

(No Model.)

2 Sheets—Sheet 1.

J. H. GILMAN.
CULTIVATOR.

No. 539,174.

Patented May 14, 1895.

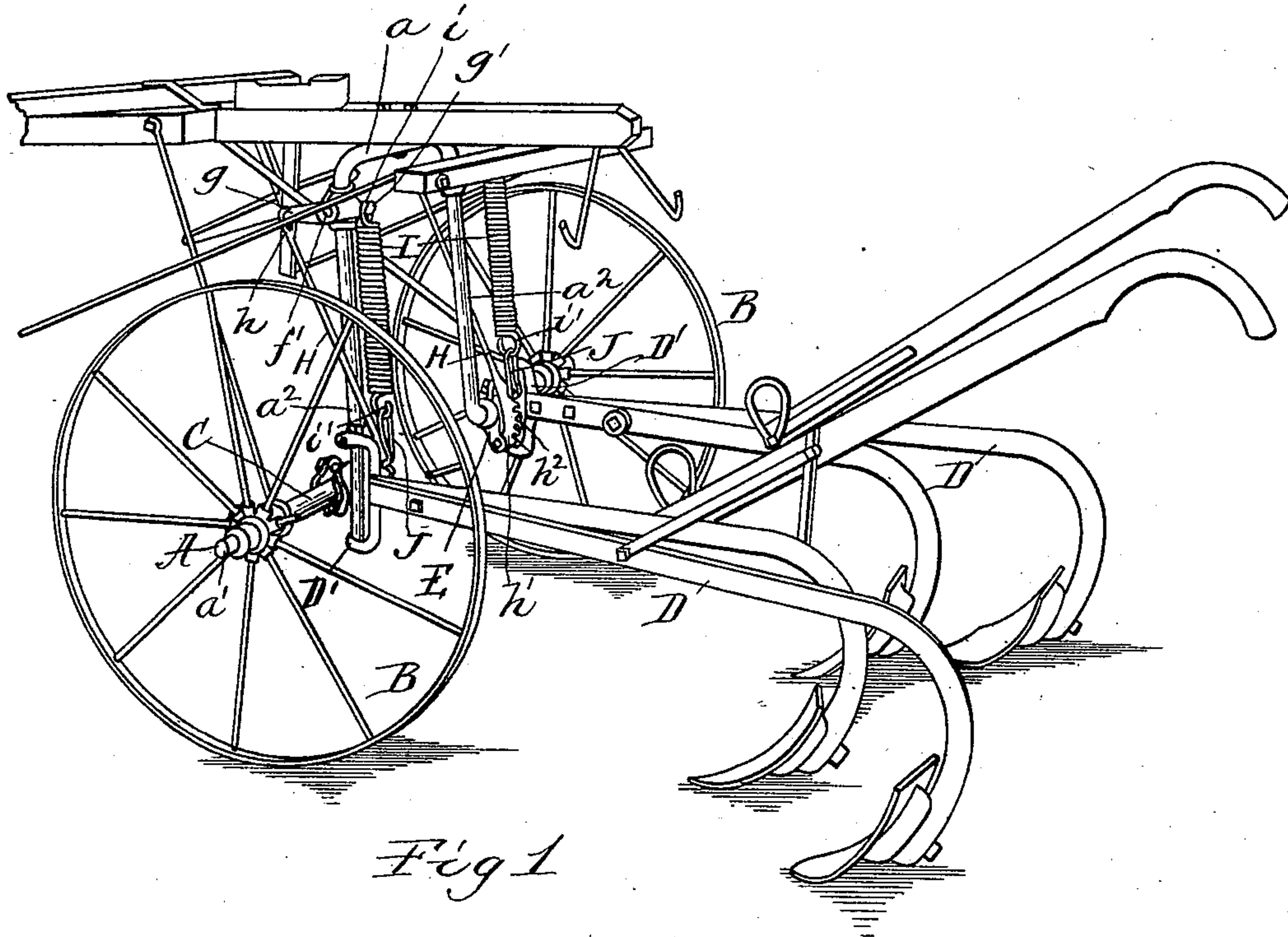


Fig 1

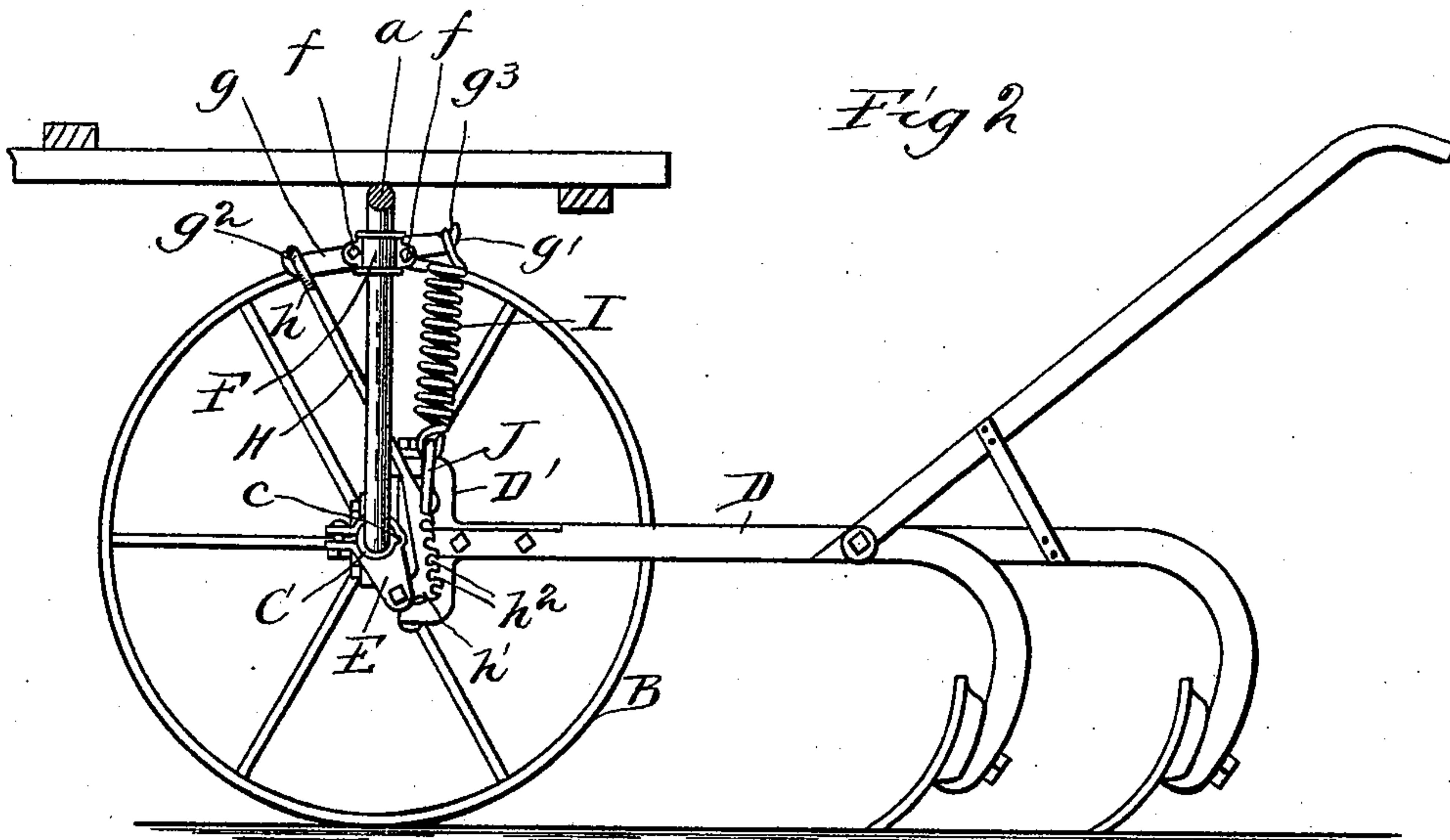


Fig 2

Witnesses
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Inventor
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By *Robert Thacher*
Attys

