

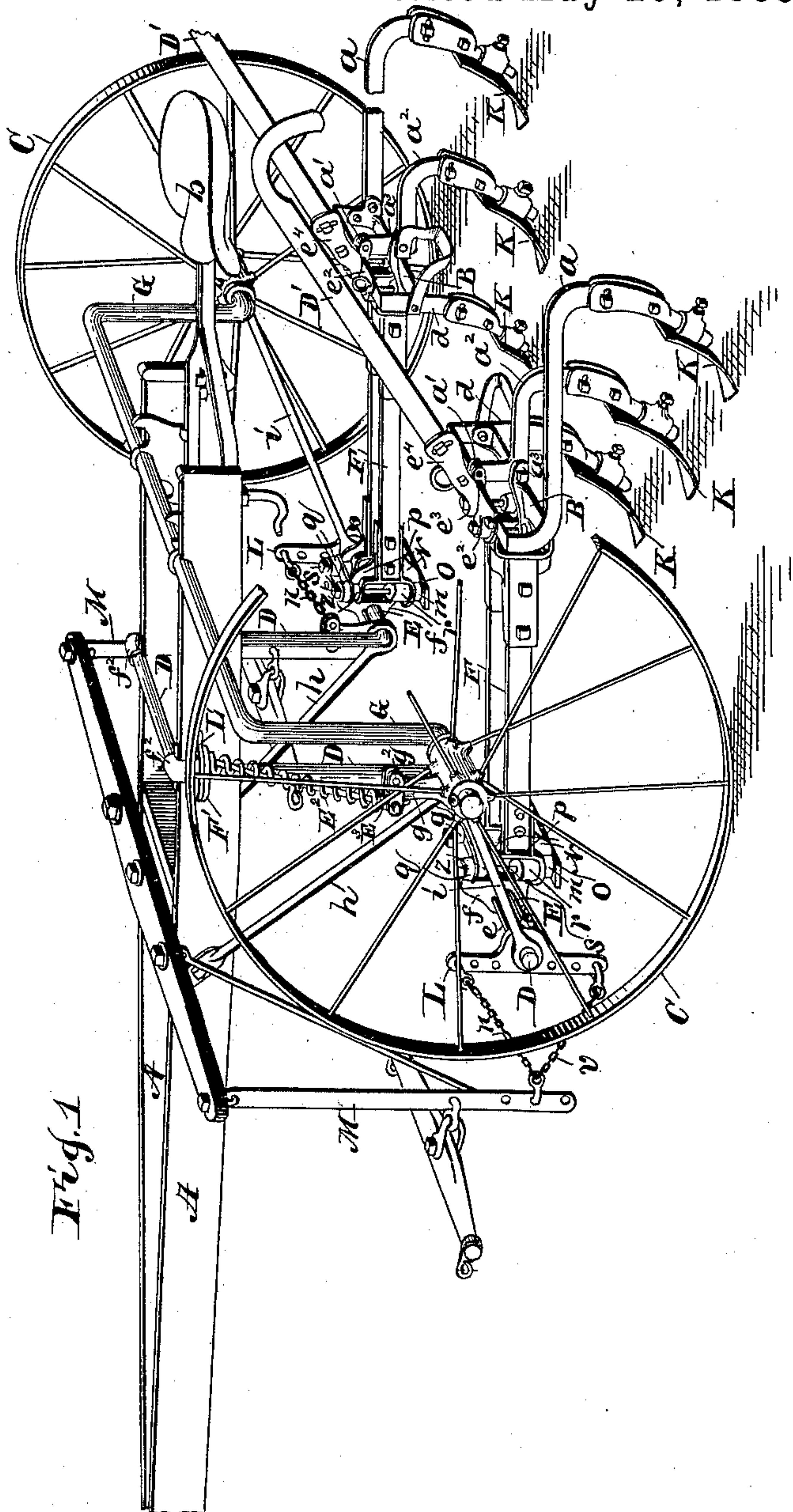
(No Model.)

4 Sheets—Sheet 1.

C. E. PATRIC.
CULTIVATOR.

No. 383,541.

Patented May 29, 1888.



