

Aug. 18, 1959

K. B. SORENSSEN ET AL
VERTICALLY ADJUSTABLE AND FOLDABLE ROD
WEEDER SUPPORT WHEELS

2,900,031

Filed Feb. 20, 1957

2 Sheets-Sheet 1

FIG. 1

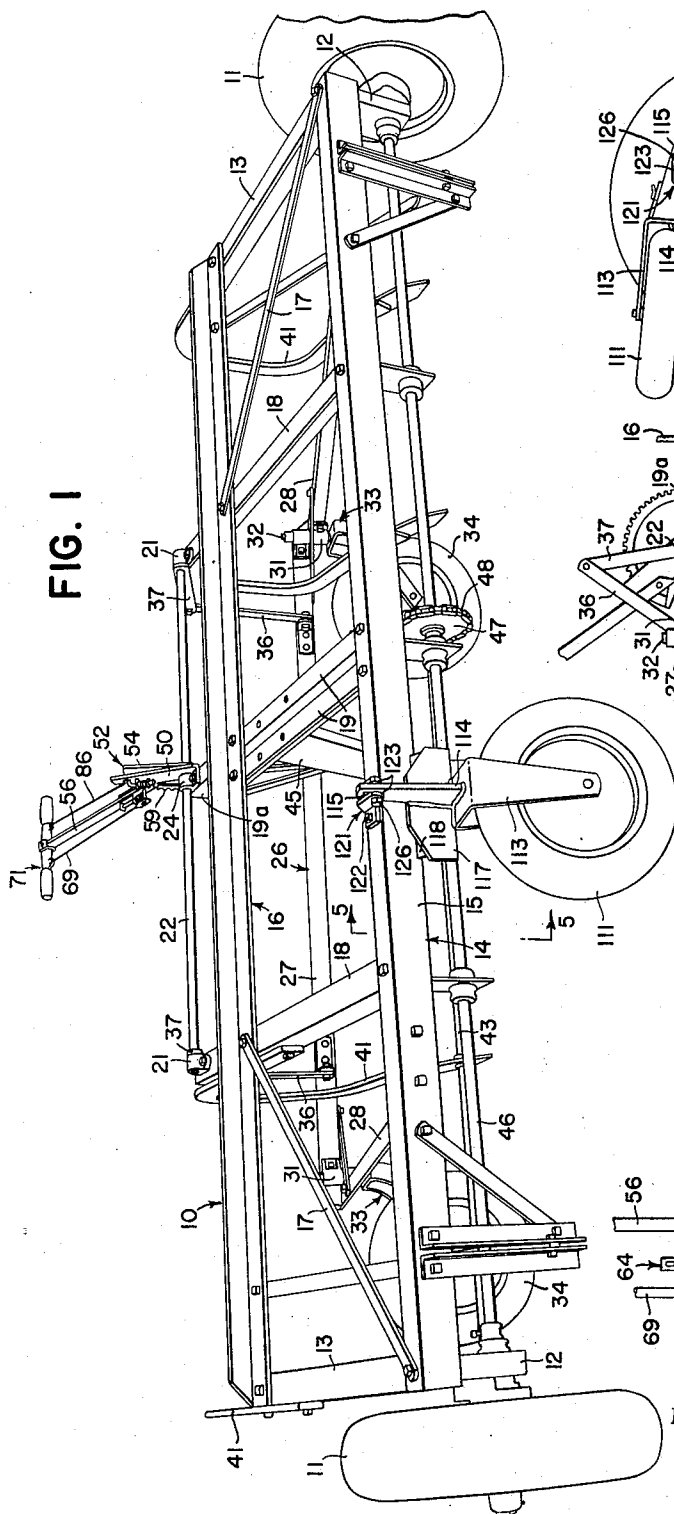


FIG. 2

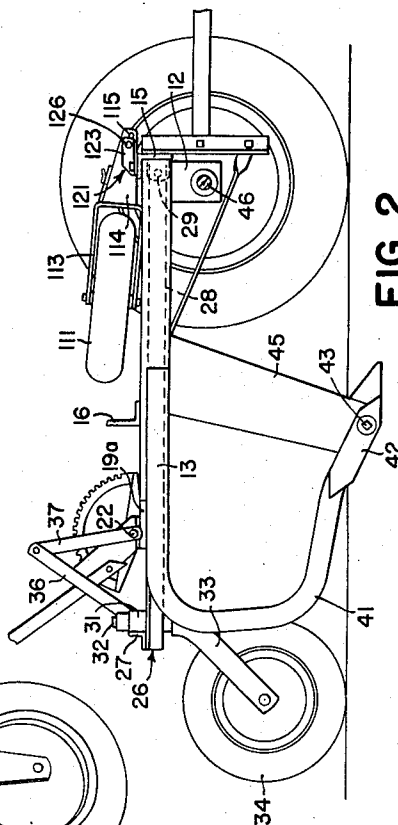


FIG. 8

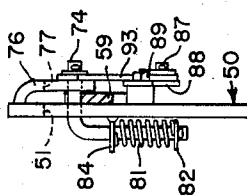
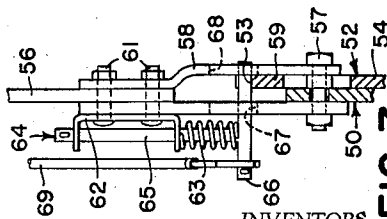


