

Dec. 11, 1923.

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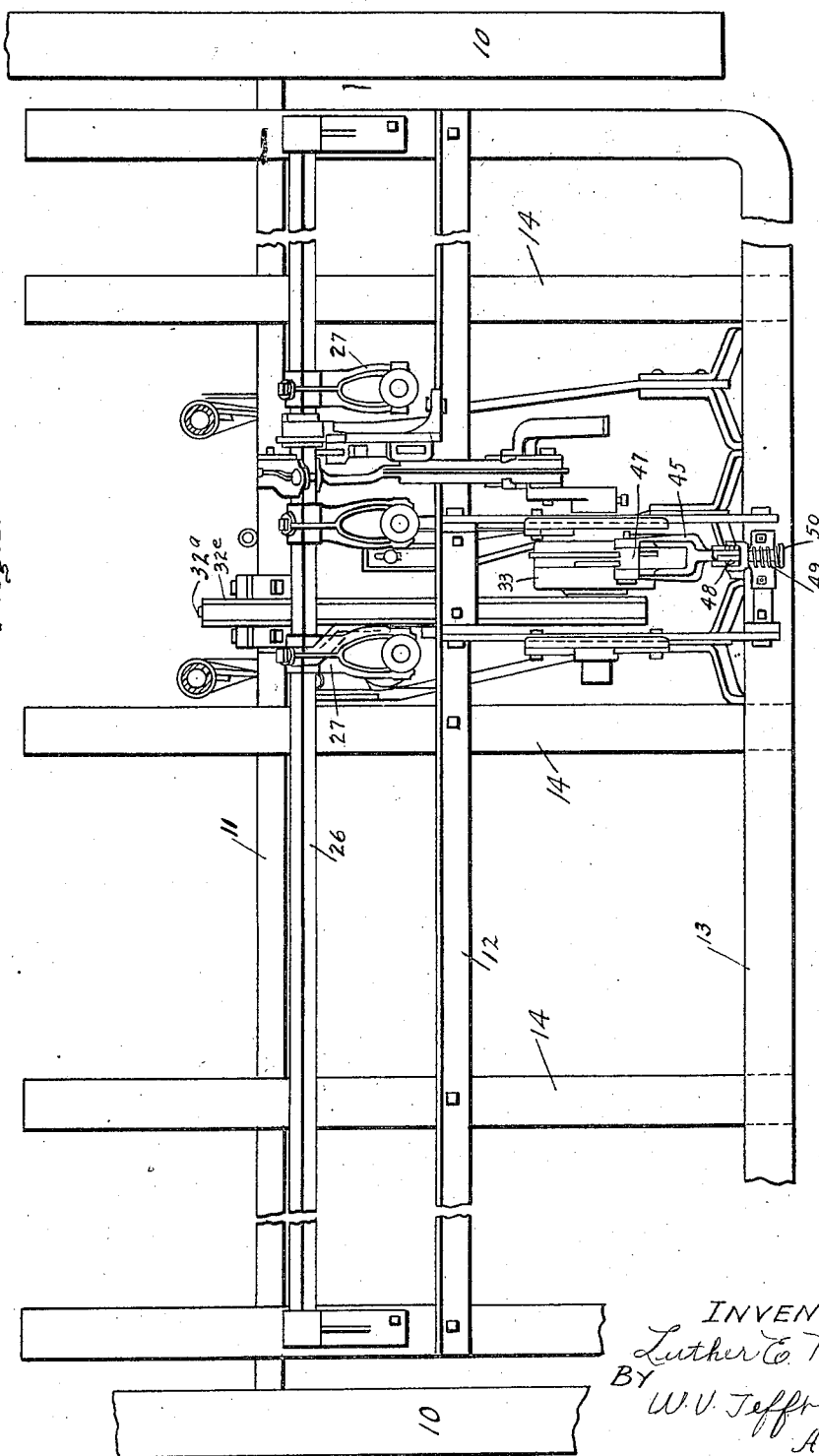
L. E. ROBY

POWER OPERATED DRAFT LIFTING DEVICE

Filed April 22, 1921

6 Sheets-Sheet 1

Fig. 1.



