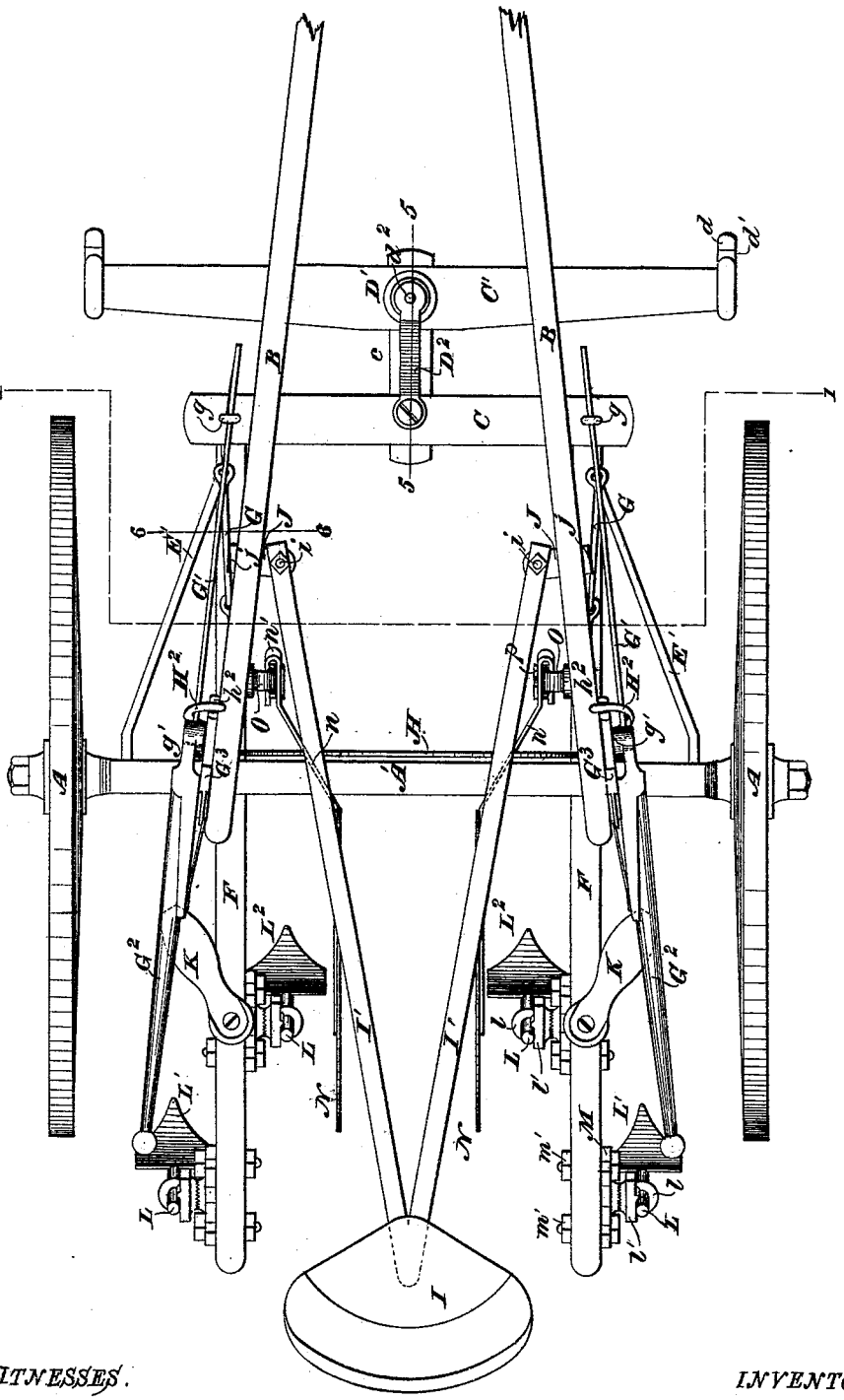
3 Sheets—Sheet 1.

J. H. JONES.

CULTIVATOR.

No. 185,932. Patented Jan. 2, 1877.

Fig 1



WITNESSES.

Wm A. Skinkle

R. Stich

INVENTOR.

J Herva Jones.

