

Nov. 13, 1923.

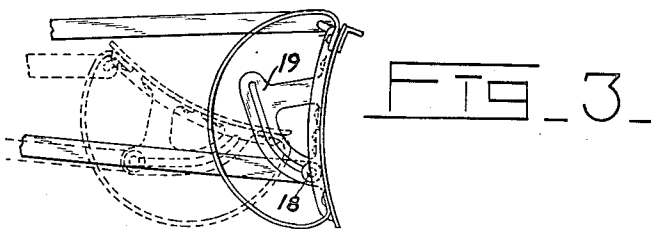
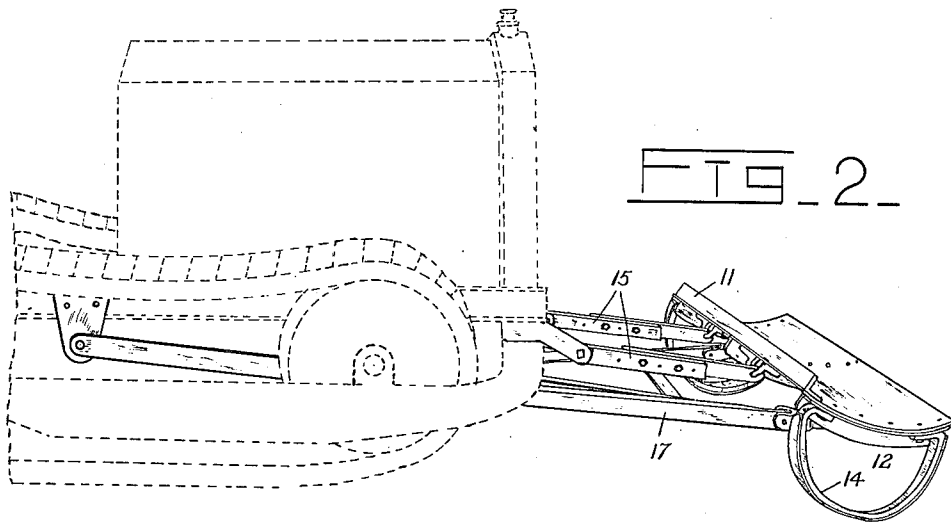
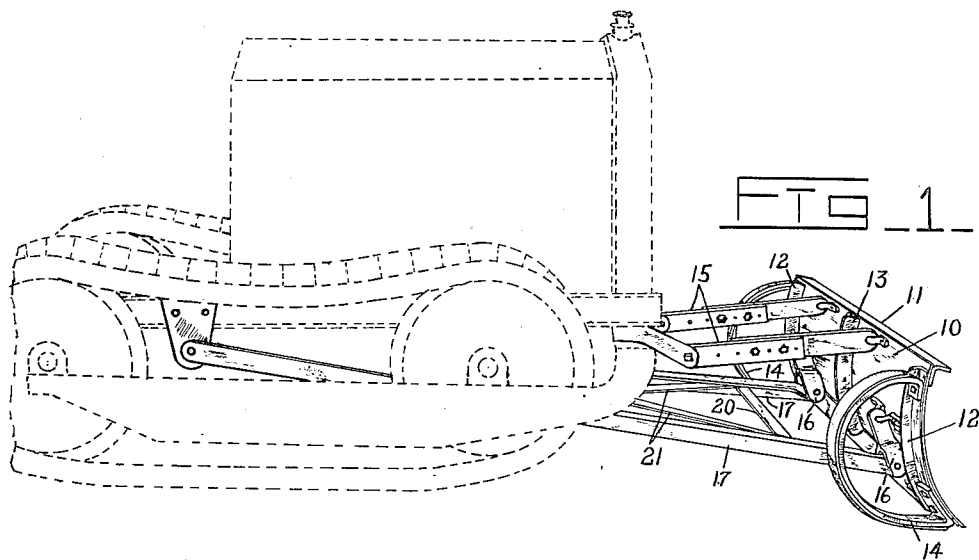
G. D. TOY ET AL

