No. 726,709. PATENTED APR. 28, 1903.

B. D. LEMERT.

DITCHING PLOW.

APPLICATION FILED SEPT. 23, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

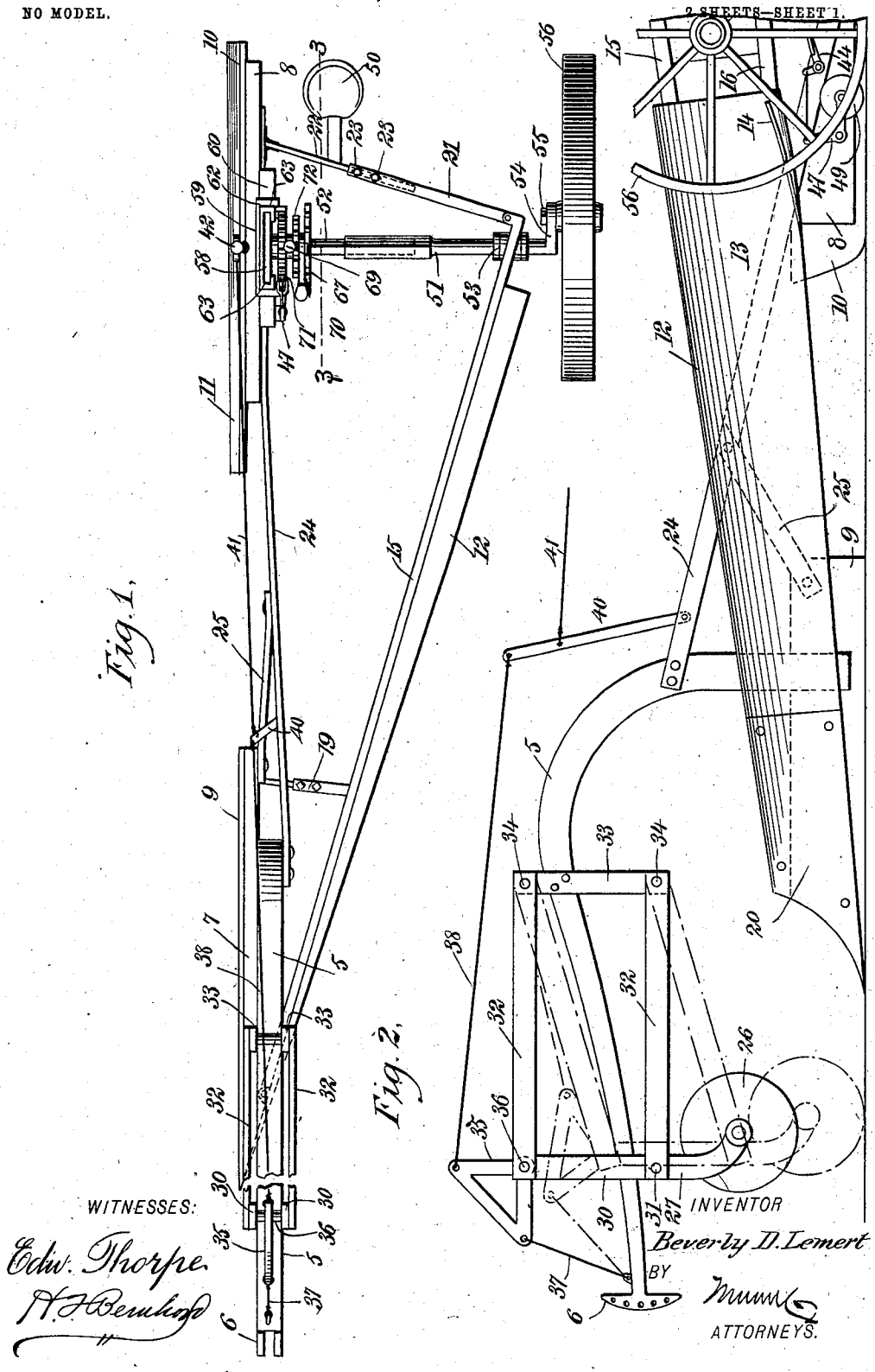


Fig. 1.

Fig. 2.

