April 5, 1932. J. S. REYNOLDS 1,852,062

SINGLE LEVER REVOLVING SCRAPER

Filed March 12, 1929 2 Sheets-Sheet 1

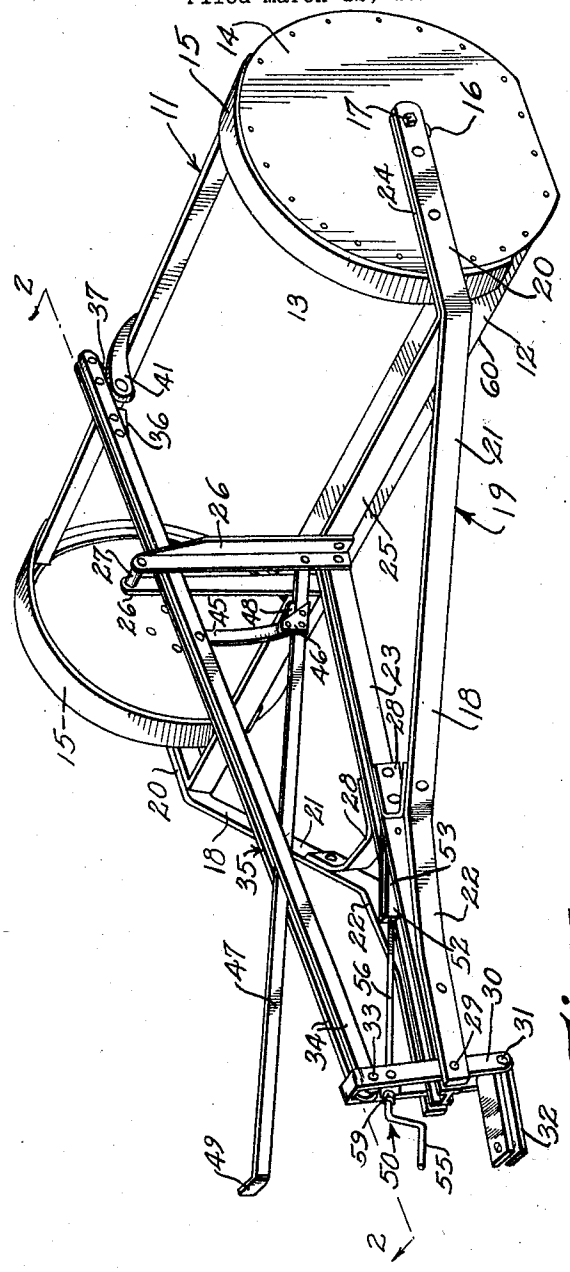


Fig. 1.

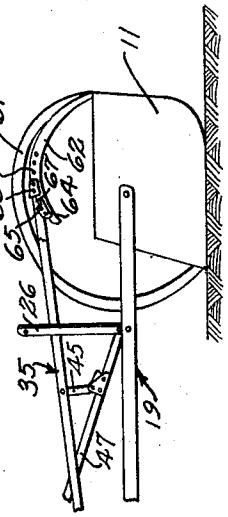


Fig. 5.

Inventor
Joseph S. Reynolds, decd
by Olive M. Reynolds, Executrix
BY Fad Adams
ATTORNEY.

April 5, 1932. J. S. REYNOLDS 1,852,062

SINGLE LEVER REVOLVING SCRAPER

Filed March 12, 1929 2 Sheets-Sheet 2

Fig. 2.

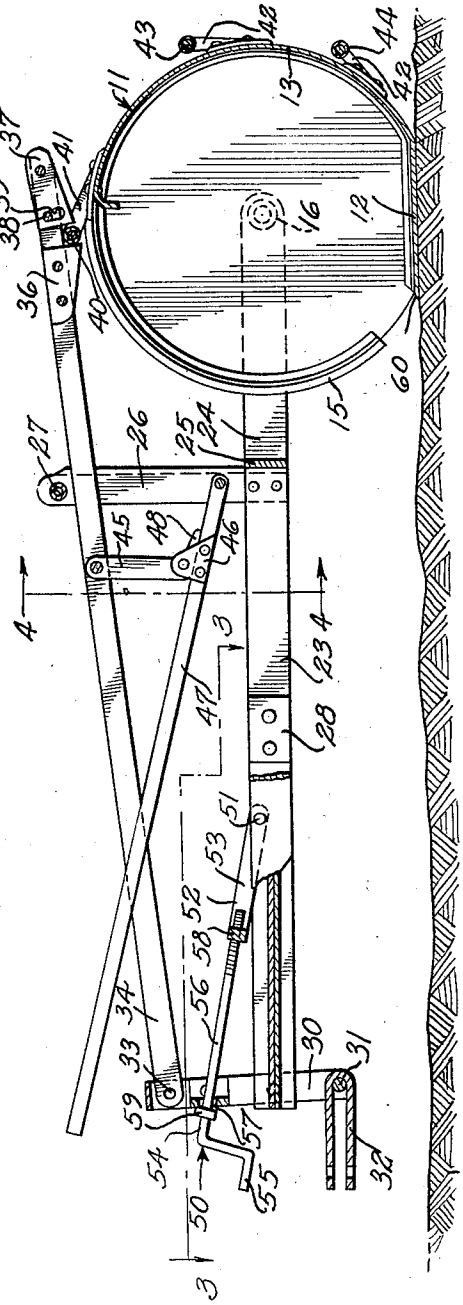


Fig. 3.