SCRAPER

Filed Aug. 28, 1922

1,473,890

3 Sheets-Sheet 1



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SCRAPER

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3 Sheets-Sheet 2

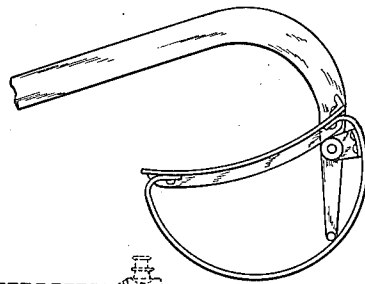
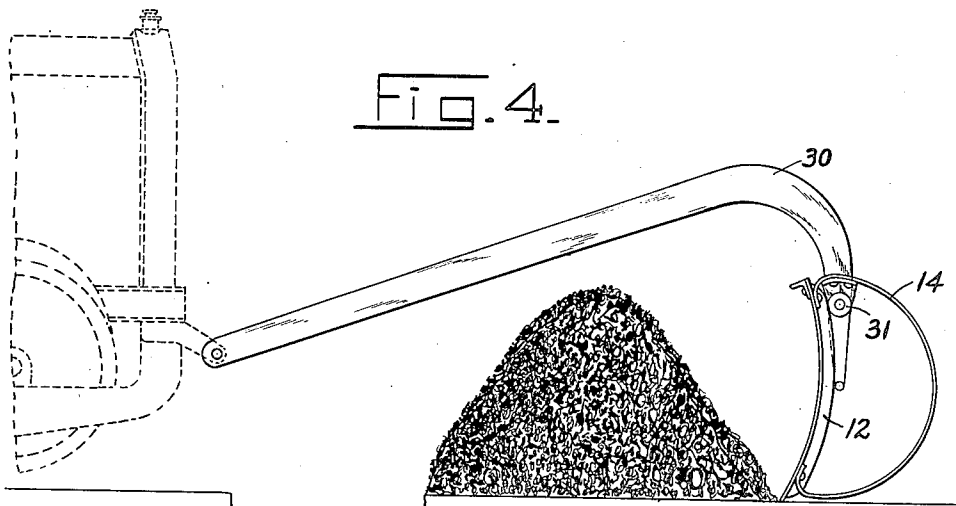


Fig. 5.

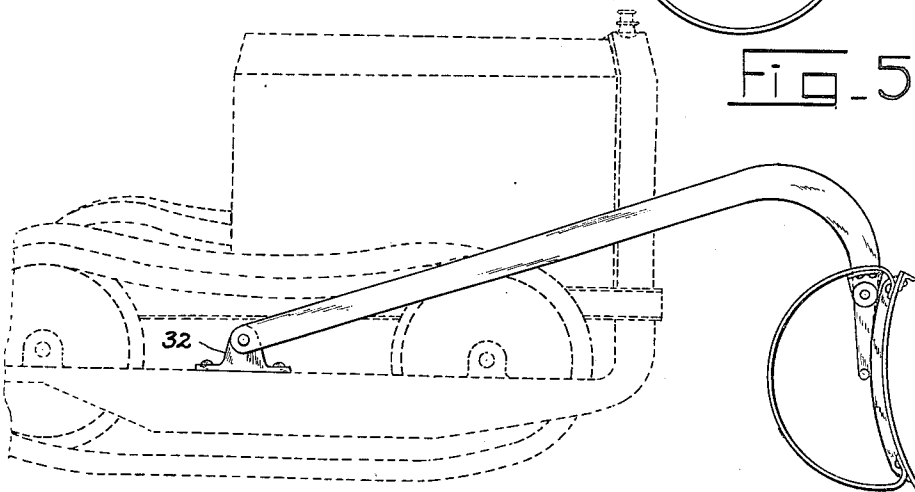


Fig. 6.

