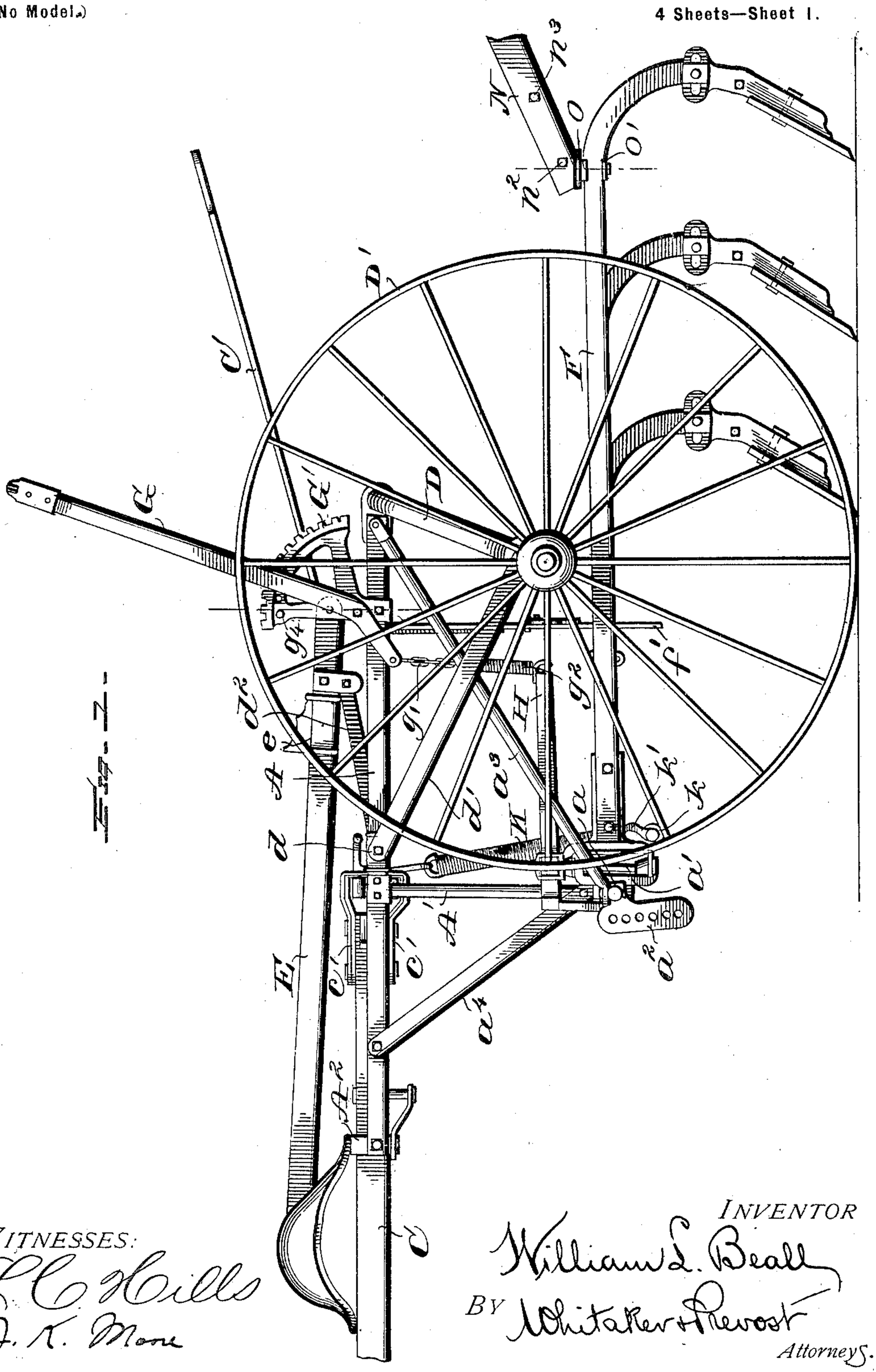
No. 659,885. Patented Oct. 16, 1900.

W. L. BEALL.

WHEEL CULTIVATOR.

(Application filed June 22, 1900.)

(No Model.) 4 Sheets—Sheet 1.