By his Attorneys

Baldwin Hopkins & Peyton

3 Sheets—Sheet 2.

J. H. JONES.

CULTIVATOR.

No. 185,932. Patented Jan. 2, 1877.

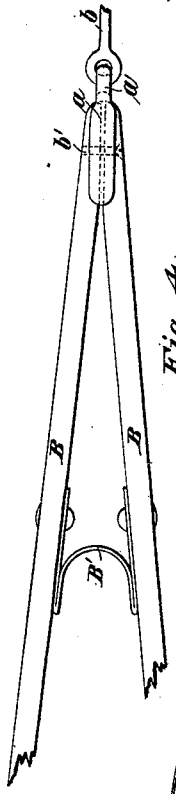


Fig 4.

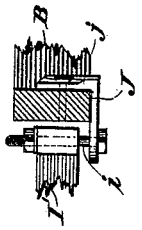


Fig 12.

Fig 5.

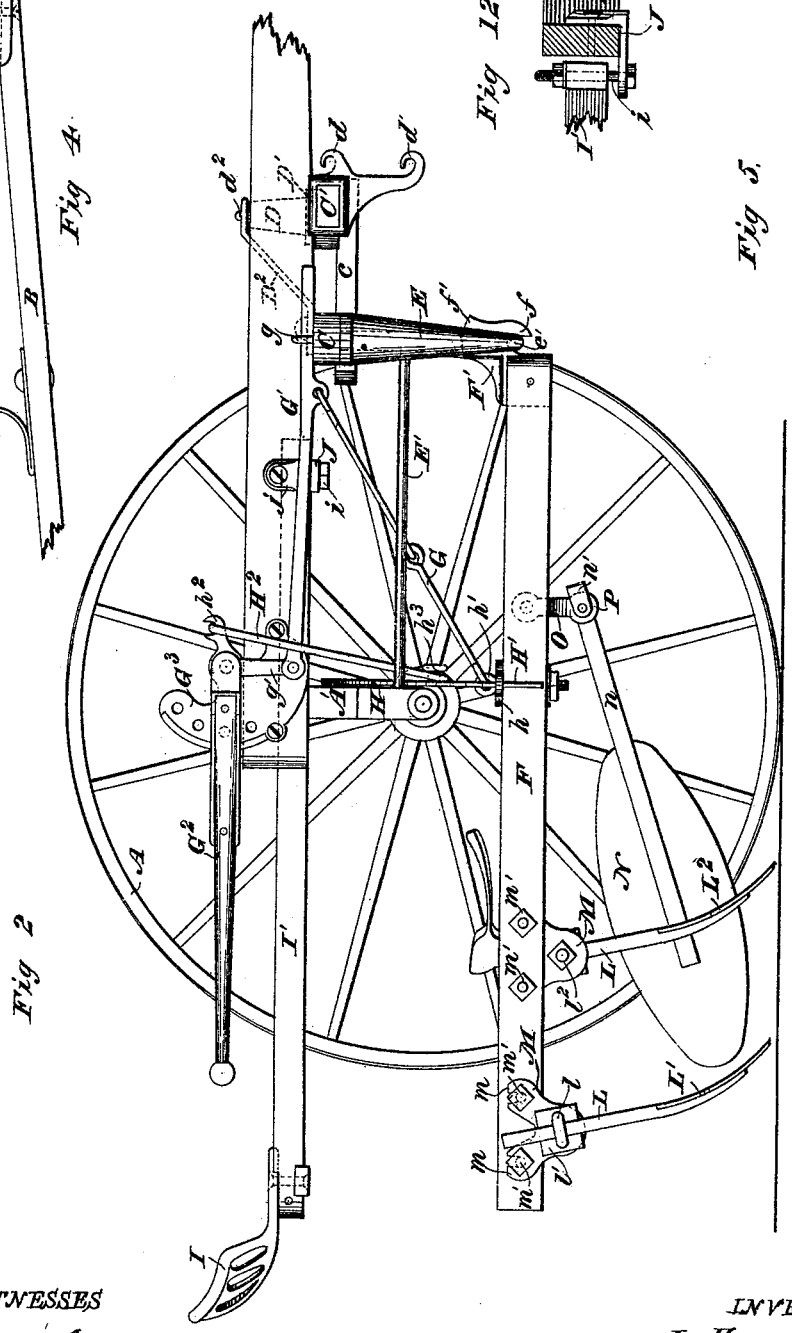


Fig 2

WITNESSES

Wm A. Skinkle

R. Skirk

INVENTOR.