FIG. 7



INVENTORS.
KNUD B. SORENSSEN
BRIAN E. KENT

BY
C. Parker & Johnson
ATTORNEYS

Aug. 18, 1959

K. B. SORENSEN ET AL
VERTICALLY ADJUSTABLE AND FOLDABLE ROD
WEEDER SUPPORT WHEELS

2,900,031

Filed Feb. 20, 1957

2 Sheets-Sheet 2

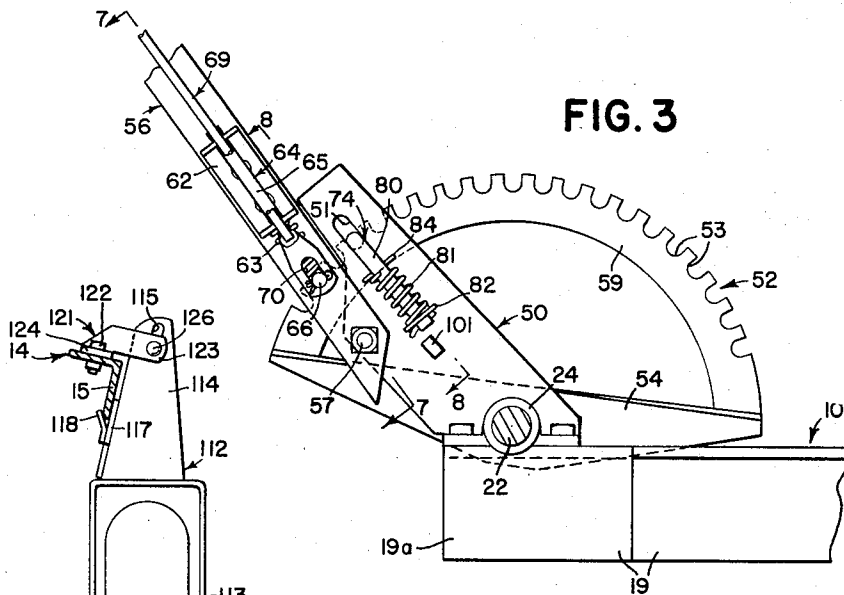


FIG. 3

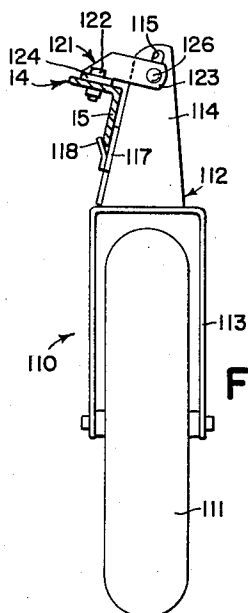


FIG. 5

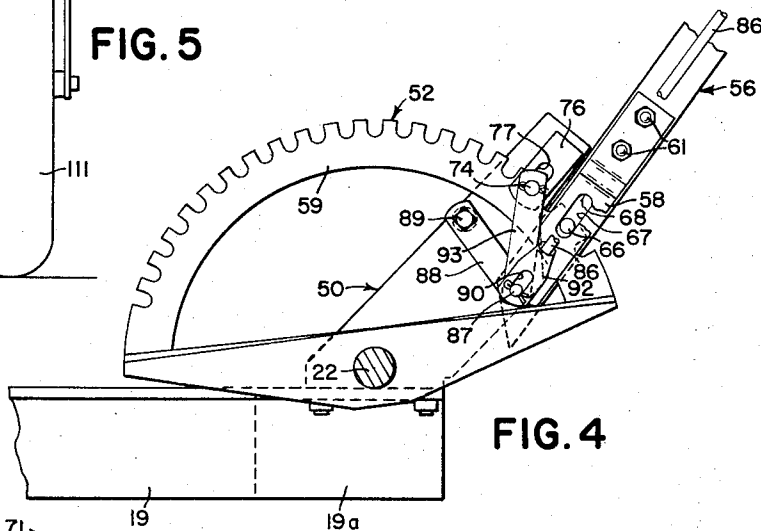
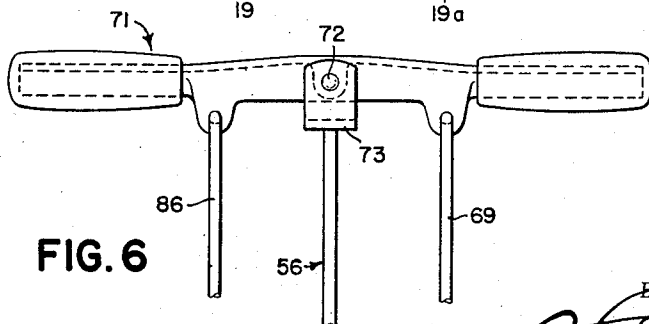


FIG. 4



1

2

2,900,031

VERTICALLY ADJUSTABLE AND FOLDABLE ROD WEEDER SUPPORT WHEELS

Knud B. Sorensen, Rock Island, and Brian E. Kent, Moline, Ill., assignors, by mesne assignments, to Deere & Company, a corporation of Delaware

Application February 20, 1957, Serial No. 641,363

13 Claims. (Cl. 172—44)

The present invention relates generally to agricultural implements and more particularly to such ground working implements as rod weeders and the like.

