

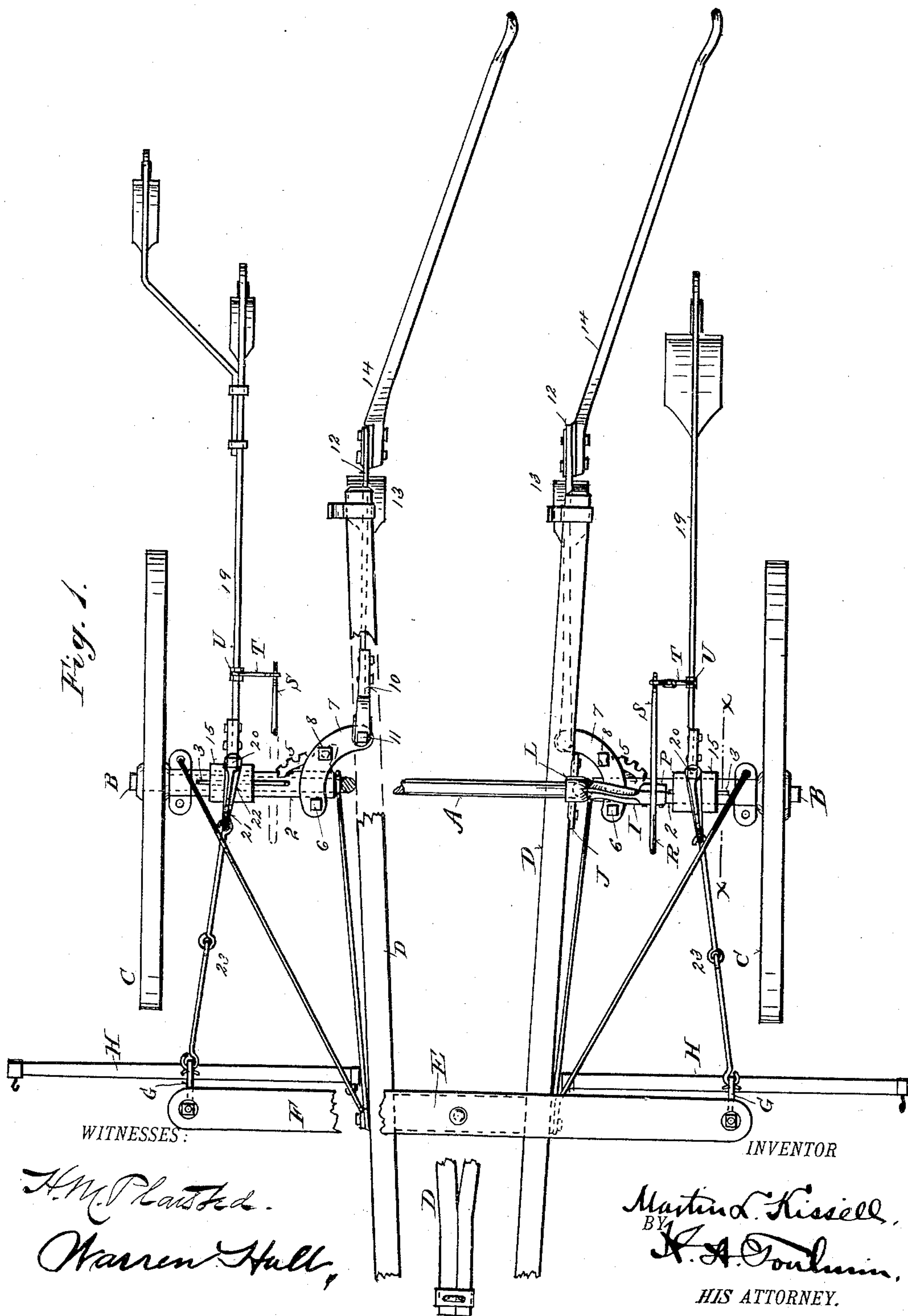
(No Model.)

3 Sheets—Sheet 1.

M. L. KISSELL.
CULTIVATOR.

No. 453,010.

Patented May 26, 1891.