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3 Sheets-Sheet 3

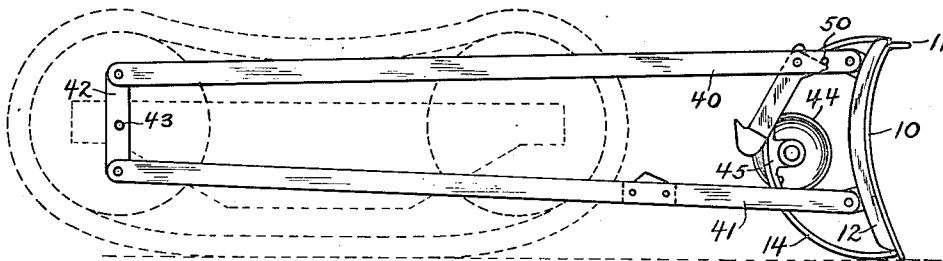


FIG. 7.

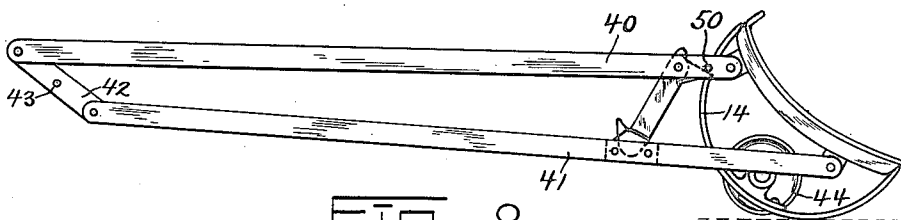


FIG. 8.

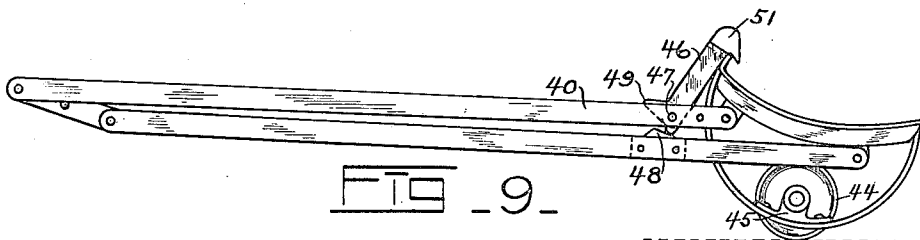


FIG. 9.

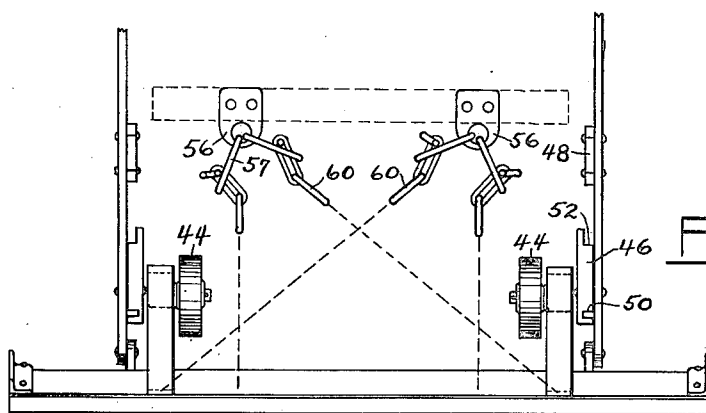


FIG. 10.

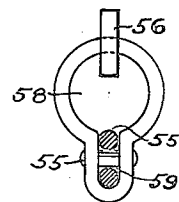


FIG. 11.

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UNITED STATES PATENT OFFICE.

GEORGE D. TOY AND HUGH T. TOY, OF SIDNEY, OHIO.

SCRAPER.

Application filed August 28, 1922. Serial No. 584,931.

To all whom it may concern:

Be it known that we, GEORGE D. TOY and HUGH T. TOY, citizens of the United States, residing at Sidney, in the county of Shelby and State of Ohio, have jointly invented new and useful Improvements in Scrapers, of which the following is a specification.