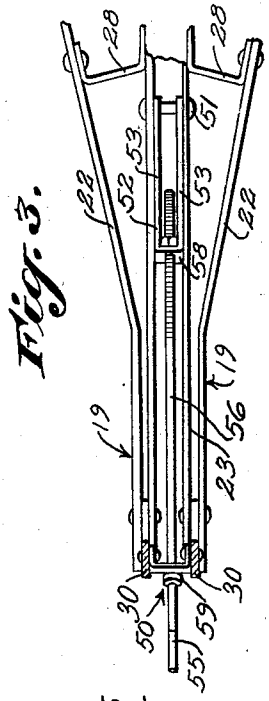
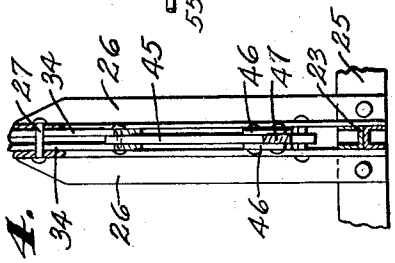


Fig. 4.



Inventor
Joseph S. Reynolds, dec'd
by Olive M. Reynolds, Executrix
BY Ford Davis

ATTORNEY.

Patented Apr. 5, 1932 1,852,062

UNITED STATES PATENT OFFICE

JOSEPH S. REYNOLDS, DECEASED, LATE OF LOS ANGELES, CALIFORNIA, BY OLIVE M. REYNOLDS, EXECUTRIX, OF LOS ANGELES, CALIFORNIA; TRANSFERRED BY DECREE OF DISTRIBUTION TO OLIVE M. REYNOLDS AND SECURITY-FIRST NATIONAL BANK, OF LOS ANGELES, CALIFORNIA, TRUSTEES

SINGLE LEVER REVOLVING SCRAPER

Application filed March 12, 1929. Serial No. 346,323.

This invention relates to revolving earth scrapers for leveling ground, hauling dirt, etc. A common type of scraper comprises a revolving scoop rotatably secured to a draft frame by which a tractive vehicle pulls the scoop along the surface of the ground. Mechanism is associated with the draft frame and the scoop adapted to cause the scoop to assume cutting, carrying, spreading, and traveling positions as may be desired.

The present scrapers usually require a plurality of levers to actuate the control mechanism to move the scoop from one position to another, thus increasing the difficulty of an efficient control of the scraper by the driver of the tractive vehicle.

It is the object of this invention to provide a revolving earth scraper adapted to be moved to carrying, spreading, and traveling positions by the operation of a single lever.

When the scraper is in carrying position it is necessary to exert some force upon the scoop to move it into cutting position. If the scoop could be moved from carrying to cutting position by the operation of the same lever that moves the scoop into carrying, spreading, and traveling positions, and if this operation could be accomplished by the driver of the tractive vehicle while the scraper is in motion, the operation of the scraper would be made much more simple and easy.

It is an object of this invention to provide a revolving scraper of the class described adapted to be moved to carrying, spreading, and traveling positions and from carrying to cutting position by the operation of a single lever by the driver of the tractive vehicle while the scraper is in motion.

It is frequently necessary to vary the depth of cut of the scraper in order to provide for the different characteristics of the earth being moved or the type of work being done.

It is an object of this invention to provide a revolving earth scraper of the class described which includes means for varying the depth of cut of the scraper.

It is often desirable to effect this change in the depth of cut of the scraper while the scraper is in operation.

It is another object of this invention to provide a revolving earth scraper of the class described which comprises means for varying the depth of cut of the scraper while the scraper is in motion, this means being operable by the driver of the tractive vehicle.

It is still another object of this invention to provide a scraper of the class described which when moved to cutting position remains in that position until the scoop becomes filled with earth and automatically assumes carrying position from the cutting position when the scoop becomes filled with earth.

It is a further object of this invention to provide a rotary earth scraper of the class described which includes a scoop control mechanism superior to other scoop controls in its simplicity and reliability in operation and sturdiness and cheapness of construction.

Other objects and advantages will be made evident in the following description which may be better understood in the light of the accompanying drawings in which:

Fig. 1 is an elevational view of the scraper of this invention.

Fig. 2 is a sectional view taken as indicated by the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary plan view taken as indicated by the line 3—3 of Fig. 2 of the means for varying the depth of cut of the scraper of this invention.

Fig. 4 is a view indicated by the line 4—4 of Fig. 2 of a portion of the control mechanism of this invention.

Fig. 5 is a side elevational view of a revolving earth scraper illustrating a modified form of the stop and engagers of my invention.

Referring to the drawings and particularly to Fig. 1, the numeral 11 represents a scoop having a bottom 12 and a back 13, provided by a single member bent as shown in the drawings. Secured to each end of the bottom 12 and back 13 of the scoop 11 as by suitable angle-irons are ends 14. Secured to the ends 14 and extending around a portion of the periphery thereof, as best illustrated in Fig. 1, are runners 15. Also secured to each of the ends 14 is a trunnion 16 providing an outwardly extending pin 17 upon which side bars 18 of a draft frame 19 are rotatably mounted.

