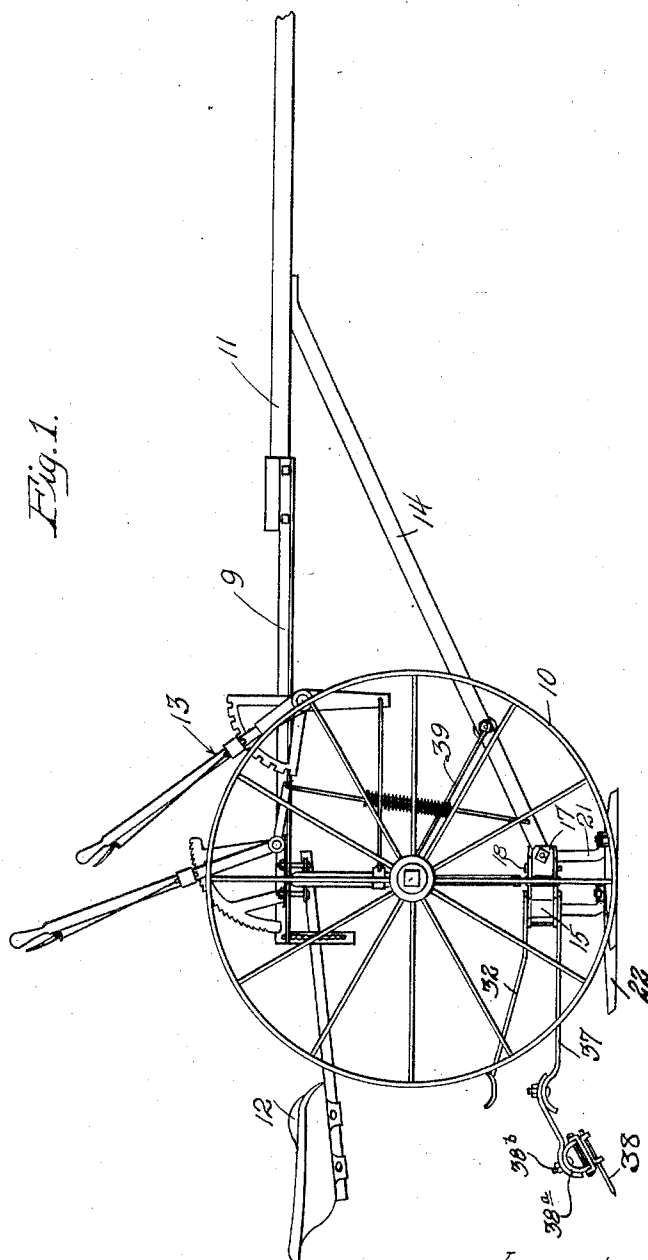


1,009,663.

R. W. E. HAYES.
CULTIVATOR.
APPLICATION FILED FEB. 24, 1911.

Patented Nov. 21, 1911.