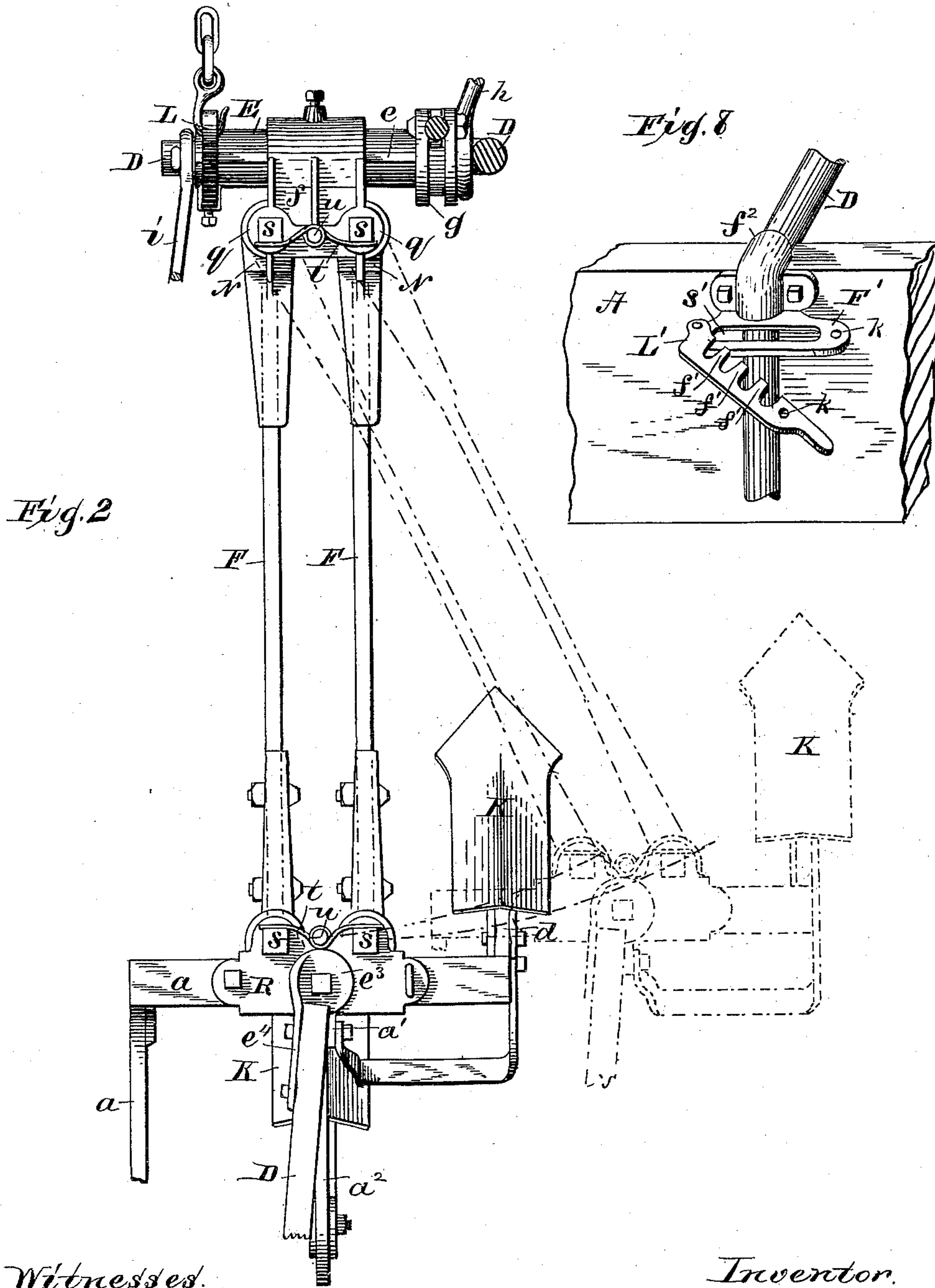
Witnesses
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Charles S. Ray.