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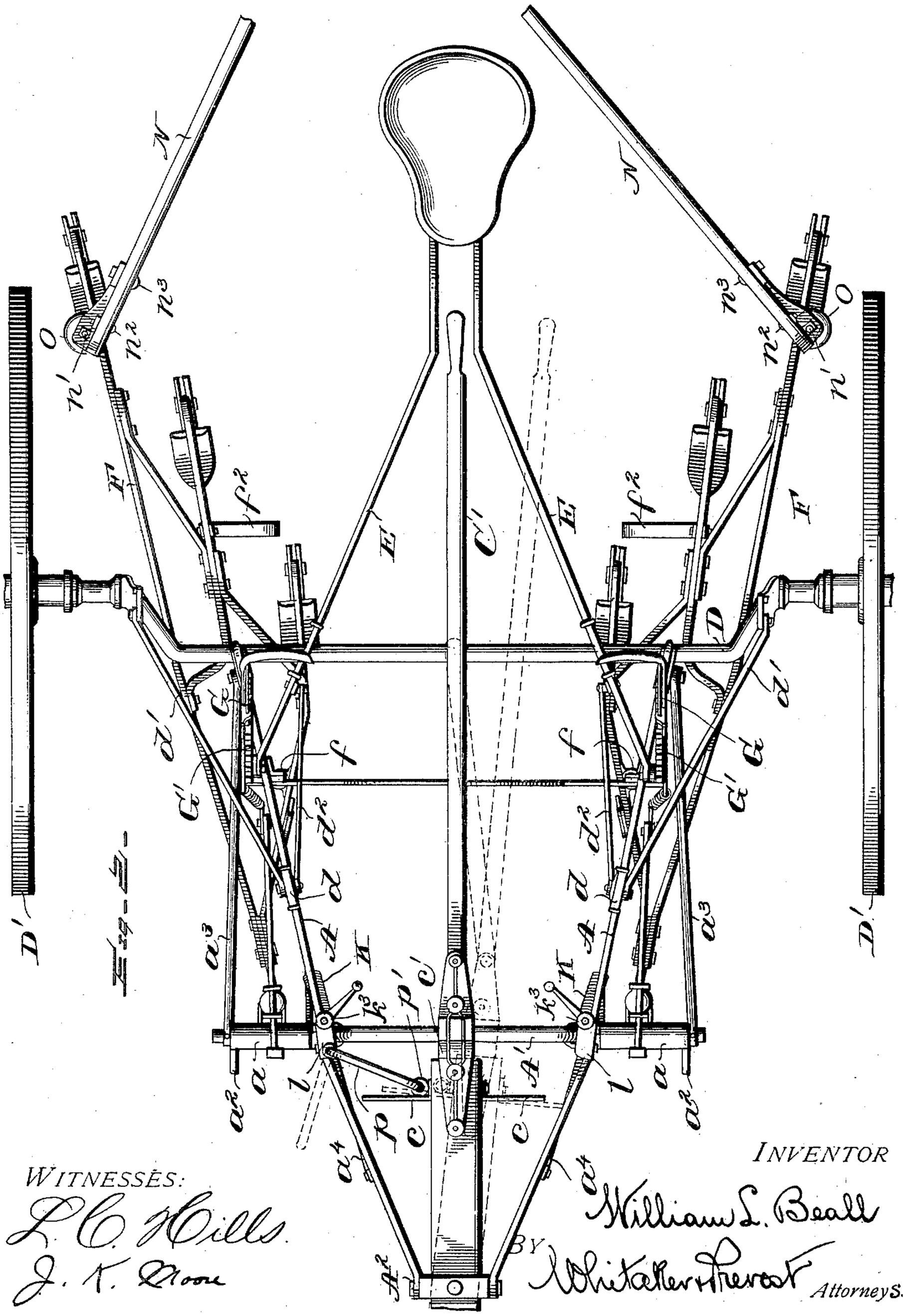