The object and general nature of the present invention is the provision of a rod weeder in which new and improved means for raising and lowering the weeder rod is provided. More particularly, it is an important feature of this invention to provide raising and lowering means in the nature of a jack in which an oscillating handle may be swung successively through several strokes to raise the weeder rod and associated parts into a raised or transport position from a ground penetrating or operating position, and similarly, the raising and lowering means of the present invention is also adapted to be operated through several strokes successively for lowering the weeder rod from a transport position into a ground penetrating or working position. Implements of this type have heretofore been provided with raising or lowering means but generally they have been constructed so that the hand lever is movable only through a single stroke in at least one of the raising and lowering directions, if not in both directions. Implements of this kind, especially those constructed to work a strip of ground of considerable width, are relatively heavy and it is relatively difficult even to lower the implement from a transport position into a working position by manipulating a hand lever of the single stroke type and manual operation thereof, even in the lowering direction, is attended by at least some hazard in the event the operator loses his grip on the hand lever or is unable physically, by virtue of the relatively great effort required, to positively control the lowering of the weeder rod and associated portions of the main frame. It is even more difficult, especially in the larger sizes, to raise the weeder rod and associated portions of the main frame from a working position into a transport position. It is, therefore, an important feature of this invention to provide raising and lowering means in the nature of jacking mechanism that is operable through several strokes of a hand operated lever to both raise and lower the tool and associated parts into and out of transport and working positions.

More specifically, it is a feature of this invention to provide a part rockably mounted on the main frame and connected with the transport frame of the rod weeder, with a successively operated hand lever and means thereon for controlling a pair of latches for alternately latching the shiftable part to the main frame and to the oscillatable hand lever, optionally, whereby the hand lever may be operated through successive strokes to raise and lower the weeder rod. It is a further feature of this invention to provide raising and lowering means affording considerable mechanical advantage, both in the raising and lowering directions, so that without the exertion of undue effort, the operator has secure and positive control of the implement at all times.

Still further, a feature of this invention is the provi-

sion of a rod weeder having a main frame carrying drive wheels and a ground penetrating weeder rod, and a transport frame movably connected with the main frame and shifted positively and both the rod-raising direction and in the rod-lowering direction, the raising and lowering means being so constructed and arranged that the transport frame and the associated transport wheels may be raised entirely off the ground so as to leave the main frame supported on the drive wheels and on the supports for the weeder rod. By virtue of this construction, a further advantage is secured. When the main frame is supported as just described, the rod-supports are so arranged that the raising and lowering lever may be locked in place and used to tilt the main frame about the points of connection of the rod supports with the ground so as to facilitate the raising of the forward portion of the main frame and the associated drive wheels off the ground, thereby facilitating the placing of an auxiliary transport wheel attachment in position so as to support the forward portion of the main frame, after which the raising and lowering means may then be used to raise the rear portion of the main frame and the associated weeder rod and rod supports entirely off the ground, whereby the implement is then supported for endwise transport, as may be desirable when moving the implement from place to place along roads, narrow lanes and in other zones of restricted area. In this connection it is a further feature of this invention to provide new and improved auxiliary wheel attachment means whereby the latter is adapted to be swung automatically into position to support the associated portion of the main frame merely by the momentary raising of the latter.

These and other objects and advantages of the present invention will be apparent to those skilled in the art after a consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a perspective view of a rod weeder incorporating the principles of the present invention and shown with its auxiliary wheel attachment means in place so as to provide for endwise transport of the implement.

Fig. 2 is an end view of the rod weeder shown in Fig. 1, but illustrating the rod weeder in its operating or ground working position.

Fig. 3 is an enlarged fragmentary side view showing the principal portions of the raising and lowering mechanism, showing the latter from the right side of the implements.

Fig. 4 is a view of the raising and lowering mechanism, being a view taken from the left side of the implement.

Fig. 5 is a sectional view taken generally along the line 5—5 of Fig. 1, showing certain details of the auxiliary transport wheel attachment.

Fig. 6 is an enlarged fragmentary view showing the control handle for operating the latches of the raising and lowering means, the handle in Fig. 6 being shown as it appears from the rear of the implement looking forwardly.

Fig. 7 is a sectional view taken generally along the line 7—7 of Fig. 3.

Fig. 8 is a sectional view taken generally along the line 8—8 of Fig. 3.