Inventor
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Witnesses.
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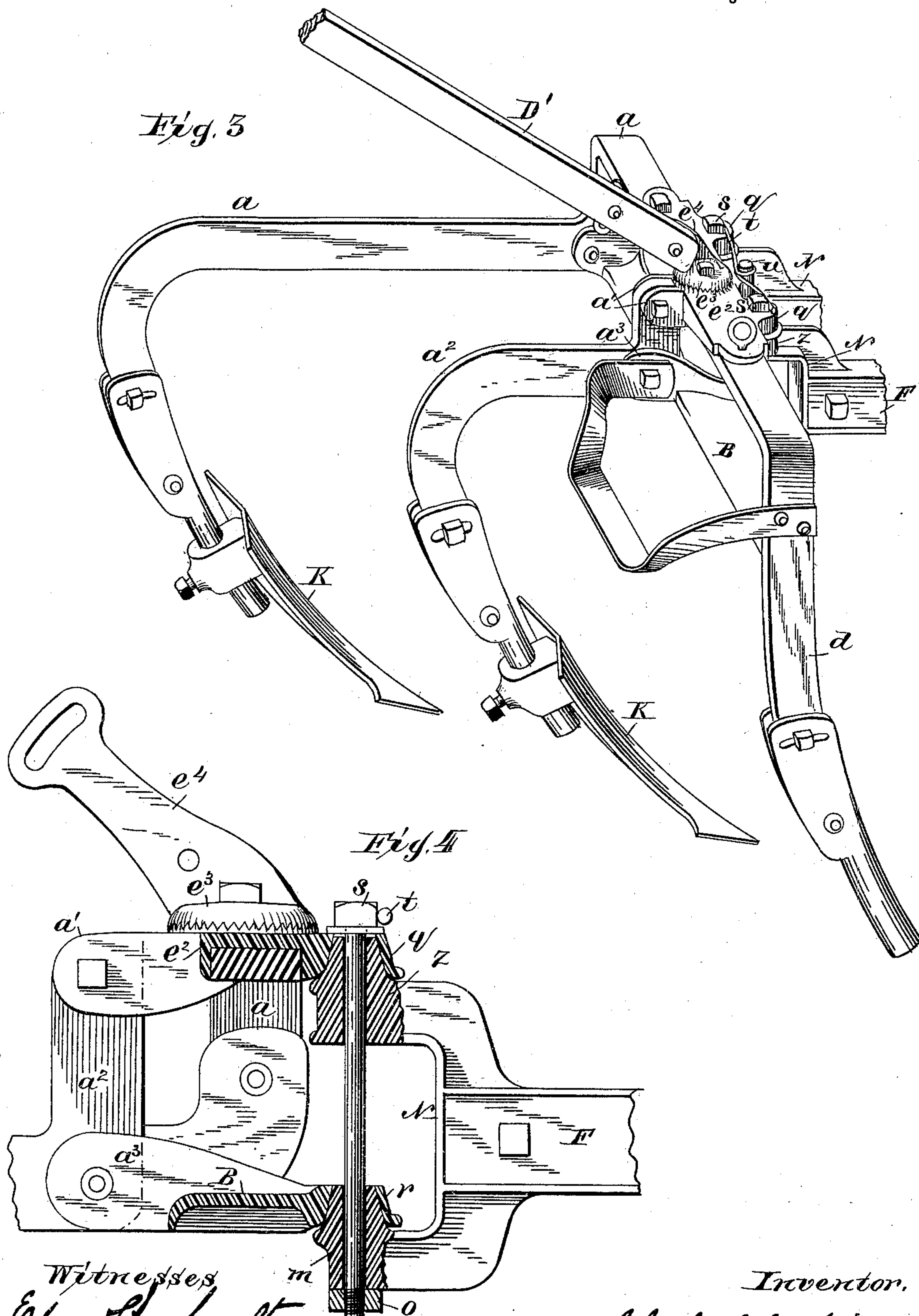
(No Model.)

4 Sheets—Sheet 3.

C. E. PATRIC.
CULTIVATOR.

No. 383,541.

Patented May 29, 1888.



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(No Model.)