WITNESSES:

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H. J. Benning

INVENTOR

Beverly D. Lemert

BY

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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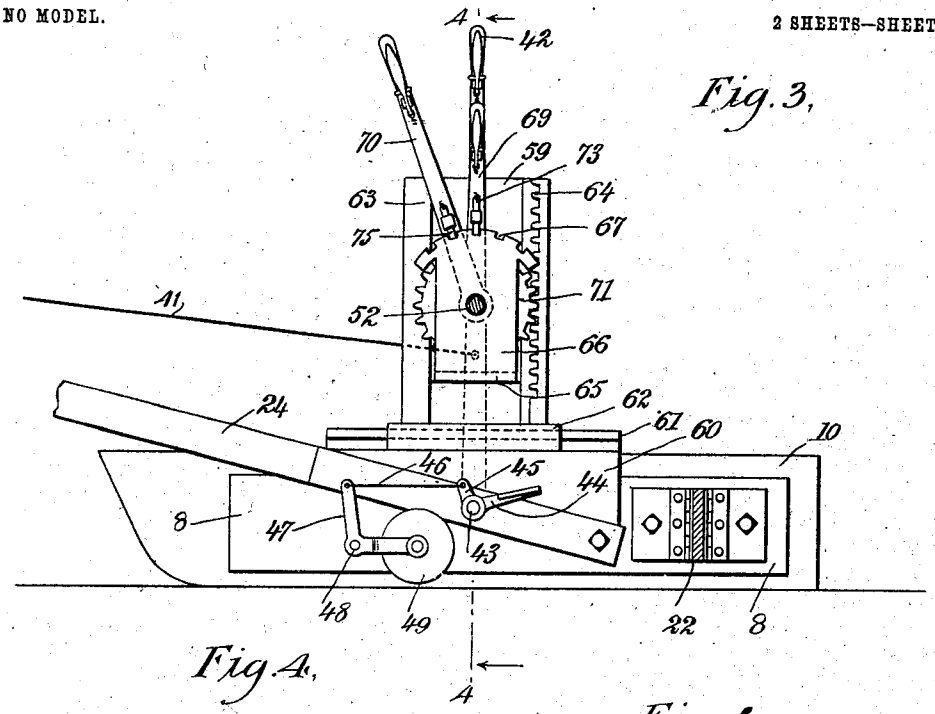


Fig. 3.

Fig. 4.

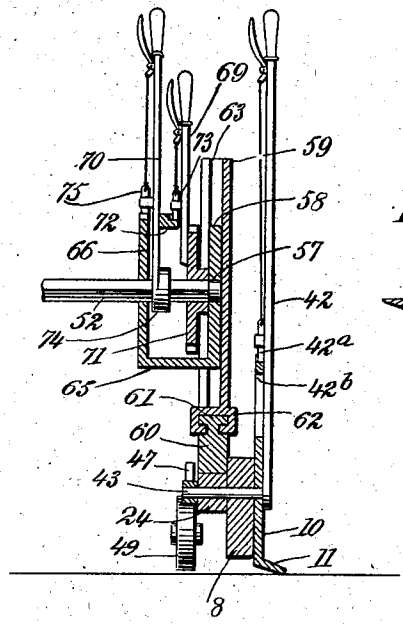


Fig. 5.

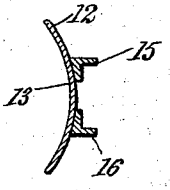


Fig. 6.

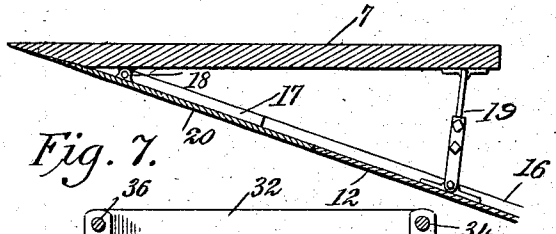
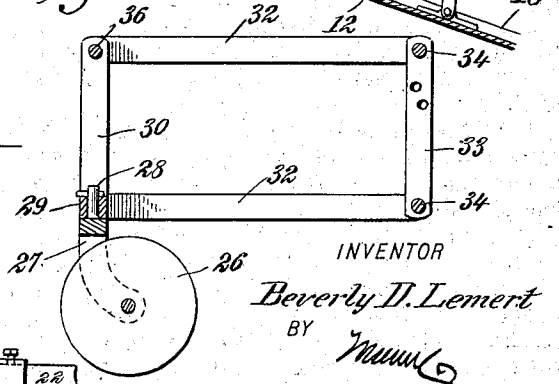


Fig. 7.