Our invention relates to scrapers of the class to be attached to a tractor and used for the various purposes, such, for example, as leveling dumps or back-filling ditches.

The principal object of our invention is to so construct a scraper of the class referred to that it will not drag material with it as it moves backward. This is accomplished by rocking the scraper blade from its operative position to a recumbent position as it starts backward and elevating the blade from the ground. Another object is to so support the blade as it moves forward that although its lower edge rests on the ground and acts effectively, it is prevented from digging into the ground. Other objects and advantages of scrapers constructed according to our invention will be pointed out presently.

The invention will be explained with the aid of the following drawings, in which—

Figure 1 illustrates the preferred form of our scraper in its operative position. It is shown attached to a crawling tractor, but it is to be understood that any type of tractor may be employed.

Figure 2 illustrates the manner in which the blade is rocked into a recumbent position when the tractor backs.

Figure 3 is a detail showing a modified arrangement of the lower link.

Figure 4 shows an arrangement for back-filling a ditch where the tractor must be stationed on the side of the ditch opposite to that on which the earth has been piled.

Figure 5 shows the operation of the scraper seen in Fig. 4 when the direction of the tractor is reversed.

Figure 6 shows the parts seen in Figs. 4 and 5 but assembled and attached to the tractor differently.

Figure 7 illustrates still another modification. This type is designed more particularly for cases where the scraper is liable to be moved long distances without being in service. In this figure the blade is shown in operative position.

Figure 8 shows the same arrangement when the blade is being moved backward.

Figure 9 shows this arrangement in condition for transportation.

Figure 10 is a plan of the arrangement shown in Figs. 7 to 9, inclusive, and

Figure 11 is a detail view, showing an arrangement for varying the length of the chains shown in Figure 10.

Referring now to Figures 1 and 2, the scraper comprises a blade 10 which is reinforced at the upper edge and ends by angles 11 and 12—12. Another angle, 13, is located about the center of the blade. On the back of the blade, at each end, is located a segmental rocker 14, each having a removable shoe or tread which can be renewed when necessary. A pair of links 15 is pivotally attached to the blade at its upper edge, the other ends of the links being pivotally connected to the tractor. A pair of short links 16 is pivotally connected to the blade below the links 15, which links depend and at their lower ends are pivotally connected to long links 17, the other ends of which are pivotally connected to the tractor at points as shown. When the tractor moves forward, as is supposed to be the case in Fig. 1, the links 16 lie against the blade and the lower edge of the blade is pushed along by the links 17, the effect being the same as though the links 17 were connected directly to the blade. And thus the links 15 and 17 cooperate to hold the blade in its operative position, that is, approximately vertical, allowing the lower edge of the blade to scrape the ground. As the link attachments are all pivotal, the scraper is enabled to rest on the ground at all times and accommodate itself to the surface it is moving over, regardless of whether the tractor is on higher or lower ground.

When the direction of the tractor reverses and it moves backward, that is, to the left as it is seen in Fig. 2, the blade rolls on the rockers 14 to the recumbent position shown in Fig. 2, elevating the blade from the ground so that it cannot drag any of the material back with it. The blade is enabled to assume this recumbent position by virtue of the links 17 being attached to the blade by means of the short links 16. That is, as the tractor starts backward it draws the upper edge of the blade with it, and also the links 17. But instead of the links 17 drawing the lower edge of the blade backward the short links swing away from the blade allowing the blade to roll,

and this action continues until the links 16 and 17 have assumed a position substantially end on, that is, the short and long links being practically in alinement. Then the scraper is dragged back, the rockers sliding along the ground, and thus retro-movement of the material the scraper is acting upon is avoided. The effect of the links straightening out in the manner described is as though the links 17 had been lengthened, that is as though they were telescopic, for example. There are other ways of effecting this result, one of which is shown in Fig. 3. There the link 16 is dispensed with and the link is attached to the blade by a stud 18 which plays in a curved slot in a member 19.