Referring first to Fig. 1, it will be seen that the rod weeder in which the principles of the present invention have been incorporated is somewhat similar to the rod weeder shown in U.S. Patent 2,556,416 issued June 12, 1951, to Howard F. Clausen and comprises a main frame 10 normally supported on a pair of drive wheels 11

journaled by suitable bearing means in vertical brackets 12 that are fixed to end bars 13 that form a part of the main frame 10. The latter also includes a transversely disposed front bar 14, preferably in the form of an angle member that includes a downwardly extending front flange 15, and a rear cross bar 16, also in the form of an angle. The bars 13, 14 and 16 are suitably connected together in rigid relationship and maintained in position and reinforced by diagonal braces 17. The main frame 10 also includes a pair of fore-and-aft extending intermediate angles 18, and between the angles 18 a second pair of angles 19 are disposed generally centrally of the frame 10. The rear ends of the angles 18 are extended rearwardly of the rear transverse angle 16 and receive suitable bearing means 21 in which a rockshaft 22 is mounted for rocking movement. One of the central frame angles 19 is extended rearwardly to a point in transverse alignment with the rear portions of the angles 18, and this extended section, as indicated at 19a, carries bearing means 24 in which a central portion of the rockshaft 22 is journaled.

It will be noted that the drive wheels 11 are disposed adjacent the front angle 15 of the main frame 10. Extending generally rearwardly from the rear portion of the frame 10 is a transport frame 26 that comprises a rear transverse angle 27 that is connected at its ends to a pair of forwardly extending transport frame angles 28, the forward ends of which are pivotally connected, as at 29, to the front transverse angle 15 of the main frame 10. Fixed to the rear portion of each transport frame end angle 28 and the adjacent portion of the transverse angle 27 is a transport wheel spindle bearing member 31, preferably in the form of a sleeve, which receives the upwardly extending spindle portion 32 of the associated caster wheel fork 33. The latter receives the associated transport caster wheel 34 through any suitable form of bearing means. It will be noted that the transport caster wheels 34 may swing 360°. The rear portion of the transport wheel frame 26 is connected through links 36 with a pair of arms 37 that are fixed, as by welding, to the end portions of the rockshaft 22. Rocking of the rockshaft 22 therefore serves to raise and lower the rear portion of the main frame relative to the transport frame 26.

Secured to the main frame end angles 13 and the main frame intermediate angles 18 are pendants 41, of conventional construction so far as the principles of the present invention are concerned, the lower forwardly disposed portions of the pendants receiving ground penetrating shoe means 42 that rotatably supports a transversely disposed weeder rod 43 through suitable bearing means 44. As will be seen from Fig. 2, the pendants 41 and shoes 42 form suitable supporting means for the ground penetrating weeder rod 43 and, also these pendants and shoes are disposed to engage the ground at a point substantially midway between the front and rear portions of the main frame 10. The weeder rod 43 is driven from the ground wheels 11 through sprocket and chain means disposed within an enclosing generally vertically extending housing 45, and to this end, the ground engaging drive wheels 11 are connected to rotate a transverse drive shaft 46 that is carried on the front transverse angle 15 of the main frame 10. The drive shaft 46 carries a suitable sprocket 47 over which a drive chain 48 is trained. The drive chain 48 through suitable means (not shown) drives the sprocket and chain means that is enclosed within the housing 45. It will be noted from Fig. 1 that the upper portion of the housing 45, together with the associated driving connections, are supported by the two centrally arranged angles 19.

The mechanism for raising and lowering the rear portion of the main frame 10 relative to the transport frame 26, with which the present invention is more particularly concerned, will now be described.

A generally upwardly and rearwardly extending bracket 50 is fixed to the rear portion of the main frame 10, as by being welded to the central bearing member 24. The bracket 50 is in the form of a plate that is slotted at its outer end, as at 51. Fixed to the rockshaft 22 adjacent the bracket plate 50 is a notched sector 52, the notches being indicated at 53. The sector 52 includes a base part 54 and an arcuate notched part 59. The part 54 is welded to the shaft 22. A hand lever 56 is pivotally connected, as by a bolt 57, with the rigid bracket 50. The hand lever 56 includes a hammer strap 58 that passes along the other side of the arcuate member 59 of the sector 52, the end of the hammer strap 58 being apertured to receive the pivot bolt 57. The hammer strap 58 is fixed to the lever 56 by a pair of bolts 61 which also fix a U-shaped guide 62 to the hand lever 56. The end portions of the guide 62 are apertured to receive a latch detent 64 that, as best shown in Fig. 7, comprises a generally T-shaped member having a shank section 65 slidable in the guide 62 and a head section 66 that extends through slots 67 and 68 formed in the main part of the hand lever 56 and in the strap 58. The head section 66 is engageable with the notches in the arcuate sector member 59. A spring 63 is disposed between the lower end of the guide 62 and the head section 66 of the latch 64 so as to bias the latter for movement toward the notched sector 52. A link 69 has a lost-motion connection 70 with the latch member 64 and extends outwardly along the handle 56 to a pivoted latch operating member 71 to which the link 69 is pivotally connected. The member 71 is pivoted, as at 72, to a yoke 73 that is fixed to and forms a part of the hand lever 56.