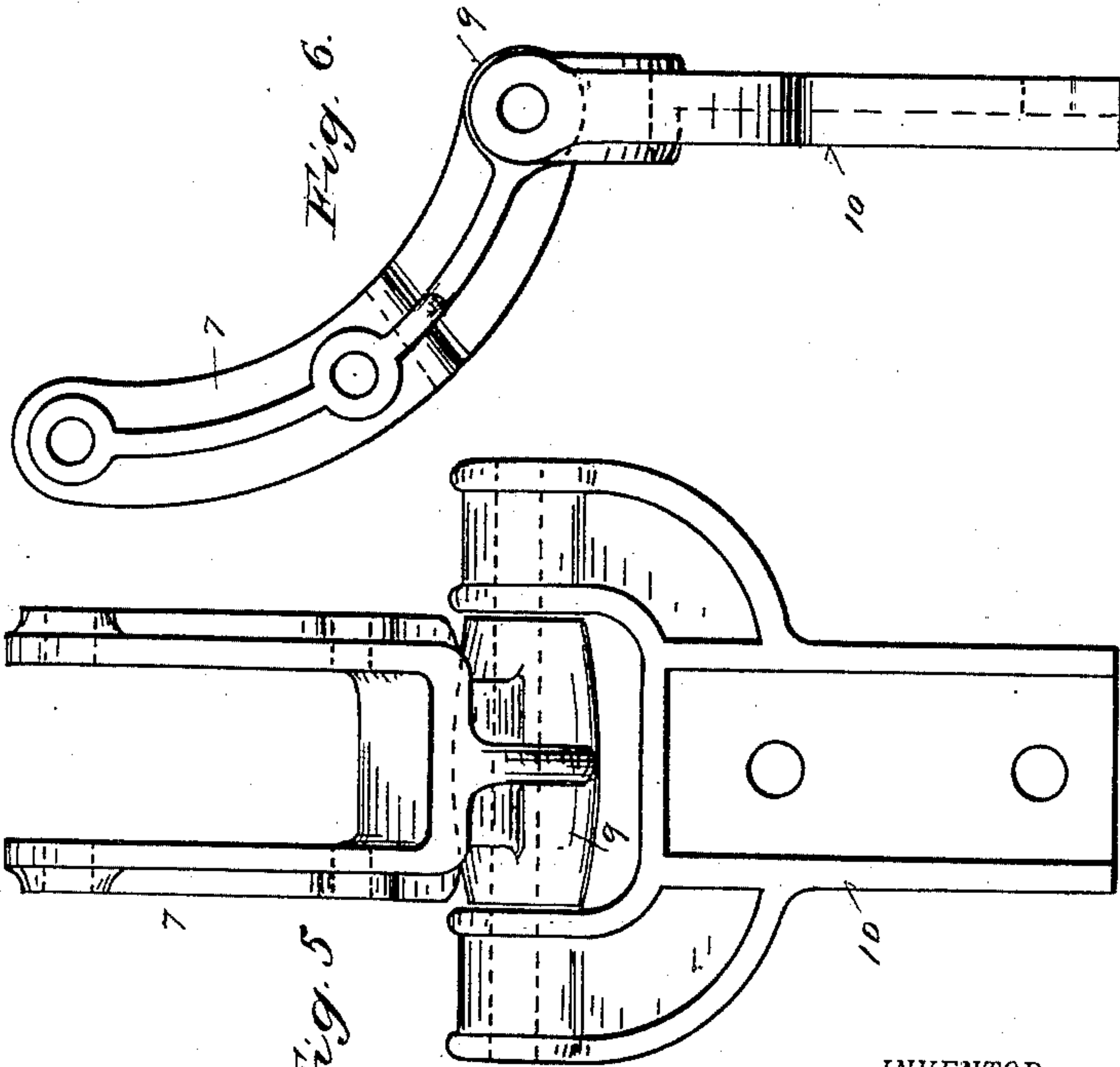
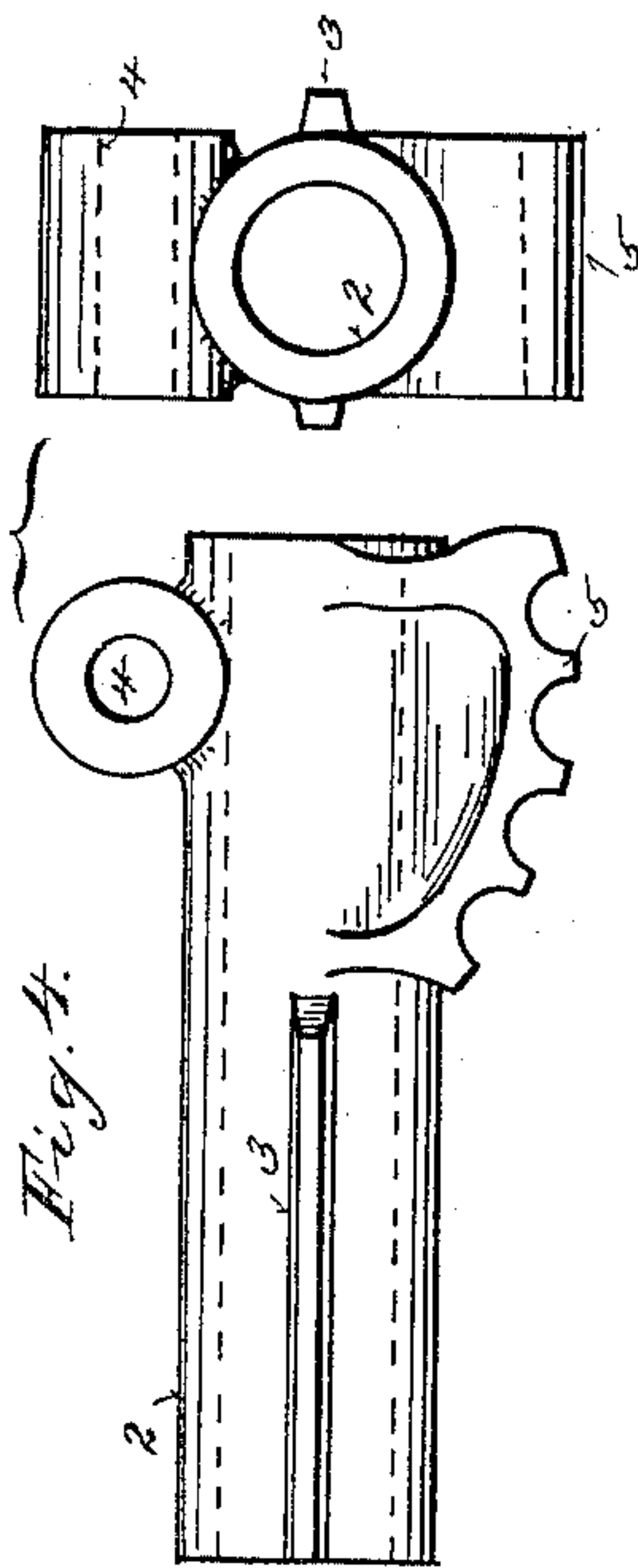
