W. S. GRAHAM.

POWER LIFT TRACTOR LISTER.

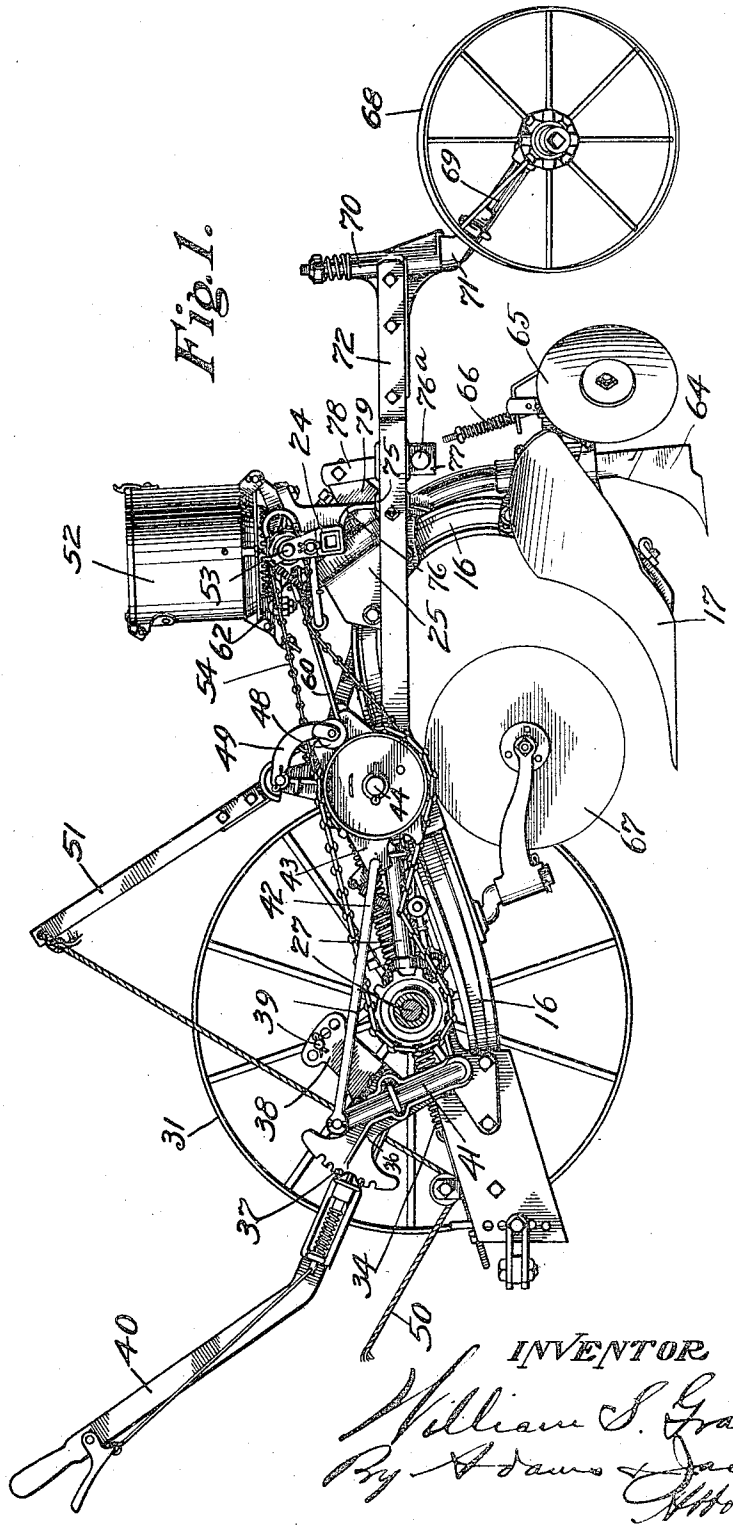
APPLICATION FILED SEPT. 11, 1917.

1,259,511.

Patented Mar. 19, 1918.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 3.

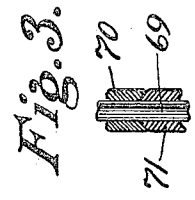


Fig. 2.

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4 SHEETS—SHEET 3.

