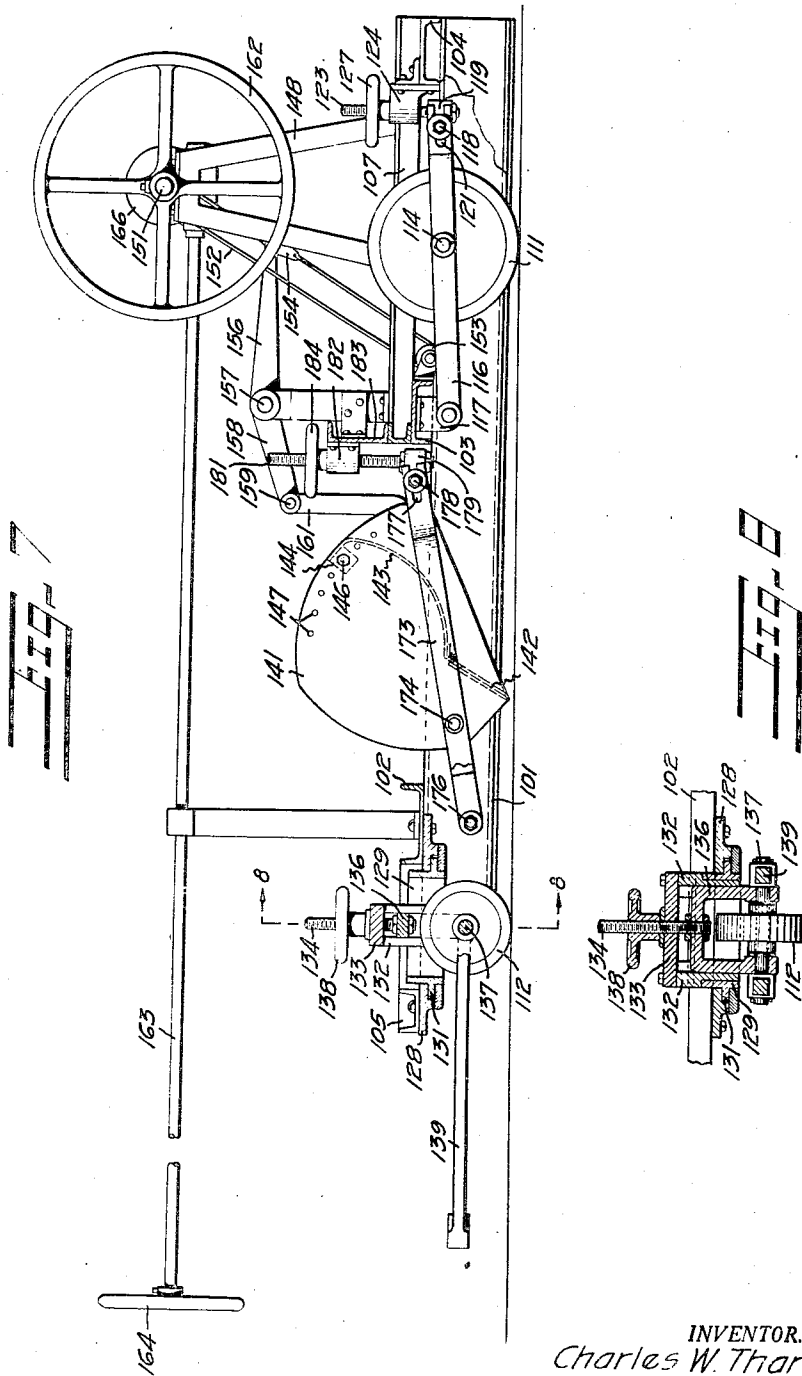
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UNITED STATES PATENT OFFICE

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LEVELER

Application filed January 25, 1930. Serial No. 423,343.

My invention relates to devices for leveling land surfaces and is particularly related to levelers which are adjustable for operation under varying conditions of grading.

Many of the scraping devices or graders which are now in use have several disadvantages, probably the greatest being that such devices are not adaptable for operation under various surface conditions. Another disadvantage which exists is that a considerable amount of space is required for maneuvering and turning the present type of leveler.