4 SHEETS-SHEET 1.



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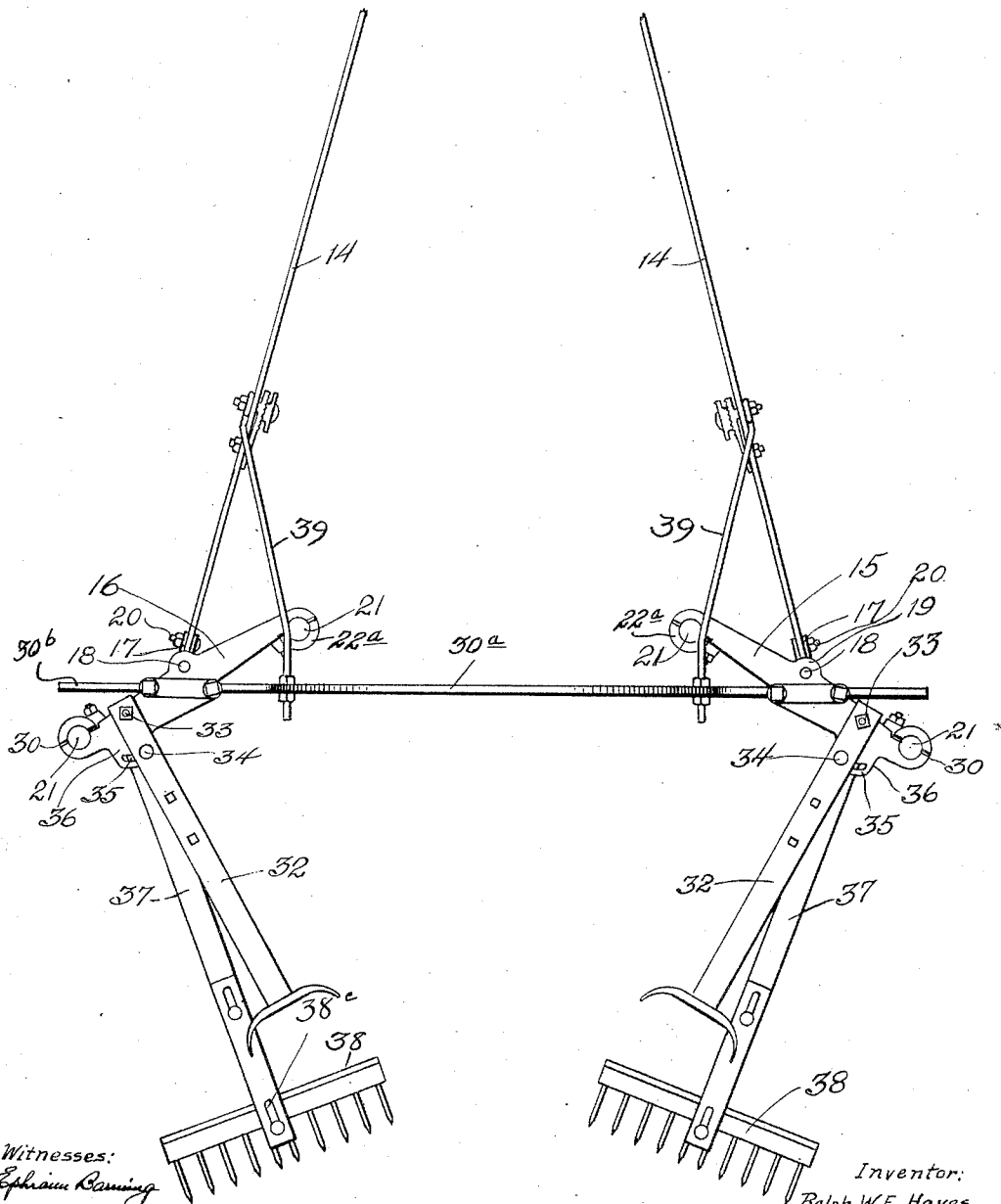
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4 SHEETS—SHEET 2.

Fig. 2.