Means is provided for selectively locking the sector 52 to the bracket 50 that is fixed to and forms a part of the main frame 10. To this end, a latch member 74 is disposed in the slot 51 formed in the outer end of the bracket 50, which carries an L-shaped bracket 76 that is also slotted, as at 77, the slots 51 and 77 being in register and the slotted portions being spaced apart so as to receive the notched sector member 59 therebetween. The transverse portion of the latch 74 extends through both of the slots 75 and 76 and is movable therein into and out of engagement with the notches on the member 59. The elongated or main portion 80 of the latch member 74 extends radially inwardly along the bracket 50 and carries a biasing spring 81 that bears at one end against an abutment washer 82 connected with the latch 74, and at the other end the spring 81 bears against a slotted bracket 84 that receives the detent or latch 74 and is secured, as by welding, to the bracket 50.

The latch 74 is operated by means on the hand lever 71. This means includes an operating link 86 that at its lower end is connected to a pivot stud 87 that is carried by a release lever 88. The latter is swingably mounted on a pivot stud 89 carried by the bracket 50. The pivot stud 87 receives a slotted plate 92 welded to and forming the lower portion of the operating link 86. The slot, shown at 90, in the plate 92, forms a lost-motion connection, similar to the connection 70 mentioned above. A link 93 connects the stud 87 with the adjacent portion of the latch 74. The link 86 extends along the hand lever 56, generally opposite the other link 69, and is pivotally connected to the handle 71 at a point opposite the connection of the link 69 thereto. It will be seen, particularly from Figs. 3 and 4, that the stud 87 is located so as to lie adjacent the pivot 57 at which the hand lever 56 is pivoted to the stationary bracket 50. This is for the purpose of causing a pull on the link 86 to release the latch 74 from the sector 52 in any position of the hand lever 56. A pull on the other link 69 serves to disengage the latch 64 from the sector 52 the links 69 and 93 are operated by swinging the handle 71 in one direction or the other about its pivot 72, and when the handle 71 is operated

to pull outwardly on one link, the other link moves idly inwardly relative to its associated latch by virtue of the slotted or lost-motion connection at its inner end with the associated latch.

The hand lever 56 and associated parts, as described above, constitutes raising and lowering means in the form of a jack for raising and lowering the rear portion of a main frame relative to the transport frame, the construction being such that a plurality of successive oscillations of the hand lever 56 is capable of either raising the rear portion of a main frame relative to the transport frame or, optionally, raising the transport frame by a plurality of oscillations of the hand lever 56 relative to the main frame so as to elevate the casting transport wheels entirely off the ground, the main frame then being supported by the front drive wheels and by the contact of the weeder rod shoes with the ground.

To raise the main frame relative to the transport frame, for example, the handle 71 is operated in the following manner. If the hand lever 56 is not already in its upper position, lying substantially in contact with the stationary bracket 50, the hand lever 56 is moved into that position by first pulling outwardly on the right end of the handle 71 in order to release the latch 64 from the sector 52. This frees the hand lever 56 from the sector 52, the latter being at this moment latched against movement relative to the main frame 10 by virtue of the latch 74. After the hand lever 56 has been moved to its upper position, the handle 71 is manipulated to reengage the latch 64 with the sector 52 and then the handle 71 is swung in the other direction to exert a pull through the link 86 against the latch lever 88, which acts to release the latch or detent 74 from the sector 52. It may be necessary when doing this to swing the hand lever 56 in one direction or the other to relieve the pressure on the latch 74. With the latter latch released, the hand lever 56 may then be swung downwardly, shifting the sector 52 and rocking the rockshaft 22 in a direction to swing the end arms 37 downwardly, relative to the main frame 10, thus bearing against the transport frame and transport casting wheels to raise the rear portion of the frame. In performing this function, the hand lever 56 acts with a mechanical advantage that is determined by the distance between the pivot 57 and the sector-engaging latch or detent 64. The downward movement of the hand lever 56 is limited by engagement of the innermost end of the hand lever 56 with a suitable stop such as the part 101 that is welded to the stationary bracket 50. Without the stop 101, the latch 64 could bind against the sector 52. After the hand lever 56 has been swung downwardly through one stroke, the handle 71 may be manipulated to reengage the latch 74 with the sector 52, which thus locks the sector and the rockshaft 22 against movement, and then the handle 71 may be moved in the other direction to disengage the latch 64 from the sector, after which the hand lever 56 is raised upwardly into a position to be reengaged with the sector 52, the holding latch 74 released and the frame 10 raised another increment by another downward stroke of the hand lever 56. This action may continue until the frame is raised as far as desired. For transport in the normal direction of travel, the frame 10 is raised until the weeder rod 43 and shoes 42 raise entirely out of contact with the ground. It will be noted that by leaving the hand lever 56 in its raised position in which it contacts the rear edge of the bracket 50, the sector 52 and rockshaft 22 are held in interconnected relation with the main frame by a dual locking action. That is, the sector 52 is held locked to the main frame by the locking latch 74. In addition, the latch 64 connects the sector with the hand lever 56, and the latter, being disposed against the rear or upper edge of the bracket 50, thus serves as additional locking means, insuring that the main frame, particularly the rear portion thereof, including the weeder rod itself, will be securely and positively held in a raised or transport position.