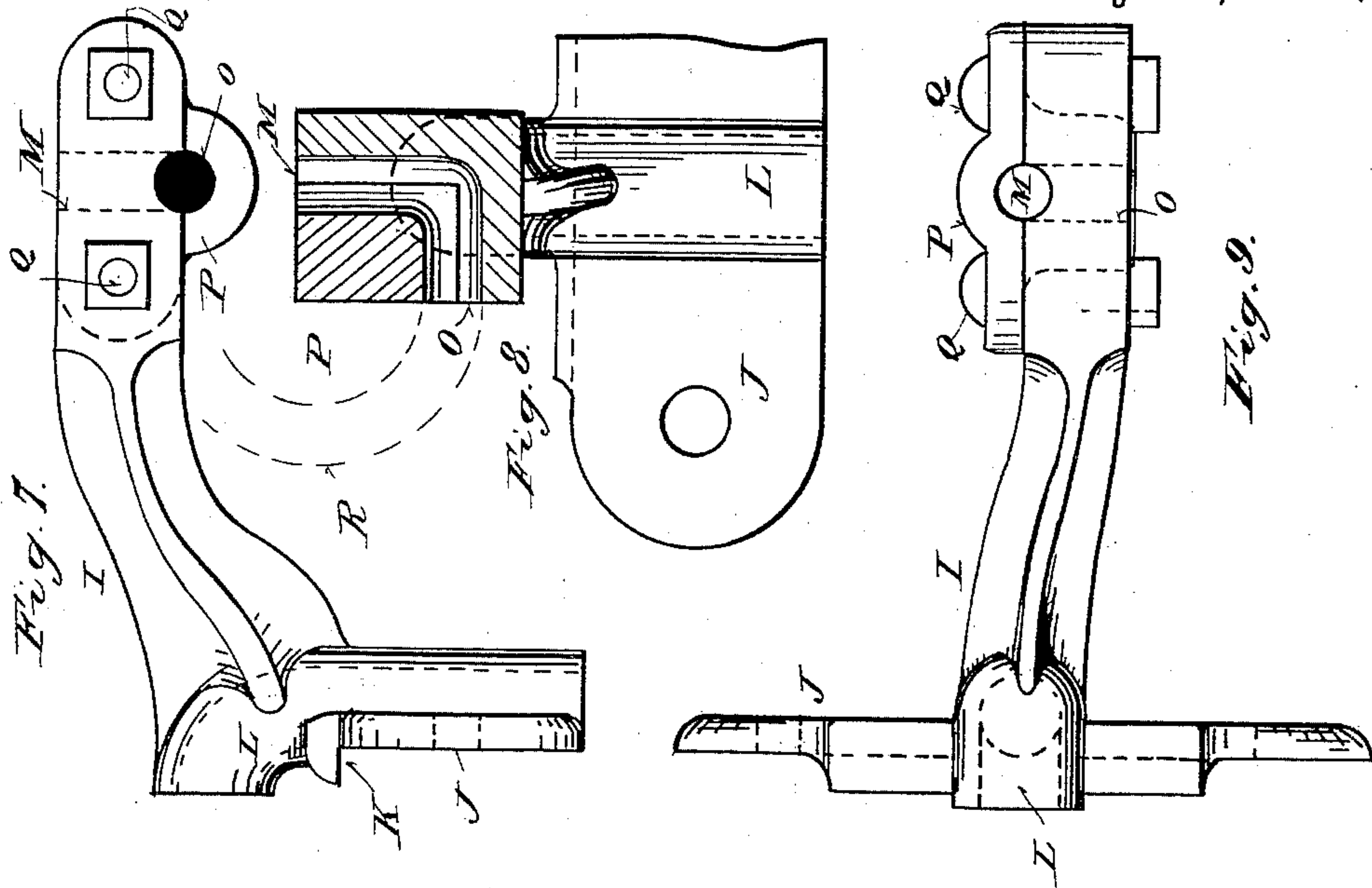
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3 Sheets—Sheet 3.