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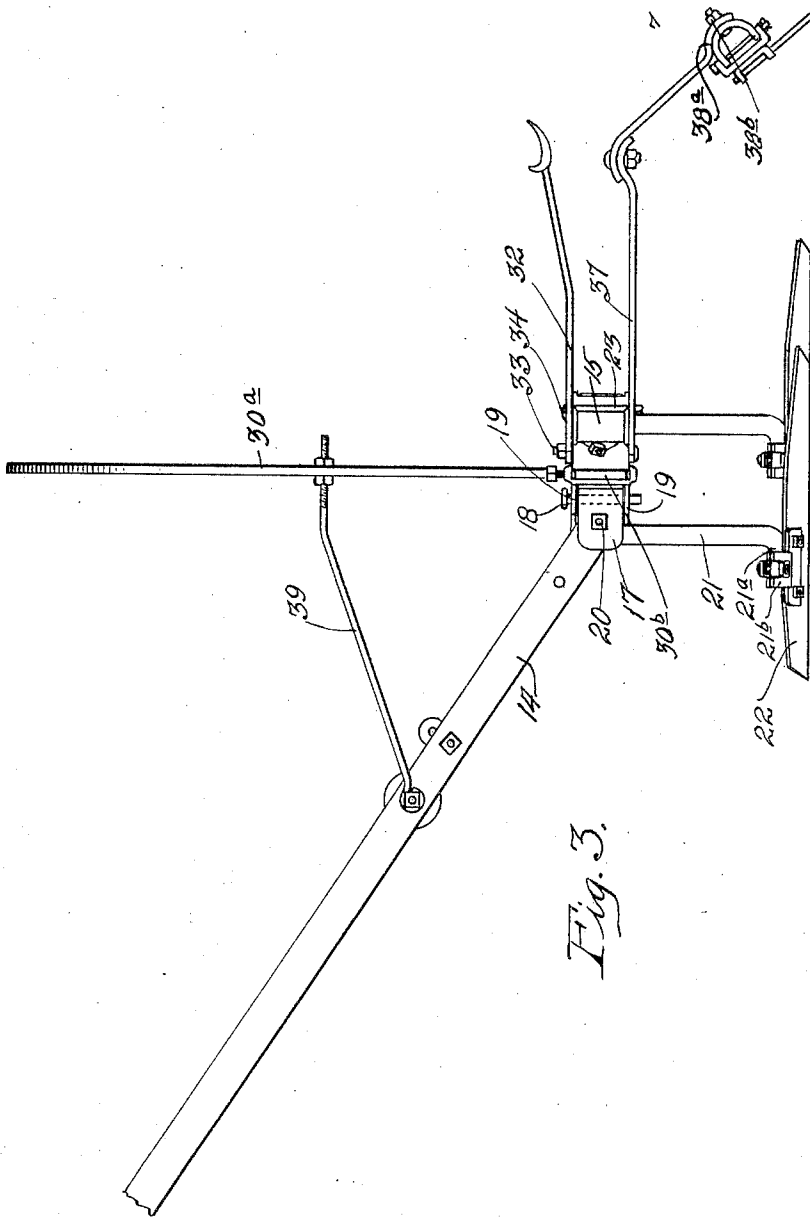
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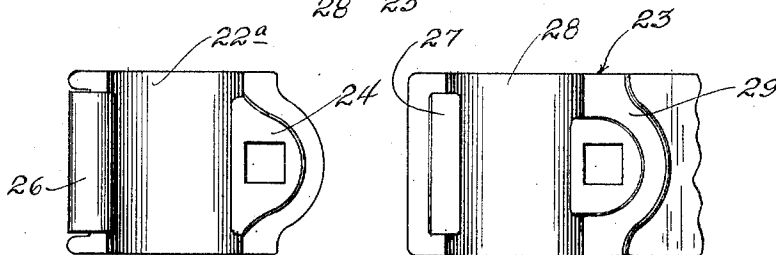
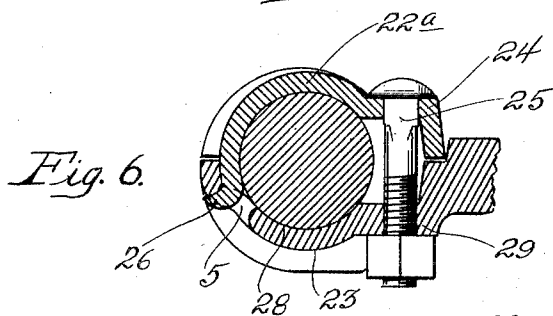
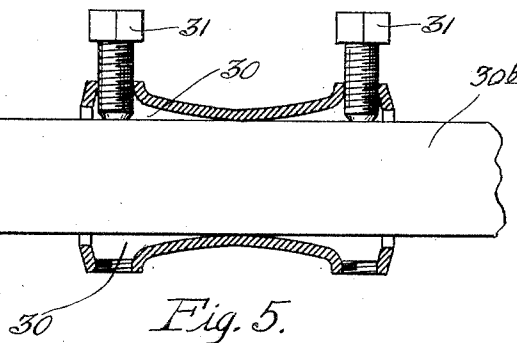
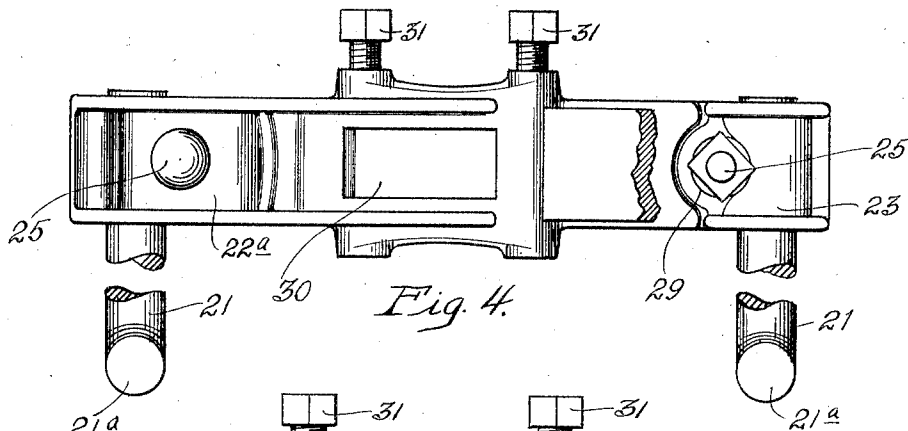
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4 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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CULTIVATOR.