J Herva, Jones,

By his Attorneys

Baldwin, Hopkins & Peyton.

3 Sheets—Sheet 3.

J. H. JONES

CULTIVATOR.

No. 185,932. Patented Jan. 2, 1877.

Fig 3

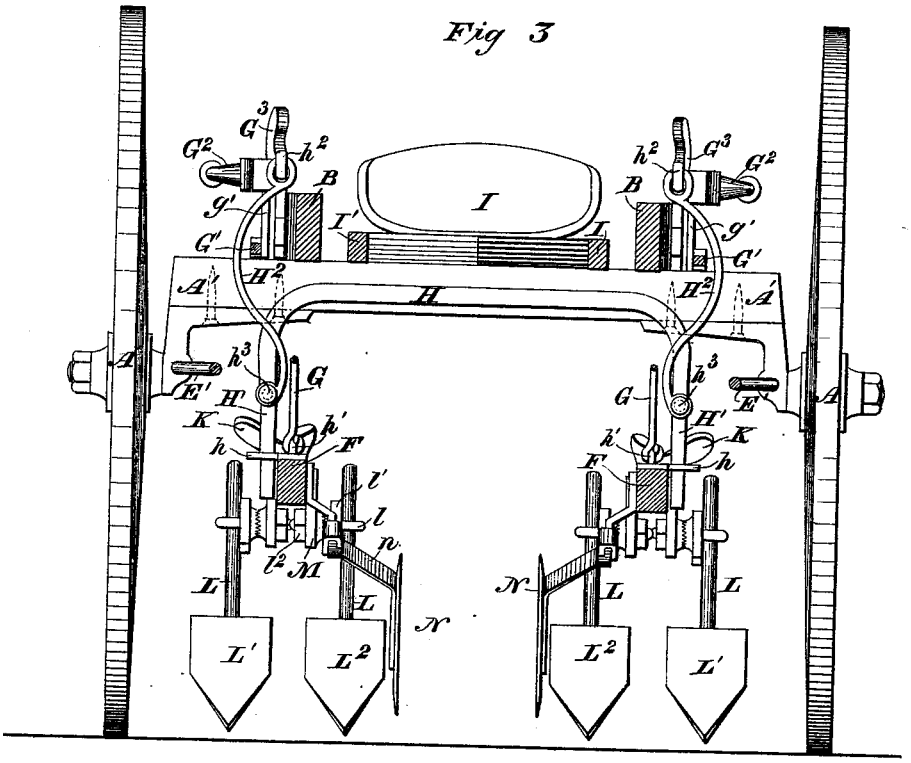


Fig 6

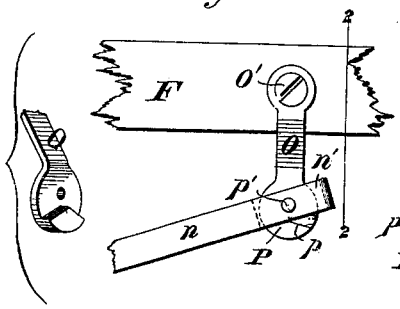


Fig 7

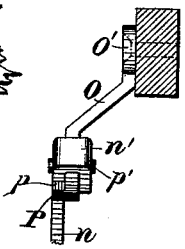


Fig 8.

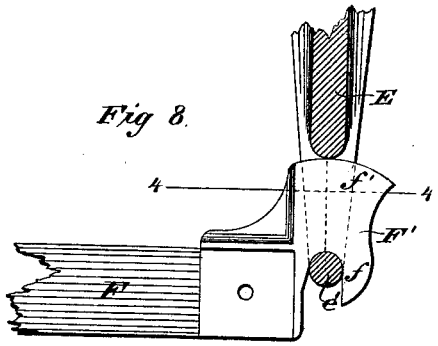


Fig 10.

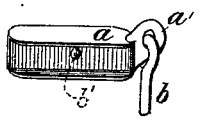


Fig 11.

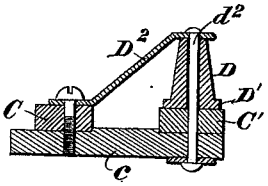


Fig 9.

