This invention relates to an automatic land leveling device and has for its principal object the provision of an efficient device which can be drawn over uneven ground and which will automatically regulate itself so as to cut off the high portions and fill in the low portions of the ground to bring it to a perfect level.

Another object of the invention is to so construct the device that the operator can regulate the depth of the scraper blade cut without effecting the automatic adjustment, in cases where the load becomes too great for the tractor or other pulling medium.

A further object of the device is to provide an effective spring suspension which will assist in raising the scraper blade and which can be manually controlled when required so that the device can be used as an ordinary scraper to gather and discharge earth at desired places.

A still further object of the invention is to provide means for raising the scraper blade and frame so that the device can be rendered inoperative while being transported.

Other objects and advantages reside in the detail construction of the device which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawings which form a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawing:

Fig. 1 is a plan view of the complete device.
Fig. 2 is a side elevation of the same.
Fig. 3 is an enlarged cross section, taken on the line 3-3, Fig. 1.
Fig. 4 is a fragmentary longitudinal cross section taken on the line 4-4, Fig. 1, illustrating the action of what will be herein-after designated as the permanent set lever.
Fig. 5 is a similar cross section, taken on the line 5-5, Fig. 1, illustrating the action of the manual control lever. In this view the operator's seat and its supports have been omitted.

The invention comprises a rectangular frame 10 formed preferably of channel iron and braced by suitable angle iron braces 11. Under the forward extremity of the frame 10 a pointed fender bar 12 is placed and under the rear extremity of the frame 10 a drag plate 13 is positioned. The fender bar 12 is formed from an angle iron positioned so that its angle will be pointed forwardly. One leg of the angle thus forms a beveled surface which will guide the forward extremity of the frame 10 over irregularities in the ground. The drag plate 13 comprises a longitudinally bent plate which extends entirely across the rear of the frame 10 so as to break and smooth down clods, etc.

On each of the side members of the frame 10 and slightly to the rear of the center, bearing blocks 14 are secured to support bearings 15. Axle cranks 16 are journaled in each of the bearings 15. Each of the axle cranks 16 carries on its one extremity a control wheel 17. The opposite extremities of the two axle cranks are connected across the frame 10 by means of an axle tube 18. Thus, as the wheels 17 are forced upwardly the axle cranks 16 will act to force the axle tube 18 downwardly and vice versa.

A supporting angle iron 19 extends entirely across the frame 10 forward of the wheels 17 and carries a series of U-shaped hinge members 20. Bent, channel shaped, blade supports 21 are hinged on hinge pins 22 in the hinge members 20 and extend upwardly and rearwardly therefrom. An arcuate scraper blade 23 extends laterally across all of the blade supports 21 and projects downwardly therefrom. The blade 23 is secured to each of the supports 21 by means of attachment clips 24 and rear braces 25.

A bell crank shaft 26 is positioned across the supports 21 over the blade 23 in bearing plates 27 which are secured to the supports 21. The crank shaft 26 is provided adjacent its extremities with levers 28, the extremities of which connect with links 29, which...
extend downwardly to a bearing 30 on the crank tube 18. The crank shaft 26 is also provided intermediate its extremities with a second lever 31, which extends substantially at right angles to the levers 28. The second lever 31 is actuated through a connecting bar 32 from a permanent set lever 33. The permanent set lever 33 is provided with a latch which coacts with a notched segment 35 upon one of the supports 21 to maintain the lever 33 in any desired position.

When the permanent set lever 33 is moved rearwardly as indicated by the dot-dash lines in Fig. 4, the connecting bar 32 will force the lever 31 backwardly. This causes the shaft 26 to rotate and force the levers 28 downward so as to re-act against the axle tube 18 and lift all of the blade members 21 together with the blade 23 as shown in Fig. 4. When it is moved forwardly, of course, the reverse of this operation will take place and the blade 23 will be forced downwardly. Thus, the relative position between the axle tube 18 and the blade 23 can be set by means of the lever 33.

The axle cranks 16 can be manually operated by means of a manual control lever 36, which extends from a control shaft 37. The control shaft extends laterally entirely across the frame 10 and is supported in an elevated position upon bearing pedestals 38. Relatively short actuating levers 39 project from the shaft 37 adjacent each of its extremities. From each axle crank 16 an axle lever 40 extends upwardly immediately inside of the axle crank bearings 15. At each side of the device relatively long bent connecting rods 41 extend from the upper extremities of the axle levers 40 to a connection with the actuating levers 39.

From the forward extremity of each of the connecting rods 41 a spring rod 42 extends to a tension spring 43 which is secured to the frame 10 in a spring clip 44. The springs 43 constantly tend to pull the connecting rods 41 forwardly and in doing so constantly urge the axle crank 16 so as to force the wheels 17 downwardly and assist in raising the axle tube 18 with its connecting mechanism.

As the control lever 36 is swung forwardly to the position indicated in Fig. 5, the connecting rods 41 will be thrown forwardly, assisted by the springs 43, and the axle cranks 16 will be rotated so as to force the wheels 17 downwardly and lift the entire frame 10. This causes the axle tube 18 to swing upwardly and lift the blade 23, as illustrated in Fig. 5.

A seat 45 is provided for the operator which is carried on a rear extremity of a seat beam 46, the forward extremity of which is held down by means of a seat strap 47. The seat beam 46 is supported upon a seat post 48 from the supporting channel 19.