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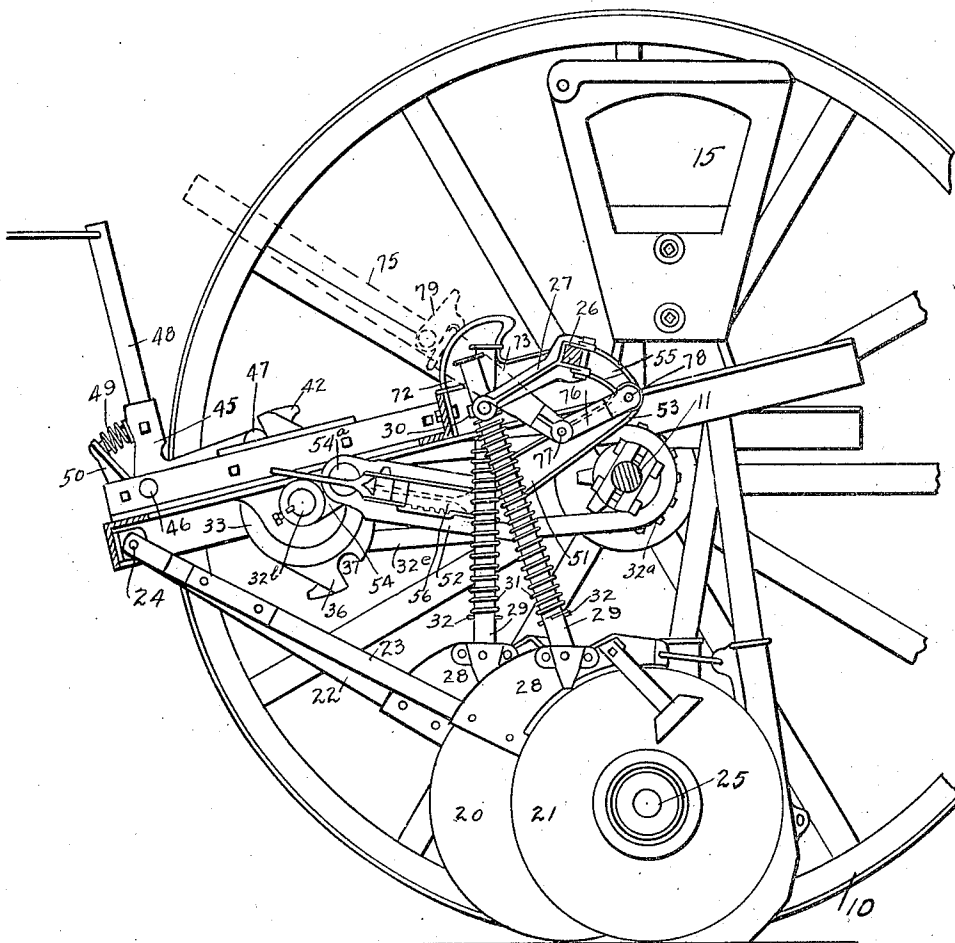
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6 Sheets-Sheet 2

Fig. 2.



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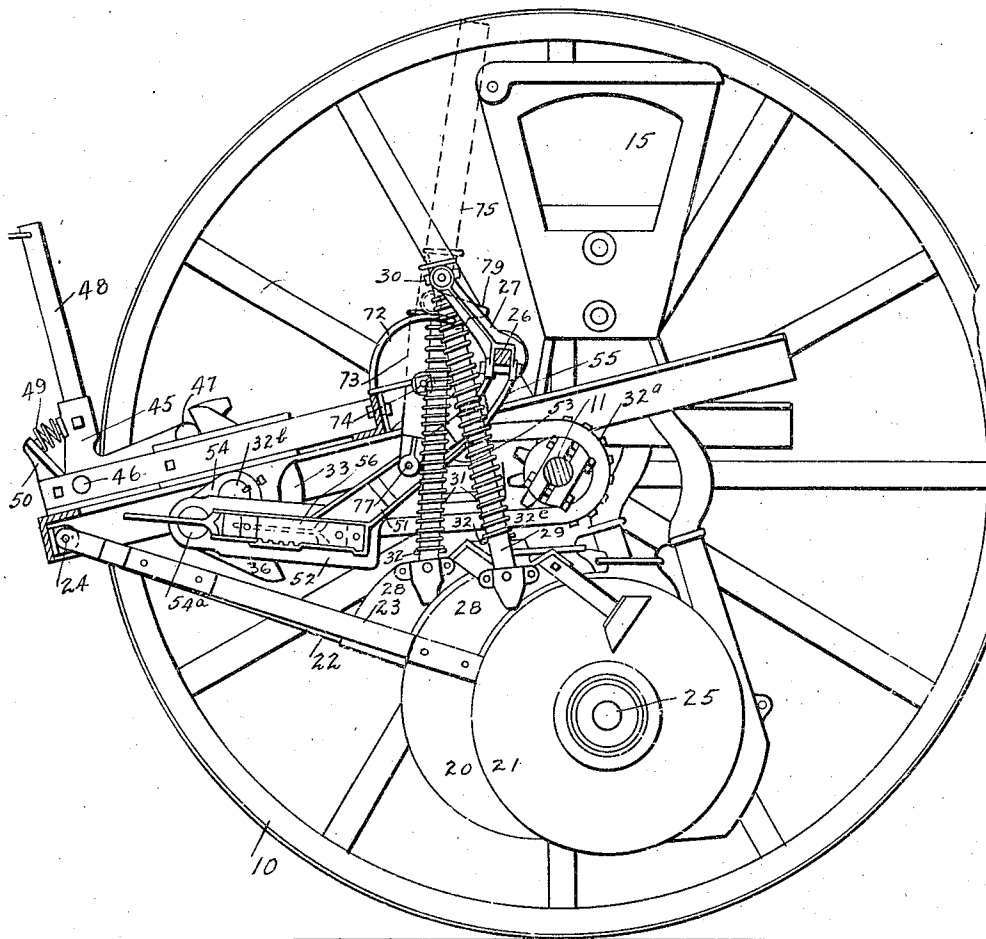
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6 Sheets-Sheet 3