1,009,663.

Specification of Letters Patent.

Patented Nov. 21, 1911.

Application filed February 24, 1911. Serial No. 610,649.

To all whom it may concern:

Be it known that I, RALPH W. E. HAYES, a citizen of the United States, residing at Galva, in the county of Henry and State of Illinois, have invented certain new and useful Improvements in Cultivators, of which the following is a specification.

This invention relates more particularly to a casting which forms a mounting for an arch connecting frame, and which also forms a mounting for the shovels and rakes.

One object of the invention is to so construct this casting that it is reversible, thereby enabling one casting to serve for use on either side of the arch connecting frame.

Further objects of the invention are, to provide means for enabling an adjustment of the arch frame transversely or longitudinally of itself; to provide for an adjustment of the foot levers and rake members with respect to the casting; to so position the foot lever with respect to the pivotal center of the casting that an efficient leverage will be obtained when it is desired to move the shovels to enable them to dodge an obstruction; and to provide a brace between the bar attached to the tongue of the cultivator and the arch member, which brace will be secured to each of these members at a point remote from their juncture, thus increasing the rigidity and strength thereof.

The invention further consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of the assembled cultivator having embodied therein the improvements of the present invention; Fig. 2, a plan view of the arch frame and the castings in which it is mounted, and also showing the shovels and rakes in operative position; Fig. 3, a side elevation of the parts shown in Fig. 2; Fig. 4, a front elevation of the casting which forms the mounting for the arch member, rakes, and shovels Fig. 5, a sectional detail through one of the castings showing the slot in which the end of the arch member is mounted; Fig. 6, a sectional detail showing the method of securing the stem upon which the shovels are mounted; Fig. 7, a face view of one portion of the locking members for holding the

shovels in position; and Fig. 8, a face view of the other portion of the locking member for holding the shovels in position.

The device comprises a framework 9, to which is secured the ordinary traction wheels 10 and tongue 11. The framework and the method of securing the wheels and tongue thereto are of any of the ordinary and well known types at present in use and do not constitute a part of this invention. Carried by the frame 9 is a seat 12, as is usual and well known in constructions of this character. Adjustment of the framework about the axial center of the wheels 10 is accomplished in the usual and well known manner, through the medium of lever and segment mechanism 13.

Secured to the tongue 11 are companion bars 14 extending upon opposite sides of the tongue; and, as shown in Fig. 2, one end of one of the bars is connected to a casting 15 and the end of the other bar is connected to a casting 16. Each of these castings is similar in construction and it is thought that a description of one, together with the various functions performed thereby, will be sufficient for the purpose of describing the present invention. Hence, hereinafter when the term "casting" is used, it is understood that reference is not being made to a single casting, but is being made to each casting of the pair which is employed with the device. Indeed, I consider one feature of my invention to lie in the peculiar and novel construction of the casting, which enables it to be interchangeable and adapted for use upon either side of the machine; that is to say, which can be used on either the right or left hand side of the arch member. This is an important point in devices of this nature, because of the fact that it reduces materially the cost of construction, being all made from the same pattern, and whenever a dealer has two castings on hand, he has a complete equipment for a machine. Obviously, if the castings were of different types, it would frequently happen that the dealer might find himself well supplied with those adapted to be used on one side of the arch, but lacking in those adapted to be used on the opposite side. It will thus be seen that

material advantages would arise from the employment of a single form of casting for use on either side of the machine.

The bars 14 are connected to the castings by means of a U-shaped strap 17, which surrounds a pin 18 extending through oppositely disposed ears 19 formed with the castings; and a pivotal connection between the casting and the bars 14 is effected by means of a bolt or other suitable device 20 which extends through the strap 17 and the bar 14, as best shown in Fig. 3. This connection serves to enable a vertical pivotal movement between the bar and casting, since the strap is so secured to the casting as to prevent vertical pivotal movement between these two parts. Adjacent the outer edges of the castings are secured companion rods or stems 21, which are provided with horizontally extending ends 21^a adapted to receive a clamping member 21^b secured to the shovels 22, the shovels being of any ordinary and well known type adapted to perform the work allotted to devices of the nature of the present invention.