The device is drawn by means of horses or a tractor which are connected through any suitable draft gear such as indicated at 49, which connects with draft loops 50 formed upon the forward extremity of the frame 10. As the device is drawn over the ground the wheels 17 will drop into depressions and raise over mounds or other projections. When the wheels drop into a low spot or depression they will actuate the axle cranks 16 so as to cause the axle tube 18 to raise the blade 23 an amount equal to the depth of the depressions into which the wheels have dropped. When the wheels raise over a mound they will actuate the axle crank 16 to force the axle tube 18 downwardly and cause the blade 23 to be projected downwardly a depth equal to the height of the mound so that the ground will be automatically leveled by the passage of the device.

Should the operator find that his tractor or farm is not able to pull the device through the mounds at the depth to which the wheels automatically set the blade, he may move his set lever 33 rearwardly so that the blade will not cut so deeply. On his second passage over this spot he can then set the lever 33 forwardly so that the projections can be graded to a level.

The set lever 33 is also used when it is desired to grade the ground to a slightly higher level than that at which the wheels are traveling so that the loosely graded dirt will thereafter settle to a level position. Thus, by use of the set lever 33 the operator can definitely control the amount of cut or fill of his scraper blade 23 without effecting the automatic action of the axle cranks 16.

Should the operator desire to use the device simply as a scraper or transporter of earth, for instance, where it is required to fill a relatively deep hole or depression, he makes use of the control lever 36. Thus, by forcing the control lever 36 downwardly he can cause the blade 23 to dig and gather a pile of earth. When he has reached the position for dumping this earth he can raise and throw the control lever forwardly, thus raising the entire machine and blade so as to release the earth at the desired point.

By throwing the control lever 36 to its extreme forward position, indicated in Fig. 5, the blade 23 can be automatically locked in the raised position. This results in positioning the rearward pull of the blade weight past the dead center of the actuating levers 39, in which position it will be maintained by the springs 43 until the operator throws the control lever rearwardly to raise the levers 39 from their dead center position.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same
may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. An automatic land leveling device comprising a frame; bearings carried by said frame; axle cranks rotatably maintained in said bearings; wheels supported on one extremity of said axle cranks; a scraper blade vertically actuated by the other extremity of said axle cranks; and springs arranged to draw upon said axle levers.

2. An automatic land leveling device comprising: a frame; bearings carried by said frame; axle cranks rotatably maintained in said bearings; wheels supported on one extremity of said axle cranks; a scraper blade vertically actuated by the other extremity of said axle cranks so that as said wheels move downwardly from said frame said blade will move upwardly therein; blade supports extending forwardly from said blade; hinge members supporting the forward extremities of said supports so as to allow said blade to swing upwardly; a set lever carried by one of said supports; and an operative connection between said set lever and said axle crank so that movement of said set lever will change the relative position of said blade to said axle crank.

3. An automatic land leveling device comprising: a frame; bearings carried by said frame; axle cranks rotatably maintained in said bearings; wheels supported on one extremity of said axle cranks; a scraper blade vertically actuated by the other extremity of said axle cranks so that as said wheels move downwardly from said frame said blade will move upwardly therein; means for forcing said wheels downwardly, said means comprising: axle levers projecting from said axle cranks; and springs arranged to draw upon said axle levers.

4. An automatic land leveling device comprising: a frame; means for supporting said frame from the ground adjacent its forward and rearward extremities; axle cranks journaled at each side of said frame; wheels maintained on one extremity of said axle crank; a cross axle member connecting the other extremity of said axle cranks across said frame; a supporting member extending across said frame forwardly of said wheels; blade supports hinged to said supporting member and extending rearwardly therefrom; a scraper blade projecting downwardly from said blade supports; and an operative connection between said cross axle member and said blade so that rotation of said axle cranks will act to raise and lower said blade.

5. An automatic ground leveling device comprising: a frame; means for supporting said frame from the ground adjacent its forward and rearward extremities; axle cranks journaled at each side of said frame; wheels maintained on one extremity of said axle cranks; a cross axle member connecting the other extremity of said axle cranks across said frame; a supporting member extending across said frame forwardly of said wheels; blade supports hinged to said supporting member and extending rearwardly therefrom; a scraper blade projecting downwardly from said blade supports; and an operative connection between said cross axle member and said blade so that rotation of said axle cranks will act to raise and lower said blade, said operative connection comprising: a crank shaft journaled on and extending across said blade supports; a fixed lever projecting from said crank shaft; links connecting said levers to said cross axle member; and means for manually rotating said crank shaft.

6. An automatic ground leveling device comprising: a frame; means for supporting said frame from the ground adjacent its forward and rearward extremities; axle cranks journaled at each side of said frame; wheels maintained on one extremity of said axle cranks; a cross axle member connecting the other extremity of said axle cranks across said frame; a supporting member extending across said frame forwardly of said wheels; blade supports hinged to said supporting member and extending rearwardly therefrom; a scraper blade projecting downwardly from said blade supports; and an operative connection between said cross axle member and said blade so that rotation of said axle cranks will act to raise and lower said blade, said operative connection comprising: a crank shaft journaled on and extending across said blade supports; a fixed lever projecting from said crank shaft; links connecting said levers to said cross axle member; and means for manually rotating said crank shaft.

In testimony whereof, I affix my signature.

LEWIS W. EVERSMAN.