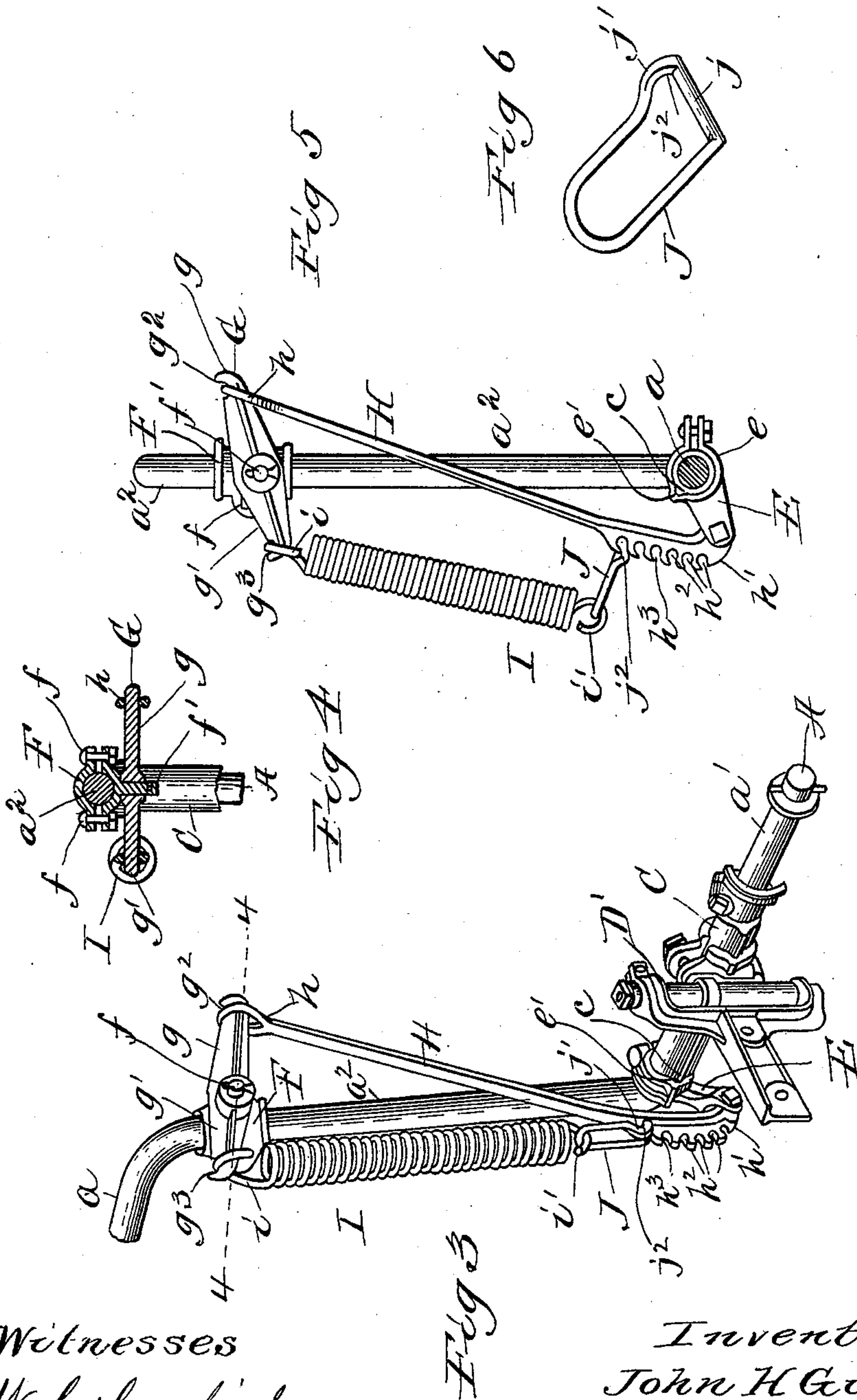
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W. C. Corlies
Jno. A. Christianson.