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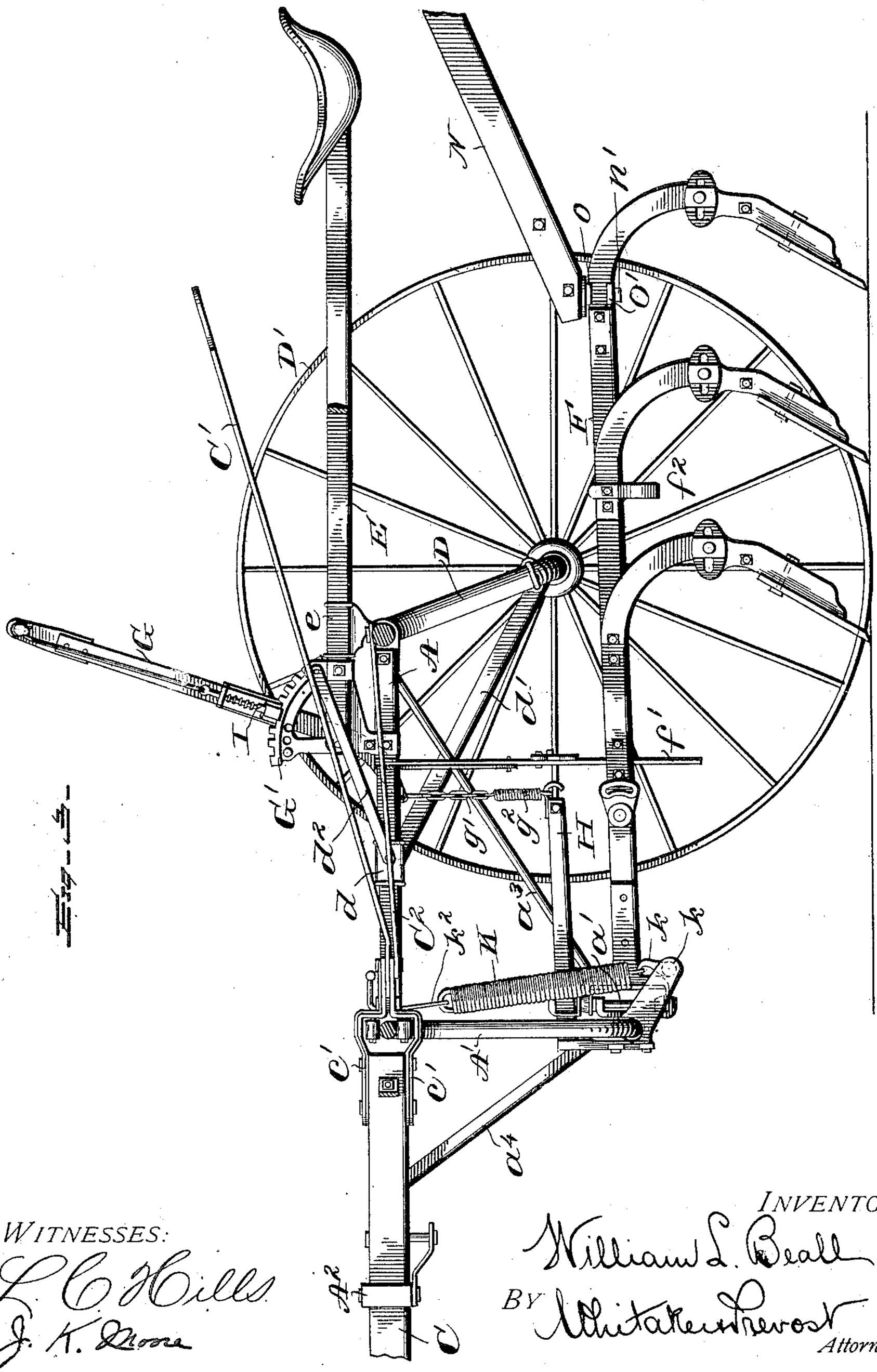

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(No Model.) 4 Sheets—Sheet 4.

Fig. 4.

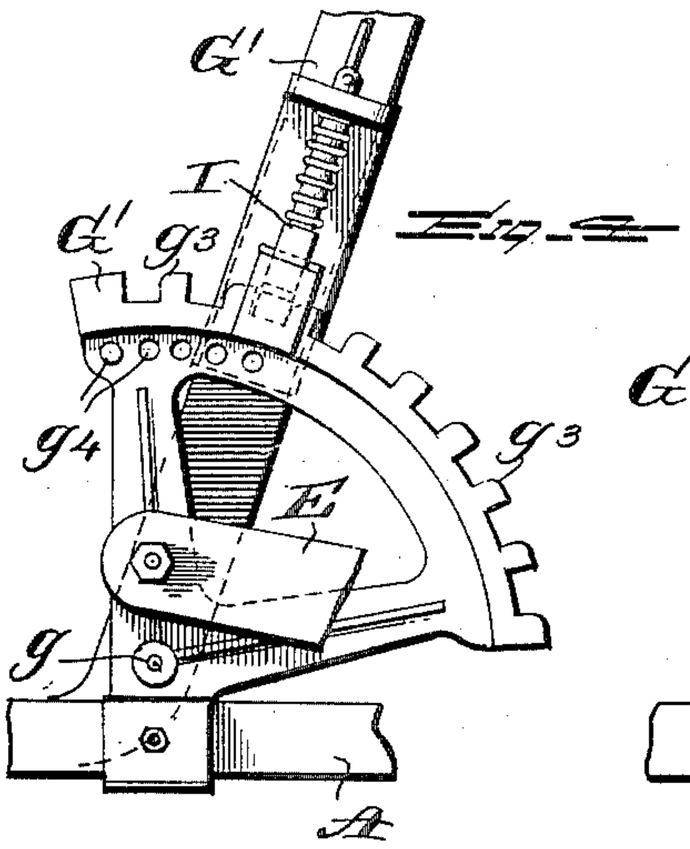


Fig. 5.