4 Sheets—Sheet 4.

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Fig. 5

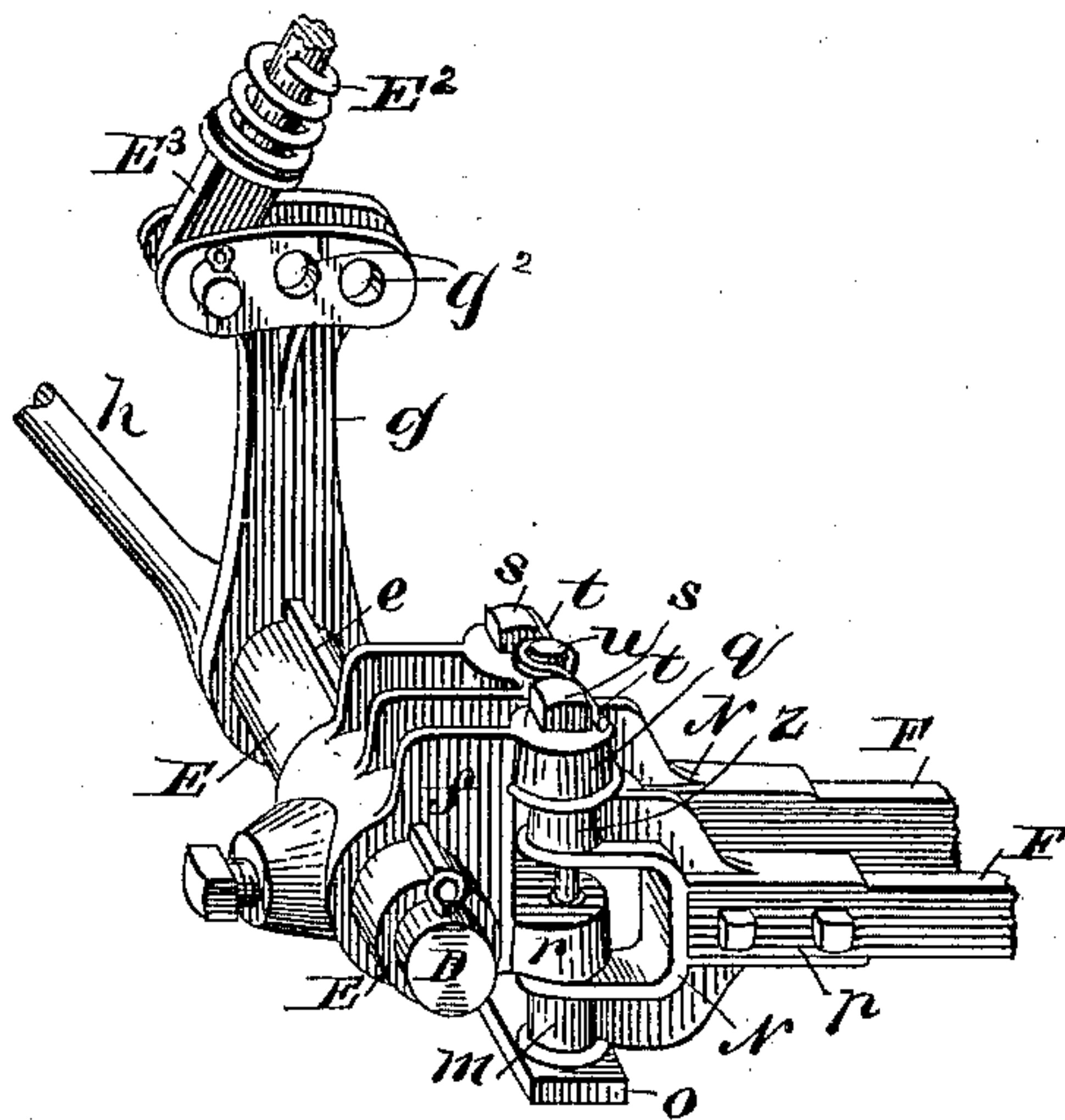