Each of the side bars 18 of the draft frame 19 comprises a portion 20 adjacent to the scoop 11, parallel with the ends 14 thereof, a portion 21 adjacent to the portion 20 bent to converge toward the central longitudinal axis of the scraper, and a portion 22 converging at a more acute angle than the portion 21 toward the longitudinal axis of the scraper. The converging portions 21 of the side bars 18 are suitably secured to a central bar 23. The forward ends of the portions 22 of the side bars 18 are bent parallel to the planes of the ends 14 of the scoop 11, as best shown in Fig. 1.

Secured to the pins 17 of the trunnion 16 and positioned between the ends 14 and the portions 20 of the side bars 18 are ends 24 of a cross-member 25. The ends 24 of the cross-member 25 are parallel to and suitably secured, as by rivets, to the portions 20 of the side bars 18. Secured centrally to the cross-member 25 and extending upwardly therefrom are two guide bars 26 which may be in the form of angle-irons. Connecting the two guide bars at their top is a horizontal pin 27 for a purpose to be described later. Between the guide bars 26 at the bottom is fixedly secured the rearward end of the central bar 23. U-shaped plates 28 may be provided connecting the central bar 23 to that end of portion 21 of each of the side bars 18 adjacent to the portion 22 to provide rigidity for the draft frame 19.

Adapted to be supported in the eye provided by the forward ends of the side bars 18 of the draft frame 19, as by a pin 29, is a draft link 30. The lower end of the draft link 30 is provided with a pin 31 to which a connecting link 32 is secured, the connecting link 32 being adapted to be secured to a tractive vehicle. The draft link 30 and connecting link 32 may be referred to as a connecting means adapted to connect the draft frame 19 to a tractive vehicle.

Provided on each of the lateral sides of the draft link 30 at its upper end is a pin 33 upon which there is rotatably supported a bar 34, the two bars 34 forming a latch member or engaging means 35. Supported between the bars 34 of the latch member 35 at the rearward end thereof are two engagers 36 and 37 disposed in spaced relation, as best shown in Fig. 2. The forward engager 36 is rigidly secured to the bars 34, and the rearward engager 37 is pivoted between the bars 34 and is adapted to be so swung that no portion thereof extends below the bars 34, the degree of swinging movement of the engager 37 being controlled by a pin 38 attached to the bars 34 and passing through a slot 39 in the engager 37.

The engagers 36 and 37 are adapted to engage a horizontal stop 40 supported between a pair of centrally disposed arms 41 attached to the back 13 of the scoop 11. As best shown in Fig. 2, the stop 40 is adapted to retain the scoop 11 in carrying or cutting position when in engagement with the engagers 36 and 37. There may also be provided a stop 43 adapted, when in engagement with the engagers 36 and 37, to retain the scoop 11 in a spreading position, and a stop 44 adapted, when in engagement with the engagers 36 and 37, to retain the scoop 11 in a traveling position. Because if the stops 43 and 44 are supported exactly as the stop 40 there is a tendency for earth to become packed between the arms 41, thus rendering the engagement of the engagers 36 and 37 with the stops 43 and 44 to some extent uncertain, it is preferable to support each of the stops 43 and 44 by a single arm 42 attached centrally to one of the horizontal stops 43 or 44.

Pivoted at its upper end between the bars 34 of the latch member 35 intermediate its ends is a link 45. The link 45 is pivoted at its lower end between two plates 46 fixedly attached as by rivets one on either side of a releasing lever 47, the rearward end of which is rotatably secured between the two guides bars 26. As clearly shown in Figs. 1 and 2, the link 45 is provided at its lower end with a dog 48 which is integral with and extends backward from the link 45 at an angle somewhat larger than a right angle. The link 45 is so pivoted between the two plates 46 and the dog 48 so formed on the link 45 that the dog 48 is adapted to engage the upper surface of the releasing lever 47 when the releasing lever is in the position illustrated in Fig. 1 with the scoop in carrying position. The releasing lever extends forwardly between the bars 34 of the latch member 35 and is provided with a handle 49 substantially at right angles with the releasing lever 47 and within reach of the driver of the tractive vehicle. The link 45 and the releasing lever 47 comprise the operating means of this invention, and the releasing lever 47, the link 45, the latch member 35, the draft link 30, and the stops on the scoop 11 may be referred to as the control means of this invention.

This invention provides adjusting means 50 for varying the depth of cut of the scraper which includes a clevis 52, the arms 53 of which are rotatably secured to the central bar 23 adjacent to the U-shaped plates 28 as by a pin 51.

The adjusting means 50 for varying the depth of cut of the scraper includes also a crank 54 comprising a handle 55 and a portion 56. The portion 56 of the crank 54 is slidably disposed in a cylindrical bore 57 in the draft link 30 near the upper end thereof. The portion 56 is provided with threads near its rearward end and is adapted to be threadedly received in a cross-member 58 of the clevis 53. Formed on the portion 56

of the crank 54 in front of the draft link 30 is an annular stop or stop member 59 adapted to engage the forward face of the draft link 30.