As seen in Figure 1, the rockers act as guides and prevent the lower edge of the scraper blade digging into the ground. The links 15 are made in two parts so that their length may be adjusted, thereby varying the position of the blade with reference to the ground. The links 17 are connected by cross bars 20 and 21 to give lateral rigidity to the structure.

One of the uses of such a scraper is filling in ditches after the purpose for which the ditches were dug has been accomplished. It frequently occurs that there is no room for a tractor on the side of a ditch on which the earth has been piled, and it becomes necessary to operate the tractor on the opposite side of the ditch. Fig. 4 shows, diagrammatically, an arrangement of our invention for this purpose. This arrangement also illustrates a modification of our invention in which but two links are used instead of four, and wherein the same parts can be used for either pulling or pushing the scraper.

In this construction the scraper is substantially the same as in that already described. The link 30 is pivotally attached to the rocker 14 at 31, and extending downward its lower extremity bears against the angle 12 on the back of the blade. Extending some distance above the blade the link makes a turn and runs at a downward slope to the point where it is pivotally attached to the frame of the tractor. Thus arched the link is enabled to pass over the pile of earth beside the ditch, and it is clear that when the tractor moves backward, i.e., to the left as it is seen in Figure 4, it will draw the scraper toward the open ditch, dragging a quantity of the earth with it. The pivotal connection 31 and bearing of the lower end of the link against the blade enable the single link 30 to maintain the rectitude of the blade which in Figures 1, 2 and 3 requires two links. For obvious reasons a link 30 is placed at each end of the blade, just as in Figures 1 and 2 a pair of links is placed at each end. When the

tractor moves forward, that is, to the right as seen in Figure 4, the blade rolls on its rockers as in Figure 5, this movement being limited by the end of the link impinging on the inner surface of the rocker, as in Figure 5.

In Figure 6 the parts are the same as in Figure 4, but the scraper has been turned around, and in order to bring it close to the tractor the links have been attached to brackets 32 carried by tractor frame near its rear end. The term "tractor" is used in this specification in a broad sense, for while the type of tractor shown is especially well adapted to the purpose, it is obvious that other tractors, or even other means than a tractor, using the term now in a specific sense, may be used for supporting the free ends of the links and moving the scraper.

We shall now describe the structure shown in Figs. 7 to 11, inclusive. Inasmuch as the blade and shoe are substantially like those shown in the other views we shall use the same numerals in referring to those parts. Pivotally attached to the back of the blade 10, near its upper edge, is a bar 40, and below this bar, that is, near the lower edge of the blade, a bar 41, is pivotally attached. The free ends of these bars are pivotally connected respectively to the ends of a short bar 42, this bar being pivotally attached to the tractor at 43. While the pivotal attachment 43 may be at any suitable point on the tractor, we prefer to make it coincide with the axis of the driving wheels. By referring to Fig. 8 it will be seen that as the tractor backs, the shoe 14 rolling on the ground rocks the blade just as it does in the other structures shown; when the tractor moves forward the blade rocks the other way, and thus the blade is brought to operative or inoperative position as the tractor moves forward and backward.

In some kinds of service it becomes necessary to transport the scraper considerable distances, and to avoid the severe wear on the rockers which this would entail, we equip the rockers with wheels 44. These wheels run on studs projecting from brackets 45 secured in the rockers. When the wheels are to be brought into use the blade is rocked to the position shown in Fig. 9, and it is retained in that position by a hook 46, pivoted to the bar 40 at 47, and engaging the upper edge of the blade. The pivotal end of the hook is arranged to impinge on a block 48 which is riveted to the bar 41, thereby rendering the condition shown in Fig. 9 stable. The hook has a laterally extending lug 49, which normally bears on a pin 50 set in bar 40, and holds the hook in an angularly depending position, where it is adapted to engage the block 48 as the blade rocks in response to backward movement of the tractor, and prevent the blade

rocking far enough to bring the wheel to the ground. (See Figure 8.) The hook is cut away at 51 to form a shoulder 52 which engages the block.