It is therefore an object of my invention to provide a leveler which is adaptable to various surface conditions.

It is another object of my invention to provide a leveler which can be turned in a relatively small space.

It is still a further object of my invention to provide a leveler which can be adjusted by the operator thereof from a position upon the leveler or from a position on a draft device which may be provided for hauling the leveler.

The leveler of my invention possesses several advantageous features some of which will be set forth in the following description. In the drawings I have shown the preferred embodiment of my invention but it is to be understood that I am not to be limited to the form shown, as my invention, as defined in the appended claims, may be embodied in a plurality of forms.

Figure 1 is a plan of an embodiment of my invention.

Figure 2 is a side elevation of an embodiment of my invention with portions broken away showing the construction of the scoop and of the adjustable blade mounted thereon.

Figure 3 is a detail showing the scoop and blade construction of my device together with means for adjusting the blade.

Figure 4 is another detail of the scoop and blade construction of my device illustrating the blade and the scoop lying in one of their extreme positions.

Figure 5 illustrates mechanism shown in the detail of Figure 4 but with the scoop in its other extreme position.

Figure 6 is a plan of a modification of my device.

Figure 7 is a side elevation, partially in cross section, of the modification shown in Figure 6.

Figure 8 is a detail in cross section, taken on the line 8—8 of Figure 7.

In its preferred form, the leveler of my invention comprises a frame having wheel and runner suspensions and a scoop pivotally secured on the frame together with a blade mounted on the scoop with means for pivoting the scoop between two extreme positions, and means for vertically and angularly adjusting the blade with respect to the ground.

The modification of my leveler which I have shown in Figures 1 to 5, inclusive, preferably comprises a pair of runners 1 rigidly secured to each other by transverse beams 2, 3 and 4, the beams and runners constituting the frame and the runners comprising one of the suspensions of my leveler. A wheel suspension also is provided and preferably is mounted upon a pair of longitudinally extending platforms 6 and 7, which are secured by bolts or other suitable means to the beams 3 and 4, and upon a longitudinally extending beam 8 having an offset portion 9 which is secured to the beam 2 in a similar manner.

The wheel suspension which I have provided for my leveler preferably comprises a pair of rear ground wheels 11 and a pair of front ground wheels 12. The rear ground wheels are rotatably mounted on the cranks 13 of a pair of cranked axles 14, the axles conveniently being journaled in bearings 16 which are suitably secured to the platforms 6 and 7. The front ground wheels 12 are rotatably mounted on an axle 17 which is pivotally mounted on the offset portion 9 of the beam 8. Suitable draft means for permitting the hauling of the leveler either by draft animals, a tractor or other motive force is provided and preferably comprises a yoke 18 connected to the axle 17.

In accordance with my invention, either the wheel suspension or the runner suspension of my device, or both, can be utilized as desired. Means for adjusting the leveler for operation upon either of the suspensions or

upon both are provided and preferably are connected with the wheels. The means connected to the front wheels 12 conveniently include an upright threaded rod 21, pivotally
 5 mounted on the base of an inclined stay 22. The stay 22 is rigidly secured to the longitudinal beam 8 and also to a pair of supports 23, the latter being rigidly secured to the transverse beam 3. A lever 24 loosely encom-
 10 passes the rod 21 and is pivotally connected at one of its ends to an upstanding pivot pin 26 and at its other end to a link 27. The pin 26 conveniently is mounted in a collar 28 secured to the offset portion 9 of the beam 8
 15 and the link 27 preferably is pivotally connected to the beam 8.

To effect movement of the lever 24, I provide a hand wheel 29 screwed upon the threaded rod 21. Rotation of the hand wheel
 20 raises or lowers the front ground wheels 12 with respect to the frame and thereby places the front of the leveler on the wheels, the runners, or upon both suspensions.