When the scraper is in a position which is illustrated in Fig. 1 with the engagers 36 and 37 of the latch member 35 engaging the stop 40, the scoop 11 occupies its carrying position. If the connecting link 32 is attached to a tractive vehicle and the scoop 11 drawn along the surface of the earth, a cuting edge 60 formed on the bottom 12 of the scoop 11 is adjacent to the surface of the earth.

When it is desired to move the scoop 11 into the cutting position it is necessary only to depress the handle 49 of the releasing lever 47. When the releasing lever 47 is in its normal position as illustrated in Fig. 1, the dog 48 of the link 45 engages the upper surface of the releasing lever 47 so that when the forward end of the releasing lever 47 is depressed, the upper end of the link 45 is caused to move forwardly in an arc about the point of attachment of the releasing lever 47 to the guide bars 26.

This forward movement of the upper end of the link 45 causes the bars 34 of the latch member 35 to which it is attached to move forwardly also. As the latch member 35 is moved forwardly, the engagers 36 and 37 on the rearward end thereof and in engagement with the stop 40 of the scoop 11 are likewise moved forwardly so that the scoop 11 is rotated forwardly sufficiently to cause the cutting edge 60 on the bottom 12 of the scoop 11 to so engage the ground as to cut a ribbon of earth therefrom which is collected in the scoop 11. The resistance to forward motion caused by the engagement of the cutting edge 60 with the earth retains the scoop 11 in cutting position until it is filled with earth, so that it is necessary for the operator of the tractive vehicle to depress the handle 49 of the releasing lever 47 only long enough for the cutting edge 60 of the scoop 11 to begin cutting a ribbon of earth from the surface of the ground. The operator may then release the downward force upon the handle 49 of the releasing lever 47 and the scoop 11 will retain its cutting position in the manner above described.

As the cutting edge 60 on the bottom 12 of the scoop 11 cuts the ribbon of earth from the ground, this earth is collected in the scoop 11 and exerts a force upon the back 13 of the scoop 11, tending to so rotate the scoop 11 as to bring the cutting edge 60 out of engagement with the ground. This tendency of the scoop 11 to rotate in the manner described applies an increased tension to the latch member 35.

The draft link 30 is so pivoted intermediate its ends by the pin 29 to the draft frame 19 that when the scoop 11 is filled with earth the tension on the latch member 35 is sufficient to cause the upper end of the draft link 30 to move towards the scoop 11, thus permitting the scoop 11 to rotate to such an extent that the cutting edge 60 is moved out of engagement with the ground and the scoop assumes its carrying position as illustrated in Figs. 1 and 2, in which it is adapted to carry the earth to the location desired.

If while the earth is being transported by the scoop in this carrying position a part of the load spills out because of depressions in the ground, the tension upon the latch member 35 is so decreased by the weight of the earth shifting rearwardly of the pivotal mountings 17 of the scoop 11 that the upper end of the draft link 30 moves forwardly away from the scoop 11, thus permitting the cutting edge 60 to again engage the ground and add to the earth in the scoop 11 the amount thus lost, when the scoop 11 will again assume its carrying position in the manner above described.

When it is desired to dump the earth it is necessary for the operator of the tractive vehicle to elevate the handle 49 of the releasing lever 47. This movement of the releasing lever 47 causes the link 45 to move upwardly thus elevating the free end of the latch member 35 and moving the engagers 36 and 37 thereon out of engagement with the stop 40.

This disengagement of the engagers 36 and 37 with the stop 40 permits the forward motion of the scraper to roll the scoop 11 so that the stop 40 moves forwardly. This rotation of the scoop 11 is terminated by the engagement of the engagers 36 and 37 with the stop 43 if the upward pressure on the handle 49 of the operating lever 47 is released soon after the engagers 36 and 37 are disengaged from the stop 40. With the engagers 36 and 37 engaging the stop 43 the scoop 11 assumes its spreading position, sliding upon its runners 15 on the surface of the ground, with the cutting edge 60 of the bottom 12 at some little distance from the ground and adapted to spread the earth as it falls from the scoop 11 over the surface of the ground.

When it is desired to move the scoop 11 from its spreading to its traveling position the handle 49 of the releasing lever 47 is moved upwardly, thus causing the free end of the latch member 35 to move upwardly in the manner before described. This upward movement of the free end of the latch member 35 moves the engagers 36 and 37 out of engagement with the stop 43, thus permitting the scoop 11 to so rotate that the stop 44 moves forwardly. This rotation of the scoop 11 is terminated by the engagement of the engagers 36 and 37 with the stop 44 if the upward force exerted on the handle 49 of the releasing lever 47 is removed soon after the engagers 36 and 37 are disengaged from the stop 43. With the engagers 36 and 37 in en-

gagement with the stop 44 the scoop 11 is in its traveling position in which it is adapted to be drawn along the surface of the ground upon its runners 15, with the cutting edge 60 and back 13 at a maximum distance from the surface of the ground.

If it is desired to dump the earth from the scoop 11 in a pile instead of spreading it over the ground, the scoop 11 may be moved from its carrying position to its traveling position by the retention of the handle 49 of the releasing lever 47 in its uppermost position by the operator of the tractive vehicle until the stop 43 has rotated beyond the engagers 36 and 37. As the releasing lever 47 is then permitted to assume its normal position as illustrated in Fig. 1, the engagers 36 and 37 will engage the stop 44 to stop the further rotation of the scoop 11, and the earth from the scoop 11 will be dumped therefrom into a pile on the surface of the ground.