WITNESSES

Wm A. Skinkle

H. Stith

INVENTOR

J Herva. Jones

By his Attorneys

Baldwin, Hopkins & Peyton.

UNITED STATES PATENT OFFICE.

JAMES HERVA JONES, OF ROCKFORD, ILLINOIS, ASSIGNOR TO RALPH EMERSON AND WILLIAM A. TALCOTT, OF SAME PLACE.

IMPROVEMENT IN CULTIVATORS.

Specification forming part of Letters Patent No. **185,932**, dated January 2, 1877; application filed October 5, 1876.

To all whom it may concern:

Be it known that I, JAMES HERVA JONES, of Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Cultivators, of which the following is a specification:

My improvements chiefly relate to a cultivator of the class known as "straddle-row" machines, which are provided with "split tongues," or those formed of two pieces converging from the axle forward to a point at which they join.

The objects of my invention are to perfect and simplify the devices by which the shovel-beams or drag-bars are connected with the main frame in such manner as to allow them free play, within certain limits, both horizontally and vertically, without possibility of their twisting or wabbling; to so connect the beams with their lifting-levers that they may be moved sidewise, substantially on a level or in the same horizontal plane throughout their movement, whether the shovels are at work or elevated; to render various working parts of the machine reversible and interchangeable; and generally to increase the efficiency of the machine.

The subject matter claimed will hereinafter specifically be designated.

The accompanying drawings illustrate all my improvements as embodied in a single machine. Obviously, however, some of the improvements may be used without the others, and in machines differing somewhat in construction and operation from that therein shown and hereinafter described.

Figure 1 represents a plan or top view of my improved cultivator, with a portion of the outer end of the tongue or draft frame broken away; Fig. 2, a side elevation of the same, with one of the supporting-wheels removed; Fig. 3, a transverse vertical section therethrough, on the line 1 1 of Fig. 1, looking from the front. Fig. 4 is a plan view of a portion of the front end of the tongue removed from Fig. 1; Fig. 5, a side elevation of a portion of the section of tongue broken away from Fig. 2. Fig. 6 is an enlarged view, in elevation, of a portion of the inside of one of the shovel-beams, showing the manner of connecting therewith one of the holders by which the arm or shank of one of the shields is secured in position; Fig. 7, a vertical section on the line 2 2 of Fig. 6, representing a front view of the connections between the shovel-beam and shield-shank. Fig. 8 is a side view, on an enlarged scale, of the front end of one of the shovel-beams or drag-bars, showing its connection with the pendant or down-hanger from the main frame, the pendant being in section in the plane of the line 3 3 of Fig. 9; Fig. 9, a view of the same parts, partly in plan, the pendant being in section on the line 4 4 of Fig. 8. Fig. 10 is a view, in perspective, of the reversible socket for the tongue. Fig. 11 is a vertical section on the line 5 5 of Fig. 1, showing the devices for securing the evener and preventing wabbling, and Fig. 12 a vertical section on the line 6 6 of Fig. 1, showing a front elevation of one of the connections between the seat-pieces and tongue-pieces.

The supporting-wheels A A are secured upon the opposite ends of an elevated cranked or bent axle, A′, as usual. The split tongue or draft-frame is formed of longitudinal pieces B B, secured at their rear ends to the axle, and converging forward therefrom to their front ends, where they join and are connected together by a metallic double socket-piece or webbed casting, *a*, which is provided at its front end with an angular projection or short inclined arm, *a′*, having a hole for the attachment of an eyebolt, *b*, to connect with the ordinary neck-yoke of the team. The sockets on either side of the central portion or web of this casting *a*, formed between the upper and lower flanges, receive the ends of the tongue-pieces, which are secured in place by means of a bolt and nut or screw, *b′*, passing through the tongue-pieces and web of the socket-piece. By removing the fastening-screw, detaching, removing, and refastening the webbed casting or socket-piece, it will be seen that the neck-yoke eyebolt may be raised or lowered to suit different teams. A brace, B′, between the side pieces of the tongue, near its front, prevents them from being injured or sprung out of place by inward pressure of the draft animals. A cross-piece, C, parallel with the axle, is secured beneath the