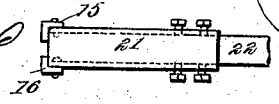


Fig. 8.

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UNITED STATES PATENT OFFICE.

BEVERLY D. LEMERT, OF FORT MORGAN, COLORADO.

DITCHING-PLOW.

SPECIFICATION forming part of Letters Patent No. 726,709, dated April 28, 1903.

Application filed September 23, 1902. Serial No. 124,509. (No model.)

To all whom it may concern:

Be it known that I, BEVERLY D. LEMERT, a citizen of the United States, and a resident of Fort Morgan, in the county of Morgan and State of Colorado, have invented new and useful Improvements in Ditching-Plows, of which the following is a full, clear, and exact description.

My invention relates to improvements in ditching-plows; and one object that I have in view is the production of a simple and efficient machine adapted to perform the work of clearing weeds and other obstructions from both field and head laterals of irrigating-ditches and for making new irrigating-ditches.

A further object of the invention is to equip a ditching-plow with an improved form of landside which is especially designed to overcome any tendency of the landside to run upward against a side of the ditch, and thereby obviate rocking or "side flopping" of the plow when equipped with an ordinary continuous landside.

A further object is to provide improved means for bodily raising the plow and adapted to support the same in an elevated position clear of the ground in order to easily transport the apparatus from one place to another or to turn the plow around, one of the supporting devices being regulatable to vary the depth of the plow-point.

A further object is to provide means whereby the width of the machine may be varied to adapt it for service in ditches of varying widths.

A further object is to provide means under control of the operator to adjust the rear part of the machine for use in ditches of deep or shallow depths.

A further object is to provide means whereby the rear axle may be rocked, extended, and shifted both laterally and angularly in order to maintain it in a level position and at right angles to the landside under all conditions or adjustments of the machine or its several parts, thus making the axle run freely and easily in its boxes and overcoming one of the serious objections to machines of this type, in which the axle is liable to bind and run unevenly in its bearings.

Further objects and advantages of invention will appear from the subjoined description, and the novelty will be defined by the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of a ditching-plow constructed in accordance with my invention. Fig. 2 is a side elevation thereof, certain parts being broken away. Fig. 3 is an enlarged sectional elevation taken in the plane of the dotted line 3 3 of Fig. 1. Fig. 4 is a section at right angles to Fig. 3, taken in the plane of the dotted lines 4 4 of Fig. 3. Fig. 5 is a detail transverse section through a portion of the moldboard. Fig. 6 is a detail horizontal section through the front landside-bar, the point, and a part of the moldboard; and Fig. 7 is a detail sectional view of the means for supporting the front caster-wheel. Fig. 8 is a detail view showing the parts comprising the extensible brace between the moldboard and one member of the divided landside.

5 designates a draft-beam which is similar to the beams used on ordinary plows, except that the arch and the draft end thereof are somewhat higher than the ordinary beams in order to secure the proper draft on the implement and to allow ample room for trash which abounds more or less in old irrigation-ditches which it may be desired to clean out. The front end of this beam is provided with a vertical elongated clevis 6, having a vertical series of apertures of any suitable number, thus making provision for the attachment of the draft appliance in a manner to suit the number of horses that may be employed in hauling the machine through a ditch.

To the rear lower end of the draft-beam is bolted a landside-supporting bar 7, the same consisting of a flat plate which is fastened at a point intermediate of its length to the beam. The landside which I employ consists of two members or sections which are disposed in substantially the same horizontal and vertical plane and are separated one from the other for a suitable distance, and one member or section of this landside is mounted on or carried by the bar 7, while the other landside member is rigidly fastened to another

supporting-bar 8, the latter being located at the rear end of the machine.