Fig. 3.



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6 Sheets-Sheet 4

Fig. 4.

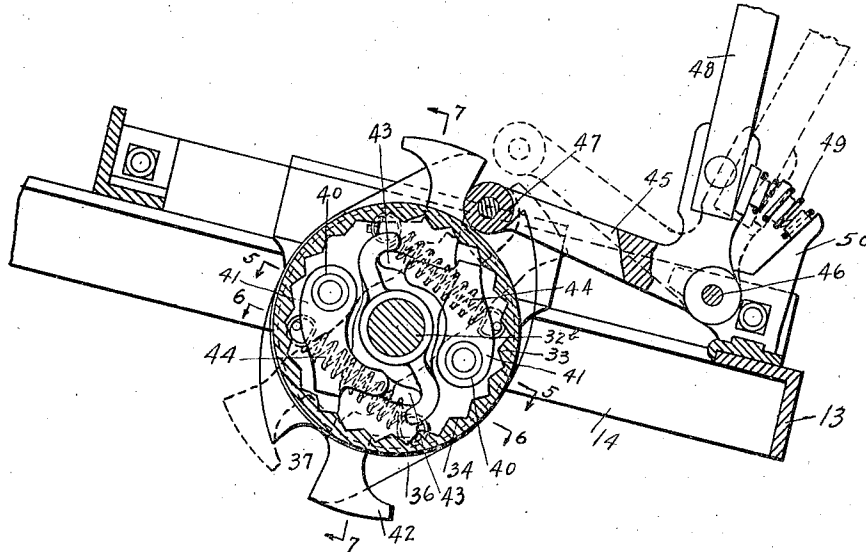


Fig. 5.

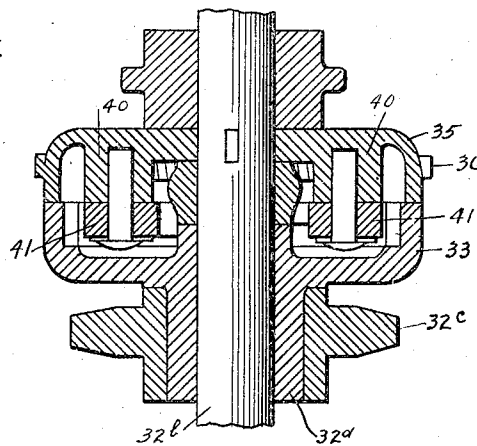
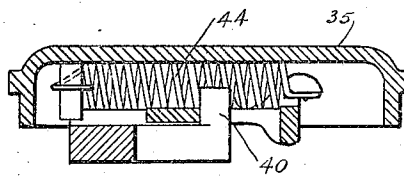


Fig. 6.



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6 Sheets-Sheet 5

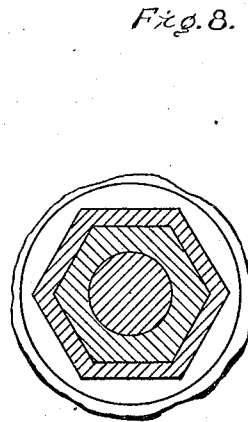
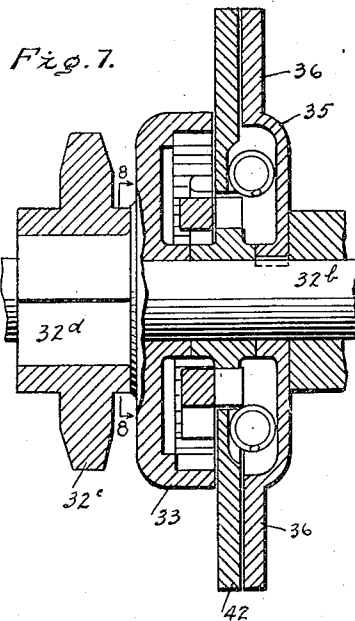


Fig. 9.