tongue to the opposite side pieces thereof, about in line with the front of the wheels. The evener C′ is pivoted upon a short arm or bar, *c*, secured to and projecting forward from the cross-beam C, above mentioned, of the main frame. It is provided at each end with two draft-hooks, *d* d^1, for a well-known purpose. The pivot pin or bolt d^2 of the evener is fitted above the evener with an elongated broad-based enveloping sleeve or tubular casting, D. The bottom flange D^1 of this sleeve bears upon the top of the evener, while vertical movement is prevented by means of the strap-iron or retaining-brace D^2, through which the pivot d^2 passes, and against which the top of the sleeve bears. The pivot may either be headed down upon the strap to secure it against vertical movement, or provided with a screw and nut or other well-known retaining devices, which will effectually prevent endwise movement of the long sleeve D.

It will be seen that all tendency of the evener to twist or rock vertically is effectually counteracted by means of the broad bearing of the base of the sleeve D, and that, owing to the height of this sleeve and the leverage attained thereby, there is but little strain on the strap-iron, even when the draft is applied to the lower hooks of the evener.

Secured beneath the frame cross-piece C, near the ends thereof, are two pendants or down-hangers, E E, slotted at their lower ends. The upper ends of these pendants are provided with flanges, to give them a broad bearing against the cross-beam, and admit of their being strongly secured in place by screws or otherwise. To give additional strength to the pendants, they are braced by means of diagonal bars E^1 E^1, which are connected at their front ends to the pendants, about midway of their length, and secured at their rear ends to the cranks of the axle. At either side, and projecting inward from the opposite walls of the slots in the lower ends of the pendants, are V-shaped ribs or centrally-raised projections *e e*. (See Fig. 9.) The opposite sides or branches of the pendants formed by the slots are connected at their lower ends by round cross-pieces or pins e^1. Each shovel-beam or drag-bar F is connected at its front end to its down-hanger E, so as to swing sidewise and rock vertically, and yet be incapable of twisting or wabbling to any appreciable extent, such as practically to interfere with the perfect work of the shovels by inclining or tilting them. A hooked plate, F′—one for each beam—may be secured in place by fitting its rearwardly and downwardly projecting portion in a slot in the forward end of the beam, and passing a pin or bolt through the beam and plate. The hook-plate for each beam is made of a thickness but slightly less than the opening through the pendants, or the distance between the opposite ribs of the slot-walls, and is also of a width or height sufficiently great to afford a bearing against the sides of the slot long enough to prevent any injurious wabbling or twisting of the plate therein. The hook *f*, at the under front edge of the plate, fits on the cross-piece *e′* of the pendant; and the upper edge *f′* of the plate, at and near its front end, is curved, and works during the rocking of the beam close to the central solid portion of the pendant or top wall of the slot, to prevent accidental disengagement of the hook.

In securing the hook in place, and in removing it from the slotted down-hanger, it is necessary, it will be seen, to depress the rear end of the shovel-beam to a much greater extent than is ever reached by it while the machine is in operation.

But two pieces are required to make each connection of a beam with the frame—the vertically-slotted down-hanger and the hooked plate—while leaving the beam free to be given all movements required while at work. Too great sidewise movement is prevented by the bearing of the broad-faced plates against the inclined sides of the central ribs or projections of the slots at the extremity of the movement to which it is desirable to limit the beams.

From the construction of the down-hangers, it will be noticed that they are interchangeable, and that no precautions are needed in securing them in place upon the frame, for so long as the slot is at right angles to the cross-beam either side can be placed in front.

The driver is enabled to lift and lower the shovel-beams by devices which allow the beams at all times, whether raised or lowered, to be swung sidewise substantially on a level or in the same horizontal plane.