The frame 10 may be lowered by substantially the re-

verse of the above-mentioned operation. When it is desired to lower the frame and weeder rod, as to place the latter in operating or ground working position, the hand lever 56 is first disengaged from the sector 52 and swung downwardly to a lower position, after which the latch 64 is engaged with the sector and the hand lever operated a slight amount, sufficient to relieve the pressure on the locking latch 74. Then the part 71 is manipulated to release the locking latch 74, after which the handle 56 is raised, which permits the frame to lower until the hand lever 56 engages the bracket 50, and then the locking latch 74 is reengaged with the sector, the hand lever latch 64 disengaged from the sector 52 and the hand lever lowered. Next the hand lever latch 64 is reengaged with the sector 52 and the locking latch 74 disengaged, after which the frame may be lowered another increment of lowering movement. Thus, even though the frame 10, including the pendants and weeder rod, may be relatively heavy, the same is raised and lowered manually with relative ease.

The raising and lowering mechanism just described is particularly adapted for use with the larger size implements that work a relatively wide strip of ground, and it is desirable to provide for endwise transport of these implements so that they may readily be passed through gates, along narrow lanes, highways and the like where transport of the implement in its normal transport position would not be feasible.

To provide for endwise transport in the implement described above, it is not necessary to make any change in the support of the rear portion of the implement on the transport wheels 34, for they readily swing into the proper position for endwise travel. It is, however, necessary to provide transport means to support the forward portion of the main frame, including the drive wheels 11, so that the latter are carried out of contact with the ground. According to the principles of the present invention, we provide an auxiliary transport wheel attachment that is so constructed and arranged as to be carried by the front portion of the main frame of the rod weeder and is especially adapted to cooperate with the positive action jack type raising and lowering mechanism that, as described above, raises and lowers the transport frame and associated casting wheels relative to the rear portion of the main frame.

The auxiliary transport wheel attachment is indicated in its entirety by the reference numeral 110 and includes a transport wheel 111 journaled by suitable bearing means in the lower portion of a wheel standard 112, the lower portion of which is formed as a fork member 113 receiving the wheel and the upper portion of which is in the form of a vertically extending standard 114 having a vertically extending slot 115. Secured to one edge of the wheel standard 114 is a transverse frame-engaging plate 117 that preferably is welded to the standard section 114 and to the fork member 113. A frame-engaging lip 118 is fixed to the inner side of the plate 117 in such spaced relation that the flange 15 of the front frame angle 14 is adapted to be received therebetween, as best shown in Fig. 5.

The transport wheel supporting member 112 is swingably connected with the main frame 10 by means of a bracket 121 that is adapted to be fastened to the upper flange of the frame angle 14 by a pair of bolts 122 or other suitable means. The bracket 121 includes a pair of lugs 123 that are fixed to a base plate 124 in laterally spaced apart relation. The spacing between the lugs 123 is that sufficient to receive the upper or slotted end of the transport wheel standard 114. The lugs 123 are apertured to receive a pivot bolt 126 that extends through the slot 115. The slot 115 accommodates a limited amount of vertical movement of the auxiliary transport wheel attachment 110 relative to the main frame 10.

In operation, that is, with the weeder rod in soil working position, the wheel attachment 110 is normally swung

7

upwardly and over onto the main frame 10 to occupy an inoperative position, as shown in Fig. 2, the attachment being supported by virtue of the pivot bolt 126 and the engagement of an edge of the wheel standard 114 with the top of the bracket base plate 124. When it is desired to provide for endwise transport of the rod weeder, all that it is necessary to do is first swing the transport wheel 111 from the position shown in Fig. 2 over to the position shown in Fig. 1 where the wheel 111 is in contact with or adjacent the ground and the lip 118 contacting the outer face of the front frame angle flange 15. Next, the hand lever 56 and associated latches may be manipulated so that the transport frame 26 with its castering wheels 34 are lifted entirely off the ground, the implement being supported by the front drive wheels 11 and the weeder rod shoes 42. As can be seen from Fig. 2, the shoes are located approximately midway between the front and rear of the implement, and therefore, with the transport frame and associated parts entirely off the ground, the hand lever 56, locked to the sector 52 in the proper position while the sector itself is locked to the stationary bracket 50, may then be used as a lever to tip or tilt the entire implement about the points of contact of the weeder rod shoes with the ground, the implement being tilted after the auxiliary transport wheel has been swung upwardly and outwardly relative to the main frame angle 14 until the wheel extends downwardly into contact with the ground as mentioned above. Then as the implement is tilted about the weeder rod shoes, the front part of the main frame and the drive wheels 11 are lifted into a raised position. During this movement, the auxiliary wheel attachment 110 swings downwardly and inwardly, since the center of gravity of the attachment is located forward of the pivot 126, the wheel standard swinging into a position carrying the lip section 118 downwardly and then underneath the lower edge of the flange 15 of the frame angle 14. By virtue of the slot 115, the wheel standard is permitted to occupy such a position relative to the main frame that the lip section 118 clears the lower edge of the frame angle as the transport wheel unit swings downwardly into a generally vertical position underneath the angle 14. Then the hand lever 56 is manipulated to first lower the transport frame 26 until the caster wheels 34 rest on the ground. Then the hand lever 56 is further oscillated, with proper actuation of the associated latches, so that the rear portion of the main frame 10 is raised so as to elevate the weeder rod and associated shoes above the ground. The implement is then supported on the rear castering wheels 34 and on the front auxiliary wheel 111. The weight of the frame and associated parts transmitted to the auxiliary wheel attachment 110 acts to hold the front flange 15 of the frame angle 14 in interconnected relation between the lip section 118 and the frame-engaging plate 117. The extent of contact between these parts is such that the auxiliary transport wheel 111 is held against displacement out of its endwise transport position. Any kind of end mounted hitch may be used for drawing the rod weeder in its transport position. After being transported to the desired destination, the transport frame 26 is again lowered until the main frame can be tilted on the shoes, and then the auxiliary transport wheel unit 110 is swung upwardly and over onto the frame and into its inoperative position (Fig. 2), after which the shoes 42 and rod 43 are lowered into their operating position.