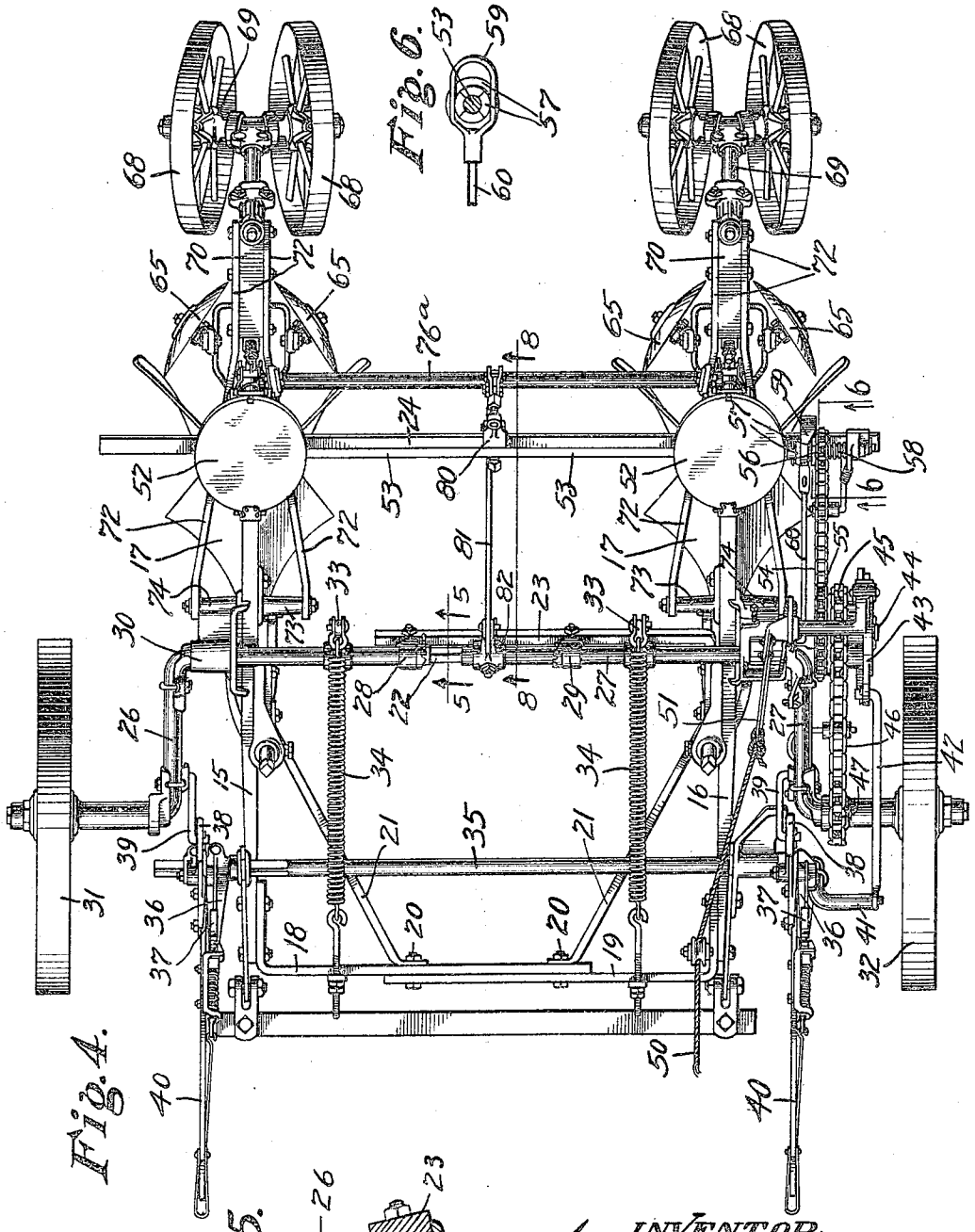


Fig. 4.

Fig. 6.

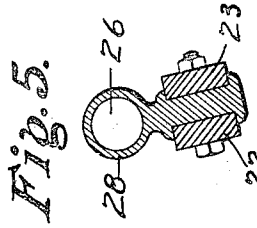


Fig. 5.

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4 SHEETS—SHEET 4.

Fig. 7.

