

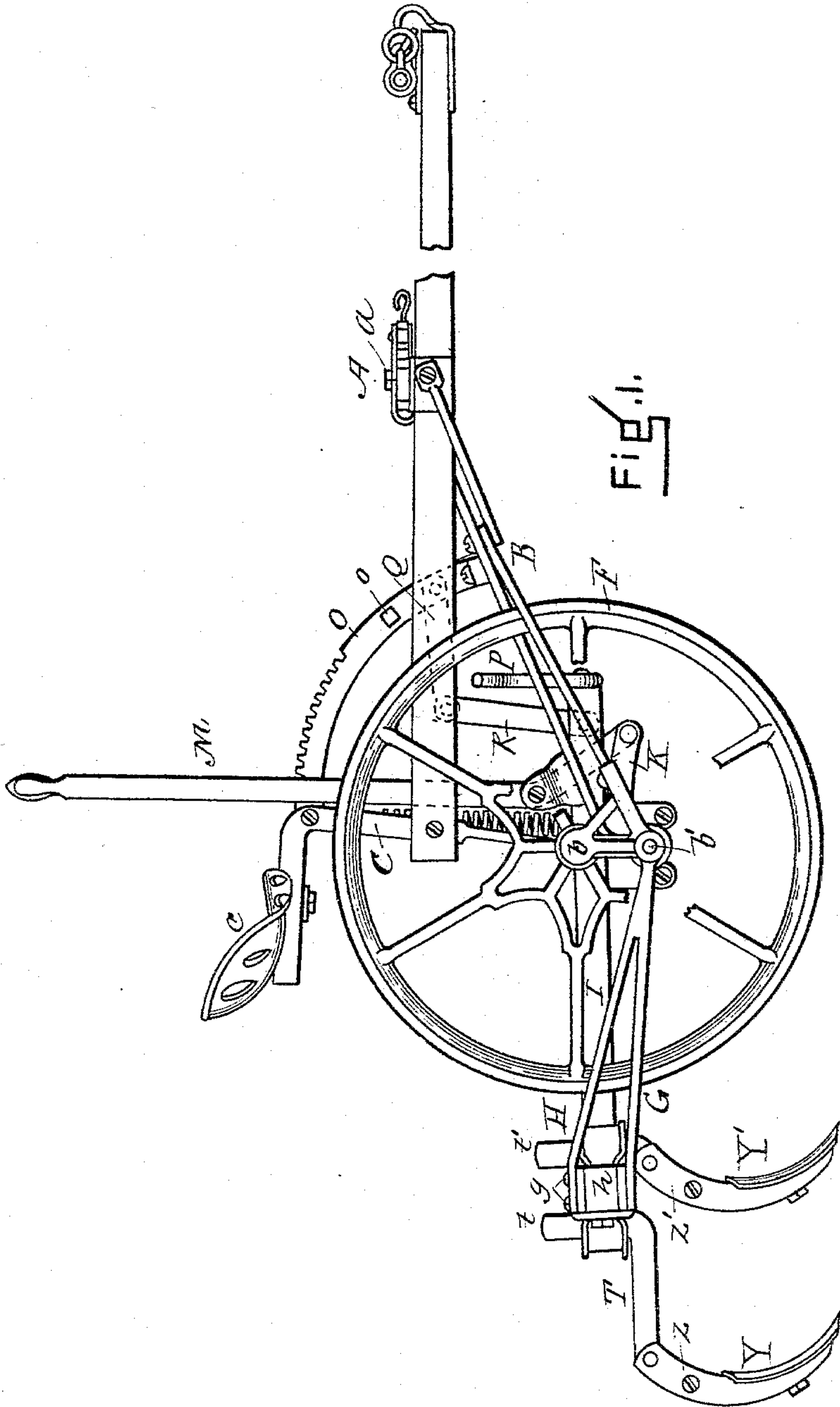
(No Model.)