To admit of the horizontal swing of the beams in machines like that herein represented, in which the driver's seat is mounted in rear of the axle, and the levers for controlling the beams located some distance in rear of the hinged connection between the front ends of the beams and the main frame, so as to bring the levers within easy reach of the driver in his seat, it becomes necessary to connect the upper ends of the lifting-connections of the beams with the levers by a support in advance of them and intermediate of them and said connections, so as to locate the points at which the connections are jointed at their upper ends substantially in the same vertical plane as that in which the joints between the front ends of the beams and frame are located, and thus enable the connections and beams to swing around a common, or substantially common, center. Each beam, in this instance, is connected by links G, or other suitable flexible connection, with a support, consisting of an endwise-moving rod or thrust-bar, G^1, operated by a lever, G^2. The lower end of the link-connection G, it will be seen, is secured to the beam, so as to enable it to be lifted easily, at some distance from its forward end; and from its lower end the connection extends upward and forward to the thrust-bar G^1, where it is jointed at a point over, and but slightly in rear of, a line drawn vertically

through the joint between the forward end of the beam and the down-hanger.

By this manner of connecting the beam and lifting-lever, it will be seen that when swinging sidewise the two centers upon which the beam swings are nearly in the same vertical plane, and that for all practical purposes the beam swings sidewise in a horizontal plane, or without appreciably varying the depth at which the shovels carried thereby are working. The forward end of the thrust-bar works in a suitable guide, *g*, on the cross-beam C, while its rear end is jointed to one end of a short arm or crank, *g'*, the opposite end of which is secured to the rocking hand-lever G^2. (Shown as secured by a bracket, G^3, to the outside of the tongue-piece, by the side of which the thrust-bar is located.) A suitable segmental detent and engaging devices enable the operator to hold the beam at any elevation desired. The lifting devices for both beams and the various parts connected therewith are alike, and therefore a description of such parts, as applied to the remaining beam, is unnecessary.

To cause the two shovel beams to move sidewise together they are connected by means of a yoke, H, the elevated central portion of which is parallel with the axle and extends along in front thereof, while its downwardly-projecting ends H^1 pass through slots in metallic plates *h*, (shown as held in place by the eyebolts h^1,) by which the inclined lifting-links G are secured to the beams. Thus while the beams may be raised and lowered independently of each other, they are compelled to move sidewise together. The yoke is supported and prevented from moving up and down by rods H^2 H^2, curved to pass around the thrust-bars, secured at their opposite ends, respectively, to hooks h^2 on the fronts of the brackets G^3, and headed pins h^3 on the yoke ends. These pivot-pins h^3, it will be seen, are sufficiently long to accommodate the slight oscillating movements of the yoke caused by raising and lowering the beams. By this manner of constructing the rods H^2 and locating them, the same brackets G^3 which support the lifting-levers and thrust-bars are made to sustain the yoke, while allowing free endwise movement of the thrust-bars along the outsides of the tongue-pieces and inside the rods. The location of the supporting horns or hooks h^2 leaves unobstructed the working of the levers and their retaining devices, which engage with the detents of the brackets.

The driver's seat I is mounted some distance behind the axle, upon the rear ends of two wooden spring-pieces, I' I'. These pieces converge from their front ends to the seat, and are secured at their front ends inside the tongue-pieces by means of long screw-bolts and nuts *i i*. The bolts project upward from metal brackets J J, which are adjustable back and forth upon the tongue-pieces by means of the flanges *j j*, which embrace the outside of the tongue-pieces, and screws or bolts passing through said flanges and into or through the tongue-pieces. The bolts *i i*, by which the front ends of the seat-frame are secured to the adjustable brackets, are made long enough to admit of the vertical adjustment of the seat. By screwing the nuts up or down upon these bolts it will be seen that the rear end of the seat-frame will be depressed or raised, the frame rocking upon the axle of the machine as a fulcrum. By this construction the seat can be moved forward and at the same time lowered to enable the driver, if short, to reach the foot-rests K K upon the shovel-beams, and thus enable him to control the sidewise movement of the beams, while for a taller person the seat may be moved farther back and raised by adjusting the brackets and manipulating the screw-bolts. By this adjustment not only is the driver enabled to reach the foot-rests, but the weight of the forward part of the machine and downward pressure thereon can be counterbalanced, and the driver be located in a position best suited to enable him to operate the lifting levers.