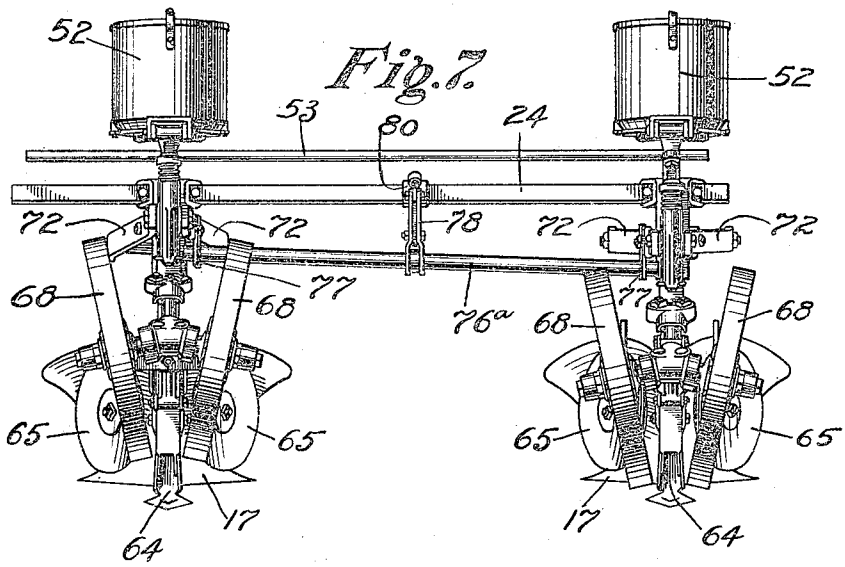


Fig. 8.

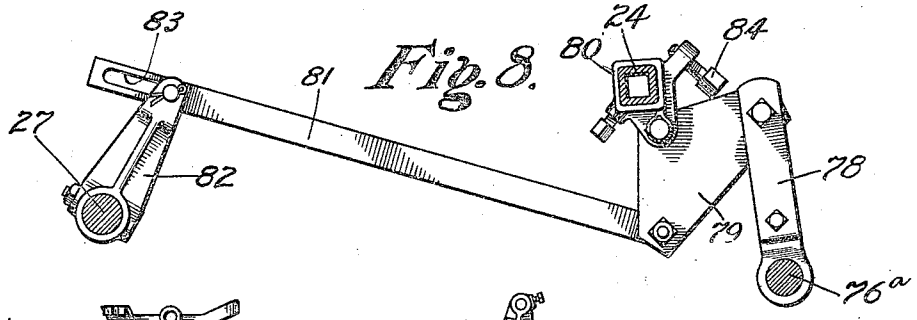


Fig. 9.

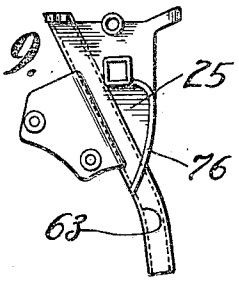
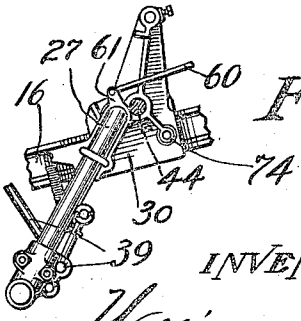


Fig. 10.



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UNITED STATES PATENT OFFICE.

WILLIAM S. GRAHAM, OF CANTON, ILLINOIS, ASSIGNOR TO PARLIN & ORENDORFF COMPANY, OF CANTON, ILLINOIS, A CORPORATION OF ILLINOIS.

POWER-LIFT TRACTOR-LISTER.

1,259,511. Specification of Letters Patent. Patented Mar. 19, 1918.

Application filed September 11, 1917. Serial No. 190,757.