It is evident that when the engagers 36 and 37 are released from engagement with one of the stops they will automatically become engaged with the next adjacent stop as the scoop 11 rotates by virtue of the swinging movement of the engager 37. As any one of the stops upon the scoop 11 contacts the lower edge of the engager 37 the forward end of the engager 37 is swung upwardly so that no portion of the engager 37 extends below the bars 34 of the latch member 35.

When the stop on further rotation of the scoop 11 contacts the rearward end of the engager 36, the forward end of the engager 37 by virtue of the force of gravity drops to the position in which it is illustrated in Fig. 2. The engager 37 in this position cooperates with the engager 36 to retain the scoop 11 in that position until the engagers 36 and 37 are elevated by the operation of the releasing lever 47.

In Fig. 5 there is illustrated a modified form of the invention adapted to be employed with a scoop 11 of somewhat different design than the scoop in that form of scraper already described. Arcuated runners 61 are provided on either side of the scoop 11 and are adapted to support the scoop when it rotates.

Attached to the scoop 11 at the back and substantially in the middle thereof is an arm 62 curved with a radius less than the radius of curvature of the runners 61 so that its forward end is between the scoop 11 and the runners 61. The forward end of the arm 62 is provided with a plurality of openings 63 adapted to receive bolts 64 to retain engagers 65 and 66 thereon. As illustrated in Fig. 5 the engagers 65 and 66 are substantially similar to the engagers 36 and 37 in the embodiment previously described except that both of the engagers 65 and 66 are fixedly attached to the arm 62.

The latch member 35 is provided with a horizontal pin 67 attached at the rearward end thereof between the bars 34 and adapted to be received between the engagers 65 and 66. The plurality of openings 63 permit the position of the engagers 65 and 66 to be changed relative to the arm 62 so that the scoop can be made to assume the exact position desired. Likewise, other engagers may be attached to the arm 62 so that when they are in engagement with the pin 67 of the latch member 35, the scoop 11 will be retained in spreading and traveling positions as above described.

The operation of the control means and adjustment means of this embodiment of the invention is identical with the operation of these means in that embodiment previously described.

A variation in the depth of cut in the invention is accomplished by variation of the extent to which the upper end of the draft link 30 may be rotated forwardly upon the pin 29. This variation is accomplished by the engagement of the stop 59 on the crank 54 with the upper end of the draft link 30. If it is desired that the scoop 11 should assume that cutting position in which it has the maximum depth of cut, the crank 54 is adjusted so that the stop 59 thereon permits the upper end of the draft link 30 to move forwardly to its maximum extent. The forward movement of the draft link to its maximum extent causes the latch member 35 and the stop with which it is engaged to move forwardly to their maximum extent, and the scoop 11 is thereby rotated so that the cutting edge 60 cuts its maximum depth from the surface of the ground. If it is desired to cause the scoop 11 to assume that cutting position in which the depth of cut of the cutting edge 60 is a minimum, it is necessary only to rotate the handle 55 of the crank 54 so that the stop 59 thereon permits a lesser forward movement of the upper end of the draft link 30.

This diminished forward movement of the upper end of the draft link 30 permits only a very small forward movement of the latch member 35 and the stop on the scoop 11 with which it is associated so that the scoop 11 is rotated forwardly through only a very small arc and the cutting edge 60 cuts from the surface of the ground a very thin ribbon of earth.

It should be apparent that by adjustment of the crank 54 between these two extreme positions the arc through which the scoop 11 is rotated by the depression of the handle 49 of the releasing lever 47 may be varied to any extent desired so that the scoop 11 in its cutting position may be made to operate with any depth of cut that is required.

It is apparent that by providing the association of a latch member, releasing lever, draft link, and draft frame as above described, this invention provides a revolving

earth scraper adapted to be moved to cutting, carrying, spreading, and traveling positions by the operation of a single lever.

Moreover, since by the operation of the same operating lever the scoop may be moved from carrying to cutting position in the manner described, it is likewise apparent that this invention provides a revolving earth scraper adapted to be moved from any one of the three positions corresponding to the carrying, spreading, and traveling operations, to any one of the other of said positions and adapted to be moved from carrying to cutting position by the operation of a single lever.

It should also be obvious from an understanding of the function of the adjusting means 50 as above described that a revolving earth scraper of the class described has been provided which includes means for varying the depth of cut of the scraper.

Furthermore since the crank 54 is so positioned at the forward end of the draft frame 19 as to be in reach of the driver of the tractive vehicle, it is apparent that this invention provides a revolving earth scraper of the class described which includes means for varying the depth of cut of the scraper by the operator of the tractive vehicle while the scraper is in motion.

By providing the apparatus as above described comprising but very few movable elements, this invention provides a revolving earth scraper of the class described which is simple and reliable in operation and sturdy and cheap in construction.

Although that form of embodiment of the invention herein illustrated and described is fully capable of performing all of the objects herein stated, it is not to be restricted to that form, for the invention is capable of embodiment in various other forms all coming within scope of the claims to follow.