A comparable arrangement is provided for raising or lowering the rear ground wheels 11 with respect to the frame. Threaded rods 31 and 32 conveniently are pivotally connected to the beam 3 and collars 33 are slidably mounted upon the rods 31 and 32. Arms
 30 36 are provided for connecting the rods to the crank shafts 14. One end of each of the arms is pivotally secured to the corresponding collar 33 and the other end of each arm is mounted in a corresponding boss 37 carried by the crank shafts 14. Hand wheels 38 and 39 are provided and are adapted to be screwed upon the threaded rods 31 and 32 respectively. Rotation of the hand wheels actuate the crank shafts 14 and cranks 13,
 40 through movement of the arms 36, thereby raising or lowering the ground wheels 12 with respect to the frame which places the rear of the leveler upon the runners, upon the wheels, or upon both suspensions.

A scoop is provided and usually is disposed intermediate the transverse beams 2 and 3 of the frame. The scoop preferably is fabricated of metal and comprises a pair of side wings 41 and a blade. Preferably the blade
 50 is formed in two portions pivotally connected to each other, one portion thereof being formed of a substantially flat plate 42 and rigidly secured to the side wings and the other portion thereof being formed of an
 55 arcuate plate 43. The scoop conveniently is eccentrically pivoted to the runners 1. The stay 22 and the beams 2 and 3 are so spaced that there is ample room for the operation of the scoop about its pivotal axis.

In accordance with my invention, I provide means for angularly adjusting the blade with respect to the scoop and means for pivoting the scoop between two extreme positions. The means which are provided for angularly ad-
 65 justing the blade preferably include depend-

ing apertured lugs 44 which conveniently are secured to the extremity of the arcuate plate 43. The lugs are pierced by bolts 46 which are adapted to be received selectively in aper-
 70 tures 47 in the side wings 41 of the scoop.

The provision of such means for angularly adjusting the plate 43 furnishes a leveler which has several advantages over levelers now in use. In the detail shown in Figure 3 it is to be noted that the plate 43 of the blade is disposed in one of its extreme positions and that the scoop is carried in one of its intermediate positions. With the scoop and blade as shown, the leveler is adapted to remove a relatively large layer of the ground and by forcing it ahead of the scoop, move it to another location. However, there is no appreciable carrying of the earth by the scoop and blade in these positions. With the arcuate portion 43 of the blade disposed in another extreme position and the scoop likewise pivoted to another extreme position, as shown in Figure 5, my leveler is enabled to remove but a relatively thin layer of the ground and move it to another location. However, as occasion de-
 85 mands, the position of the blade and scoop can be adjusted, as shown in Figure 4, and with the blade and scoop in these positions, the leveler is enabled to carry earth from one place to another as well as remove layers of the ground. With these means for adjusting the blade and scoop, the difficulties attendant upon varying surface conditions and which levelers now in use are incapable of handling are overcome.

The means for pivoting the scoop between its extreme positions preferably include a pair of standards 48 which are rigidly mounted upon the platforms 6 and 7 and which carry a rotatable drum 49. The drum is mounted on a shaft 51 which is journaled in the upper part of the standards. These means also include an endless cable 52 which is trained around the drum 49 and around a pulley 53 mounted on the frame. The cable is interrupted to receive a member 54 to which is pivotally connected a lever 56. The opposite end of the lever 56 is pivotally secured to supports 23 by means of a pin 57. A bifurcated lever 58 is also pivoted on the pin 57 and is joined to the lever 56. Pivotally secured to the lever 58 by a pin 59 is an arm 61, the other end of which is pivotally connected to the arcuate portion 43 of the blade. Conveniently mounted on the shaft 51 is a rotatable hand wheel 62. Rotation of the hand wheel effects movement of the linkage just described whereby the scoop is pivoted about its axis. In this connection, it is to be noted that the pivotal swing of the scoop is governed by the position of the arcuate portion 43 of the blade as well as by the linkage just described.

In the modification of my device illustrated in Figures 6 to 8 inclusive, I provide runner and wheel suspensions. Runners 101 are rig-
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idly secured to each other by transverse beams 102, 103, 104 and 105. The wheel suspension which I have provided in this modification, preferably is mounted upon a pair of longitudinally extending platforms 106 and 107, which are secured by bolts or other suitable means to the beams 103 and 104, and also upon the transverse beams 102 and 105.