To all whom it may concern:

Be it known that I, WILLIAM S. GRAHAM, a citizen of the United States, and a resident of Canton, in the county of Fulton and State of Illinois, have invented certain new and useful Improvements in Power-Lift Tractor-Listers, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in agricultural implements and particularly to improvements in lister plows, and it has for one of its objects the provision of a form and arrangement of parts by which great strength is secured without undue weight. It is another object of my invention to provide a two-row machine of this type capable of being adjusted laterally for rows of different distances apart. It is another object of my invention to provide new and improved means for raising and lowering the plows by power from the machine or from one of the ground wheels, and to provide also new and improved means for transmitting power to the seed dropping mechanisms. It is another object of my invention to provide a new and improved arrangement of framework and supporting wheels whereby each of the wheels is caused to bear properly upon the ground irrespective of any irregularities of the surface. It is another object of my invention to provide new and improved means for adjusting the suction of plows, and new and improved means for regulating the depth at which the plows shall run in the ground, the regulating means for either plow being adjustable independently of the other plow. It is another object of my invention to improve machines of this type in sundry details hereinafter pointed out. The preferred means by which I have accomplished by several objects are illustrated in the drawings and are hereinafter specifically described. That which I believe to be new and desire to cover by this application is set forth in the claims.

In the drawings:—

Figure 1 is a side view of a machine embodying my improvements showing the plows in their lowered operative position, one of the supporting wheels at the forward end of the machine being omitted for clearness of illustration.

Fig. 2 is a view similar to Fig. 1, but showing the plows in their raised inoperative position for turning at the end of a row or for transportation;

Fig. 3 is an enlarged detail, being a fragmentary-sectional view taken substantially on line 3—3 of Fig. 2;

Fig. 4 is a top or plan view of the machine as shown in Fig. 1;

Fig. 5 is an enlarged detail taken substantially on line 5—5 of Fig. 4;

Fig. 6 is an enlarged detail, being a sectional view taken substantially on line 6—6 of Fig. 4;

Fig. 7 is a rear elevation of the rear portion of the machine, showing the covering wheels at one side in abnormal raised position relative to the covering wheels at the opposite side, the operating means for the seed dropping mechanism being omitted for clearness of illustration;

Fig. 8 is a detailed view, being substantially a section taken on line 8—8 of Fig. 4;

Fig. 9 is a side view of one of the brackets by which the seed hoppers are supported in position; and

Fig. 10 is a fragmentary view illustrating the bracket by which the clutch and some of its coöperating parts is supported upon the framework.

Referring to the several figures of the drawings, in which corresponding parts are indicated by the same reference characters:—

15—16 indicate heavy plow beams having plow bodies or furrow openers 17 of any suitable type mounted upon their rear end portions. As is best shown in Fig. 4 the forward end portions of the plow beams 15—16 are firmly joined together by means of transversely extending bars 18—19 which are secured together by means of bolts 20 passing through suitable registering openings, one of the bars 18—19 being provided with a plurality of openings whereby the plow beams 15—16 may be adjusted laterally relative to each other. Diagonally disposed brace bars 21 are provided serving to assist in bracing the plow beams 15—16 relative to each other. The beams 15—16 are further connected together by transversely extending bars 22—23 which are also adjustably connected at their inner end portions so as to permit lateral adjustment of the beams.

The beams 15—16 are still further connected together by means of a laterally extending bar 24 which is fixedly mounted near its end portions upon brackets 25 (see Figs. 1, 2 and 9) which are secured upon the beams 15—16 respectively. The bar 24 is adjustable relative to one or both of the brackets 25 so as to permit the lateral adjustment of the beams 15—16.

Axle members 26—27 are revolubly mounted in transverse position upon the framework above described, being journaled near their inner ends by means of brackets 28—29 respectively carried by the bars 22—23 and being journaled upon the beams 15—16 respectively by means of brackets 30 (see Figs. 4 and 10). Horizontally extending outer end portions of the axle members 26—27 are provided with carrying wheels 31—32 respectively. Each of the axle members 26—27 is provided with an arm 33 rising therefrom, the upper end portion of which is connected by means of a coiled spring 34 with the forward end portion of the framework, the springs 34 serving to assist in the operation of lowering the carrying wheels 31—32 relative to the framework as hereinafter described for raising the plow bodies 17 out of contact with the ground.