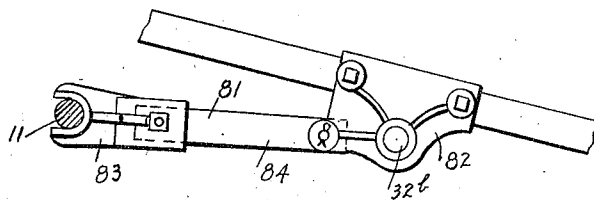
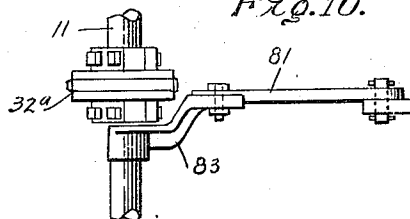


Fig. 10.



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6 Sheets-Sheet 6

Fig. 11.

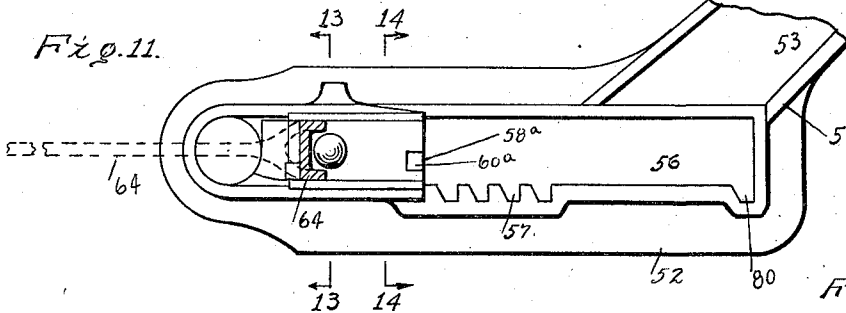


Fig. 12.

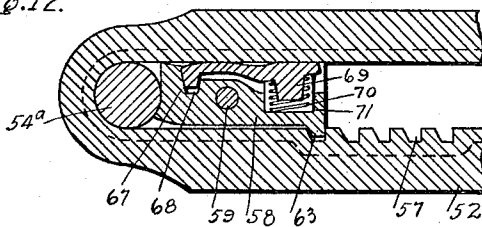


Fig. 14.

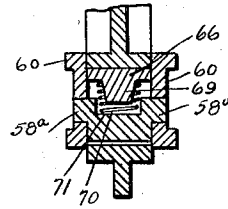


Fig. 13.

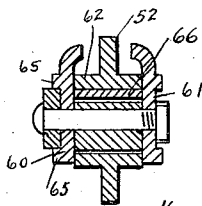


Fig. 15.

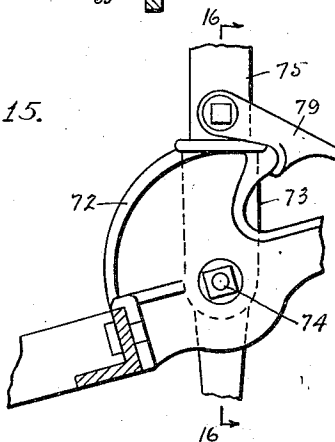
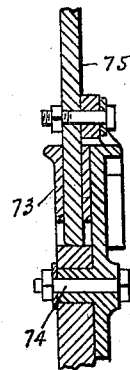


Fig. 16.



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UNITED STATES PATENT OFFICE.

LUTHER E. ROBY, OF PEORIA, ILLINOIS.

POWER-OPERATED DRAFT LIFTING DEVICE.

Application filed April 22, 1921. Serial No. 463,505.

To all whom it may concern:

Be it known that I, LUTHER E. ROBY, a citizen of the United States of America, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Power-Operated Draft Lifting Devices, of which the following is a specification.

This invention relates to power lift devices commonly used in connection with cultivating and seeding implements.

The invention has special reference to devices associated with furrow opener gangs to establish a fixed and unvarying point of maximum raising, but permitting variation in distance to which the furrow openers may be lowered and includes a specially designed reach member connected with a driving member and a rockable member and associated parts wherein variable lost motion space is provided, whereby a normal thrust of the driving element may be reduced or extended.