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WITNESSES:

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MARTIN L. KISSELL, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE P. P. MAST & COMPANY, OF SAME PLACE.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 453,010, dated May 26, 1891.

Application filed November 4, 1890. Serial No. 370,356. (No model.)

To all whom it may concern:

Be it known that I, MARTIN L. KISSELL, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Cultivators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in cultivators.

My improvements have reference to a spring equipment, in connection with a draft attachment, whereby the manual labor of lifting the beam in whole or in part from operative to inoperative position may be avoided and the work performed mechanically, and whereby the manual labor of depressing the shovels into the ground and of resisting the upward lifting action of the spring may be avoided, and the work done by the draft strains; have reference to matters of arrangement and construction in the spring equipment, and have reference to matters of arrangement and construction in the draft attachment.

My improvements have further reference to the provision of two beams, one of which has an up-and-down movement but no lateral swing, and the other of which has both an up-and-down movement and a lateral swing, and intermediate connections whereby the manipulation of the latter beam laterally will not affect the former beam, and whereby the manipulation of the latter beam vertically will affect the former beam, resulting in giving a beam that will take care of itself as the machine is drawn through the field, and another beam which may be manipulated laterally to suit the sinuosities of the rows of plants, and which is preferably much lighter or smaller, so that the labor of handling it is reduced to the minimum; have reference to the provision of means for adjusting these beams a greater or less distance apart at their connected ends, and to adjust the distance of the laterally-swinging beams of the respective sets to and from each other to agree with the distance between the rows of the plants, and have reference to certain details of construction in the coupling of the beams.