The front member of the landside is indicated at 9 and the rear landside member at 10. These two members are fastened securely to the supporting-bars 7 8, respectively, such fastening of the parts being attained by the employment of a bolt or other suitable means. The landside member 9 is a flat plate applied laterally to the bar 7 and presenting an edge to the ground. The landside member 10 is applied and arranged in a similar way with relation to the bar 8; but the rear member 10 is somewhat wider than the front member 9, the lower edge of said wide member 10 being curved or deflected laterally, so as to produce a rib or fin 11, which is adapted to ride against one of the walls of the ditch.

It will be observed that the landside is interrupted or discontinuous owing to the spacing of its members at some distance apart, as shown by the drawings, and this discontinuous construction of the landside in connection with the outwardly-trending rib or fin 11 on the rear member overcomes sidewise movement of the implement, this sidewise movement of the implement being one of the objectionable features of ordinary ditching-plows having continuous landsides.

12 designates a moldboard which extends lengthwise of the machine, said moldboard being disposed in an oblique or inclined position relative to the plane of the landside and also occupying an outwardly and rearwardly inclined position, as clearly shown by Figs. 1 and 2 of the drawings. This landside has a concave working face 13, and the rear corner of this moldboard at the lower part of the raised rear end thereof is curved upward slightly, as indicated at 14, thereby giving a twisted contour to the rear part of the moldboard, which enables it to slightly raise the soil as it travels thereover. The moldboard is supported by and attached to a frame which consists of a pair of angle-bars 15 16, which are disposed parallel to each other and arranged within the machine to correspond to the position of the inclined moldboard. These parallel supporting-bars are on the rear side or convex face of the moldboard, and the front ends of the bars are extended or prolonged beyond the lower end of said moldboard, thus making provision for the attachment of a hinge-plate 17. This hinge-plate is disposed between the parallel bars and to one side of the plane of the moldboard, and said hinge-plate extends forwardly beyond the front end of said moldboard. The hinge-plate is adapted to meet with the front end of the landside-supporting bar 7, and said plate and the bar are united pivotally or hingedly together, as at 18, thus making provision for the lateral or angular adjustment of the moldboard with relation to the front landside member. Any suitable or preferred construction of hinge-joint may be adopted, and the front landside 9 and the front portion of the moldboard are united by an extensible brace 19, the same consisting, preferably, of parts which are attached to the bar 7 and to the bars 15 16, said parts of the brace overlapping each other and fastened together in a manner to permit endwise adjustment of said brace.

20 designates a point which is disposed in advance of the moldboard 12 and lies flush therewith. The point is provided with inclined side edges which converge toward the front penetrating end of said point, the latter being beveled or tapered so as to easily clear its way through obstructions or to penetrate the soil of the ditch. The tapering point at its rear end is equal in width to the front part of the moldboard, and said point is adapted to be secured firmly to the extended front ends of the parallel angle-bars 15 16.

My invention contemplates the employment of interchangeable points, and the point which is used for cutting the soil in a manner to form a new irrigation-ditch is quite short, so that its front end will lie flush with the front landside member 9, as shown by Fig. 1. The point may, however, be modified so as to increase its length, especially when the machine is employed for cleaning out old irrigation-ditches by removing the growth of weeds or other obstructions therein. The long point which may be used is intended to be fastened to the frame formed by the angle-bars 15 16, so as to occupy a flush relation to the moldboard 12, and the active end of this long point is adapted to extend beyond the front landside member 9.

The rear ends of the angle-bars 15 16 are extended or prolonged beyond the rear end of the moldboard 12, and the angle-bars support an arm 21, the same lying at right angles to said bars at their ends. (See Figs. 2 and 8.) The arm 21 is of channeled form to receive the member 22 of the extensible brace, and this brace lies at an angle to the bars 15 16, which support the moldboard. A bar 22 is arranged between the arms 21 of the angle-bars, and one end of this bar is bolted or otherwise fastened in a secure manner to the rear bar 8, which supports the landside member 10. The arms 21 and the bar 22 form an extension-brace between the supporting-bar 8 and the angle-bars 15 16, and the member 22 of this extension-brace is fastened adjustably by the bolts 23 to the arms 21, which constitute the other member of the extensible brace, whereby the parts of the machine at the rear end thereof are connected firmly together, and provision is made for adjusting the moldboard and its supporting-bars to different angular position with relation to the divided landside, whereby the width of the machine may be varied to enable it to work advantageously in ditches of different widths.