The invention also includes a peculiar and special manner of relating the clutch control mechanism to the machine and to the driving axle and rock shaft therein, whereby simplicity of attachment and detachment is effected, and better results obtained than are obtained in marketed machines of similar character. The invention also includes details with reference to the features mentioned.

The invention further includes details and general combinations of parts hereinafter more particularly pointed out in the specification and claims and illustrated in the drawings, in which—

Fig. 1 is a plan view showing my improved devices applied to the frame of the seeding machine;

Fig. 2 is a vertical sectional view through the framing of the machine and showing my devices applied thereto;

Fig. 3 is a view similar to Fig. 2, except that movable parts are shown in different positions;

Fig. 4 is a view, partly in section, showing locking devices and control therefor in association with the framing of the machine;

Fig. 5 is a section on the line 5—5 of Fig. 4;

Fig. 6 is a section on line 6—6 of Fig. 4;

Fig. 7 is a section on the line 7—7 of Fig. 4;

Fig. 8 is a sectional view on the line 8—8 of Fig. 7 and shows a sleeve portion of a disk member in conjunction with a sprocket wheel and its relation to a supporting shaft member.

Fig. 9 is a detail view of a brace between the framing members and a shaft support for operating mechanism.

Fig. 10 is a view similar to Fig. 9, but taken at right angles thereto;

Fig. 11 is a side elevation of a portion of the reach member;

Fig. 12 is a vertical sectional view through the longitudinal center of devices shown in Fig. 11;

Fig. 13 is a cross section through line 13—13 of Fig. 11;

Fig. 14 is a section on the line 14—14 of Fig. 11;

Fig. 15 is a detail view of parts employed to effect manual lifting of operating mechanisms;

Fig. 16 is a vertical sectional view on line 16—16 of Fig. 15.

At each side of the seeding machine is a carrying wheel 10, in which is supported the axle or shaft 11. The shaft is operatively connected so that it will be driven by the carrying wheels, or at least one of them, in a one-way direction. A frame formed of angle iron is provided, and included in such frame are bars 12 and 13 extending the width of the machine and bars 14 extending lengthwise thereof. A seed box 15 extends across the machine and is suitably supported upon the frame. Immediately beneath the box is designed to be provided a series of seeding devices (not shown). The seeding devices are designed to be operated from the shaft (not shown) which is optionally operative from a suitable connection with axle 11. As the above described elements are not material to the present invention, further detail reference to same is unnecessary.

20 and 21 are furrow opener disks selected here as members of gangs of such disks that are ordinarily used, the same being arranged relatively as shown. 22—23 are drag bars, their forward ends being pivotally connected as at 24 to the frame and their rear ends connected with the journal supports as 25, of the disks.

26 is a rock shaft and 27 are rocker arms secured thereto. 28 are plate members attached to the drag bars. 29 are rods pivot-

ally connected at their lower ends to plate members 28. 30 are collar members embracing the upper end portions of rods 29 and having a pivotal support in connection with rocker arms 27. 31 are coil springs embracing rods 29, designed to be held under a more or less compression tension between pin members 32 and collar members 30. This form of connection between rocker arms and drag bars being common, further description is unnecessary.

32^a is a sprocket wheel fixed on axle 11. 32^b is a short shaft suitably supported in connection with the framing members of the machine at a spaced distance from axle 11 and parallel therewith. 32^c is a sprocket wheel fixed to sleeve member 32^a (see Fig. 5) of a ratchet disk member 33 hereinafter to be more particularly referred to. Shaft 32^b is driven from axle 11 by means of sprocket chain 32^e connecting the sprocket wheels upon said shafts respectively.

Referring now to the draft operated lifting mechanism to effect the raising of a gang or gangs, each comprising a plurality of furrow openers, 33 is a flanged ratchet disk, the same being provided with the sleeve member 32^a, loosely mounted upon shaft 32^b and having angularly fashioned faces to accommodate the seating of a driving sprocket thereon. The interior face of the flange of said disk is provided with ratchet teeth 34. 35 is a disk centered and fixed upon the shaft 32^b and provided with a flange 36, the latter having oppositely disposed cutout portions or ways 37 in the peripheral edge thereof. Disk 35 is fashioned at its peripheral edge in a manner to support, and properly guide a roller member of a control means (hereinafter to be described) to locking seats 37 in the peripheral edge of said disk 35.