Inventor
John H. Gilman

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UNITED STATES PATENT OFFICE.

JOHN H. GILMAN, OF OTTAWA, ILLINOIS, ASSIGNOR TO THE KING & HAMILTON COMPANY, OF SAME PLACE.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 539,174, dated May 14, 1895.

Application filed February 27, 1894. Serial No. 501,651. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. GILMAN, a citizen of the United States, residing at Ottawa, in the county of La Salle and State of Illinois, have invented a certain new and useful Improvement in Cultivators, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

10 Figure 1 represents a perspective view of a cultivator embodying my invention, the tongue being in section; Fig. 2, a longitudinal section of the same just inside one set of shovels and looking outward; Fig. 3, a detail
15 perspective view of the spring and coupling detached; Fig. 4, a detail plan section taken on the line 4 4 of Fig. 3; Fig. 5, a side elevation of the coupling-spring shown in Fig. 3, looking from the outside; and Fig. 6, a per-
20 spective view of the spring-connecting link detached. In these drawings, Figs. 1 and 2 are upon one scale by themselves. Figs. 3, 4, and 5 are upon another and larger scale; and Fig. 6, upon another scale by itself, still more
25 enlarged.

My invention relates to wheel cultivators of a well known type, in which the shovel or draft beams are connected to the axle of the wheels, this axle being usually arched, and
30 which is provided with lifting springs adapted to assist in the raising or lifting of the shovel beams.

The invention relates especially to the lifting springs and their accompanying parts, by
35 means of which the springs are utilized in lifting the said beams.

I will describe in detail so much of a cultivator embodying my invention as is necessary for an understanding of the construction and operation of the invention, and the special improvements which I believe to be new and desire to secure by Letters Patent will be more definitely pointed out in claims.

40 In the drawings, A, represents the axle of a two-wheeled cultivator, this axle being constructed with the well known rising, central arch, a , while the wheels, B, are mounted on its respective ends. On each of the horizontal sections or ends, a' , of this axle there is
50 loosely mounted a sleeve, C, to which the shovel or draft beams, D, are secured by a

coupling, D', which permits lateral vibration or swinging of the beams, the vertical vibration of the latter being effected by the oscillation of the sleeve itself on its axle support. 55 These are all well known devices in common use, and there is no necessity for any further description here.

A short arm, E, is secured to the sleeve at the inner end thereof next to the upright 60 member, a^2 , of the axle arch. The arm is fixed on the sleeve by means of a divided collar, e , at its inner end, which is clamped around the sleeve, as seen in Fig. 5, and is held in place by means of a small spline, c , 65 on the sleeve and a corresponding groove, e' , on the inside of the said collar and transverse thereof.

A short sleeve or collar, F, is mounted on the upright arm, a^2 . This sleeve is made in 70 two parts, which are fastened together and at the same time clamped upon the said upright arm by means of bolts, f , passing through side lugs on the respective parts, as seen in Fig. 4. This fastening device provides for 75 fixing the sleeve at any point desired on the upright arm of the arch, and at the same time provides for readily adjusting it up or down on said arm for the purpose which will presently appear. The half sleeve, on 80 the outside of the upright arm to which it is attached, is provided with a short horizontally projecting pin, f' . On this pin is loosely mounted a lever, G, so as to extend both in front and rear of its pivotal support and be 85 left free to rock or oscillate thereon. The pivotal bearing of this lever is arranged a little nearer to one end of the latter than the other, and the longer arm, g , thereof is the one which extends forward of the support, 90 while the shorter arm, g' , extends to the rear, as seen in Figs. 1 and 2. At the respective extremities of the lever arms there are notches, g^2 and g^3 , in the upper edge of the lever, the former at the front end and the 95 latter at the rear end thereof. A link rod, H, is hinged or pivoted at its lower end to the outer or free end of the arm, E, which, as described above, is fixed on the sleeve, C, and so becomes a crank arm for the latter. The 100 upper end of this rod, H, is provided with a loop, h , adapted to hook over the forward end