What is claimed is:

1. In a scraper, the combination of: a scoop; stops associated with said scoop; a draft frame pivoted to said scoop; engaging means adapted to engage said stops to releasably retain said scoop in predetermined positions; operating means associated with said engaging means and adapted to release said engaging means from engagement with said stops and to move said scoop from carrying to cutting position; a lever associated with said engaging means, said operating means being operable through the manipulation of said lever while said scraper is in motion; connecting means associated with said draft frame and adapted to connect said draft frame to a tractive vehicle so that said scoop will automatically assume a carrying position from a cutting position when loaded; and adjusting means associated with said draft frame and said engaging means, said adjusting means being adapted to vary the depth of cut of said scoop while in cutting position.

2. In a scraper, the combination of: a scoop; stops associated with said scoop; a draft frame pivoted to said scoop; engaging means adapted to engage said stops to releasably retain said scoop in predetermined positions; operating means associated with said engaging means and adapted to release said engaging means from engagement with said stops and to move said scoop from carrying to cutting position; a lever associated with said engaging means, said operating means being operable through the manipulation of said lever while said scraper is in motion; connecting means adapted to connect said draft frame and a tractive vehicle and associated with said draft frame and said engaging means whereby said scoop is retained in cutting position until loaded and when loaded automatically assumes a carrying position; and adjusting means associated with said draft frame and said engaging means, said adjusting means being adapted to vary the depth of cut of said scoop while in cutting position.

3. In a scraper, the combination of: a scoop; stops on said scoop; a draft frame pivotally mounted on said scoop; a draft link pivotally mounted on said draft frame, said draft link being adapted to be connected to a tractive vehicle; an engaging member associated with said draft link and adapted to releasably engage the stops on said scoop to retain said scoop in predetermined positions; and a lever associated with said engaging member and adapted to actuate said engaging member to release it from engagement with said stops and to move said scoop from carrying to cutting position, said lever being operable by the driver of the tractive vehicle.

4. In a scraper, the combination of: a scoop; stops on said scoop; a draft frame pivotally mounted on said scoop; a draft link pivotally mounted on said draft frame, said draft link being adapted to be connected to a tractive vehicle; an engaging member associated with said draft link and adapted to releasably engage the stops on said scoop to retain said scoop in predetermined positions; a lever associated with said engaging member and adapted to so actuate said engaging member as to release its engagement with said stops or to move said scoop from carrying to cutting positions, said lever being operable by the driver of the tractive vehicle; and a crank having a stop thereon, said crank being adjustably associated with said draft frame and adapted to limit the movement of said draft link relative to said draft frame to control the cutting position of said scoop.

5. In a scraper, the combination of: a scoop; stops attached to said scoop; a draft frame pivotally mounted on said scoop; a

draft link pivotally mounted on said draft frame and adapted to be connected at one end to a tractive vehicle; an engaging member pivotally mounted on the other end of said draft link, said engaging member being adapted to releasably engage said stops to retain said scoop in predetermined positions; a lever having one end associated with said draft frame, the free end of said lever being operable by the driver of the tractive vehicle; and a link pivotally mounted near one of its ends on said lever and at the other of its ends on said engaging member, said link being adapted to move said engaging member upwardly out of engagement with said stops when the free end of said lever is moved upwardly and to move forwardly said engaging member and that end of said draft link associated therewith to move said scoop from carrying to cutting position when the free end of said lever is moved downwardly.

6. In a scraper, the combination of: a scoop; stops attached to said scoop; a draft frame pivotally mounted on said scoop; a draft link pivotally mounted on said draft frame and adapted to be connected at one end to a tractive vehicle; an engaging member pivotally mounted on the other end of said draft link, said engaging member being adapted to releasably engage said stops to retain said scoop in predetermined positions; a lever having one end associated with said draft frame, the free end of said lever being operable by the driver of the tractive vehicle; a link pivotally mounted at one of its ends on said lever and at the other of its ends on said engaging member, said link being adapted to move said engaging member upwardly out of engagement with said stops when the free end of said lever is moved upwardly and to move forwardly said engaging member and that end of said draft link associated therewith to move said scoop from carrying to cutting position when the free end of said lever is moved downwardly; a crank adjustably associated with said draft frame; and a stop on said crank, said stop being adapted to limit the rotative movement of said draft link relative to said draft frame to limit the depth of cut of said scoop in cutting position.

7. In a scraper, the combination of: a scoop; stops attached to said scoop; a draft frame pivotally mounted on said scoop; a draft link pivotally mounted on said draft frame and adapted to be connected at one end to a tractive vehicle; an engaging member pivotally mounted on the other end of said draft link, said engaging member being adapted to releasably engage said stops to retain said scoop in predetermined positions; a lever having one end associated with said draft frame, the free end of said lever being operable by the driver of the tractive vehicle; a link pivotally mounted at one of its ends on said lever and at the other of its ends on said engaging member, said link being adapted to move said engaging member upwardly out of engagement with said stops when the free end of said lever is moved upwardly and to move forwardly said engaging member and that end of said draft link associated therewith to move said scoop from carrying to cutting position when the free end of said lever is moved downwardly; guide bars mounted on said draft frame, said guide bars being adapted to guide the free end of said engaging member so that it engages said stops on said scoop; a crank adjustably associated with said draft frame; and a stop on said crank, said stop being adapted to limit the rotative movement of said draft link relative to said draft frame to limit the depth of cut of said scoop in cutting position.