The means provided for turning the axle members 26—27 relative to the framework for moving the carrying wheels 31—32 up and down relative to the frame comprises a rock-shaft 35 connected with the axle members. The connection of the rock-shaft 35 at each side of the machine with the axle member at that side comprises an arm 36 fixedly mounted upon the rock-shaft and provided with a rack bar 37 at its upper end. Bellcrank levers 38 are pivotally mounted upon the arms 36, the rearwardly extending arms of such bellcrank levers being connected by means of links 39 with the axle members 26—27 as best shown in Fig. 4. The bellcrank levers 38 are adapted to be turned upon their pivots by means of lever extensions 40 which are adapted to be adjustably secured to the rack bars 37 in any suitable manner. By the manipulation of the levers 40, the position at which the rearwardly extending arms of the bellcrank levers 38 stand relative to the arms 36 may be adjusted.

The means for turning the rock-shaft 35 for swinging the levers 38 and thus adjusting the axle members 26—27 and the carrying wheels 31—32 mounted thereon comprises a crank arm 41 formed upon one end portion of the rock-shaft. The outer end of the crank arm portion 41 is connected by means of a link 42 with a plate 43 rotatable about an axle 44 fixedly mounted upon the framework. The plate 43 is adapted to be given a partial rotation about the axle 44 by a clutch mechanism of any suitable type by which such plate is connected as desired with a gear 45 which is driven continuously during the forward movement of the machine by means of a chain 46 connecting such gear with a gear 47 which is connected with the carrying wheel 32. The clutch mechanism comprises a roller 48 revolubly mounted upon an arm 49 which is adapted to be swung toward the rear by a pull upon a cord 50 connected to the upper end of an arm or lever 51. The parts of the clutch as shown in the drawings are of the type illustrated in my Letters Patent No. 1,163,143, granted on December 7, 1915, covering improvements in gang plows. As is readily understood in the art, upon a movement of the roller 48 to the right in Figs. 1 and 2, the clutch mechanism is thrown into operation for giving the plate 43 a single half revolution, at the end of which the clutch is again thrown out of operation. Inasmuch as the clutch in and of itself forms no part of my present invention, it is believed to be unnecessary to further describe the same herein. It will be understood that, with the gear 45 in constant rotation by reason of the forward movement of the plow, when the roller 48 is given a backward movement, the plate 43 will be given a half rotation, serving either to move the plow body 17 upward out of operative engagement with the ground from the position shown in Fig. 1 to the position shown in Fig. 2, or to give such plow body the reverse movement, depending upon the original position of the plow body.

Each of the plow beams 15—16 is provided with seed dropping mechanisms of an approved type. In the construction shown the seed dropping mechanism comprises a hopper 52 mounted upon the bracket 25 above the plow body 17. Each of the two hoppers shown in the drawings is provided with suitable seed dropping parts of any approved type adapted to be operated by a shaft 53. This shaft in turn is driven by a sprocket chain 54 mounted upon a gear 55 which is rotatable with the gear 45 hereinbefore referred to, the connection of the chain 54 with the shaft 53 being effected through the medium of a gear 56 loosely mounted upon the shaft 53. The shaft 53 and the gear 56 are provided with intermeshing clutch members 57 (see Figs. 4 and 6) by which the shaft is adapted to be driven by the gear 56, a spring 58 being provided for holding the gear 56 yieldingly in position for operative engagement of the clutch members. Means are provided for throwing the clutch members 57 out of engagement for stopping the rotation of the shaft 53, such means comprising a cam yoke 59 connected by means of a link 60 with an arm 61 rising from the axle member 27 (see Fig. 10). The arrangement is such

that, when the axle member 27 is moved for raising the plow body 17 out of engagement with the ground, the link 60 is thrown forward by the arm 61, serving to force the cam yoke 59 between oppositely-disposed portions of the clutch members 57 for forcing the gear 56 to one side against the action of the spring 58, serving to stop the rotation of the shaft 53. It is thus seen that when the plow bodies 17 are thrown out of operation, the seed dropping mechanism is at the same time thrown out of operation.

At the point where the seed is discharged from the hopper 52, a suitable observation opening is provided as shown at 62 in Fig. 1 whereby the operator can observe the number of kernels dropped. The seed from the hopper 52 falls into a pipe or duct 63 (see Fig. 9) from which it passes to a shoe 64 through which it drops into the furrow. Disks 65 are revolubly mounted in diagonal position adjacent to the shoe 64 for covering the grain in the furrows, such disks being provided with springs 66 which serve to hold them yieldingly in the desired operative position relative to the shoe 64. In the construction shown colters 67 of any suitable type are mounted upon the plow beams in front of the plow bodies 17.