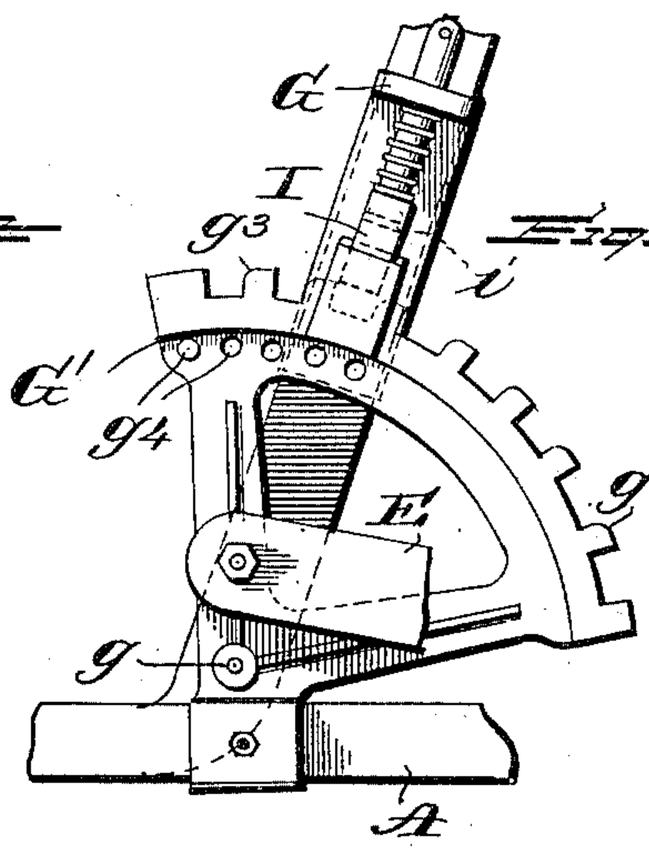


Fig. 6.

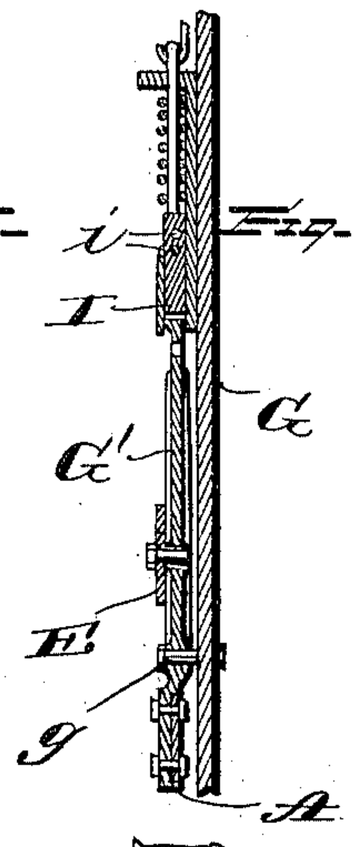


Fig. 7.