8. In a scraper, the combination of: a scoop; stops on said scoop; a draft frame pivotally mounted on said scoop; a draft link pivotally mounted on said draft frame, said draft link being adapted to be connected to a tractive vehicle; an engaging member associated with said draft link and adapted to releasably engage the stops on said scoop to retain said scoop in predetermined positions; a lever associated with said engaging member and adapted to so actuate said engaging member as to release its engagement with said stops or to move said scoop from carrying to cutting positions, said lever being operable by the driver of the tractive vehicle; and adjusting means associated with said draft frame and adapted to limit the movement of said draft link relative to said draft frame to control the cutting position of said scoop.

9. In a scraper, the combination of: a scoop; stops on said scoop; a draft frame pivotally mounted on said scoop; a draft link pivotally mounted on said draft frame, said draft link being adapted to be connected to a tractive vehicle; an engaging member associated with said draft link and adapted to releasably engage the stops on said scoop to retain said scoop in predetermined positions; a lever associated with said engaging member and adapted to so actuate said engaging member as to release its engagement with said stops or to move said scoop from carrying to cutting positions, said lever being operable by the driver of the tractive vehicle; and crank means associated with said draft frame and adapted to limit the movement of said draft link relative to said draft frame to control the cutting position of said scoop.

10. In a scraper, the combination of: a scoop; stops on said scoop; a draft frame pivotally mounted on said scoop; a draft link pivotally mounted on said draft frame, said draft link being adapted to be connected to a tractive vehicle; an engaging member as-

sociated with said draft link and adapted to releasably engage the stops on said scoop to retain said scoop in predetermined positions; a lever associated with said engaging member and adapted to so actuate said engaging member as to release its engagement with said stops or to move said scoop from carrying to cutting positions, said lever being operable by the driver of the tractive vehicle; a crank adjustably associated with said draft frame; and a stop carried by said crank adapted to limit the movement of said draft link relative to said draft frame to control the cutting position of said scoop.

11. In a scraper, the combination of: a scoop; stops on said scoop; a draft frame pivotally mounted on said scoop; a draft link pivotally mounted on the front of said draft frame, said draft link being adapted to be connected to a tractive vehicle; an engaging member associated with said draft link and adapted to releasably engage the stops on said scoop to retain said scoop in predetermined positions; a lever associated with said engaging member and adapted to so actuate said engaging member as to release its engagement with said stops or to move said scoop from carrying to cutting positions, said lever being operable by the driver of the tractive vehicle; and means adjustably associated with said draft frame adapted to limit the movement of said draft link relative to said draft frame to control the cutting position of said scoop.

12. In a scraper, the combination of: a scoop; stops associated with said scoop; a draft frame pivoted to said scoop; engaging means adapted to engage said stops to releasably retain said scoop in predetermined positions; operating means associated with said engaging means, said operating means being adapted to release said engaging means from engagement with said stops and to move said scoop from carrying to cutting position; and adjusting means associated with said draft frame and adapted to limit the movement of said operating means to control the cutting position of said scoop.

13. In a scraper, the combination of: a scoop; stops associated with said scoop; a draft frame pivoted to said scoop; engaging means adapted to engage said stops to releasably hold said scoop in predetermined positions; a link connected to said engaging means, said link being pivoted to the front of said draft frame; and operating means connected to said engaging means and said frame and adapted to control the different positions of said scoop.

14. In a scraper, the combination of: a scoop; stops associated with said scoop; a draft frame pivoted to said scoop; engaging means adapted to engage said stops to releasably retain said scoop in predetermined positions; a draft link connected to the front end of said frame and to said engaging means; releasing means connected to said frame and said engaging means for releasing said engaging means from said stops; and adjusting means connected to said draft link and frame for varying the depth of cut of said scoop.

15. In a scraper, the combination of: a scoop; stops associated with said scoop; a draft frame pivoted to said scoop; engaging means adapted to engage said stops for releasably retaining said scoop in predetermined positions; a link connected to said frame and engaging means; connecting means adapted to connect said link with a tractive vehicle; releasing means pivoted to said draft frame and engaging means for releasing said engaging means from said stops; and means connected to said frame and link for varying the depth of cut of said scoop.

16. In a scraper, the combination of: a scoop; stops associated with said scoop; a draft frame pivoted to said scoop; a draft link pivoted on said frame; connecting means adapted to connect said link with a tractive vehicle; guide bars secured to said frame; engaging means pivoted to said link and adapted to engage said stops for releasably retaining said scoop in predetermined positions; operating means pivoted to said guide bars and said engaging means for releasing said engaging means from said stops; and means connected to said frame and said link and adapted for adjustment to vary the depth of cut of said scoop.

17. In a scraper, the combination of: a scoop; stops associated with said scoop; a draft frame pivoted to said scoop; a draft link pivoted on said frame; connecting means adapted to connect said link with a tractive vehicle; guide bars secured to said frame; engaging means pivoted to said link and adapted to engage said stops for releasably retaining said scoop in predetermined positions; operating means pivoted to said guide bars and said engaging means for releasing said engaging means from said stops; a crank pivotally mounted on said link and being connected to said frame; and a stop element on said crank adapted to limit the movement of said link relative to said frame to control the cutting position of said scoop.