The stems 21 are held between a fixed clamping member 23, formed integral with the casting, and a movable clamping member 22^a formed separably from the casting, as best shown in Figs. 6 and 8. The movable clamping member comprises a semi-circular collar, which, at one end, is provided with an ear 24 adapted to receive a bolt 25, and at its other end with a lug 26, which is adapted to be inserted through a slot 27 formed adjacent the edge of the fixed clamping member; and the lug 26 is of a formation, as best shown in Fig. 6, so that when it is inserted into the slot it will lie behind the metal forming the end of the fixed clamping member and be interlocked therewith.

The fixed clamping member comprises a semi-cylindrical recess 28 adapted to cooperate with the recess of the clamping member 23 and form a seat for the reception of the upper end of the stem 21; and the fixed clamping member terminates, at its inner end, in an ear 29, registering with the ear 24, the bolt 25, when the device is assembled, passing through both ears, and thus forming a secondary means for locking the two clamping members together and securing the stem 21 in position.

The casting is provided with a slot 30, which, as shown in Figs. 2 and 4, extends through the casting at an angle with respect to the body portion thereof; hence, when the arch member 30^a is setting at right angles to the direction of movement of the cultivator, the casting will be lying at an acute angle thereto, whereby the shovels will be placed out of alinement with one another and will lie at an angle with respect to the movements of the cultivator.

As shown in Fig. 5, the slot 30, through

which the ends 30^b of the arch 30^a are entered, is of a curved formation, the distance between the upper and lower edges being less at the center than at the ends. This provides a space at either end of the slot between the upper and lower walls and permits of movement of the end of the arch within the slot for purposes of adjusting the arch with a movement horizontally. This adjustment is performed by means of companion set screws 31 which find a bearing in the upper walls of the slot, extend into the slot, and rest against that portion of the arch lying therein, at points upon opposite sides of the center of the slot. As shown in Fig. 5, openings are made at the top and bottom of the walls of the slot to receive these set screws, but the screws are only entered into the top walls, the holes in the bottom walls being provided so that when the casting is turned upside down for use upon the opposite side of the arch, a bearing for the screws will be provided.

As shown in Fig. 5, by loosening the screw upon the right hand side and lowering the screw upon the left hand side, the outer end of the arch will be forced down thus lifting that portion of the arch lying outside of the casting upward. If the reverse movement of the screws is effected, the inner end of the arch, or that portion lying to the inner side of the center of the casting, will be thrown downward and the body portion thrown downward therewith, the arch in its movement in either direction rocking about the center of the curve at the center of the walls of the slot. Hence, by means of this peculiar formation of slot and by providing set screws, movement of the arch into and out of the slot, or vertically of itself, is permitted, this being done by loosening both screws and sliding the end of the arch in the slot; and also movement of the end of the arch up and down within the slot, or horizontally of itself, is permitted by means of loosening one of the screws and tightening the other. Thus an adjustment of the arch both ways is possible without removal from the casting.

Secured to the casting is a foot lever 32 attached by means of a bolt 33 and a bolt 34, the latter lying within a slot 35 formed in an ear 36 extending from the upper face of the casting. The slot 35 is provided so as to enable adjustment of the foot piece with respect to the casting, whereby it will extend out therefrom at any angle desired.

The foot piece is for the purpose of moving the shovels to enable them to dodge obstructions, which movement is provided for in all machines of the class to which that of the present invention belongs; but it will be noted that the foot piece in the present invention is secured at a point outside of the supported center of the casting, lying, as

shown more clearly in Fig. 2, outside and to the rear of such supported point. Hence, when pressure is applied to the foot piece for the purpose of moving the shovels, a greater leverage is obtained, the usual method employed in all devices, so far as I am aware, being to secure the foot lever within the point of support for the castings, which position evidently would not give as great a leverage as that of the present invention, being nearer the fulcrum point.

Positioned below the foot lever is a bar 37, which is secured to the casting by means of the bolt 33 and a bolt and slot connection similar to the bolt and slot connection 34 and 35 heretofore described, and to the bar 37 is secured an implement 38, which, as shown, is in the form of a drag or rake, and is utilized for the purpose of leaving a level cultivation. The instrument is mounted within a semi-cylindrical seat 38^a formed on the end of the bar 37, and is adjustable within said seat by means of a bolt 38^b operating within a slot 38^c; and these means, shown in Fig. 3, are provided for adjusting the member 38 so that it may be inclined at any angle desired with respect to the ground line. The arch member is secured to the bars 14 by means of a tie rod 39, as best shown in Fig. 3. It will be seen from this figure that the tie rod is secured to the arch member and to the bar 14 at a point removed from their ends, and thus forms a strong and efficient brace.