4 Sheets—Sheet 1.

S. L. ALLEN.
CULTIVATOR.

No. 562,786.

Patented June 30, 1896.



WITNESSES

A. V. Flannery
Geo. Holmes

INVENTOR

Samuel L. Allen
by Wm B. H. Dows
Atty.

(No Model.)

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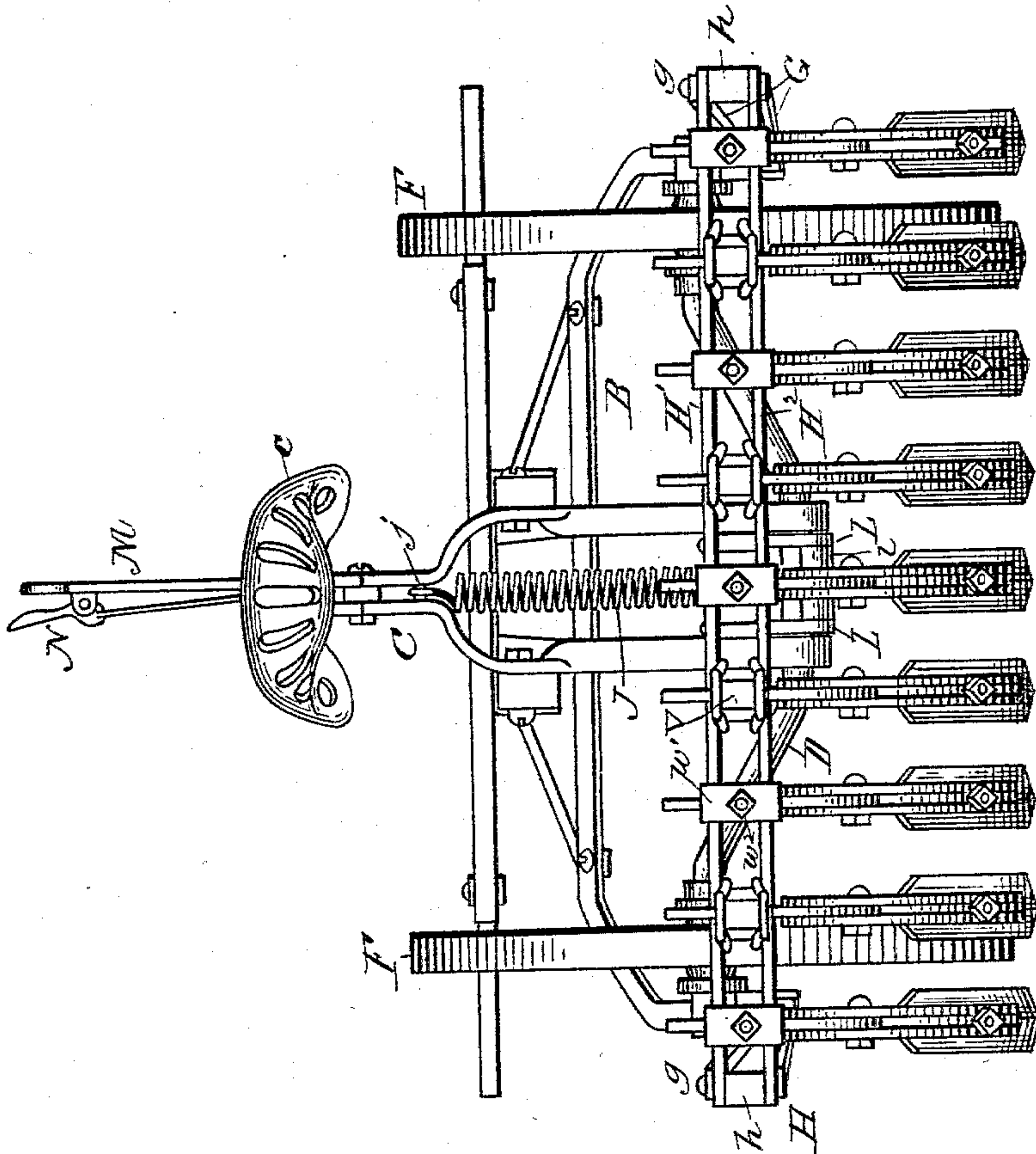


FIG. 2.