40 are studs upon disk 35, to which respectively are pivoted pawls 41, which said pawls are adapted at times to engage the ratchet teeth 34 on disk 33. 42 is a locking lever pivotally supported upon shaft 32^b; 43 are slotted ways therein, through which stud members 40 project, the shape and inclination of the slots in said lever with reference to the arc of movement thereof being such that as the lever is moved, pawls 41 will also be moved towards or from the pivoted centering of said lever, into either locked or unlocked relation with the ratchet disk, according to the direction of movement of the lever. The locking lever 42 is held under the tension of springs 44, one end of each of said springs being connected with the locking lever, and the other end with disk 35 so that normally, and when disk 35 is inactive, the outer ends of the locking lever will be positioned in front of the locking seats 37 in the periphery of said disk (under the thrust of the roller member

of the control mechanism) at which time the pawls 41 will be out of engagement with the ratchet disk 33.

Manually controlled mechanism is provided for establishing a clutched or unclutched relation between ratchet disk 33 and disk 35, including bell crank member 45, pivoted as at 46 to a stud or pin secured on the framing members of the machine. 47 is a roller pivoted between and at the outer end of spaced arm portions of said bell crank. 48 is a lever suitably connected with the bell crank; 49 is a spring member spaced between the upstanding portion of the bell crank and the stop plate 50, the latter being suitably fixed to the framing of the machine.

In the relation of the parts of the control mechanism shown and described, normally member 47 thereof will rest in the locking seats in disk 35 and in this relationship of the control mechanism to said disk, the locking lever 42 will have been forced forwardly, as hereinbefore noted, under the thrust of the roller 47 of the control mechanism. The forward movement of said locking lever, through the stud connection of pawl members 41, will cause said pawls to be disengaged from ratchet disk 33, whereby said disk 35 will be at rest. When it is desired that disk 35 shall be rotated to drive shaft 32^b, the bell crank member 45 may be actuated to elevate roller member 47 into the position shown in dotted lines in Fig. 4, whereby locking lever 42 is released and is drawn under the tension of the connected spring members 44 into the position shown in dotted lines in said figure. The movement of locking lever 42 from its normal position (shown in Fig. 4) to its position shown by dotted lines in said figure, and the action of the slot members therein upon the lug members of the pawls will cause the latter to engage the ratchet disk, whereby disk 35 will be driven, and likewise shaft 32^b.

I have provided a connection between shaft 32^b and rocker bar 26, whereby the latter may be rocked through the action of the former, said connection comprising a bar member which may be generally referred to here as 51, composed of reach portions 52 and 53; crank member 54 fixed on shaft 32^b and provided with crank pin 54^a; rocker arm 55 fixed on rocker shaft 26, said bar member being pivotally related at its opposite ends respectively to said crank and rocker arm member.

The relationship established herein between the constantly driven ratchet disk 33 normally stationary, disk 35 and the rocker shaft 26, is for the purpose of rocking the latter shaft in order to raise or lower the disk gang or gangs, and it will be noted from the disclosure and description that under normal conditions, disk 35 and shaft 32^b will be at rest, but when clutched with disk 33,

will be driven throughout a half turn, and then will be unclutched through the stop action of roller 47, interrupting the rotary movement of locking lever 42, whereby pawl members 41 are shifted to disengage the ratchet disk. During the half turn movement of disk 35 and shaft 32^b, the crank member 54 will be moved through one-half of a complete circle, thereby through its connection with rocker shaft 26, the latter will be shifted to effect either a raising or lowering movement, according as the crank member is related to shaft 32^b. Repeating the above described operation effects a turning of disk 35 and its connected mechanism, through the remaining half of a single revolution and similarly effects the movement of parts connected therewith.

It is desirable in practice that the furrow opener gangs be raised to a certain definite point, but that the distance of lowering may be varied, and to the end of accomplishing this result, I have provided a connecting means between the crank arm 54 and rocker arm 55, wherein the length of movements of the bar member 51 may be varied to meet the requirements of variation in the raising and lowering movement of the disk gangs. This connecting means comprises the bar 51, the reach portion 52 thereof being slotted as at 56, such slot extending nearly the entire length of said reach portion. In the lower wall of the slotted portion of the reach member 52 I have provided a series of locking seats 57. An adjustable locking member 58 is disposed in slot 56 and is pivoted upon bolt 59, the latter being supported in plate members 60 disposed respectively at each side of reach member 52 and bearing upon laterally projecting flange members of said reach member 52. The manner of relating such plate members to the flange portions of the reach member is such that said plates may be readily moved in a direction lengthwise of slot 56.