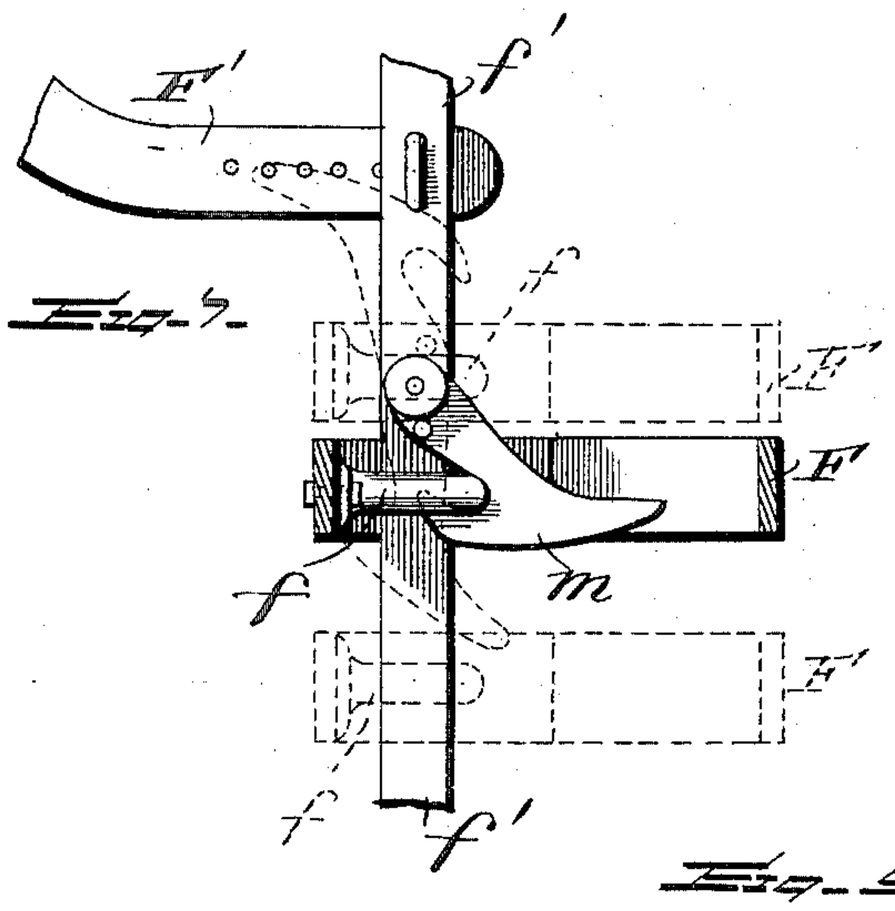


Fig. 8.

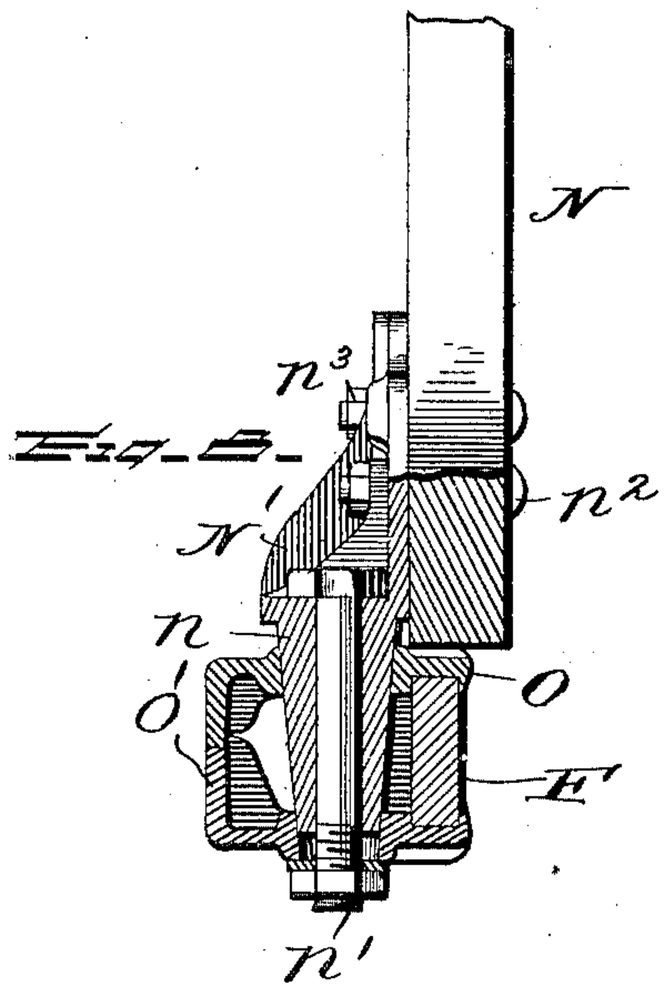
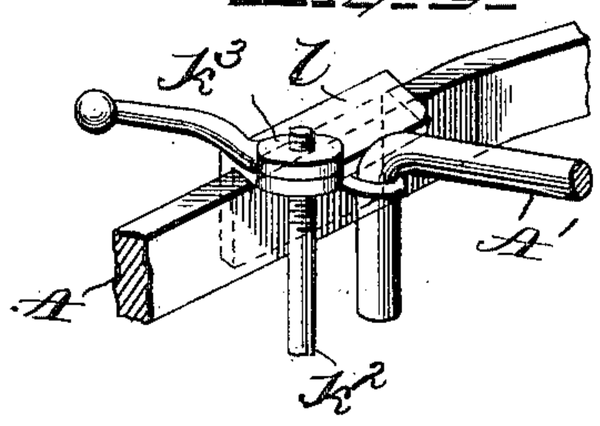


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM L. BEALL, OF ALBION, MICHIGAN, ASSIGNOR TO THE GALE MANUFACTURING COMPANY, OF SAME PLACE.