WITNESSES

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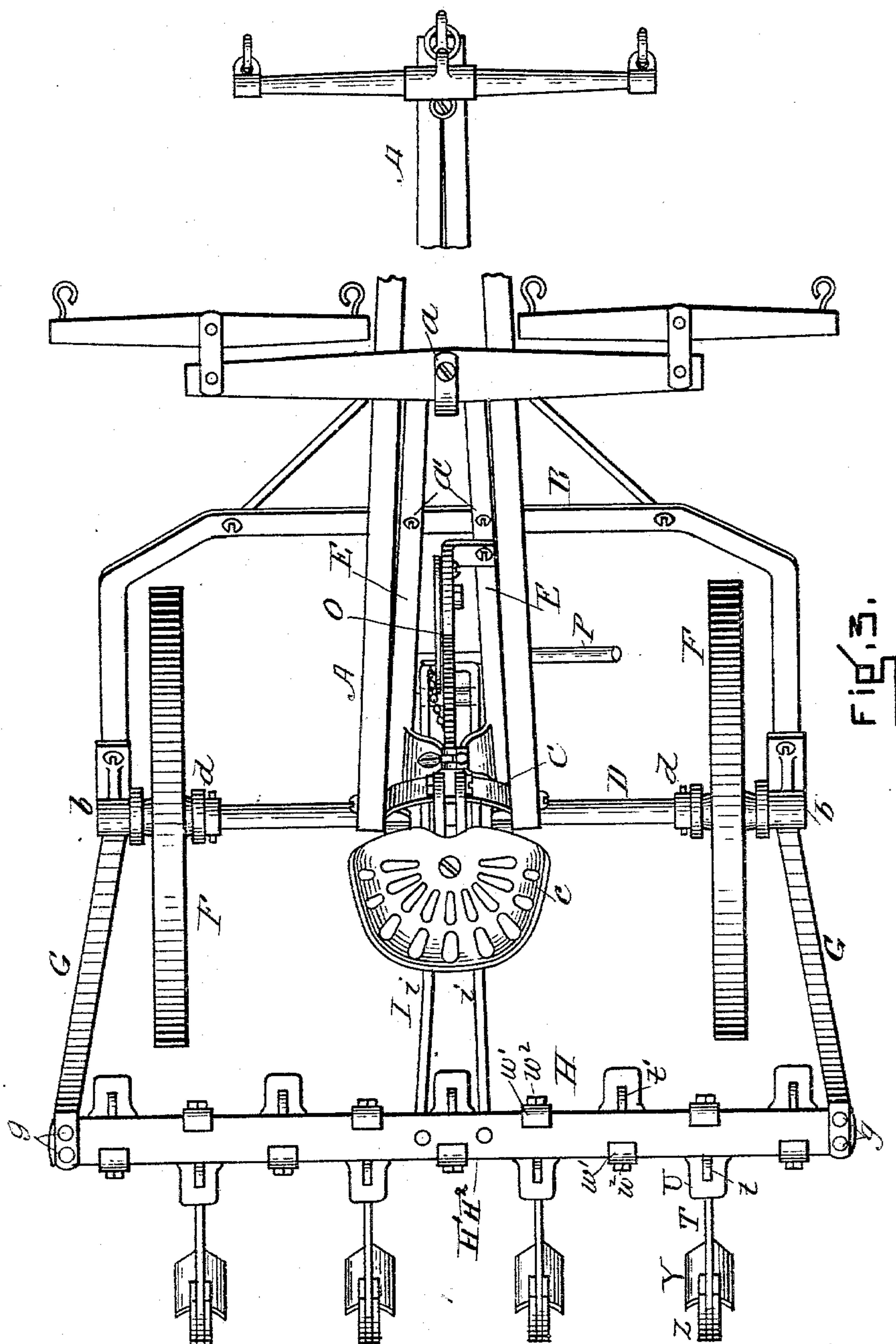
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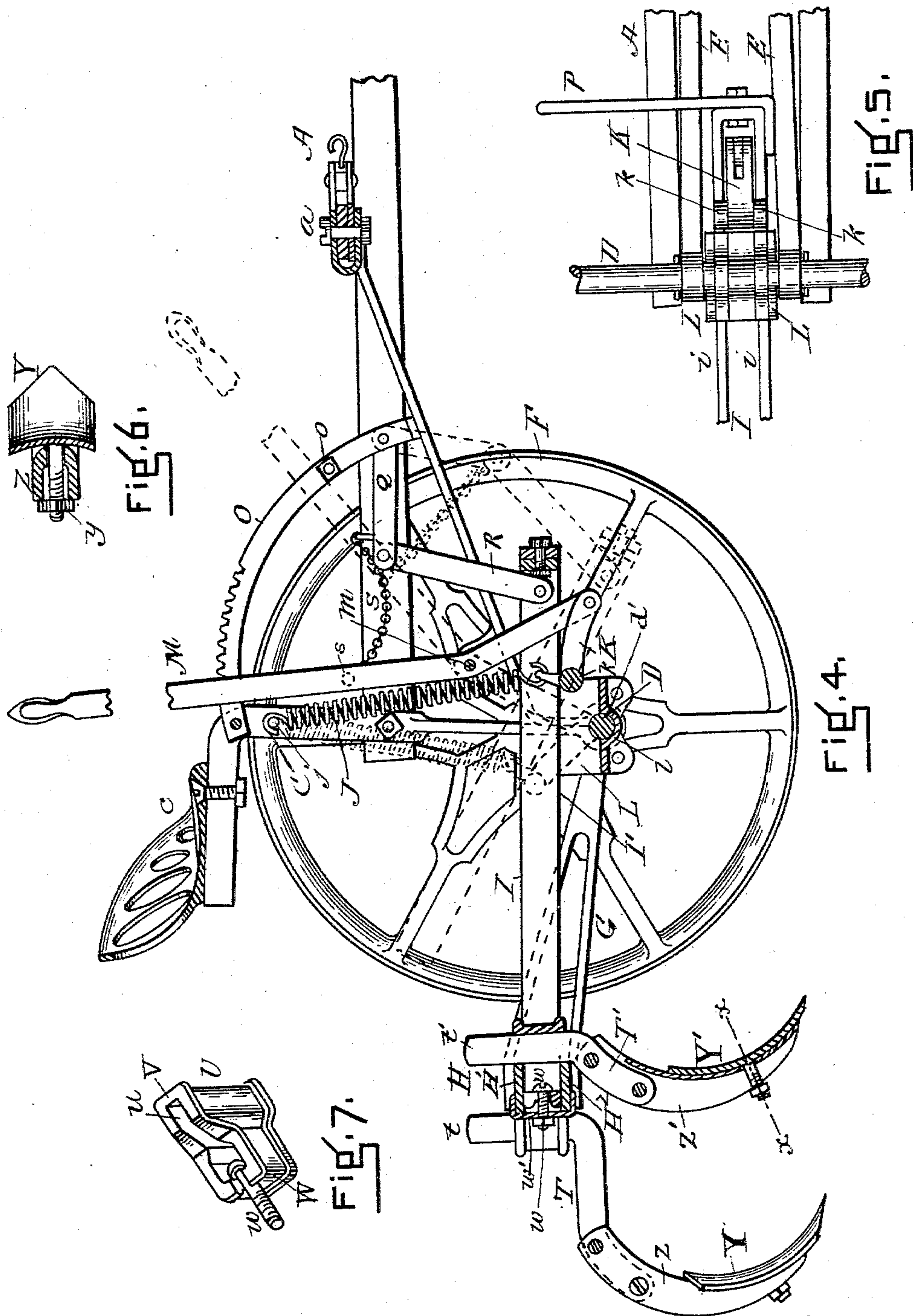
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4 Sheets—Sheet 4

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UNITED STATES PATENT OFFICE.