The rear part of the plow-beam 5 and the front part of the rear supporting-bar 8 are

connected by a draft brace or rod 24, the end portions of which are rigidly fastened to said beam, and the front supporting-bar 7 is braced by a stay 25, having its upper rear end attached to the brace 24.

26 designates a caster-wheel which is journaled in the lower end of a forked hanger 27, the latter having a vertical stem 28, which is swiveled in a carrying-block 29. This carrying-block is rigidly fastened to a pair of hanger-arms 30, and these hanger-arms are pivoted, as at 31, to the front end of the four links 32, the latter being disposed in horizontal positions. One pair of horizontal links are pivoted at their rear ends to the upper ends of the vertical supporting-arms 33, the latter being fastened rigidly to the plow-beam 5 at a point intermediate of its length, and the other pair of these horizontal links are pivoted to the lower ends of the vertical arms 33, the pivotal connections of the links 32 to the vertical fixed bars being indicated at 34.

35 designates a bell-crank lever which is fulcrumed at its angle or corner on a transverse bolt 36, attached to the forward ends of the upper links 32 and the upper ends of the hanger-arms 30, and one end of this bell-crank lever is attached by a rod or chain 37 to the front part of the plow-beam, preferably at a point in rear of the clevis 6 thereof. The other arm of the bell-crank lever 35 is fastened to a rod 38, which extends rearwardly from the beam 5 and is fastened to the upper end of a lever 40, that is fulcrumed on the draft-bar 24, and from this lever 40 extends another rod 41, which is attached to an adjusting-lever 42, the latter being located at the rear end of the machine and on the outside face of the rear landside member 10. This lever 42 is rigidly fastened to a short shaft 43, which extends through a landside member 10, the supporting-bar 8, and the rear part of the draft-bar 24, so that the inner end of this short shaft 43 terminates on the inside of the machine, thus making provision for the attachment of a treadle-lever 44 to said shaft. This treadle-lever 44 is provided with a short arm 45, to which is attached a link 46, the latter being fastened to the lower end of a bell-crank wheel-hanger 47. Said wheel-hanger is pivoted or fulcrumed at 48 to the landside-supporting bar 8, and in the other arm of this wheel-hanger is journaled a carrying-wheel 49, the same being normally held by the wheel-hanger in a position raised above the lower outwardly-turned edge 11 of the landside member 10. The adjusting-lever 42 may be provided with a thumb-latch 42^a, adapted to engage with a segment 42^b, provided on the landside, as indicated in Fig. 4. The lever 42 and the treadle-lever 44 are arranged within convenient reach of a driver adapted to occupy a seat 50, the standard of which may be attached to the member 22 of the extensible brace, and the machine operator is thus able to manipulate the lever 42 by the treadle 44 in order to simultaneously adjust the caster-wheel 26 and the carrying-wheel 49. It is evident that the wheels 26 49 may be depressed for the purpose of raising the plow out of the ground, and the plow may be sustained in a raised position for the purpose of conveniently transporting the machine from one place to another or for turning the machine around. The lever 42 may also be adjusted to lower the caster-wheel 26 a limited distance, and thereby make said caster-wheel regulate the penetration of the point 20 into the soil.