Means is provided for pressing the soil firmly down upon the seed in the furrow and for raising the rear ends of the plow beams 15—16 when the plow bodies are being raised out of operative position. This means comprises a pair of pressure wheels 68 mounted upon diagonally-disposed axes upon axle members 69 which are adapted to revolve upon vertical axes relative to bracket members 70 mounted as hereinafter described. The axle members 69 are provided with brackets 71 fixed thereon having rounded upper ends working in correspondingly-shaped recesses in the lower ends of the brackets 70, as is shown in Fig. 3. The brackets 70 are connected with the framework of the machine by means of longitudinally-extending bars 72 which are pivotally mounted at their forward ends upon the plow beams 15—16 in front of the seeding mechanisms. The bars 72 are mounted on the plow beams in the construction shown by means of bosses 73—74, the bosses 74 being formed with the brackets 30, as is best shown in Fig. 10. As is best shown in Figs. 1 and 2, each of the bars 72 is provided with a slide-block 75 fixedly mounted upon its inner face, the slide-blocks 75 being in engagement with curved ribs 76 carried by the brackets 25 (see Fig. 9). The slide-blocks 75 serve to support the bars 72 in proper position relative to the plow bodies while at the same time permitting the bars 72 to swing vertically about their horizontal axis defined by the bosses 73—74. By this means the pressure wheels 68 are maintained in proper position transversely of the machine relative to the furrow and the seed dropped therein.

The means for raising the rear ends of the plow beams relative to the pressure wheels 68 as above suggested, comprises a transversely-extending bar 76 mounted in hangers 77 carried by the inner longitudinally-extending bars 72. At about its middle point the bar 76[a] is provided with an arm 78 fixedly mounted thereon and pivotally connected at its upper end with a bellcrank lever 79 which is fulcrumed upon a bracket 80 carried by the transversely-extending bar 24. The other arm of the bellcrank lever 79 is pivotally connected by means of a link 81 with an arm 82 fixedly mounted upon the axle member 27, a slot 83 being provided in the connection between the link 81 and the arm 82 to provide a certain desired play between such parts. In the construction shown, the bellcrank lever 79 is in the form of a triangular bracket, but it will be understood that this is not essential. As will be readily understood, particularly from an inspection of Fig. 8, when the shaft 27 is moved in counterclockwise direction in Fig. 8 for raising the plow bodies from the ground, as hereinbefore explained, the arm 82 will likewise be given a movement in counterclockwise direction in said figure, serving after the play provided by the slot 83 has been taken up to move the link 81 toward the left in Figs. 4 and 8 for giving the bellcrank lever 79 a movement in clockwise direction in Fig. 8. This movement of the lever 79 serves to raise the bar 24 relative to the bar 76[a], serving thus to raise the rear end portions of the beams 15—16 relative to the pressure wheels 68. As is best shown in Fig. 8, the bracket 80 is provided with a set screw 84 for limiting its movement in counterclockwise direction in said figure. The downward movement of the bar 24 relative to the bar 76 is thus limited, serving thus to limit the downward movement of the rear ends of the beams 15—16 relative to the pressure wheels 68. Inasmuch as the vertical movement of the forward end portions of the beams 15—16 is effected independently of the pressure wheels 68, it will be seen that means is provided in this way for controlling the suction of the plow body. By the provision of the slot 83 in the forward end of the link 81 an adjustment of either of the axle members 26—27 relative to the rock-shaft 35 through the medium of one of the levers 40 may be effected for varying the depth of the plowing of one of the plow bodies 17 without affecting the position of the lever 79.

By reason of the form of connection employed between the pressure wheels 68 and the plow beams 15—16 through the medium of the transversely-extending bar 76[a], the

pressure wheels 68 at either side of the machine are free to move upward relative to the pressure wheels at the opposite side of the machine, the connection of the bar 76ª with the hangers 77 and with the lever 79 through the medium of the link 78 being made loose enough to permit of the desired play between the parts. In this way the framework and the operating parts taken as whole are supported evenly by the forward carrying wheels 31—32 and by the pressure wheels 68 regardless of variations in the surface conformation.