5 While there are various ways in which we might limit the rocking of the blade as the tractor starts forward, we prefer to do this with chains 55 attached to the upper edge of the blade, the other ends of the chains being 10 attached to eyes 56 that are carried by the tractor. In order to adjust the length of these chains we place a special link 57 in the eye 56, said link having a large part 58 through which the links of the chain may 15 pass, and a narrow part 59 in which any link may be hooked flatwise, as in Fig. 11. By this means we are enabled to make adjustments in steps the length of one link. To provide for lateral stability of the scraper 20 with reference to the tractor we attach a chain 60 to each end of the blade, and attach the other end of each of these chains to the eye 56 at the other side of the tractor, crossing the chains. These chains are attached to 25 the eyes by the adjusting means just described.

While only the structure shown in Figs. 7 to 10 are equipped with wheels it is obvious that the other structures shown may 30 also be so equipped. The push bar arrangement shown in Figs. 7 to 10 is similar to that shown in our application number 584,930 filed herewith for driving gear for snow plows.

35 It is to be understood that we do not restrict ourselves to the specific structures shown, nor is the scope of our invention limited thereto except as it is limited by the appended claims.

40 What we claim is as follows:

1. A scraper comprising a blade adapted to occupy an operative and an inoperative position, a link pivotally attached to the blade, the free end of the link being adapted 45 to attach to a tractor, and means whereby the blade is made to assume its operative position when it is moved in one direction by the tractor, and made to assume its inoperative position when it is moved in the 50 opposite direction.

2. A scraper comprising a blade adapted to occupy an operative position and an inoperative position, a link pivotally attached to the blade, the free end of the link being 55 adapted to attach to a tractor, and a segmental shoe attached to the blade, adapted to roll on the ground when the blade is moved in one direction and rock the blade with reference to said link from its operative position, and to rock the blade back to its inoperative position when it 60 is moved in the opposite direction.

3. A scraper comprising a blade adapted to occupy an operative position and an inoperative position, a link pivotally attached 65 to the blade, the free end of the link being adapted to attach to a tractor, and a segmental shoe attached to the blade, adapted to roll on the ground when the blade is moved in one direction and rock the blade with reference to said link from its operative position, and to rock the blade back to its inoperative position when it is moved in the opposite direction.

to the blade, the free end of the link being adapted to attach to a tractor, a segmental shoe attached to the blade, adapted to roll on the ground when the blade is moved in one direction and rock the blade with reference 70 to the link from its operative to its inoperative position, and to rock the blade back to its operative position when it is moved in the opposite direction, and means for limiting the movement of the blade with reference 75 to the link, the blade being in operative position at one extremity of said movement and inoperative position at the other extremity thereof.

4. A scraper comprising a blade adapted 80 to operate in an approximately vertical position with its edge on the ground, a link pivotally attached to the blade, the free end of the link being adapted to attach to a tractor, and means whereby the blade is 85 made to assume said operative position when it is moved in one direction and to assume a recumbent position elevated from the ground when it is moved in the opposite direction.

5. A scraper comprising a blade adapted 90 to operate in an approximately vertical position with its edge on the ground, a link pivotally attached to the blade, the free end of the link being adapted to attach to a tractor, and a rocker attached to the blade, adapted to roll on the ground and rock the blade from its operative to a recumbent position when the blade is moved in one direction and from said recumbent to its 100 operative position when the blade is moved in the opposite direction.

6. A scraper comprising a blade adapted to operate in an approximately vertical position with its edge on the ground, a link 105 pivotally attached to the blade, the free end of the link being adapted to attach to a tractor, a rocker attached to the blade adapted to roll on the ground and rock the blade from its operative to a recumbent 110 position elevated from the ground, when the blade is moved in one direction, and from said recumbent to its operative position when the blade is moved in the opposite direction, and means for limiting the movement of the blade with reference to the link, the blade being in operative position at one extremity and in recumbent position at the other extremity of said movement.