Fig. 6

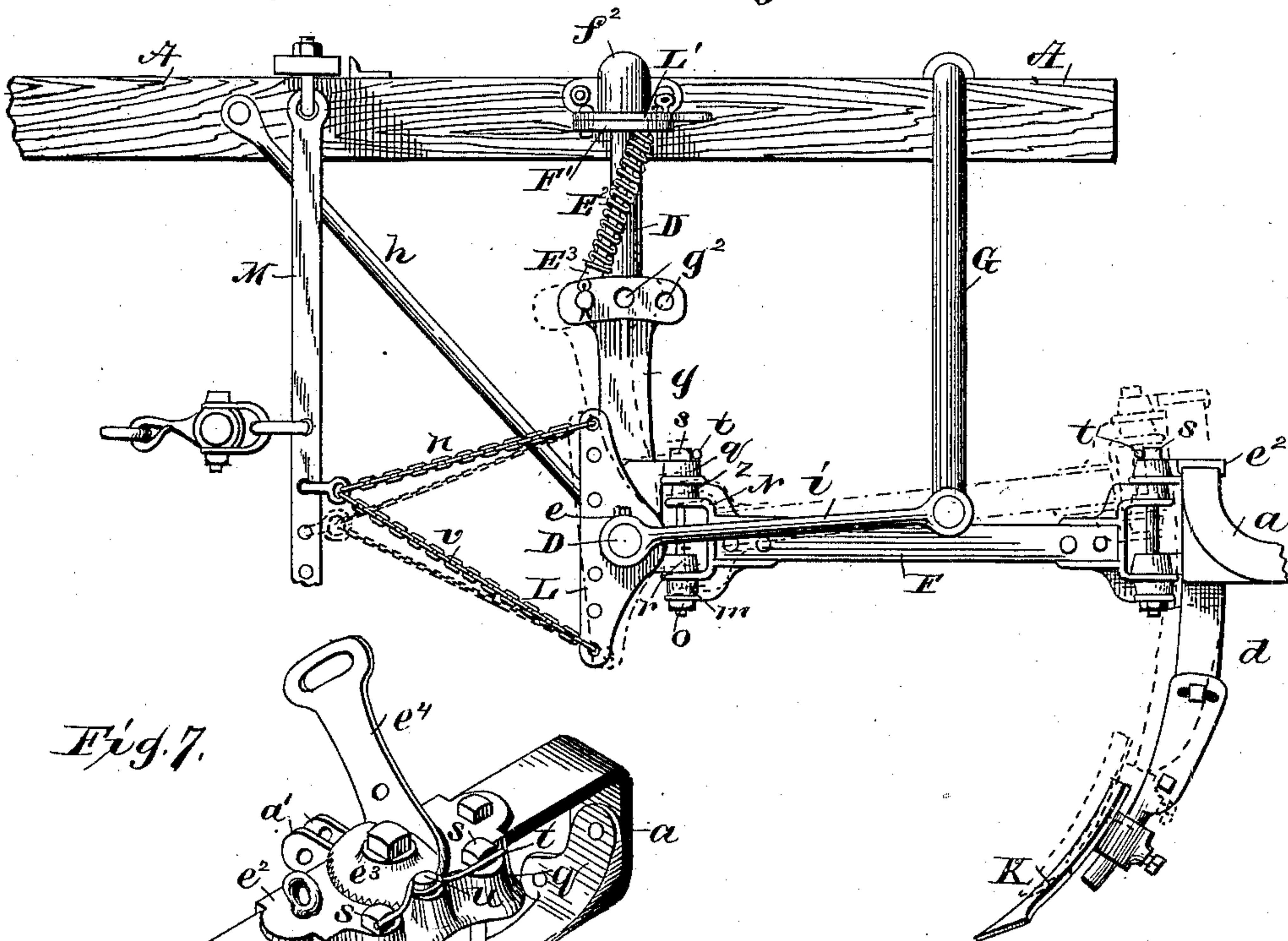
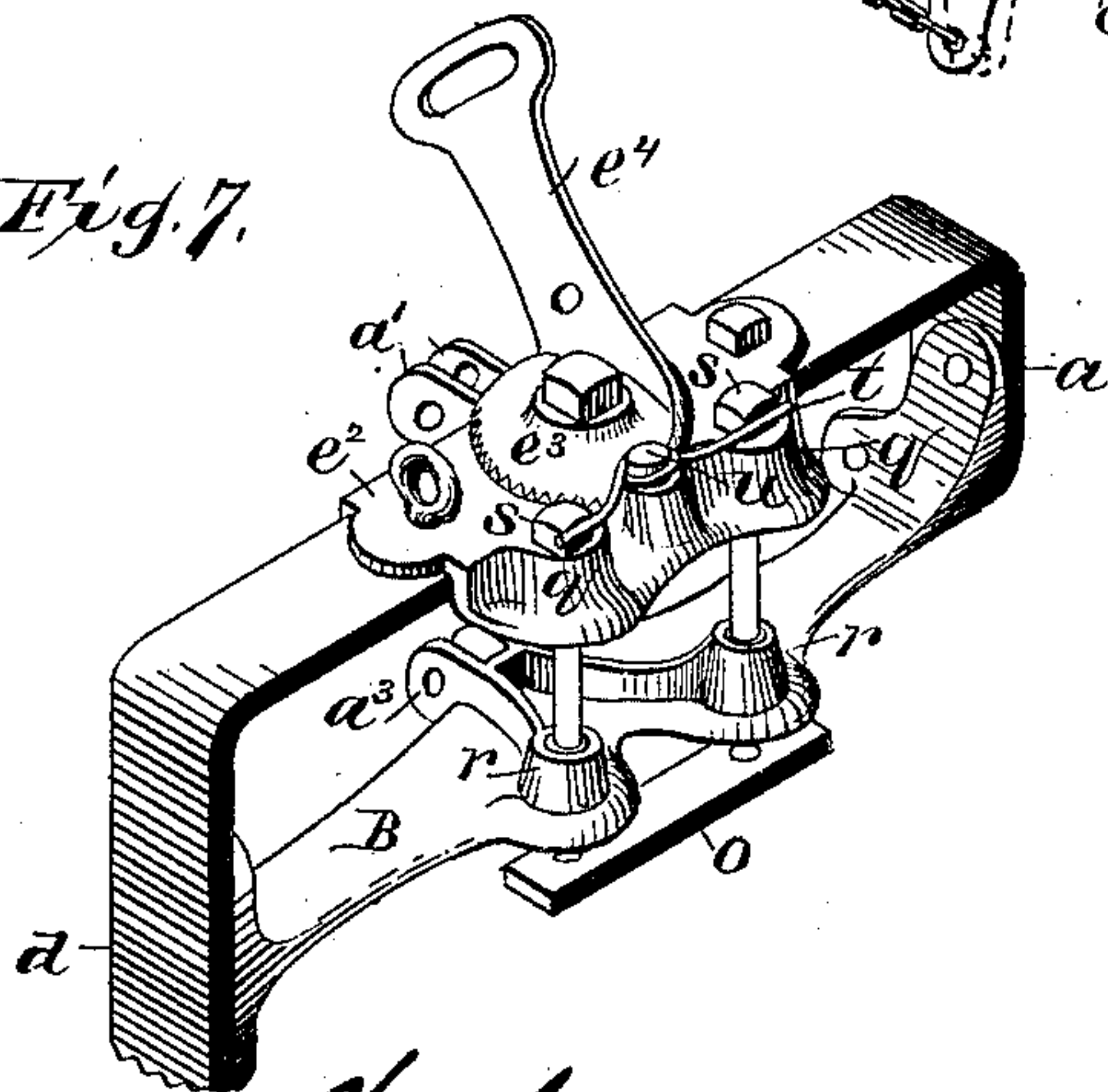