18. In a scraper, the combination of: a scoop; stops associated with said scoop; a draft frame pivoted to said scoop; a draft link pivoted on said frame; connecting means adapted to connect said link with a tractive vehicle; guide bars secured to said frame; engaging means pivoted to said link and adapted to engage said stops for releasably retaining said scoop in predetermined positions; operating means pivoted to said guide bars and said engaging means for releasing said engaging means from said stops; a crank pivotally mounted on said link and being

connected to said frame, said crank adapted for adjustment to move said scoop to various cutting positions; and a stop connected to said draft link and adapted for engagement with said crank to vary the depth of cut of said scoop.

19. In a scraper, the combination of: a scoop; a draft frame pivoted to said scoop; connecting means associated with said draft frame and adapted to connect said draft frame to a tractive vehicle so that said scoop will automatically assume a carrying position from a cutting position when loaded; control means for releasably retaining said scoop in a predetermined position; and adjusting means attached to the front end of said draft frame for varying the maximum depth of cut of said scoop.

20. In a scraper, the combination of: a scoop; a draft frame pivoted to said scoop; a stop on said scoop; engaging means for engaging said stop to retain said scoop in cutting position; a lever associated with said engaging means and operable to disengage said means from said stop and to move said scoop into cutting position; and adjusting means for limiting the longitudinal movement of said engaging means to define the depth of cut of said scoop.

21. In a scraper, the combination of: a scoop; a draft frame pivoted to said scoop; a stop on said scoop; engaging means for engaging said stop to retain said scoop in cutting position; a lever associated with said engaging means and operable for moving said engaging means in two directions to disengage said means and said scoop and to move said scoop into cutting position; and adjusting means for limiting that movement of said engaging means which accomplishes the movement of said scoop into cutting position to define the depth of cut of said scoop.

22. In a scraper, the combination of: a scoop; stops on said scoop; a draft frame pivotally mounted on said scoop; a draft link pivotally mounted on the front end of said draft frame; an engaging member associated with said draft link and adapted to releasably engage the stops on said scoop to retain said scoop in a predetermined position; and a lever associated with said engaging member and adapted to actuate said engaging member to release it from engagement with said stops and to positively move said scoop from carrying to cutting position, said lever being operable by the driver of the tractive vehicle.

23. In a scraper, having a draft frame and a scoop pivoted to rotate in said draft frame, said scoop when seen from one end being rotatable in a counter-clockwise direction to force it from the carrying to the digging position, the combination of: a stop carried by said scoop; a latch member adapted to engage said stop; an operating lever; means connecting said lever to said latch member in such a manner that a movement of said lever in one direction releases said latch member from said stop and allows said scoop to rotate freely in a counter-clockwise direction and a movement of said lever in the opposite direction positively turns said scoop in said counter-clockwise direction; and adjustable means for limiting the distance said scoop can be so turned in said direction.

24. In a scraper, having a draft frame and a scoop pivoted to rotate in said draft frame, said scoop when seen from one end being rotatable in a counter-clockwise direction to force it from the carrying to the digging position, the combination of: a stop carried by said scoop; a latch member adapted to engage said stop; an operating lever; means connecting said lever to said latch member in such a manner that a movement of said lever in one direction releases said latch member from said stop and allows said scoop to rotate freely in a counter-clockwise direction and a movement of said lever in the opposite direction positively turns said scoop in said counter-clockwise direction; and adjustable means operable by a person positioned ahead of said draft frame, for limiting the distance said scoop can be so turned in said direction.

25. In a scraper, the combination of: a frame; a scoop pivoted in said frame in such a manner that it can rotate therein; a stop carried by said scoop; a bar, a portion of which is engaged by said stop and pressed forward by the pressure of said stop when said scoop is pulled forward over the ground; means for limiting the forward movement of said bar due to said pressure; and means for so connecting a tractor to said bar that the pull of said tractor tends to force said bar backward against said pressure of said stop.

26. In a scraper, the combination of: a frame; a scoop pivoted in said frame in such a manner that it can rotate therein; a stop carried by said scoop; a bar, a portion of which is engaged by said stop and pressed forward by the pressure of said stop when said scoop is pulled forward over the ground; means for limiting the forward movement of said bar due to said pressure; means for adjusting said limiting means for regulating the depth of cut of said scoop; and means for so connecting a tractor to said bar that the pull of said tractor tends to force said bar backward against said pressure of said stop.

27. In a scraper, the combination of: a frame; a scoop pivoted in said frame in such a manner that it can rotate therein; a stop carried by said scoop; a bar, a portion of which is engaged by said stop and pressed forward by the pressure of said stop when said scoop is pulled forward over the ground; means by which an operator on said tractor can pull said bar forward; means for limiting the forward movement of said bar due to said

pressure; and means for so connecting a tractor to said bar that the pull of said tractor tends to force said bar backward against said pressure of said stop.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 16th day of February, 1929.

OLIVE M. REYNOLDS,
Executrix for Joseph S. Reynolds, Deceased.