of the oscillating lever, G, and to be seated in the notch, g^2 , therein. The lower end of this link or connecting rod is widened and curved somewhat so as to provide a kind of sector, h' , the outer edge of which is curved and is provided with a series of notches, h^2 . These notches are constructed with a constricted opening, back of which the notch is opened out to its normal size and is made circular in form. The upper edge of each notch, which makes the upper boundary for the opening, is brought down a little on a curve, thereby forming a slight hook, h^3 , turning downward at each notch, as seen in Fig. 5. The corresponding lower edge is nearly straight, as also seen in said figure as well as in Figs. 2 and 3. A spring, I, is connected respectively to the short arm of the rocking lever, G, and to this notched sector at the lower end of the connecting rod, H. In the drawings this spring is shown as a spiral coil provided at its upper end with a hook, i , adapted to pass over the end of the rear end of the oscillating lever and be seated in the notch g^3 , therein. At the lower end of this coil there is also a hook or loop, i' , which provides for connecting this end to the lower end of the rod, H, by means of a long link, J, one end of which takes the hook, i' , of the spring coil, while the other is adapted to be engaged with any one of the notches, h^2 , in the lower or sector end of the connecting rod. The sector end of the link, J, is peculiarly constructed, so as to provide for locking the link in any notch in which it may be entered, except in one single position. For this purpose the link at this end is constructed with a short, straight cross bar, j , round in shape and of a size corresponding to the interior circular enlargement of the notch. Obviously this bar cannot be entered directly into the notch. Therefore, and to provide for making this connection one of the side bars of the link is bent outward close to the cross bar, j , so as to make here a bent or curved section, j' , standing out from the general plane of the link. This bent section is flattened for a little way at its junction with the straight end bar, as seen in Fig. 6, and is made so thin by this flattening that it will pass through the opening into any one of the notches. The flattened section, j^2 , is also about straight, but lies at an angle to the said end bar and the plane of the link, as seen in Fig. 5.

The link is connected with the notched end of the rod, H, by placing the bend in the link and the straight end bar at one side of the notched end of the rod and directly opposite one of the notches, and then moving the end of the link inward, the thin part of the bend passing through the notch opening and the end bar passing into the enlarged aperture of the notch, as seen in Fig. 5; but owing to the peculiar construction of these two parts, this connection can be made only when the link is turned well down into a position about perpendicular to the connecting rod, as seen in Fig. 5, and the parts must be brought into

this relative position to make the connection. In working adjustment, however, this link will always be turned up, as seen in Figs. 1, 2, and 3, thereby throwing the bend up at one side of the connecting rod and on the outside of the notch, in which position the link cannot be disconnected from the notch in which it is entered, so that in working adjustment this connecting link is locked to the connecting rod, H, and so the lifting spring is also locked to the same rod.