51 designates an axle having an extension member 52. The member 51 is provided with a polygonal or square socket in which is slidably received the angular or polygonal axle member 52, thus making provision for endwise adjustment of the axle when the moldboard is adjusted to different inclined positions relative to the landside for the purpose of increasing or decreasing the width of the machine. The axle member 51 is journaled in an axle-box 53, which is supported between the parallel angle-bars 15 16 at a point just in rear of the moldboard 12, and the outer end of this axle member 51 is provided with a crank 54, to which is attached a stub-axle 55, adapted to carry a ground-wheel 56. The member 52 of the extension-axle is connected with the socketed member 51, so as to rock or turn therewith and at the same time be capable of a slidable movement relative thereto, and this axle member 52 is journaled in a bearing-opening 57 in a vertically-movable slide 58. This slide 58 is disposed within a vertical frame-plate 59, the latter being mounted on a horizontal guide-rail 60, which is secured firmly to the draft-bar 24 or to the rear landside-supporting bar 8. The frame-plate 59 is adjustable horizontally on the rail 60, and to operatively connect said frame-plate and the rail in a manner to permit this horizontal adjustment of the frame-plate I employ a slidable connection between the parts. The rail 60 is provided with grooves in its side faces adapted to form a T-head 61 at the upper edge of said rail, and the lower part of the frame-plate 59 is constructed with a flanged shoe 62, the latter being arranged to embrace the T-head of the rail 60, while the flanges of said shoe are received in the grooves of the rail, reference being had more particularly to Figs. 3 and 4.

The frame-plate 59 is provided at its front and rear edges with the vertical guideways 63, in which are fitted the front and rear edges of the vertically-movable slide 58, which serves as a bearing for the axle member 52, and this frame-plate 59 is furthermore provided with a toothed rack 64, the same being disposed in a vertical position at the rear edge of the plate and in rear of one of the guideways 63 thereof. The vertically-movable slide 58 is provided with a horizontal arm 65, the same extending outwardly from the plate at the lower edge thereof and sup-

porting a vertical rack-plate 66, the upper edge of which is formed with a series of notches, forming a rack 67. The rack-plate is joined by the arm 65 with the slide 58, which supports the axle member 52, and this rack-plate 66 is disposed in a lateral spaced relation to the shaft-slide 58. The parts practically constitute a single casting. The shaft-slide 58 and the rack-plate 66 are spaced far enough apart to accommodate two levers 69 70, said lever 69 being somewhat shorter than the lever 70, as shown by Fig. 4.

The short lever 69 is fastened rigidly to a gear-pinion 71, having a round opening adapted to fit on the polygonal axle member 52 for the purpose of making said pinion and the short lever 69 loose on the axle, and this gear-pinion 71 has intermeshing engagement with the rack 66 of the vertical frame-plate 59. The lever 69 is adapted to turn the pinion 71, which meshes with said stationary rack 64 for the purpose of raising the inner end of the axle and slide 58, in which the axle member 52 is journaled, thus making provision for leveling the axle under certain conditions in the service of the machine.

The long lever 70 is provided with a rack 72, with which engages a latch 73, that is carried by the lever 69, and this lever 70 is provided with a foot-piece 74, having a square opening to receive the square axle member 52, thus making the lever 70 fast with said axle. Said lever 70 is furthermore provided with a latch 75, which is adapted to engage with the rack 67 on the plate 66, that is attached to or forms a part of the shaft-slide 58, and this lever 70 is adapted to rock or turn the axle formed by the members 51 52 in a manner to adjust the crank 54 and the ground-wheel 56.

The parts of my improved machine are intended to be constructed of iron and steel; but any suitable materials may be adopted in the manufacture of the machine. The improved means for adjusting the extensible axle 51 52 enables the axle to be kept in a level condition under all adjustments of the various parts of the machine to suit ditches which may vary in width and depth and at the same time allows the axle to be brought under all conditions of service in a position at right angles to the plane of the landside, thus preventing the axle from being thrown out of line, cutting the axle-boxes 53 58, and overcoming any tendency of the machine to run untrue.

The lever 70 is adapted to adjust the crank-axle in a way to secure two objects—first, to raise and lower the rear part of the moldboard, so as to throw the dirt into any depression that exists in the ditch-bank, and, secondly, to overcome inequalities of the ground over which the wheel 56 is compelled to travel, such as back furrows, dead-furrows, ant-hills, &c. When the machine is in operation in a deep ditch, the angle of inclination of the axle 51 52 to the landside is greater than when the machine is in a shallow ditch, and to keep the axle in a level position and allow the desired movement of the parts the lever 69 may be adjusted to make the gear-pinion 71 raise or lower the shaft-slide 58 relative to the upright frame 59. When the moldboard is adjusted to change the angle relative to the landside, and thereby widen the rear end of the machine for large ditches, the angle of the axle 51 52 is changed with relation to the plane of the landside; but by moving the shoe 62 and the frame-plate 59 on the T-head of the horizontal rail 60 the axles and the parts coöperating therewith may be brought into proper position relative to the landside, so that the axles will lie at right angles thereto.