The shovel-standards L are secured to the rear ends of the shovel-beams in such manner as to admit of their ready adjustment to different inclinations thereto, and so as to allow them to swing back, when encountering unyielding obstructions, to avoid injury to the machine. Each beam in this instance carries two shovels, L^1 L^2, one secured to its inside and the other to its outside. The standards are all connected with the beams in like manner; hence a description of the attachment of one suffices for all. Each standard is directly secured by means of an eyebolt, *l*, in a groove in the outer face of a plate, l^1. The eyebolt passes through this plate and is drawn tight by a nut, l^2, on the threaded end of the bolt, which nut bears against one face of a bracket, or, as I prefer to term it, a slip-casting, M, through which the threaded end of the bolt passes. The adjusting surfaces or contiguous inner faces of the slip-casting M and plate l^1 are of circular outline and serrated or indented, as shown. Thus, when the bolt is drawn tight by its nut, the standard, plate, and bracket or slip-casting are locked firmly together. By loosening the nut the serrated faces may be turned upon each other to adjust the inclination of the standard. The slip-casting M is formed with two upwardly-projecting inclined arms, *m m*, slotted as shown, to receive the headed bolts m^1 m^1, which pass through the beam and are drawn tight by the nuts on their opposite threaded ends. The serrated portion of the slip-casting or bracket M, it will be seen, projects downward below the beam so that the eyebolt *l* passes through it beneath and clear of the beam, thus admitting of the adjustment of the standard without disturbing the bracket. Moreover, by thus lowering the serrated face of the bracket the shovel-beam may be swung higher than usual, and the driver's seat

correspondingly raised. I am also enabled to use a shorter shovel-standard than could be employed were it secured higher on the bracket or directly to the side of the beam; smaller and consequently cheaper iron may be used to form the standard than is needed for a long one; and the short standard may be adjusted or slanted forward much nearer to a horizontal position than a long standard could be, without throwing the shovel and foot of the standard forward to an objectionable extent. The range of adjustment of the standard is therefore increased by shortening it and lowering its point of attachment to the bracket. The slotted arms of the pendent slip-casting, it will be observed, are of equal length and radiate from a common center, the centers of the slots therein being equal distances from the eyebolt *l*, by which the shovel-standard is secured in place. Thus it will be seen that these slip-castings are all alike, and that they are interchangeable, as the same one may be used either inside or outside the beam. When an obstacle is encountered the forward arm of the casting slips from its retaining-bolt, being held by friction only, and the casting swings back on the rear arm. As soon as the obstacle is passed the casting is again adjusted as before.

Shields or guards N N for protecting the plants from the earth, stones, &c., turned up by the shovels, are located, as usual, inside the inner shovels. These shields are elliptical or oval in form, as shown, and are removably connected to the shovel-beams. They are both reversible and interchangeable, and are secured in place so as to be free to rock vertically within certain limits and accommodate themselves to inequalities in the surfaces over which they move. The shields are exactly alike, and the manner of attaching both the same. Their bent shanks *n n* extend forward and sidewise, and each is provided with a hook or loop, *n'*, at its end, to embrace a pendent bracket or holder, O, one for each beam. The holders are each secured to the inside of its beam by means of a screw-bolt and nut or screw, O', by loosening and tightening which the holders may be inclined by swinging to adjust their elevation, and secured in the desired position. The hooks *n'* clasp the pendants O O, and each of the shanks *n* rests at its forward end, when the shields are depressed to their lowest limits, upon the rear side of the double incline or centrally-projecting ∧-shaped upper surface *p* of the inwardly-projecting lower end P of the pendent holder. A pivot-pin, *p'*, serves to secure the shank to the holder, and allow it to rock. The pivots *p'* should be secured in place so as readily to be detached when it is desired to remove or reverse the shields.

It will be seen that both the upper and lower edges of the shield are alike, and that either edge can be used as a cutting or working edge. When the edge of either or both shields becomes worn or battered, they are each detached, turned, and secured in place upon the opposite beam. The holders are likewise interchangeable, and, by means of their double inclines, prevent the shields from entering the soil too far, alike when applied to either beam.

The operation of my improved machine will readily be understood from the foregoing description.

Various modifications thereof may be adopted without departing from the spirit of my invention—such, for instance, as forming the cross-beam C of the main frame with slots or forward bends at the points where the thrust-bars cross it, and attaching the lifting-connections farther forward to these bars, so that when the beams are lowered and the shovels at work (the time when it is important that the beams should swing sidewise horizontally instead of describing a vertical curve) the points of connection between the links G' and thrust-bars will be brought directly over the joints between the front ends of the beams and the down-hangers. A like result would be produced by declining the downhangers backward; but the construction shown answers well in practice, the very slight difference in the depth at which the shovels work, caused by swinging the beams to their extreme limit, being immaterial, the depth at which they work being substantially the same throughout their swing.