WHEEL-CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 659,885, dated October 16, 1900.

Application filed June 22, 1900. Serial No. 21,224. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. BEALL, a citizen of the United States, residing at Albion, in the county of Calhoun and State of Michigan, have invented a new and useful Wheel-Cultivator, of which the following is a specification.

My present invention relates to wheel-cultivators, and more particularly to that class of wheel-cultivators known as "straddle-row" cultivators, or such as cultivate the soil between two rows of the crop at the same time; and such invention consists in certain new constructions and combinations of parts, whereby the cultivator is adapted to a wider range of use than heretofore and the manipulation of the same is facilitated.

In the accompanying drawings I have shown the best form in which I have contemplated embodying my invention, and my said invention is disclosed in the following description and claims.

In the drawings, Figure 1 is a side elevation of a cultivator embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a longitudinal vertical section. Figs. 4, 5, and 6 are detail views of the toothed sector and pawl used with the lever for raising the cultivator-sections. Fig. 7 is a detail showing catch for holding sections in raised position. Fig. 8 is a section of the devices for securing the handles to the beams of the sections, and Fig. 9 is a detail of the clamp for connecting the side bars of the frame to the arched draft-bar.

In the drawings the main frame of the cultivator is shown composed mainly of side bars A A and arched draft-bar A′. The lower or depending ends of the draft-bar extend outward in a horizontal direction. Upon these horizontal portions are mounted two sleeves a a, and to these sleeves, which turn freely on the draft-bar, the two cultivator-sections F F are pivoted by a vertical pivot a'. A draft-clip a^2 is connected to each of these sleeves. The lower or depending ends of the draft-bar are securely held in their position in respect to the frame by braces a^3 a^3, extending from the outer ends of the draft-bar rearwardly toward the rear ends of the side bars A A, to which they are secured, and further by braces a^4 a^4, extending from the draft-bar, at or near the inner ends of the horizontal portions of the same, forwardly to the side bars A A forward of the draft-bar A′.

The forward ends of the draft-bars are secured to the yoke A^2, within which the tongue C passes and in which it is pivoted by a vertical pivot, permitting it to swing a certain distance laterally. The extent of this lateral movement is limited by the bumpers c c on each side of the tongue in rear of the yoke A^2, and which contact with the side bars A A when the tongue is moved laterally a sufficient distance.

The arched axle D of the cultivator has its highest portion pivoted in the ends of the side bars or in castings or clips secured thereto. The lower or depending portions of the axle are provided with parts to receive the supporting-wheels D′ D′.

Upon the side bars of the frame are slides d, to which are pivoted two pairs or sets of links. One pair of these links d' d' have their opposite ends pivotally connected to the lower or depending portions of the axle D, and the other pair d^2 d^2 have their opposite ends pivotally connected with the seat-supporting bars E E. These seat-supporting bars are in this instance pivoted to standards of the notched segments G′ G′, so that the seat can be folded forward upon the tongue, as shown in Fig. 1, or swung rearwardly to the position shown in Figs. 2 and 3. Upon the seat-bars E E are two slides e e, which are provided with notches at different distances from the bar to vary by engaging the axle the height of the seat when in position for use.

As the machine pivots upon the axles the balance of the machine is changed by the change in the position of the seat, so that when the latter is in position for use the weight of the implement is carried forward to counterbalance the weight of the rider. The links d^2 d^2 when the seat is at either extreme of its movement are brought into nearly a horizontal position, so nearly that they act to lock the seat against movement resulting from any strain or force applied to the axle.

To the rear end of the tongue are attached the straps c' c', which are brought nearly together a short distance from the end of the

pole and are there secured to the rearwardly-extending hand guide-bar C′. One of these straps extends above and one below the arched draft-bar, and they are provided with friction-rollers for engaging the said draft-bar and permitting the easy movement of the tongue from one side to the other. To the under side of the straps C′ C′ is pivoted a bar C^2, which I term the "tongue guide-bar." This bar extends rearwardly to the arched axle and is provided above the axle with a slot which engages a pin or bolt forming a pivot for the rear end of said tongue guide-bar.

One of the bars forming a part of the frame of each cultivator-section is provided with an eye *f*, and through these eyes are passed two vertically-disposed rods or bars *f′ f′*. These rods or bars are pivoted at their upper ends to ears secured in this instance to the side bars A A, so that they are free to swing transversely of the implement. An arched connecting-bar F′ has its ends pivoted to the bars *f′ f′*, while the middle of the arched portion is pivoted to the tongue guide-bar.