In the accompanying drawings, forming a part of this specification, and on which like

reference letters and figures indicate corresponding parts, Figure 1 represents a plan view of a cultivator with the arch broken away at one side embodying my improvements; Fig. 2, a side elevation of the same with one of the spindles and the coupling-sleeve in section on the line *xx* and a wheel removed; Fig. 3, a plan view, in detail, on a larger scale, of a part of the coupling; Fig. 4, a plan and an end view of a part of the coupling; Fig. 5, a view of the beam-casting and a part of the coupling; Fig. 6, a plan view of the same parts; Fig. 7, a detail elevation of the spring-connecting arm; Fig. 8, a partial plan and partial sectional view of the same part, and Fig. 9 a plan view of the connecting-arm complete. Fig. 10 is a detail of the spring-connection with the beam having lateral swing.

The letter A designates an arched axle of any approved type, bent into horizontal spindles B, to which the beams are coupled and upon which the wheels C are mounted. To this arch is secured in any convenient manner the frame, consisting, essentially, of the split tongue D.

To a cross-piece E (shown in dotted lines) is pivoted the doubletree F, from which depend the hangers G, having a number of holes to receive the hook of the singletree H, to which the draft-chains are attached. The lower ends of the hangers G are connected with the coupling attachment presently to be described, so that the draft strains are applied to that attachment for the purpose also presently to appear.

An arm I, provided with an integral plate J, shouldered at K, is bolted to a branch of the tongue D. The middle portion of the plate is formed with an elongated boss L, the inner side of which is curved to fit the arch about the part where it changes from a vertical to a horizontal. Thus the plate serves to connect the tongue with the arch. The outer end of the arm is provided with a vertical recess M and a horizontal recess O, as seen in Figs. 7, 8, and 9. A cap P is similarly recessed and is secured to the arm by the bolts Q. Thus a right-angled hole is formed in which to insert the shank of the spring and clamp it securely. There are one of these arms with its plate, &c., at each side of the

arch. The spring consists of a resilient rod R, formed into a convolute coil at one end and terminating in an arm or extension S. The coils are sufficiently numerous, and are
 5 so arranged that the sweep of the arm through which the coils act with force beyond that required to merely vibrate the arm is equal to the sweep of the beam vertically about its pivot in moving from its down position to or
 10 nearly to its hang-up position, whereby the spring is effective in lifting the beam either all or pretty nearly all of the distance it is required to be lifted. Thus the labor of the operator, which would otherwise be excessive,
 15 is lessened or practically avoided.

I am aware that the use of convolute springs to operate upon cultivator-beams is old, and wish to be distinctly understood as disclaiming the same in a broad sense. As heretofore
 20 applied, however, two objections, among others, may be mentioned, namely: first, that they merely lifted the beam through a very short distance or small part of the vertical sweep from the operative to the hang-up position, and, secondly, that they interfered with
 25 the lateral movement of the beam constantly required in the field by tending to draw the beam back from a lateral adjustment to either side of the line of draft, thus interfering with
 30 the free manipulation of the beam, and adding to the labor of the operator by requiring him to overcome such tendency. I overcome these two vital objections by giving the spring the long sweep connection above mentioned,
 35 and by placing the spring so far away from my beam that the deflection of the connecting devices between the spring and the beam by the lateral adjustments of the beam is so slight as not to affect such adjustments of the
 40 beam. The preferred means of connection consists of a rod T, engaged by the spring at one end and with the beam at the other end, as by a clamp U, and provided with a turn-buckle V or other means of adjusting its
 45 length to increase or decrease the tension of the spring upon the beam. In Figs. 1 and 2 the spring equipment is connected directly with the beam which has no lateral swing, but in Fig. 10 it is connected with the beam
 50 having the lateral swing as well as the up and down movements. I have used it in connection with both kinds of beams. It is with the latter kind that its freedom from the tendency to interfere with the lateral movements
 55 of the beam is shown in practice.