The wheel suspension of this modification of my device preferably comprises a pair of rear ground wheels 111 and a single front ground wheel 112. The rear ground wheels are rotatably mounted upon axle shafts 114 which are journaled in bifurcated levers 116. The levers are pivotally connected at their forward ends to brackets 117 which are suitably secured to the beam 103 and, at their bifurcated ends, are connected to pins 118 which conveniently are secured in bosses 119. Each of the forks of the levers is slotted, as at 121, so that the levers are slidably carried by the pins 118.

Means for enabling an operator of my leveler to adjust the rear ground wheels to surface conditions are provided and preferably include threaded rods 122 and 123 which engage the bosses 119 and which are held in upright position by means of brackets 124 suitably secured to the beam 104. Hand wheels 126 and 127 are provided and are adapted to be screwed upon the rods 122 and 123 respectively. Rotation of the wheels effects the raising or lowering of the ground wheels 111 relative to the frame, thereby placing the leveler either upon the runners 101, upon the wheels 111, or upon both of these suspensions.

Means are provided for mounting the front ground wheel 112 and for raising or lowering it relative to the frame. These means preferably include an annulus having a flange 128 which is suitably secured to the under sides of the beams 102 and 105. A cylindrical member 129 having a flange 131 is disposed in the annulus and is adapted to support channeled uprights 132. The uprights conveniently are connected to each other by an apertured cross member 133. I also provide a threaded rod 134 which pierces the cross member 133 and which is fixed in by an inverted U-shaped yoke 136. The yoke is slidably mounted in the channels of the uprights 132 and secured to the yoke 136 is a shaft 137 upon which is rotatably mounted the front ground wheel 112. A hand wheel 138 conveniently is provided and is adapted to be screwed upon the threaded rod 134. Rotation of the hand wheel raises or lowers the ground wheel 112 relative to the frame thereby placing the leveler either upon the runners 101, upon the wheel 112, or upon both of these suspensions. Suitable draft means is provided for hauling the leveler and preferably comprises a yoke 139 which is secured to the shaft 137 outside of the yoke 136. With the construction described, the

yoke 139 is movable through substantially a semicircle enabling my leveler to be turned in a relatively small space.

A scoop is provided, preferably fabricated of metal, and comprises a pair of side wings 141 and a blade. The blade is formed of two portions pivotally secured to each other, one portion comprising a substantially flat plate 142, and the other portion being made of an arcuate plate 143.

In the modification of my device, I also provide means for vertically adjusting the blades with respect to the ground. These means preferably include a pair of levers 173 which conveniently are secured to the side wings 141 of the scoop by suitable bolts 174 and also are secured at one of their ends to the runners 101 by suitable bolts 176. The levers conveniently are slotted at their other ends, as at 177, so as to be slidably carried on pins 178 which are secured to bosses 179. I also provide threaded rods 181 which are adapted to be held in upright position by means of brackets 182 and which are seated in the bosses 179. The brackets 182 are suitably secured to supports 183 which are rigidly secured to the transverse beam 103. Hand wheels 184 are provided and are adapted to be screwed upon the threaded rods 181. Rotation of the hand wheels raises or lowers the scoop and the blade relative to the ground. It is to be noted that the operation of the scoop and blade, by this construction, is similar to the operation of the rear ground wheels 111 when raising or lowering them with respect to the frame.

I also provide means for angularly adjusting the blade and means for pivoting the scoop between its extreme positions. The arrangement of the means for angularly adjusting the blade is similar to that described with reference to the modification of my device illustrated in Figures 1 to 5 inclusive and preferably include depending apertured lugs 144 which are secured to the extremities of the plate 143, and suitable bolts 146 which are adapted to pierce the lugs 144 and to be selectively carried in apertures 147 formed in the side wings 141. With these means, the blade can be adjusted relative to the scoop in the manner described in connection with Figures 3 to 5 inclusive.