What I claim as my invention and desire to secure by Letters Patent, is—

1. In a lister plow, the combination of a frame, a plow-body mounted on said frame, axle members revolubly mounted on said frame on the same transversely-extending axis, carrying-wheels journaled at opposite sides of the frame on crank portions of said axle members respectively, a transversely-extending rock-shaft, arms mounted on said rock-shaft, links connecting said arms with the crank arms of said axle members, means for adjusting said arms radially about said rock-shaft, and means for rotating said rock-shaft for turning said axle members and effecting a vertical adjustment of said carrying wheels relative to said frame.

2. In a lister plow, the combination of a frame, a plow-body mounted on said frame, axle members revolubly mounted on said frame on the same transversely-extending axis, carrying wheels journaled at opposite sides of the frame on crank portions of said axle members respectively, a transversely-extending rock-shaft, arms pivotally mounted thereon, levers connected with said arms, means for holding said levers in adjusted position radially relative to said rock-shaft, links connecting said arms with the crank arms of said axle members, and means for rotating said rock-shaft for turning said axle members and effecting a vertical adjustment of said carrying wheels relative to said frame.

3. In a plow, the combination of two plow-beams, transversely-extending and adjustable bars connected with said beams for holding said beams in different adjusted positions, axle members revolubly mounted on said beams transversely thereof and also revolubly supported by said bars, carrying wheels journaled on offset portions of said axle members, and plow-bodies carried by said plow-beams.

4. In a plow, the combination of two plow-beams, transversely-extending and adjustable bars connected with said beams for holding said beams in different adjusted positions, axle members revolubly mounted on said beams transversely thereof and also revolubly supported by said bars, carrying wheels journaled on offset portions of said axle members, and plow-bodies carried by said plow-beams, said axle members being arranged in alinement with each other between their offset portions.

5. In a lister plow, the combination of a frame, carrying wheels mounted thereon near nears its forward end portion, plow-bodies carried by said frame at opposite sides thereof, other carrying wheels, means connecting said last-named carrying wheels with said frame at opposite sides thereof in rear of said plow-bodies and holding said wheels in position independently of each other laterally of the frame, a transverse bar operatively connected at its end portions with said rear wheels, and connections between said transverse bar and said frame for supporting a portion of the weight of the frame from said rear wheels.

6. In a lister plow, the combination of a frame, carrying wheels mounted thereon near its forward end portion, plow-bodies carried by said frame at opposite sides thereof, other carrying wheels, means connecting said last-named carrying wheels with said frame at opposite sides thereof in rear of said plow-bodies and holding said wheels in position independently of each other laterally of the frame, a transverse bar having loose operative connection with said rear wheels, and means connecting an intermediate portion of said transverse bar with said frame permitting the rear wheels at opposite sides to have vertical movement relative to each other.

7. In a lister plow, the combination of a frame, carrying wheels mounted thereon near its forward end portion, plow-bodies carried by said frame at opposite sides thereof, other carrying wheels connected with said frame in rear of said plow-bodies and movable vertically relative to said frame but held independently of each other against movement laterally, and connections between said second named wheels and said frame adapted to support a portion of the weight of the frame from said wheels but permitting the second named wheels to have vertical movement relative to each other.

8. In a lister plow, the combination of a frame, carrying wheels mounted thereon near its forward end portion, plow-bodies carried by said frame at opposite sides thereof, other carrying wheels connected with said frame in rear of said plow bodies and movable vertically relative to said frame but held independently of each other against movement laterally, a transverse bar having loose operative connection with said second named wheels at opposite sides, and means loosely connecting an intermediate portion of said transverse bar with said frame permitting the said second named wheels at opposite sides to have vertical movement relative to each other.

9. In a lister plow, the combination of a frame, carrying wheels mounted thereon near its forward end portion, plow-bodies carried by said frame at opposite sides thereof, arms pivotally mounted on transverse axes at opposite sides of said frame, carrying wheels journaled on the rear end portions of said arms, means engaging said arms serving to hold them against movement laterally of the frame, and connections between said rear wheels and said frame adapted to support a portion of the weight of the frame from said wheels but permitting the wheels at opposite sides to have vertical movement relative to each other.