It is also obvious that the shields may be made of a semi-elliptical form—that is, with their rear ends of a different form from that shown, and that a single incline on the holder-projections would answer for the attachment of the shield-shanks, and admit equally well of the interchanging of the shields.

I claim as my invention—

1. The combination of the evener, provided with double draft-hooks, the pivot-pin connecting it to the machine, the elongated broad-based tubular sleeve enveloping the pivot-pin and bearing upon the upper surface of the evener, and the strap-iron or brace, these members being constructed and operating as set forth, for the purpose specified.

2. A down-hanger for the attachment of the shovel-beam, constructed as described, adapted to be secured at its upper end to the frame of the machine, slotted at its lower end, provided with V-shaped ribs or centrally-raised projections upon the opposite sides or inner walls of its slot, and a cross-piece or pin spanning the slot at its lower end, for the purpose specified.

3. The broad-hooked plate, adapted to be secured to the shovel-beam, constructed, as described, with a hook at its under front edge, and having its upper edge curved from the front backward, for the purpose specified.

4. The combination, substantially as hereinbefore set forth, of the slotted internally-ribbed down-hanger, its cross-pin, and the broad hooked plate secured to the shovel-beam, fitting in the slot in the down-hanger, between the vertical centrally-projecting ribs

thereof, and resting upon the cross-pin, whereby, while allowed to swing sidewise and rock vertically, the beam is prevented from wabbling, as set forth.

5. The combination of the shovel-beam, hinged at its front end to the machine, a lever for raising and lowering said beam, located upon the machine in rear of the point at which the shovel-beam is hinged, and the lifting-connection secured at its lower end to the beam, remote from its front end, and at its opposite end attached at a point substantially in the vertical plane of the said hinged connection between the beam and frame, to a support operated by the lever, these members being constructed and operating substantially as hereinbefore set forth, whereby the beam, in swinging sidewise, moves substantially in a horizontal plane, and the depth at which the shovels are working at the beginning of said movement sidewise remains unchanged.

6. The combination of the down-hanger, the shovel-beam hinged thereto, the lifting-connection, the thrust-bar, and the lifting-lever, these members being constructed and operating substantially as hereinbefore set forth.

7. The combination of the hinged shovel-beams, the lifting-levers, their supporting detent-brackets, the thrust-bars, the lifting-connections between the thrust-bars and the shovel-beams, the yoke connecting said beams and the curved rods passing around the thrust-bars, secured at their upper ends to the lever-supporting brackets, and at their lower ends jointed to the yoke, these members being constructed and operating substantially as hereinbefore set forth, whereby the levers and the yoke are both supported by the detent-brackets without interfering with the movements of the yoke, levers, or thrust-bars.

8. The combination, as hereinbefore set forth, of the shovel-beam, the bracket, yieldingly attached, by its upper portion, to said beam, and having a serrated face upon its lower pendent portion, which projects below the beam, the grooved and serrated plate, the short shovel-standard, and the eyebolt and nut by which the standard is secured in the groove of said plate and the serrated face of the plate secured to the corresponding face of the pendent portion of the bracket beneath the beam, whereby a high-swung beam may be employed, a saving is effected by reducing both the length and size of the standard, and the range of adjustment of the standard is increased, as set forth.

9. The slip-casting or bracket M, constructed as described, centrally perforated for the passage of the shovel-standard eyebolt, and provided with two inclined arms of corresponding length, radiating from its center and slotted at their outer ends, whereby the casting is adapted to be secured to the beam upon either side, with either arm in advance, in the manner and for the purpose described.

10. The combination of the shovel-beams, the slip-castings, their inclined slotted arms, the bolts passing through the slots and beam, their nuts, and the shovel-standards connected with the castings, these members being constructed and operating as set forth, whereby the castings are rendered reversible and interchangeable, adjustment of the inclination of the standards independently of the castings admitted, and injury to the machine avoided.

In testimony whereof I have hereunto subscribed my name.

J. HERVA JONES.

Witnesses:
E. H. THOMPSON,
JOHN SEGUS.