The means for pivoting the scoop between its extreme positions is similar to that described in the modification of my device shown in Figures 1 and 2 and includes a pair of standards 148 supporting a rotatable drum 149 mounted on a shaft 151 journaled in the standards. On the drum is an endless cable 152 passing over a pulley 153 and connected to a member 154 pivoted to a lever 156. A pivot pin 157 provides a fulcrum for the lever 156 and an integral bifurcated lever 158. A pin 159 forms the connection between an arm 161 fastened to the plate 143

and the lever 158. A hand wheel 162 rotatably mounted on the shaft 151 pivots the scoop by means of the linkage set forth.

In some instance, I provide means for pivoting the scoop from a remote point, such as from a draft device which may be employed to pull the leveler. These means preferably include a longitudinally extending rod 163 upon one end of which is mounted a hand wheel 164. This rod is journaled in a jacket 166 encompassing the shaft 151 and is provided with a worm, not shown, engaging a worm wheel, not shown, carried on a sleeve 167 freely rotatable on the shaft 151. A dog clutch 168 also is provided and preferably comprises a collar 169 keyed to the shaft 151 and having arms 171 provided for manually engaging and disengaging the clutch. The clutch is adapted to engage the sleeve 167 thereby coupling the shaft 151 and the rod 163. Rotation of the hand wheel 164 rotates the worm wheel and consequently the shaft 151 which in turn actuates the linkage connected thereto for pivoting the scoop between its extreme positions. When the clutch 168 is disengaged, actuation of the scoop can be effected only by the hand wheel 162.

It is to be noted that I have provided the improved leveler of my invention with means for adjusting the leveler for operation upon either one or the other or upon both of two suspensions in order to meet varying surface and operating conditions. Another important feature of my improved leveler is the provision for positioning the scoop from a position on the leveler itself as well as from a draft means used for drawing the leveler. Another feature of the leveler of my invention is the provision of means for angularly and vertically adjusting the blade and scoop with respect to the ground.

Still another feature is the provision of means for enabling the turning of the leveler in a relatively small space.

All of these important features which have been provided for in my leveler enable greater efficiency and versatility of performance and furnish a leveler which is simply handled and facily adjusted.

I claim:

1. A leveler comprising a frame, a suspension for said frame, a scoop movably mounted on said frame; said scoop including a pair of side wings, a first plate connected to said wings, a second plate mounted to move with respect to said first plate, and means on said frame and connected to said second plate for moving said scoop.

2. A leveler comprising a frame, a suspension for said frame, a scoop movably mounted on said frame; said scoop including a pair of side wings, a first plate connected to said wings, and a second plate hinged to said first plate, said second plate being adapt-

ed to be adjustably positioned on said wings, and means on said frame for moving said scoop.

3. A leveler comprising a frame, a scoop pivotally mounted on said frame; said scoop including a pair of side wings and a blade, means for pivoting said scoop, and means for adjustably positioning said blade relative to said wings whereby the pivotal range of said scoop is altered.

4. A leveler comprising a frame, a scoop pivotally mounted on said frame, said scoop including side wings, a first plate connected to said wings, a second plate hinged to said first plate, and linkage on said frame and connected to said second plate for pivoting said scoop.

5. In a leveler, a scoop having a predetermined capacity and comprising side wings, a first plate rigidly fastened to said wings, a second plate connected to said wings and to said first plate, and means for adjustably positioning said second plate on said wings whereby said capacity is altered.

6. In a leveler, a scoop having a predetermined capacity and comprising side wings, a first plate connected to said wings, and a second plate hinged to said first plate, said second plate being adapted to be adjustably mounted on said wings for altering the capacity of said scoop.

7. A leveler comprising a frame, a suspension for said frame, a scoop pivotally mounted on said frame; said scoop including side wings, a blade connected to said wings, and means for adjustably positioning said blade relative to said wings, and means on said frame for pivoting said scoop.

In testimony whereof, I have hereunto set my hand.

CHARLES W. THARP.