SAMUEL L. ALLEN, OF MOORESTOWN, NEW JERSEY.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 562,786, dated June 30, 1896.

Application filed September 16, 1895. Serial No. 562,600. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL L. ALLEN, a citizen of the United States, residing at Moorestown, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Cultivators, of which the following is a full specification.

Referring to the accompanying drawings, Figure 1 is a side elevation of my improved cultivator. Fig. 2 is a rear elevation of same. Fig. 3 is a plan of same. Fig. 4 is a vertical section of same in a plane at right angles to the axle at its central point. Fig. 5 is a view of the under side of the gang-operating mechanism. Fig. 6 is a section through the lower end of one of the standards, on the line $x x$, Fig. 4, showing connection of blade thereto. Fig. 7 is a perspective view of one of the clevises by which the standards are secured to the frame.

My invention relates to a cultivator especially adapted for use in orchards and vineyards; and it consists in novel features in construction whereby it is possible to raise and lower the gang by spring-tension, and to adjust it for depth by means of a single lever, operated by the driver in the most easy and perfect manner.

One feature of my device consists in the use of a swinging spring for operating the gang, which may be adjusted by the lever, at any desired point, in front of, directly over, or behind the axle, thus graduating the weight of the gang on the ground. When the spring is moved forward of the axle, the gang bears upon the ground, not only with its whole weight, but by the tension of the spring besides. When over the axle, the gang bears with just its own weight on the ground, and when behind the axle, it is lifted by the spring. To adjust the position of the spring, I preferably employ a lever with a truck and rollers running on the under side of a track which forms part of the pivoted tool-frame, and which extends over the axle, swings upon it in a vertical plane, and on its rear end carries the tool-head, to which it is rigidly secured. The upper end of the spring is attached to the main frame of the cultivator, and the lower end to this lever-operated truck running on the under side of the above-

mentioned track, and it will be seen that the point of application of the spring may thus be adjusted on the track before, behind, or directly over the axle.

My cultivator is designed to be made in different sizes, by simply decreasing or increasing its width, so as to be adapted to one, two, three, or more horses. The general arrangement of the draft apparatus and frame will be readily understood by the drawings, wherein—

A represents the draft apparatus, including tongue, whiffletree, &c. The tongue, which is split, is bolted to the frame B at the point a where the whiffletree is placed, and then extends farther back, where its two separated ends are bolted to the sides of the split standard C, which carries at its upper end the seat c , while its lower ends rest on and are secured to the axle D. To the lower ends of the standard C are bolted the braces E, which extend upward and forward, and are bolted to the frame B at the points a' and a .

The axle D is bent as shown in Fig. 2, so that its center d' is considerably lower than its ends, upon which the wheels F turn. The wheels F are held in place by the collars d , pinned to the shaft inside the wheels, and on the outside by the boxes b , pinned to the ends of the shaft and bolted to the frame B. These boxes b , as shown in Fig. 1, are triangular in shape, being attached to the axle at the apex, and bolted to the frame B on the side opposite the apex. A low hitch is thus secured, the point of application being at b' , at a point vertically below the end of the axle, and at such a distance below as to be practically in horizontal line with the center line of the bent axle at its lowest point. At the points b' are also pivoted the brackets G, which form part of the swinging tool-frame H. By H, I mean to include the entire rear swinging portion of my cultivator, including the brackets G, tool-head H' H^2 , and lever I, which, as hereinafter set forth, is pivoted to the axle at its central depressed point d' , thus making the entire tool-frame H swing in a vertical plane about these three points b' , d , and b' below the level of the hubs of the wheels. It will be seen that the draft on the cultivator is also applied at these three points b' , d , and b' , which

arrangement and combination adds greatly to the efficiency in operation and economy of construction.