While we have shown and described the preferred structure in which the principles of the present invention have been incorporated, it is to be understood that our invention is not to be limited to the particular details, shown and described above, but that, in fact, widely different means may be employed in the practice of the broader aspects of our invention.

What we claim, therefore, and desire to secure by Letters Patent is:

1. In a rod weeder having a main frame carrying a

8

weeder rod and a transport frame shiftably connected with the main frame and carrying ground wheel means, the improvement comprising a jack connected to act between said frames to raise and lower either frame relative to the other, said jack including a successively operable hand lever and releasable means connecting said lever with the transport frame so as to raise or lower the latter when the hand lever is moved in one direction or the other, respectively, latch means connected to act between said frames to lock them against relative movement in either direction, and means on said handle connected to control both said releasable means and said latch means so as to release one and engage the other alternately.

2. In a rod weeder having a main frame carrying a weeder rod and a transport frame shiftably connected with the main frame and carrying ground wheel means, the improvement comprising a jack connected to act between said frames to raise and lower either frame relative to the other, said jack including a hand lever pivotally connected with one frame, a part connected with the other frame and including a notched portion movable alongside said lever and also alongside a portion of said one frame, a first latch means on said frame portion and engageable with said notched portion to hold said one frame against movement in either direction relative to the other frame, a second latch means on said lever and engageable with said notched portion for connecting said lever to said notched portion and holding said lever to said notched portion against movement relative thereto in either direction, and means on said lever engageable with said first and second latch means for moving them alternately into and out of engaging and releasing positions.

3. In a rod weeder, a main frame, a transport frame movably connected with the main frame, a weeder rod rotatably supported by the main frame, and ground engaging wheels carried by the transport frame, the improvement comprising a bracket carried by said main frame, a hand lever pivotally mounted on said bracket, means to raise and lower the rod-carrying portion of the main frame relative to the transport frame and including a notched sector rockable relative to said bracket, a first latch carried by the hand lever and releasably engageable with said sector whereby oscillation of said hand lever in one direction or the other acts to rock said sector so as to shift the main frame in one direction or the other relative to said transport frame, a second latch carried by said bracket and releasably engageable with said sector for releasably locking the sector against movement relative to the main frame, and means connected with said latches for alternately engaging and releasing the latches.

4. In a rod weeder, a frame including a bracket, a rockshaft journaled in said bracket, a notched sector fixed to said rockshaft adjacent said bracket, latch means on the latter to releasably lock the sector against movement, a hand lever pivoted on said bracket for movement relative thereto about an axis, said latch means carrying a part disposed at one side of said lever adjacent said axis, a latch on said hand lever releasably engageable with said sector whereby the latter and said rockshaft may be rocked by oscillation of said hand lever, a first means on the hand lever for controlling said latch, and a second means on the hand lever and extending to a point adjacent said axis and connected with said part for operating said latch means in different positions of said hand lever relative to said bracket about said axis.

5. In a rod weeder, a frame including a bracket, a rockshaft journaled in said bracket, a hand lever pivoted on said bracket for movement relative thereto about an axis, a notched sector fixed to said rockshaft adjacent said bracket, latch means on the latter to releasably lock the sector against movement, said latch means carrying a part disposed at one side of said lever adjacent said axis, and means on said hand lever connected with said part at a point adjacent said axis for operating said latch means

in different positions of said hand lever relative to said bracket about said axis.

6. In a rod weeder, a generally transverse main frame, drive wheels carried by said main frame adjacent the forward portion thereof, a generally transverse weeder rod, ground-penetrating support means receiving said weeder rod and disposed adjacent the rear portion of the main frame, a transport frame movably connected with said main frame and extending rearwardly beyond said weeder rod, transport wheel means connected with said transport frame, said wheels being swingable from a position accommodating forward travel of the rod weeder to a position accommodating endwise movement of the rod weeder, hand lever means connected to act between said frames and to raise said transport frame relative to the main frame and lift said transport wheels off the ground, said hand lever means extending in a generally fore-and-aft extending direction away from the generally vertical transverse plane of said weeder rod support means, means locking said hand lever means against movement relative to the main frame when the transport frame and transport wheels are in a raised position, whereby generally downward movement of the lever means acts to tilt the main frame about the points of contact of said support means with the ground and thereby raise the front portion of the main frame and lift the drive wheels off the ground, and auxiliary transport wheel means attachable to the forward portion of the main frame when the latter is in its tilted position for supporting the forward portion of the main frame for endwise transport.