10. In a lister plow, the combination of a frame, carrying wheels mounted thereon near its forward end portion, plow-bodies carried by said frame at opposite sides thereof, a pair of arms pivotally mounted on transverse axes at each side of said frame, the arms at each side of the frame having sliding engagement with fixed parts for holding the arms against lateral movement, carrying wheels journaled on the rear end portions of said arms, and connections between said rear wheels and said frame adapted to support a portion of the weight of the frame from said wheels but permitting the wheels at opposite sides to have vertical movement relative to each other.

11. In a lister plow, the combination of a frame, carrying wheels mounted thereon near its forward end portion, plow-bodies carried by said frame at opposite sides thereof, other carrying wheels mounted on said frame in rear of said plow-bodies and movable vertically relative thereto, a transverse bar having loose operative connections at its end portions with said rear wheels, and means acting upon an intermediate portion of said transverse bar for moving said frame vertically relative thereto but permitting the rear wheels at one side to move vertically relative to the wheels at the opposite side.

12. In a lister plow, the combination of a frame, carrying wheels mounted thereon and movable vertically relative thereto, plow-bodies carried by said frame at opposite sides thereof, other carrying wheels mounted on said frame in rear of said plow-bodies and movable vertically relative thereto, a transverse bar having loose operative connections at its end portions with said rear carrying wheels, and means actuated by a vertical movement of said first-named carrying wheels relative to the frame for moving the rear end portion of said frame vertically relative to said transverse bar but permitting the rear wheels at opposite sides to move vertically relative to each other.

13. In a lister plow, the combination of a frame, carrying wheels mounted thereon and movable vertically relative thereto, plow-bodies carried by said frame at opposite sides thereof, other carrying wheels mounted on said frame in rear of said plow-bodies and movable vertically relative thereto, a transverse bar having loose operative connections at its end portions with said rear carrying wheels, a bell-crank lever having pivotal connection with both said transverse bar and said frame near its rear end portion, and means actuated by a vertical movement of said first-named carrying wheels relative to the frame for turning said bell-crank lever serving to move said frame vertically relative to said rear wheels but permitting the rear wheels at opposite sides to move vertically relative to each other.

14. In a lister plow, the combination of a frame, carrying wheels mounted thereon near its forward end portion, plow-bodies carried by said frame at oposite sides thereof, other carrying wheels mounted on said frame in rear of said plow-bodies and movable vertically relative thereto, a transverse bar having loose operative connections at its end portions with said rear wheels, means acting upon an intermediate portion of said transverse bar for moving said frame vertically relative thereto but serving to permit the rear wheels at one side to move vertically relative to those at the opposite side, and adjustable means for limiting the downward movement of the frame relative to said rear wheels for regulating the suction of the plow-bodies.

15. In a lister plow, the combination of a frame, carrying wheels mounted thereon and movable vertically relative thereto, plow-bodies carried by said frame at opposite sides thereof, other carrying wheels mounted on said frame in rear of said plow-bodies and movable vertically relative thereto, a transverse bar having loose operative connections at its end portions with said rear carrying wheels, a bell-crank lever having pivotal connection with both said transverse bar and said frame near its rear end portion, means actuated by a vertical movement of said first-named carrying wheels relative to the frame for turning said bell-crank lever serving to move said frame vertically relative to said rear wheels but permitting the rear wheels at opposite sides to move vertically relative to each other, and adjustable means for limiting the movement of said lever relative to the frame serving to limit the downward movement of the frame relative to the rear wheels for regulating the suction of the plow-bodies.

16. In a lister plow, the combination of a frame, carrying wheels mounted thereon and movable vertically relative thereto, plow-bodies carried by said frame at oppo-

site sides thereof, other carrying wheels mounted on said frame in rear of said plow-bodies and movable vertically relative thereto, a transverse bar having loose operative connections at its end portions with said rear carrying wheels, a bell-crank lever having pivotal connection with both said transverse bar and said frame near its rear end portion, means actuated by a vertical movement of said first-named carrying wheels relative to the frame for turning said bell-crank lever serving to move said frame vertically relative to said rear wheels but permitting the rear wheels at opposite sides to move vertically relative to each other, and a set screw adjustably mounted in said frame in position to engage said bell-crank lever for limiting the downward movement of the frame relative to the rear wheels for regulating the suction of the plow-bodies.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."