The brackets G are not at right angles to the axle, but flare outwardly, so that the tool-head $H' H^2$ which joins their rear ends is considerably wider than the gage of the wheels, thus providing for a large number of tooth-supporting standards and allowing the cultivator to operate at once on a wide strip of ground, and pass close to tree-trunks without injuring them.

The rear portions of the brackets G are bifurcated horizontally, and the two parts diverge so as to embrace, between the prongs thus formed, the ends of the head $H' H^2$. This head $H' H^2$ is preferably composed of two flat horizontal bars $H' H^2$, separated at the ends by the blocks h , the whole being firmly bolted together by the bolts g , as shown.

The frame H is raised and lowered by means of its lever I, formed by two parallel bars $i i$, joined at the forward ends, and having their rear ends bolted between the upper and lower bars of the head $H' H^2$. The lever I is at right angles to the head $H' H^2$ at its center, and extends forward between the two sides of the split seat-supporting standard C, and over the center d' of the axle D, which, as above described, is depressed at this point so that the lever I is above the axle but below the level of the center of the wheel-hubs. From the outside of each of these rods $i i$, and directly over the axle and extending downwardly, are the plates L, which are joined at the lower ends by the journal l , which turns on the axle D. It will be seen that the frame H thus swings on three points which are in line, and opposite its ends and center respectively. The under edges of the bars $i i$ are left smooth and uninterrupted to form a track I'.

J is a tension-spring secured by its upper end to the frame C by the pin j . Its lower end passes down between the parallel track-bars $i i$, forming the lever I, and is secured to a truck K beneath. This truck, as shown in Fig. 4, is simply a short bar having through its rear end a spindle projecting outward on each side at right angles to it, and carrying on each side rollers k , which run on the track I' on the under side of the rods $i i$. The lower end of the spring J is attached to the truck immediately over the rollers, and to the front end of the truck is pivoted the lever M, which is fulcrumed above to the frame at m , and extends upward within reach of the driver upon the seat.

The lever M is provided with a latch N, engaging with a notched sector O, bolted to the frame of the machine, in order to hold the lever in any desired position, and the arrangement of the sector is such that when the lever is pulled backward to the rear notch the truck is in its extreme forward position, so that the tension of the spring through the truck and roller is applied to the lever in front of the

axle, and in consequence the frame II, carrying the gang, is pressed downward. As the lever M is moved forward the rollers k move back, and when the lever is in the forward notch the arrangement is such that the roller is directly over the axle, so that the action of the spring is nullified, and the gang is free to fall of its own weight. As the lever is carried still farther forward the rollers travel back of the axle, lifting up on the frame II, and when the lever strikes the stop o the frame H and gang is lifted from the ground by the tension of the spring. To the forward end of the lever I is fastened a foot-rest P, by which the action of the spring may be aided.

The front end of the track-lever I is also connected with the frame B at the lower end of the sector O by the knuckle-joint R Q, formed by the arms R and Q, which are loosely pivoted together at their inner ends, and at their outer ends to the frame B and track-lever I, respectively. These arms are so proportioned that when the track-lever I is in its lowest position the knuckle-joint will straighten out, or even fall by its weight, a little beyond the center, as shown by the dotted lines in Fig. 4. It will be seen that when the knuckle-joint is in this position the gang cannot be lowered, but is held up rigidly by the straightened joint, the spring being nearly relaxed in this position. The only way that the gang can be lowered is by breaking the knuckle-joint, so that it will bend back, as shown in the solid position in Fig. 4; and to this end I have provided a breaking-chain S, which is connected to the elbow of the knuckle-joint Q R and to the hand-lever M at the point s .