Now, it is obvious from the description above that, when the shovels are down in working position, the draft beams are lowered to about a horizontal position, as seen in Fig. 2. This adjustment of these beams will turn the sleeve backward, thereby throwing the crank arm on said sleeve downward and so bringing a strain upon the lifting spring, if the latter is properly regulated with reference to the other devices. Now, the parts are so arranged and constructed relatively that, when in this position, seen in Fig. 2, the lifting spring will be brought under strain and the coil drawn out so as to produce considerable tension. This tension of the spring will obviously have a tendency constantly to pull up on the connecting rod, H, and so to throw up the crank arm on the axle sleeve, which, of course, acts in a direction to turn said sleeve upward and forward on the axle; but this is the movement of the sleeve in raising the shovel beams, and so the tension of the spring acts to assist in lifting said beams. The parts are also intended to be relatively arranged so that, in normal position, the crank arm on the axle sleeve will be turned down almost into a vertical line with the axle, as seen in Fig. 2. My intention is to have the parts so adjusted that this arm in the working position of the shovels will be just about as near the said vertical line as it can be without locking. By this arrangement the first action of the spring is upon a short leverage which is gradually lengthened as the crank arm is turned upward, and so the force of the spring is gradually increased as the draft beams are thrown upward. It will also be seen that the rocking lever, to which both the lifting spring and the link rod, H, are connected, is thus made to serve as a kind of equalizing device, and that the downward movement of the crank arm when the draft beams are dropped for work will bring a strain upon the lifting spring at each end thereof, and vice versa. Hence, a comparatively slight movement of the crank arm is sufficient to produce a strong tension of the lifting spring, and I secure a greater force from the latter, within the small range of movement of the said crank arm produced by the ordinary lifting of the draft beams, than is usually effected. The adjustability on its upright supporting arm of the sleeve, which carries the rocking lever, and the series of notches in the sector end of the connecting rod, H, provide for an easy and nice adjustment of the several parts

of this mechanism so as to secure a perfect action in the manner described above and with such tension of the spring as may be desired.

5 Mechanical changes may be made in the particular construction and organization of these parts without departing from the essential features of my invention as set forth above, and such changes I contemplate in the
10 practical application of my invention to different cultivators. It is evident too that it is not absolutely necessary that the support for the rocking lever shall be adjustable, as the necessary adjustment may be provided
15 by giving a sufficient range to the series of notches in the connecting rod, H. This adjustment of the support is convenient, however, and enables the general adjustment of the mechanism to be made more easily and
20 readily than if it was fixed.

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

1. In a cultivator, a sleeve mounted loosely
25 on the axle, in combination with a shovel beam connected thereto, a crank arm secured to the sleeve, a rocking lever pivotally mounted on a support above the said crank arm, a link rod connecting the crank arm with one
30 end of the said lever, and a lifting spring connecting the other end of said lever directly with the lower end of the connecting rod, substantially as described.

2. In a cultivator, the axle, A, in combination with a sleeve, C, mounted loosely thereon, a draft beam, D, coupled to said sleeve, a crank arm, E, fastened to said sleeve, a rocking lever, G, mounted on a pivotal support above said crank arm, connecting rod, H, and
40 lifting spring, I, connecting the other end of lever G. directly to the lower end of the con-

necting rod, all constructed and relatively arranged to throw the said crank arm into a nearly vertical position below the axle when the draft beams are down in working position, substantially as described. 45

3. In a cultivator, a sleeve mounted loosely on the axle and coupled to a draft beam, in combination with a crank arm fastened to said sleeve, a rocking lever, G, pivotally mounted
50 on a support above said crank arm, the connecting rod, H, provided at its lower end with a series of notches, h^2 , and connected respectively to one arm of the lever and the crank arm, and the lifting spring, I, connected at one
55 end to the other arm of the rocking lever and at its other end engaging with some one of the notches in the connecting rod, substantially as described.

4. In a cultivator, the axle, in combination
60 with a sleeve mounted loosely on said axle, a draft beam coupled to said sleeve, a crank arm fastened to the sleeve, a rocking lever, G, pivotally mounted on a support over said crank arm, the rod, H, connecting the crank
65 arm with one end of said lever and provided with a series of notches, h^2 , having contracted mouths or openings, the lifting spring, I, connected at one end to the opposite end of the rocking lever, a link, J, connected at one end
70 to the lower end of the lifting spring and provided with a straight cross bar, j' , at the opposite end and a bend, j , in one of the side bars next to said end bar and having a flattened section, j^2 , adapted to slip endwise
75 through the notch opening and turn up on the opposite side of the latter, substantially as described.

JOHN H. GILMAN.

Witnesses:

C. S. PHELPS,
C. E. TRYON.