The construction of the parts is such that the cultivator-sections are held a uniform distance apart, and in case the tongue should swing in either direction the sections will be given a corresponding movement. It will also be seen that the operator when riding can by the hand guide-bar swing the rear end of the tongue in either direction and give movement to the cultivator-sections, as desired, while in either event the sections are free to rise or fall, and that when moving laterally their vertical position is not varied by reason thereof. This result could not be obtained if the levers for lifting the cultivator-sections from the driver's seat were connected directly to the frames of the sections. Two levers G G are provided for this purpose, and these levers are pivoted to the notched segments G′ G′ at *g g*. (See Figs. 4 and 5.) The lower end of each lever is bent to a slight angle from the main portion of the lever and has secured to it the chain and spring *g′* g^2, and the lower end of the spring is connected to the rear end of the lifting arm or lever H. This arm or lever is rigdly secured to the sleeve *a*, so that upon drawing the lever G backward to exert a lifting action on the section the section is still at liberty to move laterally upon its vertical pivot in a horizontal plane.

Each of the levers G is provided with a spring-pawl I to engage the notches of the notched segment, and such pawl is manipulated by a short lever with which it is connected and which is located in such relation to the hand-grasp of the lever as to be controlled by the hand when upon the hand-grasp.

The teeth of the notched segment in place of a sharp angular corner at their forward side have a rounded or inclined surface, as shown at g^3, so that on partially raising the pawl I the lever G may be drawn backward and the pawl pass over the teeth in the manner of a pawl and ratchet.

The pawl I is provided with two holes *i i′*, one above the other, in one or the other of which is inserted, to limit the inward movement of the pawl, a pin. When this pin is placed in the upper hole *i′*, the pawl will descend to the distance necessary to lock the lever in position. When placed in the hole *i*, the pawl will be held outward above the teeth of the segment, and the lever will be free to move up and down, accommodating itself to the position of the cultivator-section.

Each of the toothed segments is provided with holes g^4, in which a pin may be inserted to limit the extent to which the cultivator-section may be permitted to move downward.

When it is desired to control the cultivator-sections by the feet of the rider, it is desirable that there shall be a lifting spring-pressure applied to each section to maintain them at the height permitted by the rider's feet and to lift them when they have been depressed. The inner end of each sleeve *a* is provided with the arm *k*, (see Fig. 3,) having a hook *k′*. To this hook is connected the lower end of a spring K. The upper end of this spring is connected to a rod k^2, which passes upward through a clip *l*, (see Fig. 9,) used to secure the side bars A to the arched draft-bar A′. The upper end of the rod k^2 is threaded and is provided with a handled nut k^3, by means of which the spring K may be adjusted to exert the desired tension.

Each of the bars or rods *f′* is provided with a catch *m* to engage the eye *f* on the cultivator-section when raised a certain distance above its working position and to hold it while moving from place to place. This catch is made in the hooked form shown in Fig. 7. This hook acts automatically both for engaging with and disengaging from the eye *f*. When not in engagement with the eye and not supporting the cultivator-section, the catch *m* hangs below its point of pivoting, as indicated in the lower dotted lines in Fig. 7. The lower side of the hook presenting an inclined or cam face to the eye *f* on raising the section, which may be either by the lever G or by the handle N, the eye engages the inclined or cam side of the catch and swings it outwardly until the eye is above the hook of the catch, when the catch falls and the hook engages the eye and holds the section in the elevated position. When it is desired to release and lower the section, the section is first raised in the manner before indicated. In doing this the eye *f* will come in contact with the shank of the catch, and the catch will be carried to nearly or quite the position shown by the upper dotted lines in Fig. 7. The section is then quickly dropped and falls below the catch and into the working position without again engaging it.

The handles N N are secured to the sections, so as to permit of the adjustment of the same vertically and angularly in respect

to their respective sections. The construction employed is shown in detail in Fig. 8. The handle is in each case secured to a casting N′ by a pivot N^2 and a securing-bolt N^3, permitting vertical adjustment. This casting N′ is provided with the downwardly-extending projection *n*, having the form of the frustum of a cone, and which has an aperture through it to permit of the passage of a securing-bolt *n′*. A plate O, having a groove to engage the top of a bar of the cultivator section-frame, and a plate O′, having a groove to engage the under side of such bar, are employed. These plates are apertured in such a manner that when placed in position there is an opening through each corresponding to the projection *n*. This projection is of such length as not to pass entirely through the plates, and when the projection is placed in the openings and the nut on the securing-bolt *n′* is tightened the parts are firmly secured together in place, and the handle N can, by slightly loosening the nut on the securing-bolt *n′*, be turned to the position desired.