I will now refer to the second branch of my invention. The preferred form of coupling consists of a pipe or sleeve 2, fitted to roll on the horizontal parts of the axle and provided
 60 with a spline 3. Near one end the pipe has an eye 4 and a notched segment 5. A yoke 7 is connected by bolts 6 to the eye 4, and is held in different lateral positions by a bolt 8, which is placed in one or the other of the
 65 notches of the segment 5. This yoke is formed with a hub 9, which fits within the jaws of the beam-casting 10 and receives the coupling-

bolt 11. Thus the inner beam is connected with the arch, the horizontal articulation being on the coupling-bolt 11 and the vertical
 70 articulation on the rolling of the pipe 2 on the arch. Thus, also, this beam may be adjusted to and from the wheel at its pivoted end, so as to occupy the proper position with relation to the distance between the rows of
 75 plants. This beam is shown at 12, being composed, preferably, of an iron bar carrying one or more shovels 13 and having secured to it a handle 14. It is preferred to make this beam shorter than the other, whereby it will
 80 be lighter and more easily handled, as the work of running in and out and to and from the plants, according to the sinuosity of their position, is left to be performed by this beam. From the connection of the beam with the
 85 pipe 2, to be presently explained, it will be seen that the up and down movements of the beam 12, whether effected by the operator or by the spring, or by both together, or otherwise, will also move such other beam up and
 90 down. A sleeve 15 is fitted upon the pipe 2 and grooved to receive the splines 3. This sleeve carries a set-screw 16, as shown in dotted lines in Figs. 2 and 3, to hold it in the desired position upon the pipe. The casting
 95 17 extends rearwardly from the sleeve 15 and receives the beam or member 19. This casting 17 has a hole 18, which receives a bolt 20, by which the draft attachment 21 is pivotally connected with the coupling. This at-
 100 tachment is in the form of two jaws 22, which straddle the coupling proper, as seen in Fig. 2.

A series of holes formed in the forward side of the coupling and extending both above and below the center of articulation of the
 105 beam serves to connect the draft attachment with the hanger G through the links 23. Thus the draft strains are applied to this attachment. They may be applied in any other way. If the connection is below the center
 110 of the point of articulation, then the strains will tend to draw the shovels into the ground and will pull against the spring. This action is diminished or increased as the point of attachment is brought nearer to or farther from
 115 the center of articulation. If the draft attachment is applied above such center, the tendency will be to lift the beam. If the draft strains draw to one side or the other, the attachment 21 will swing into line on its
 120 pivot 20. In the drawings this draft attachment is shown as connected with the beam which has no lateral movement. The spring, however, is shown in connection with the beam which has such movement, and it is
 125 obvious that the utility of the spring and draft attachment is not confined to the kind of beam with which they are used. The beam 19 carries one or more shovels, according to the kind of work desired. (See Fig. 1.)
 130

Referring to the double-beam feature of my invention, I wish to be understood as claiming, broadly, an organization involving a beam having an up-and-down but no side-

wise movement, another beam having both a sidewise and an up-and-down movement and adapted to be manipulated by hand in connection with intermediate devices, which connect said beams together in such manner that the hand-beam may be manipulated laterally without affecting the other beam and so that vertical manipulations of the hand-beam will manipulate the other beam. I wish also to be understood as claiming, broadly, the same organization qualified by the provision of the hand-beam being shorter and lighter than the other beam, so that it may be manipulated laterally with less manual labor, whereby even a boy may work the implement, and I also wish to be understood as claiming, broadly, the same organizations and each of them in connection with a spring arranged to assist in the manipulation of the beams, both with and without a draft attachment adapted to operate in conjunction with the spring in the manner hereinbefore described. In this connection I do not limit myself to the form or type of spring herein shown and described, since other forms or types may be substituted and combined with this beam organization without departing from my invention. The same remarks are true respecting the form of draft attachment herein shown and described.

Referring to the spring equipment herein set forth, I would observe that while the spring will act to lift the beam through the arc of a circle, as hereinbefore described, it still acts with a decreasing force, both in its own tension and in the application thereof to the beam. Notwithstanding that the action upon the beam grows weaker and weaker as the beam goes higher and higher, still the long sweep action enables the spring to lift the beam through an arc of sufficient length to accomplish the practical results sought.

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

1. In a cultivator, the combination, with an axle, of two beams mounted on the axle and constituting a pair, devices for effecting an adjustment to vary the distance between the forward ends of the beam, both beams having an up-and-down movement and one of them adapted to swing laterally, while the other is devoid of such lateral movement.