7. In a rod weeder, a generally transverse main frame, drive wheels carried by said main frame adjacent the forward portion thereof, a generally transverse weeder rod, ground-penetrating support means receiving said weeder rod and disposed adjacent the rear portion of the main frame, a transport frame movably connected with said main frame and extending rearwardly beyond said weeder rod, transport wheel means connected with said transport frame, a rockshaft journaled on the main frame and connected to raise and lower the transport frame relative to the main frame, a sector fixed to said rockshaft, a first latch carried by the main frame and releasably engageable with said sector, a hand lever pivoted to the main frame adjacent said first latch and carrying a second latch releasably engageable with said sector and operating when oscillated about its pivot connection with the main frame to rock said sector and rockshaft and optionally raise or lower the transport frame and transport wheels relative to the main frame, said first latch acting when engaged with the sector to hold the latter in fixed position relative to the main frame and said second latch acting when engaged to lock the hand lever to said sector, whereby when both of said latches are engaged with the sector and the transport wheels raised, said hand lever serves as means whereby the main frame may be tilted upwardly at its forward portion about the points of contact of the support means with the ground, and auxiliary transport wheel means attachable to the forward portion of the main frame when the latter is in its tilted position for supporting the forward portion of the main frame for endwise transport.

8. In a rod weeder having a main frame tiltable about a generally transverse axis, an auxiliary wheel attachment comprising a wheel standard, a bracket on the forward portion of said main frame, means providing a vertically shiftable and pivotal connection between the upper portion of said wheel standard and said bracket, a transport wheel carried by the lower portion of said standard, said pivotal connection being located relative to the center of gravity of said wheel and wheel standard so that when the main frame is raised a portion of said wheel standard swings underneath an adjacent portion of said main frame, and interlocking means acting between said main frame and wheel standard and responsive to

lowering of said main frame for locking the wheel standard to the main frame.

9. The invention set forth in claim 8, further characterized by said locking means including a lip engageable in non-rotatable relation with a portion of said main frame as a result of the upward relative movement between the wheel standard and main frame when the latter is lowered onto and supported by the transport wheel and the associated wheel standard.

10. The invention set forth in claim 9, further characterized by said wheel and wheel standard being swingable upwardly over and onto the main frame when the latter is raised and the wheel standard drops downwardly relative to the main frame until said lip is disengageable from the main frame.

11. An auxiliary wheel attachment for agricultural implements and the like having a frame bar provided with a downwardly extending portion, said attachment comprising a wheel standard having an upwardly disposed slotted portion, and a lower wheel receiving portion, a ground wheel journaled on the lower portion, a bracket attachable to said frame bar generally above said downwardly disposed portion and carrying a pivot extending through the slotted portion of said wheel standard, and a bar-engaging portion carried by said standard and adapted to pass underneath the downwardly extending portion on said frame bar when said frame is raised and said wheel standard depends from said pivot, said bar-engaging portion engaging the inner side of the downwardly disposed portion of said frame bar when the frame is lowered onto said standard.

12. In a rod weeder, a main frame carrying a weeder rod, a transport frame shiftable connected with the main frame and carrying ground wheel means, a rockshaft journaled on the main frame and connected to raise and lower the transport frame relative to the main frame, a sector fixed to said transport frame, a first latch carried by the main frame and releasably engageable with said sector, a hand lever pivoted to the main frame adjacent said first latch and carrying a second latch releasably engageable with said sector and operating when oscillated about its pivot connection with the main frame to rock said sector and rockshaft and optionally raise or lower the transport frame relative to the main frame, and said first latch acting when engaged with the sector to hold the latter in fixed position relative to the main frame and said second latch acting when engaged to lock the hand lever to said sector.

13. An auxiliary wheel attachment for agricultural implements and the like having a frame including a frame bar and means to raise and lower said frame, said attachment comprising a wheel standard having an upwardly disposed slotted portion and a lower wheel receiving portion, a ground wheel journaled on the lower portion, means on said bar pivotally receiving said wheel standard and carrying a pivot extending through the slotted portion of said wheel standard, and a bar-engaging portion carried by said standard spaced from said slotted portion and adapted to swing toward a bar-engaging position when said frame is raised and said wheel standard depends from said pivot, said bar-engaging portion engaging said frame bar when the frame is lowered onto said standard.

References Cited in the file of this patent

UNITED STATES PATENTS

1,451,697	Jeffres	Apr. 17, 1923
1,713,474	Lindquist	May 14, 1929
1,883,157	Weaver et al.	Oct. 18, 1932
2,141,805	White	Dec. 27, 1938
2,209,083	Du Vall	July 23, 1940
2,696,772	Underdown	Dec. 14, 1954