From the foregoing description, taken in connection with the drawings, it is evident that the lever 69 is employed to adjust the divided axle for leveling the same, while the lever 70 is adapted for operation in a manner to rock or turn the axle in order to raise or lower the ground-wheel 56. When the shaft is in a proper leveled condition and the latch 73 of the lever 69 is engaged with segment or rack 72 of the lever 70, any movement of the large lever 70 to raise or lower the heel of the moldboard must raise or lower the inner end of the axle correspondingly, whereby the axle is kept level and the wheel is maintained in line with or parallel to the machine.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A ditching-machine having a discontinuous landside comprising members separated by an elongated intervening space and arranged one in rear of the other, and a moldboard, a draft-beam, and a ground-wheel.

2. A ditching-machine having a landside comprising spaced members arranged one in rear of the other to leave an intervening space, said rear member of the landside being provided with a longitudinal rib which extends beyond the exposed working face thereof, a moldboard, a draft-beam, and a ground-wheel.

3. A ditching-machine having a moldboard, a landside-bar connected to said moldboard at the front end thereof, another landside-bar united to the moldboard at the rear portion thereof by an intermediate brace, a landside having spaced members fastened to the front and rear bars respectively, a draft-beam, and a ground-wheel.

4. A ditching-machine having an inclined moldboard, a front bar connected with said moldboard, a draft-beam attached to said front bar, a rear bar spaced relatively to the front bar and connected by an intermediate stay with the moldboard, a draft-bar between said beam and the rear bar, and a divided landside having disconnected and spaced members attached to the front and rear bars respectively, and a ground-wheel mounted in the rear part of the machine.

5. A ditching-machine having a draft-beam, a moldboard, a vertical bar fixed to the draft-beam, upper and lower pairs of links pivoted to said vertical bar, vertical hanger-arms pivoted to the links and supported thereby in parallel relation to said vertical bar, a caster-wheel carried by said hanger-arms, and means for adjusting the hanger-arms and the caster-wheel.

6. A ditching-machine having a draft-beam, a moldboard, vertical supporting-bars fixed to said draft-beam, horizontal links pivoted to said supporting-bars, hanger-arms pivoted to the links, a caster-wheel having a swivel connection with the hanger-arms and suspended therefrom in advance of the moldboard, a bell-crank lever fulcrumed on the hanger-arms above said beam and adjustable vertically with said arms, means connecting said lever with said beam, and a hand-lever connected operatively with said bell-crank lever.

7. A ditching-machine having a draft-bar, a landside, a moldboard, a front hanger, links connecting said hanger and the draft-beam, a caster-wheel suspended from said hanger, a bell-crank lever fulcrumed on the hanger and connected to said draft-beam, a rear hanger-lever fulcrumed on the landside and having a carrying-wheel, and a lever having operative connections with said bell-crank lever and said rear hanger-lever to simultaneously adjust the front caster-wheel and the rear carrying-wheel.

8. A ditching-machine having a landside, a draft-beam, a moldboard, a shaft mounted in the landside, a hanger pivoted on said landside, a treadle attached to the shaft and connected with the wheel-hanger, a hand-lever fastened to said shaft, a caster-wheel, means mounted on the draft-beam for adjusting said caster-wheel, a lever mounted on the caster-wheel, and adjusting devices connected with the draft-beam and said adjusting-lever.

9. A ditching-machine having a pair of parallel bars forming an inclined supporting-frame, a hinge-plate attached to the bars of said frame, an inclined moldboard provided with a concave working face and attached to said supporting-frame, a point secured to the frame and the hinge-plate and arranged flush with said moldboard, a landside hinged to said hinge-plate, and an extensible brace connecting the landside and the bars of the supporting-frame.

10. A ditching-machine having a moldboard-supporting frame, an inclined and tapering moldboard attached to the frame and provided with a concave working face, and a tapering point fastened removably to said frame and disposed in flush relation to the moldboard.