2. In a cultivator, the combination, with an axle, of two beams, intermediate devices connecting the beams together so that the upward movement of one will cause a like movement of the other, each beam being horizontally pivoted and one of them vertically pivoted, and devices to effect adjustment to vary the distances between the forward ends of the beams.

3. In a cultivator, the combination, with a wheel-frame and an arm I, secured thereto, having an angular recess or hole O and M and cap P, of a convolute spring, the inner end of the coil being bent to fit said recess or hole

and the other end of the coil terminating in an arm.

4. In a cultivator, the combination, with an arched wheeled axle, a pole secured thereto, and an arm secured to the axle near the upper end, of a convolute spring carried by the arm, a vertically and laterally swinging beam secured to the axle, a rod secured to the beam and to the spring, and a draft attachment pivotally connected with the beam by the coupling-bolt and having a series of openings and draft devices connected with the attachment and adapted to draw against the action of the spring.

5. In a cultivator, the combination, with a wheel-frame, of two beams, intermediate devices connecting the beams together so that the upward movement of one will cause a like movement of the other, each beam being horizontally pivoted and one of them vertically pivoted, whereby both beams may be moved up and down and one beam moved laterally as well.

6. In a cultivator, the combination, with a wheeled frame, of a duplex beam composed of two beams proper, intermediate devices connecting the two beams together, so that the upward movement of one will cause a like movement of the other, a horizontal pivot for both of the beams and a vertical pivot for one of the beams, the latter beam being shorter than the former, and a handle attached to the shorter beam, whereby there are provided a beam having a vertical adjustment only and another beam having both vertical and lateral adjustments and capable of direct manual manipulation.

7. In a cultivator, the combination, with a wheeled frame comprising an arched axle, and a pipe on the horizontal part of the axle, of a beam rigidly connected to said pipe and adapted to move up and down, but not laterally, and another beam connected to said pipe and having a vertical pivot and adapted to move up and down and laterally, and a handle connected to said latter beam, the up-and-down movement only of which manipulates the other beam.

8. In a cultivator, the combination, with a frame comprising an arched axle, of a pipe on a horizontal part of the axle, a sleeve fitted upon the pipe, a beam rigidly connected to said sleeve, an eye and a series of serrations in the pipe, a yoke pivoted to the eye, a bolt or pin connecting the yoke with either of the serrations, a beam connected to the yoke by a vertical pivot, and a handle connected to said latter beam, whereby the beams may be moved up and down together and the latter beam adjusted to and from the former beam and be swung laterally without affecting the former beam.

9. The combination, with a cultivator having an arched axle, of a beam secured to the lower horizontal part of the axle by a connection having a horizontal pivot, the beam being incapable of lateral swing, and another

beam secured to the said horizontal part of the axle, the connection having a horizontal and a vertical pivot, and a handle connected to the latter beam.

5 10. The combination, with a cultivator having an arched axle, of a long outer beam connected to the lower horizontal part of the axle adjacent to the wheel, the connection involving a horizontal pivot, and a shorter inner beam connected to the said part of the axle, the connection involving a horizontal and a vertical pivot, and a handle secured to the shorter beam.

15 11. In a cultivator, the combination, with an arched axle, of a beam connected to the lower horizontal part, the connection involving a horizontal pivot, the beam being incapable of lateral swing, another beam connected to the former beam and to said part of the axle, the connection involving a horizontal and a vertical pivot, a handle connected to the latter beam, and a spring connected to the frame

and to one of the said beams and adapted to lift both of the beams.

12. In a cultivator, the combination, with an 25 arched axle, of a beam connected to the lower horizontal part, the connection involving a horizontal pivot, the beam being incapable of a lateral swing, another beam connected to the former beam and to the said part of the axle, the connection involving a horizontal 30 and a vertical pivot, a handle connected to the latter beam, a spring connected to the frame and to one of said beams and adapted to lift both of the beams, a draft attachment 35 connected to one of the beams, and draft devices connected to the attachment and adapted to draw against the action of the spring.

In testimony whereof I affix my signature in presence of two witnesses.

MARTIN L. KISSELL.

Witnesses:

C. C. KIRKPATRICK,

J. W. SPAHR.