The lower face of locking member 58 is fashioned to lie normally in general contact with the face of the lower wall of slot 56, and with a lug portion 63 thereon in engagement with one of the locking seats 57 (see Fig. 12) but its forward end is provided with a slight up curve to enable it to be rocked through a downward movement applied at its forward end, whereby lug 63 may be disengaged from locking seats 57 that it may be moved lengthwise in the slot in the reach and into engagement with another slotted locking seat. Plate member 60 is provided with a marginal slot 60^a at its rear end for engagement with lug member 58^a on locking member 58. To effect the rocking movement, an arm or handle 64 is provided, the rear expanded portion thereof being seated between rib members 65 on one of the plate

members 60. By applying pressure to this handle, both the plate and rocking member are tilted to effect such unseating from the locking seats and may then be readily pushed lengthwise within the slot in said reach.

To effect a normal locking relation between the locking member and the reach member, but to permit the former to be tilted in order that it may be moved, a spacing plate or filler member 66 is provided, disposed above the locking member and having a stud 67 depending from its extreme forward end designed to engage a seat 68 in the locking member to prevent said plate being shifted lengthwise, and to relate it to the upper wall of the slot in the reach member, so that it may be moved with the locking member lengthwise of the slot. Near the rear end of filler member 66 is provided a stud 69; 70 is a coil spring member adapted to embrace said stud and projecting downwardly to be seated within seat 71 at the rear portion of the locking member. It will be seen that by this arrangement of the filler member with relation to the locking member, the latter will normally be held in locked relation with the reach member under the tension of spring 70, and that a release of the locking member is effected through its being tilted under the compression of spring 70 so that when the compression force is released the locking member will assume a locked relation with the reach member.

It will be seen from the arrangement of the parts referred to, and particularly upon noting Figure 3, that the relationship of crank arm 54 to the slot in the reach portion 52 of bar member 51 is such that the gangs will always be raised to a certain definite point of elevation, and if locking member 58 were permanently in the position shown in said Figure 3, the gangs would be lowered to a definite invariable position. However, it will be seen that by shifting locking member 58 to engage the different seats in reach member 52 the extent of lowering of the gangs may be varied according to the clearance space that intervenes between the forward or head end of said reach member 52 and that which would be occasioned by the locking member engaging the various locking seats in said bar.

I have provided means for manually raising the gangs to meet the emergency of the power actuated lifting means being out of condition to effect such raising by power, such means including an arcuate plate 72 fixed to the framing of the machine; a lever comprising a socketed reach portion 73 pivoted on pin 74 connected with said plate; a removable bar 75; a short bar 76 pivoted at one end as at 77 to the lower end of reach portion 73 of the lever, and at its other end,

as at 78 to the outer end of rocker arm 55; and a locking pawl 79 pivoted to the bar member 75 of the lever.

Preliminary to applying the hand power 5 lifting, it is necessary that the locking member 58 be moved to a point in complete stroke clearance of crank pin 54^a of crank 54, and to this end the said locking member is moved into position to engage locking seat 80 (see 10 Fig. 11) at the extreme rear end of the slot in reach member 52.

Under normal working conditions, pawl 79 will occupy the position shown in dotted lines in Fig. 2, and the parts that comprise 15 the manual lifting means will be inoperatively moved as the rocker shaft 26 is moved, when the power lift means is employed, but when the manual raising means is to be applied to raise the gangs, the lever 20 will be pushed rearwardly into a position to cause the pawl 79 to engage the forward offset in arcuate plate 72 (see Fig. 3), whereby the gangs will be maintained in raised position.

For the purpose of compensating for the draft action of chain member 32^a, which operates to drive shaft 32^b from the wheel axle, brace members 81 are provided (see 25 Figs. 1, 9 and 10) comprising bracket member 82 fixed to the framing, and a seating member 83 for embracing shaft 11, but as these brace members do not constitute any part of my present invention, it is deemed unnecessary to make more particular refer- 35 ence to same.

What is claimed is:

1. In a device of the class described, in combination, a rotative axle, a rocker member, and means for converting the rotary 40 action of the axle into a rocking motion of the rocker member, comprising an operating shaft provided with a clutch member and a crank arm thereon, a driven member normally loose on said shaft and provided with a clutch part, a driving connection between 45 the axle and said driven member, means for optionally effecting clutched relation between said shaft and driven member, a rocker bar member eccentrically related at 50 one end to the rocker member, longitudinally slotted at its other end for engagement and cooperation with the crank on the operating shaft, a filler member in the slot, adjustably related thereto, for varying the 55 length of the clearance space therein.