When the lever M is forward against the stop, the gang raised, and the knuckle-joint in its forward position, all shown by the dotted lines in Fig. 4, the chain s just reaches between the joint and the lever S. Let the operator now draw back the lever M to lower the gang, and the chain will pull back the knuckle-joint at the same time. As soon as the joint is past the center it will double up and allow the gang to drop while the chain S will hang loosely, as shown in the solid-line position, Fig. 4.

To the head $H' H^2$ are attached the tooth-supporting standards T T', by means of the special clevises U. (Shown in Fig. 7.) The clevises are linked-shaped, as shown in Fig. 7, having a vertical slot u at the broad end V, just wide enough to receive the vertical end t of the standard T. The narrow end W, having the bolt w , is then inserted between the upper and lower bars of the head $H' H^2$, as shown in Fig. 4, the bolt projecting through a bridge-piece or washer w' , which rests against the edges of the upper and lower bars of the head. A nut w^2 is then screwed onto the end of the bolt w , with the effect that the end W of the clevis is drawn toward the bridge-piece and the end t of the standard is firmly clamped between the other end V of

the clevis and the head $H' H^2$. By a single nut the standard can thus be firmly secured to the frame at any point, and the shape of the clevis prevents the standard being twisted, as well as holding it firmly in other ways. The standards shown are of two kinds—the long-reach standards T and short-reach T' —the difference being in upper bars t and t' , which, although of the same cross-section, are of different length and shape, as shown. The long-reach standards are also shown clamped to the rear side of the frame, while the short-reach are secured to the front side, but the same clevises are used in each case.

The lower ends Z of the standards, to which the blades Y are bolted, are curved and tapered, as shown, and of U-shaped cross-section, as shown in Fig. 6, the U being opened to the rear. Between the two walls of the upper ends of these pieces are bolted the upper ends t of the standards, and against the front lower ends are placed the blades Y , secured thereto by bolts and nuts y on the back. It is seen that with this construction different kinds of teeth may be used and adjusted as desired.

I claim—

1. In a cultivator, a wheel-mounted frame having a pivotally-attached tool-frame in combination with a swinging adjusting-spring attached at one end to the said mounted frame, and movably connected at its other end with said pivoted tool-frame, substantially as described.

2. In a cultivator, a wheel-mounted frame having a pivotally-attached tool-frame having the lever part I in combination with a swinging adjusting-spring J and a hand-lever M , whereby the action of said adjusting-spring J may be applied to the said lever I , at any point before, behind, or directly over the axle, all arranged as and for the purpose substantially as described.

3. In a cultivator, a wheel-mounted frame,

a pivotally-attached tool-frame, the lever part I having the track I' in combination with a swinging adjusting-spring J provided with a truck K and hand-lever M , all arranged and operated substantially as described.

4. In a cultivator, the combination of a wheel-mounted frame, a pivotally-attached tool-frame, an elbow-joint $R Q$ connected at one end with said wheel-mounted frame and at the other end with said pivoted tool-frame, a tool-frame-operating hand-lever M , and a breaking-chain S connecting said lever M and said elbow-joint $R Q$, whereby the motion of said hand-lever necessary to lower said tool-frame also breaks said elbow-joint and allows said tool-frame to be lowered, substantially as described.

5. In a cultivator, a wheel-mounted frame provided with a centrally-depressed axle D in combination with a lever I pivoted in said depression, the hand-lever-operated truck K whereby said lever I and truck K are situated and operated above said axle below the level of the center of the hubs of the wheels, substantially as described.

6. In a cultivator, frame, a tool-holding head provided with the long and short reach tool-standards T and T' , respectively, having the upper part t and t' and the lower ends Z all arranged as and for the purpose described.

7. In a cultivator, a frame having the split central seat-supporting standard C , the centrally-depressed axle D supporting the said standard C , the lever I and spring J , both located within said split standard C , substantially as described.

In witness whereof I have hereunto set my hand.

SAMUEL L. ALLEN.

Witnesses:

WILLIAM H. ROBERTS,
EDWARD W. BURT.