As shown in Fig. 2, the castings 15 and 16 are at an angle with respect to the arch member, and the shovels when mounted in position lie at right angles to the casting; hence, the shovels are positioned so that the inner ends of each shovel of the pair of shovels lying upon each side of the arch extend toward the shovels lying upon the opposite side of the machine, and thus a cut of considerable width is effected, and each shovel is lying in such relation with respect to the other shovel constituting the pair as to cause the cuts produced by each of the shovels to overlap one another, so that a cut is produced on each side of the machine of substantial width.

It will be noted that the foot levers are actuated by a direct downward thrust from the foot of the operator, and this thrust tends to embed the underlying pair of shovels more deeply in the ground on the side of the depressed lever, which forcing of this pair of shovels more deeply in the ground increases the resistance on such pair of shovels and causes the arch frame and connections to swing toward the side of the more deeply depressed shovels, thereby permitting the movement of the shovels necessary to enable them to dodge an obstruction. The foot levers in each case are connected at points outside of the points of suspension for the

frame, so that when the foot lever on one side of the machine is forced down, the arch frame and connections will swing from their points of suspension, and the farther point of suspension will afford a fulcrum, which method of applying the power increases the leverage as compared with a construction in which the foot levers act at points intermediate the two points of suspension.

I claim:

1. In a cultivator, the combination with an arch frame, of a casting, said casting having a slot extended therethrough and adapted to receive the end of the arch, means for permitting of the adjustment of the arch transversely and longitudinally of itself without removal from the casting, substantially as described.

2. In a cultivator, the combination with an arch frame, of a casting, said casting having a slot extending therethrough and adapted to receive the end of the arch, the upper and lower walls of said slot sloping outward in both directions from the center, whereby a space is provided at each end of the slot to permit of horizontal adjustment of the arch frame, and means for performing such adjustment, substantially as described.

3. In a cultivator, the combination with an arch frame, of companion reversible castings, constituting a mounting for said frame, companion stems serving as a mounting for the shovels, clamping members for securing said stems, consisting of a member fixed to the casting and a movable member independent of the casting, said members being adapted to interlock, and means for locking the clamping member in position, substantially as described.

4. In a cultivator, the combination of an arch frame, a member serving as a connection between the arch frame and shovels, means for pivotally mounting said member, a foot lever for actuating said member around a pivotal center and located outside of the point of suspension for said member, substantially as described.

5. In a cultivator, the combination of a casting serving as a support for an arch frame and as a support for the shovels, a pin carried by said casting and located at a point approximately the center thereof, a strap surrounding said pin, a bar attached to the tongue of the cultivator, a pivotal connection between the strap and bar, providing a center about which the casting is swung, and a foot lever attached to the casting at a point midway its outer end and pivotal center for swinging the casting about its pivotal center, substantially as described.

6. In a cultivator, the combination with an arch frame, of companion reversible castings, constituting mountings therefor, means

upon said castings for holding the shovels in place, a bar secured to the tongue of the cultivator, an adjustable connection between the casting and bar, and foot pieces for
5 swinging the casting about its pivotal center, secured outside the points of suspension, substantially as described.

7. In a cultivator, the combination with an arch frame, of a casting having a slot
10 extending therethrough and adapted to receive the end of the arch, the upper and lower walls of said slot sloping outward in both directions from its center, whereby
15 a space is provided at each end of the slot to permit of horizontal adjustment on the arch frame, companion adjustable members located at either side of the center of the slot and mounted within the walls of the
20 slot and serving as a means for locking the arch member in its adjusted position, substantially as described.

8. In a cultivator, the combination with an arch frame and a bar secured to the

tongue of the cultivator, of a connection between the arch and bar, consisting of tie
25 rods, extending diagonally between the arch and bars, substantially as described.

9. In a cultivator, the combination with an arch frame, of means for suspending the arch frame on opposite sides of its central
30 point, a pair of foot levers for swinging the arch frame laterally with respect to the longitudinal center of the machine, said foot levers being located in each instance
35 outside of the points of suspension for the arch frame, thereby increasing the leverage of the respective foot levers, and a pair of rearwardly converging shovels tending to throw the arch frame laterally toward the
40 side of the shovel more deeply depressed by the foot lever, substantially as described.

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