2. In a device of the class described, in combination, a driven axle, a rocker member, and means for converting the rotary action of the axle into a rocking motion of 60 the rocker member, comprising an operating shaft, spaced from the axle, provided with a crank arm thereon, a driven member normally loose on the operating shaft, means for positively driving said driven member 65 from the axle, means for optionally effect-

ing engagement between the driven member and the operating shaft, a rocker bar eccentrically connected with the rocker member at one end, provided with an elongated slot in the other end, adapted to engage the 70 crank member on the operating shaft, a filler member in said slot and means for relating said filler member to the bar to facilitate adjustment thereof within the slot and for securing the same at spaced distances there- 75 in.

3. In a device of the class described, in combination, a wheel axle, a rocker member, and means actuated by the wheel axle to variably turn the rocker member, including 80 a rocker bar, eccentrically connected with the rocker member at one end and provided with a longitudinal slotted way in the other end portion thereof, means driven from the wheel axle for reciprocating said 85 rocker bar and operably associated with the slot therein, and a filler member adjustably supported within the slot in the rocker bar and means relating said filler member to said rocker bar member in a manner to facilitate the adjustment thereof within the slot and for locking it at its different positions of adjustment to provide variation of the clearance space in said slot, to function 90 with the actuating member, for said bar, to vary the length of reciprocation of the latter.

4. In a device of the character described, in combination, a wheel axle, a rocker member, an operating shaft, means for driving 100 the operating shaft from the wheel axle, a rocker bar connecting the operating shaft and the rocker member in an eccentric relation, provided with an elongated slot therein for connection and co-operation with the 105 operating shaft, a filler member adjustably related to said slot in the rocker bar and means for adjusting said block lengthwise of the slot in the rocker bar member.

5. In a device of the character described, in combination, a wheel axle, a rocker member, an operating shaft, provided with a crank thereon, means for driving the operating shaft from the wheel axle, a rocker bar, one end thereof connected with the rocker 115 member in an eccentric relation and provided with an elongated slot in the other end portion thereof for relating the bar to the crank member of the operating shaft, a filler block, adjustably related to the slotted portion 120 of said rocker bar, comprising a filler section, a tiltable block section associated therewith and a resilient member interposed between said sections, and means for tilting 125 said block section to facilitate its adjustment lengthwise of the slot in said rocker bar.

6. In a device of the character described, in combination, a wheel axle, a rocker member, an operating shaft provided with a 130

crank arm, means for driving the operating shaft from the wheel axle, a rocker bar, one end eccentrically connected with the rock shaft, and the other end portion thereof provided with an elongated slot therein, for connection and operative relation with the crank arm on the operating shaft, a lateral wall in said slotted portion being provided with locking seats, a tiltable filler block disposed in said slot, provided with a locking member thereon, for engaging the locking seats in the wall of said slot, and means for tilting and moving said block lengthwise of said slot.

7. In a device of the character described, in combination, a wheel axle, a rocker member, an operating shaft provided with a crank member, means for driving the operating shaft from the wheel axle, a rocker bar, comprising reach portions relatively disposing at an angle, one end thereof connected eccentrically with the rocker member and provided at its other end portion with an elongated slot, for connection and operating relation with the crank on the operating shaft, a filler member, disposed in said slot, adapted for positioning, relative to said slot, to change, at option, the clearance space within said slot, within which an engaging portion of crank arm of operating shaft is designed to be carried, whereby the length of movement of the rocker arm may be varied.

8. In a device of the character described, in combination, a wheel axle, a rocker member, an operating shaft, provided with a crank arm, means for driving the operating

shaft from the wheel axle, a rocker bar, eccentrically related to the rock shaft and provided with an elongated slot therein, adapted for connection and co-operation with the crank arm of the operating shaft, there being provided locking seats in the wall of said slot, a filler block, comprising inter-engaging sections, one of said sections being provided with a locking lug for engagement with the locking seats in the wall of the slot, a resilient member interposed between said sections to normally space them apart, and a bar member, connected with one of said sections, whereby the latter may be tilted under the tension of the resilient member to facilitate adjustment of the filler block lengthwise of the slot.

9. In a device of the character described, in combination, a rocker member, an operating shaft, provided with a crank thereon, a rocker bar, one end thereof connected with the rocker member in an eccentric relation and provided with an elongated slot in the other end portion thereof for relating the bar to the crank member of the operating shaft, a filler block adjustably related to the slotted portion of said rocker bar, comprising a filler section, a tiltable block section associated therewith and a resilient member interposed between said sections, and means for tilting said block section to facilitate its adjustment lengthwise of the slot in said rocker bar.

In testimony whereof I have affixed my signature.

LUTHER E. ROBY