Fig. 7



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UNITED STATES PATENT OFFICE.

CHARLES E. PATRIC, OF SPRINGFIELD, OHIO.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 383,541, dated May 29, 1888.

Application filed December 28, 1887. Serial No. 259,256. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. PATRIC, of Springfield, Clark county, in the State of Ohio, have invented a new and useful Improvement in Cultivators; and I do hereby declare that the following is a full and accurate description of the same, reference being had to the accompanying drawings, wherein—

Figure 1 is a perspective view of my machine. Fig. 2 is a plan of same. Fig. 3 is a perspective rear view of the cultivator on one side. Fig. 4 is a vertical section through one of the rear draw-bar joints. Fig. 5 is a perspective view of the front draw-bar coupling. Fig. 6 is a side elevation of the machine. Fig. 7 is a perspective view of the front of the standard-coupling with parallel draw-bars. Fig. 8 is a perspective view of a portion of the frame, showing the securing devices for one of the arches and for the spring-rods.

My invention relates to that class of cultivators which are provided with bearing-wheels, some of which are "walking" cultivators and some "riding" cultivators.

As between the wheel-cultivator and the no-wheel cultivator, the difference is that in the former the shovels or teeth are carried by the wheels and subject to the constant control by the attendant, and may be easily moved laterally while advancing to follow any irregularity in the line of the plants or to vary the line of advance for any other cause, while in the latter the cultivator runs on the shovels and is not capable of such variation of its course.

The cultivator shovels or teeth are arranged in groups of two or three shovels, each group being provided with its own draw-bars, and capable of independent lateral movements as the machine advances, and with capacity for lateral adjustment. These conditions are not affected whether the attendant rides or walks.

In cultivators having wheels and shovels easily moved laterally it is important that the shovels shall maintain their parallelism with the line of advance, because if they assume a position oblique to the line of advance the resistance of the earth will tend to disturb their proper action. It is also important that the shovels shall be maintained in their vertical position, because if their obliquity to the horizon is changed the resistance of the earth will

be changed also. These requirements are well known, and the devices herein shown for answering them are not claimed, broadly.

The devices which are claimed will be particularly described hereinafter.

A is the tongue of my machine, constructed in some usual and proper manner. It may be provided with a seat, *b*, for the driver, and large bearing-wheels *C*, and thus constitute a riding-cultivator; or, if preferred, it may have no seat and be a walking-cultivator.

D is an arch, usually constructed of suitable round iron, properly bent and fastened to the tongue-frame by suitable clips. The extremities of the arch-bar are turned outward horizontally to constitute wrist-bearings for the coupling-sleeve *E*, to which the forward ends of the draw-bars *F* are attached.

If the machine is designed to be used as a walking-cultivator, the wheels may also be placed on the ends of the arch *D*; but if it is designed to attach a seat for the driver, then a second arch, *G*, is added and fastened to the tongue-frame *A* a sufficient distance at the rear of the arch *D*, and the wheels *C* are placed on the horizontal ends of this last-named arch, so that the driver will be located far enough to the rear to enable him to manage the cultivators conveniently, while the bearing-wheels will be far enough to the rear to balance the driver's weight properly. The arches *D* and *G* are supported by proper brace-rods, *h i*. In wheeled cultivators the shovels are more easily and freely movable, both laterally and vertically, while the wheels of the machine advance in straight lines, so that the shovels may follow the sinuosities of the line of plants, moving from side to side as necessary to avoid plants which stand in the way, and also may be lifted up clear of the ground to pass over some obstruction or to go out of action for transportation. The draw-bars *F* are therefore jointed to the sleeve *E*, with a vertical axis, by means of the coupling *f*, so that the draw-bar may swing laterally on said joint and said sleeve rotate on the horizontal extremity of the arch *D* to permit the draw-bars to move in a vertical plane. It is highly useful that the shovels *K* shall maintain their parallelism with the line of advance, and therefore said shovels are attached together, and, as a single structure, are coupled to the sleeve *E* by two

parallel draw-bars, as shown; but this is not new.