7. A scraper comprising a blade adapted 120 to operate in an approximately vertical position with its edge on the ground, a link pivotally attached to the blade, the free end of the link being adapted to attach to a tractor, a second link attached to the blade, 125 the free end of this link being also adapted to attach to a tractor, said link being arranged to cooperate with the first link in maintaining the blade in operative position and to move it along the ground, and means 130

whereby, in effect, said second link is lengthened when the blade is moved by the links in a direction opposite to that in which it moves when in operation, thereby allowing the blade to assume a recumbent position.

8. A scraper comprising a blade adapted to occupy an operative position and an inoperative position, a link pivotally attached to the blade, the free end of the link being adapted to attach to a tractor, a segmental shoe attached to the blade, adapted to roll on the ground when the blade is moved in one direction and rock the blade with reference to the link from its operative to its inoperative position, and to rock the blade back to its operative position when it is moved in the opposite direction, means for limiting the movement of the blade with reference to the link, means for removing said limit at will, and a wheel adapted to relieve the shoe and assume the carriage of the blade when said limit is removed.

9. A scraper comprising a blade adapted to operate in an approximately vertical position with its edge on the ground, a link pivotally attached to the blade, the free end of the link being adapted to attach to a tractor, a rocker attached to the blade, adapted to roll on the ground and rock the blade from its operative to a recumbent position when the blade is moved in one direction and from said recumbent to its operative position when the blade is moved in the opposite direction, and a wheel adapted to carry the blade and hold the rocker off of the ground when the scraper is to be transported.

10. A scraper comprising a blade adapted to operate in an approximately vertical position with its edge on the ground, a link pivotally attached to the blade, the free end of the link being adapted to attach to a tractor, a rocker attached to the blade, adapted to roll on the ground and rock the blade from its operative to a recumbent position elevated from the ground when the blade is moved in one direction, and from said recumbent to its operative position, when the blade is moved in the opposite direction; a second link attached to the blade, the free end thereof being also adapted to attach to a tractor, said link being arranged to cooperate with the first link in maintaining the blade in operative position and to move it along the ground, and means whereby, in effect, said second link is lengthened when the blade is moved by the links in a di-

rection opposite to that in which it moves when in operation, thereby allowing the blade to rock to the aforesaid recumbent position, with its lower edge elevated from the ground.

11. A scraper comprising a blade adapted to operate in an approximately vertical position with its edge on the ground, a link pivotally attached to the blade with its free end attached to a tractor; a second link, below the first, with its end attached to the blade by a short depending link, the other end of this second link being also attachable to the tractor; the relations of the links being such that when the tractor moves forward and the end of the lower link abuts the blade the blade is maintained in its vertical position, while when the tractor backs the lower link is permitted by the depending link to leave the blade and allow the blade to assume a recumbent position, the lower and depending links assuming a position more or less rectilinear.

12. A scraper comprising a blade having a rocker on its back arranged to slide on the ground while the blade is scraping and preventing the edge of the blade from digging into the ground, said rocker being adapted to roll on the ground when the blade is moved backward and rock the blade to a recumbent position with its scraping edge elevated; and an operating member whereby to move the blade forward and backward along the ground.

13. A scraper comprising a blade, means for hitching said blade to a tractor, said means enabling the tractor to move the blade forward and backward and permitting the blade to assume a vertical position with its edge resting on the ground when it is moved forward, and to rock to a substantially horizontal position when it is moved backward, and means in which friction between parts of the scraper and the ground is a factor, for causing the blade to assume a vertical position upon being moved forward a short distance and to maintain said position as long as the blade continues to move forward, and for causing the blade to rock to a position approximately horizontal, and elevated from the ground, upon being moved a short distance backward and maintaining that position while it continues to move backward.

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