This form of cultivator is adapted to various uses, as hereinbefore partially indicated. It can be used as a riding-cultivator, having the two cultivator-sections a uniform distance apart and the said sections being guided by the tongue under control of the draft-animals or by the operator through the hand guide-bar C′. In such case the sections may be permitted to seek their own level by reducing the tension of springs K until this is accomplished, or the springs may be tightened to exert their influence and the depth to which the teeth of the cultivator descend regulated by the pressure of the feet of the operator.

If it is desired to control the cultivator-sections chiefly by the feet of the operator, the vertical bars *f′ f′* and their arched connecting-bar are removed from the machine. The springs K will in this instance be made to exert the required tension. If it is desired, the cultivator can be used as a walking-cultivator by turning the seat into its forward folding position. The pawls I will be raised out of operative relation to the notched segment and the springs K adjusted to give the desired lifting action. In such case it is also desirable to have the tongue locked rigidly in position, and this is effected by a hook *p*, which is pivoted to one of the clips *l* at the front of the machine and is made to engage an eye *p′*, connected to the rear end of the tongue.

It is obvious that some of the features of my invention can be modified to some extent without departing from the principle of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with the side frame-bars, of the tongue pivoted for lateral movement between the said bars and bumpers secured to said tongue for impinging against said side bars and limiting the movement of said tongue in either direction, substantially as described.

2. In combination with the tongue pivoted for lateral movement, the cultivator-sections pivoted for a like movement, devices connecting the sections for maintaining them an equal distance apart and the tongue guide-bar combined with said connecting devices for communicating the movement of the pole to the sections, substantially as described.

3. In combination with the tongue pivoted for lateral movement, the cultivator-sections pivoted for a like movement, devices for maintaining the sections an equal distance apart, the tongue guide-bar combined with said connecting devices and the hand guide-bar, substantially as described.

4. In combination with the cultivator-sections pivoted for vertical and horizontal movement, devices for moving said sections vertically, including the lifting arm or lever and devices for moving said sections laterally connected with and controlled by the tongue, substantially as described.

5. The combination with the cultivator-sections pivoted for vertical and horizontal movement, devices for moving said sections vertically, including the lifting bar or lever, the tongue, devices for moving the said sections laterally, without changing their vertical position connected with and controlled by said tongue, and the hand guide-bar for controlling said tongue, substantially as described.

6. The combination with the cultivator-sections pivoted for vertical and horizontal movement, each of said sections having a guide-eye, of the vertically-disposed guiding-bars engaging said guide-eyes, a device connecting said guiding-bars, and a pivoted tongue connected with said device, substantially as described.

7. In a wheel-cultivator the combination with the pivoted arched axle of the pivoted seat and connections between the two whereby the movement of the seat on its point of pivoting will communicate motion to the axle, substantially as described.

8. The combination with the pivoted arched axle of the pivoted seat, the slides on the frame side bars and links connecting said seat and axle with said slide, substantially as described.

9. The combination with the pivoted arched axle, of the pivoted seat, slides on the frame-bars, links connecting said slides and said axle, links connecting said slides and said seat, the connections with the seat being such that the seat-links assume a nearly-horizontal position when the seat is at its extremes of movement whereby it is locked in position against strain from the axle, substantially as described.

10. The combination with the sections provided with the guiding-eyes of the vertically-

disposed guiding-bars on the supporting-catches on said bars, substantially as described.

11. The supporting-catches for the cultivator-sections having the hook and the inclined or cam side, substantially as described.

12. The combination with the sections provided with the guiding-eyes, of pivoted supporting-catches, adapted to be engaged and disengaged by the movement of the eyes against them, substantially as described.

13. The combination with the side frame-bars of the arched draft-bar, the clip connecting the same, the cultivator-sections, the lifting-spring and connecting-rod passing through said clip, substantially as described.

14. The combination with the toothed sectors, of the lifting-levers, the securing-pawls, having provision for carrying the limit of the downward movement of said pawl whereby the pawl may be permitted to engage the teeth of the sector and be held out of contact with the same, substantially as described.

15. The combination with the lifting-lever, the pawl and means for controlling the pawl of the toothed sector having teeth with the cam-faced tops, substantially as described.

16. The combination with the cultivator-frame, of the sections pivoted for vertical and horizontal movement and having the lifting-springs, the lifting-levers having a spring connection to lift said sections and the seat, whereby the operator can control the said sections by his feet, substantially as described.

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

WILLIAM L. BEALL.

Witnesses:

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M. L. DEAN.