It is highly important that in their lateral movements the shovels shall at all times maintain their parallelism with a vertical plane, because if they are canted over or become oblique to that plane they tend to run into the ground in an oblique direction, and this irregular action must be constantly resisted by the attendant. This canting over is the effect of looseness or lost motion in the vertical joints, and to obviate it I make a double joint, or in effect a single long joint, which may be tightened at its extremities, and therefore kept in proper working order without looseness or lost motion. These joints I prefer to make with two conical pintles, $z\ m$, cast or otherwise rigidly attached to a single joint-plate, N , which also has a recess or socket, p , to receive the end of the draw-bar F , which is secured therein by bolts. The pintles $z\ m$ are severally seated in the sockets q , and, being in line, a single tension-bolt, s , having its head resting on the socket q , and its nut resting under the pintle m , serves to tighten up both pintles simultaneously. Joints of the same character are employed at each end of the draw-bars.

If desired, a single long cone might be employed instead of two short pintles; but it would not be as strong nor as easily made or managed. When there are two parallel draw-bars, there will be correspondingly two joints at front and two at rear, as shown in Fig. 2. I then find it convenient to employ a bar, O , which extends across and is provided with two threaded perforations to receive the screw ends of the tension-bolts s . Therefore the nuts are restrained from turning, and I restrain the bolts s from turning by a spring-keeper, t , which is provided with a central bend to pass around a stud, u , while the free ends bear against the angular sides of the bolt-heads. The sleeve E is provided with a longitudinal rib, e , and the joint-coupling frame f is provided with a corresponding groove, so that said frame may be moved along said sleeve for lateral adjustment. A set-screw fastens and holds it in the selected position. Said sleeve E is provided at its inner end with a crank-arm, g , to which a balancing-spring may be applied to counterbalance the weight of the shovels and draw-bars, so as to render them easy to control and retain them in a lifted position. The sleeve E has also attached to it a cross-arm or bell-crank, L , and two draft rods or chains, $n\ v$, extending from this cross-arm forward to the draft-rod M , said rods $n\ v$ being respectively attached to the arm L above and below the axis of the sleeve E . The rods or chains $n\ v$ are conveniently joined together at their front ends and attached to the draft-rod M , and by shifting the point of attachment up or down along said bar M the arm L and sleeve E may be canted on their axis, and the points of the shovels are thereby pressed downward or upward, as the case may be. If pressed downward, it tends to make the shovels

run more deeply. If pressed upward, it tends to make them run more lightly, by lifting them out of the ground or preventing them from running too deeply.

I am aware that this method of controlling the shovels is not new; but heretofore variations of it have been accomplished by elongating or shortening one or the other of the rods $n\ v$, while I do it in a simpler manner by moving the point of attachment up or down on the rod M . Two of the shovel standards, a and d , are made in a single piece, from a bar of wrought-iron or other suitable material, suitably bent in the manner shown. This constitutes a double standard without joint, and therefore with maximum strength and lightness. On top of the transverse portion of said standard I place a plate, R , and bolt it securely. This plate R is provided on one edge with the sockets $q\ q$ and on the other side with lugs a' to receive and hold one extremity of the detachable center standard, a^2 . The lower joint-sockets, r , are formed on the cross-bar or plate B , which is bolted at its ends to the upright portion of the standards $a\ d$, respectively, and said cross-bar is also provided with lugs a^3 to receive and hold the standard a^2 at a point below its attachment to the lugs a' . The standard a^2 is therefore easily removable, if desired. The plate R is also provided with a radial serrated surface, e^2 , and a correspondingly-serrated plate, e^3 , is fitted thereto with center clamping-bolt, so that the plate e^3 can be rotated and fastened in any position desired. The plate e^3 is provided with a plate, e^4 , to which the handle D' is bolted. A transverse slot in said plate e^4 permits the inclination of the handle D' to be changed, as desired, to adapt it to the height of the walking attendant. The handle is therefore attached to the standard and partakes of its parallelism, so that the lateral movement of the extremity of the handles does not exceed the lateral movement of the shovels themselves. It has been common heretofore to attach the handle to the draw-bar, and it therefore partakes of its angular motion, so that the lateral movement of the extremity of the handle will exceed the movement of the shovels, as its distance from the pivot-joints at the front-end of the draw-bars exceeds the distance of the shovels from the same pivot. This is a point of considerable importance, because it increases the distance which the hand of the attendant is required to move over in guiding the shovels.