11. A ditching-machine having a landside, a moldboard connected pivotally with the front part of the landside and adjustable in a lateral direction relatively to said landside; an extensible brace having its members attached to the landside and said moldboard, an extensible cranked axle journaled in a bearing on the moldboard and extending at an angle from the landside, a ground-wheel on the outer end of the axle, means connecting the inner end of the axle with said landside, and devices whereby the axle may be rocked axially and may also be adjusted vertically relatively to the landside.

12. A ditching-machine having a landside, a moldboard adjustable laterally with respect to said landside, an extensible axle mounted in a bearing on the moldboard and extending at an angle from the landside, a ground-wheel on said axle at a point beyond the moldboard, means for rocking said axle, means connecting the inner end of said axle with the landside, means for leveling said axle relatively to the landside, and means whereby said axle may be shifted in a horizontal path substantially parallel to the plane of the landside.

13. A ditching-machine having a landside, a moldboard adjustable laterally with relation to said landside, an extensible cranked axle journaled in a bearing on the moldboard, a ground-wheel mounted on said axle at a point beyond the moldboard, means connecting the inner end of said axle with the landside, means for rocking the axle and raising or lowering the ground-wheel, and means for raising and lowering the inner end of said axle with relation to the landside to maintain the axle in a level position.

14. A ditching-machine having a landside, a moldboard adjustable laterally with respect thereto, an extensible cranked axle having members slidably coupled together, one axle member being journaled in a bearing on the moldboard, a ground-wheel mounted on the cranked portion of the axle at a point beyond the moldboard, means connecting the inner end of the axle with the landside, and separate adjusting devices for raising and lowering the inner end of the axle bodily with relation to the landside and for rocking said axle to change the elevation of the ground-wheel.

15. A ditching-machine having a landside, a moldboard adjustable laterally with respect to said landside, an extensible cranked axle carrying a ground-wheel and journaled in a bearing on the moldboard, means for rocking said axle, a shiftable axle-bearing connected with the landside and supporting the inner end of the axle, and means for adjusting the axle-bearing and the inner end of the axle in a plane parallel to the landside.

16. A ditching-machine having a landside, a moldboard adjustable laterally with respect thereto, an extensible wheeled axle journaled in the moldboard, an axle-bearing supporting the inner end of the axle and shiftable horizontally on said landside, and means for adjusting said axle.

17. A ditching-machine having a landside, an adjustable moldboard, an extensible

wheeled axle journaled on a bearing of the moldboard, an axle-bearing supporting the inner end of the axle and mounted on the landside for vertical adjustment thereon, means for raising and lowering said axle-bearing and the inner end of the axle, and means for rocking said axle.

18. A ditching-machine having a landside, a moldboard adjustable laterally with respect thereto, an extensible cranked axle having a ground-wheel and journaled in a bearing on the moldboard, a frame-plate erected on the landside and provided with a rack, a vertically-adjustable axle-bearing supporting the inner end of said axle and fitted in said frame-plate for slidable movement therein, a lever mounted on the axle and provided with a pinion which meshes with said rack, and means for rocking the axle.

19. A ditching-machine having a landside, a moldboard adjustable laterally with respect thereto, an extensible cranked axle having a ground-wheel and journaled in a bearing of the moldboard, a frame-plate on the landside, an axle-bearing supporting the inner end of the axle and slidable vertically on the frame-plate, a lever for rocking said axle, another lever connected with the frame-plate for raising and lowering the axle, and means connecting the two levers for moving them simultaneously and operate to rock the axle and adjust it vertically at one operation.

20. A ditching-machine having a landside, a moldboard, an extensible cranked axle having a ground-wheel and journaled in a bearing on the moldboard, a fixed rail on the landside, a vertical frame-plate provided with a shoe which engages with said rail, an axle-bearing slidably fitted in the frame-plate and supporting the inner end of the axle, a lever engaging with the frame-plate to raise and lower the axle-bearing and the axle, another lever on the axle having a locking device to engage with said axle-bearing, and a locking device on the first-mentioned lever to engage with a part of the second-named lever.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BEVERLY D. LEMERT.

Witnesses:
LOUIS B. HASTINGS,
JOHN I. HASTINGS.