The counterbalancing-spring E^2 is mounted on a rod, E^3 , which is coupled to the arm g at its upper end. Said rod passes through a plate, F' , against which the springs bears. The tension of the spring E^2 , acting against the extremity of the arm g , tends to counterbalance the weight of shovels k and draw-bars when raised from operative position. When the shovels are down in the ground, the rod E^3 is nearly or quite in line with the center of the sleeve E and the rod bearing in the plate F' .

When it is desired to have the shovels penetrate deeper or less deep, it is necessary to

change the point of attachment of the rod E^3 to the arm g , and for that purpose said arm is provided with a series of adjusting-holes, $g^2 g^2$.

5 The point of attachment of the rod E^3 and plate F' requires change of adjustment, and heretofore this has been accomplished only by removing said rod from one hole in the plate F' and placing it in another hole; but as it is
10 necessary to employ a very strong spring this is a matter of some difficulty. To make this adjustment easy, I make a slot in the plate F' instead of a series of holes, so that the rod E^3 can be pushed from one position to another,
15 and to lock it in position I make lever L' , provided with fingers f' , and pivot it at one end of said plate. When closed over the slot s' , the fingers f' divide said slot into several spaces, either one of which may be occupied
20 by the rod E^3 . A key, k , retains the lever in operative position. The plate F' is provided with an ear, whereby it may be attached to the tongue-frame A , and the hood f^2 may be added to cover the angle of arch D and hold it in
25 place without the use of staple-clips.

Having described my invention, I claim as new—

1. In a wheeled cultivator, a tongue or frame, A , draw-bars $F F$, and shovels attached thereto, combined with arches D and G , each provided with rigid journals and either adapted to receive the wheels, substantially as and for the purpose described.

2. The shovels $K K$, combined with the
35 double standard $a d$, made of a single bar of wrought-iron or other suitable material, bent as shown, and with the bar B , and the intermediate standard, a^2 , connecting the horizontal bars and carrying a shovel, for the purpose
40 set forth.

3. The double standard $a d$, made of a single bar of wrought-iron, combined with the cap-plate R , bolted to the horizontal part of said standard and the cross-bar B , said plate
45 and bar being provided with the sockets $q r$, and the joint-plate N , provided with the cones $z m$ and tightening-bolt, substantially as set forth.

4. The shovel standards rigidly connected
50 together, and the parallel draw-bars $F F$, to which said standards are pivoted on two parallel vertical axes, combined with the handle D' , mounted on the transverse bar of said standards, and means, substantially as described,

whereby the handle may be adjusted to any
55 desired lateral angle and partake of the parallel motion of the shovels and their standards.

5. The drag-bar F , the sleeve E , and the shovel-standard $a d$, rigidly but pivotally connected, combined with long joints composed
60 of conical pintles $z m$, and the corresponding sockets, $q r$, and tightening-bolts, substantially as set forth.

6. The draw-bar F , coupled at its end by long axis-joints, composed of conical pintles
65 $z m$, pointing in the same direction and combined with corresponding sockets, $q r$, in axial line with each other, and the tightening-bolts s , as set forth.

7. The parallel drag bars $F F$ and standards
70 of a cultivator rigidly secured together, provided with parallel joints, each composed of conical pintles $z m$ and sockets $q r$, combined with the joint-bolts s , the bar-nut O , and the spring-keeper t , as set forth.

8. The standards $a d$, made in a single piece, combined with the plate R , provided with lugs a' , the cross-bar B , provided with lugs a^3 , and the center standard, a^2 , detachably secured to said lugs, as set forth.
75 80

9. The draw-bars F , the sleeve E , to which said draw-bars are attached, the cross-arm L , and the draft rods or chains $n v$ at their rear ends, connected with said arm L at different
85 sides of the axis of the sleeve E , and united at their front ends by a pendent draft-rod, M , or its equivalent, and means, substantially as described, for adjusting said front ends of the parts $n v$ vertically upon said rod M , as set forth.
90

10. The plate F' , provided with a slot and a lever pivoted thereto and swinging parallel with the plate and across the slot, said lever provided with fingers, for the purpose set forth.
95

11. The draw-bar F , the sleeve E , its arm g , the balancing-spring E^2 , and the rod E^3 , combined with a plate, F' , having a slot, s' , and a lever provided with fingers $f f$.

12. The bracket-plate F' , provided with the
100 hood f^2 , to cover, protect, and secure the arch D , and the lever with fingers $f' f'$, as set forth.

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