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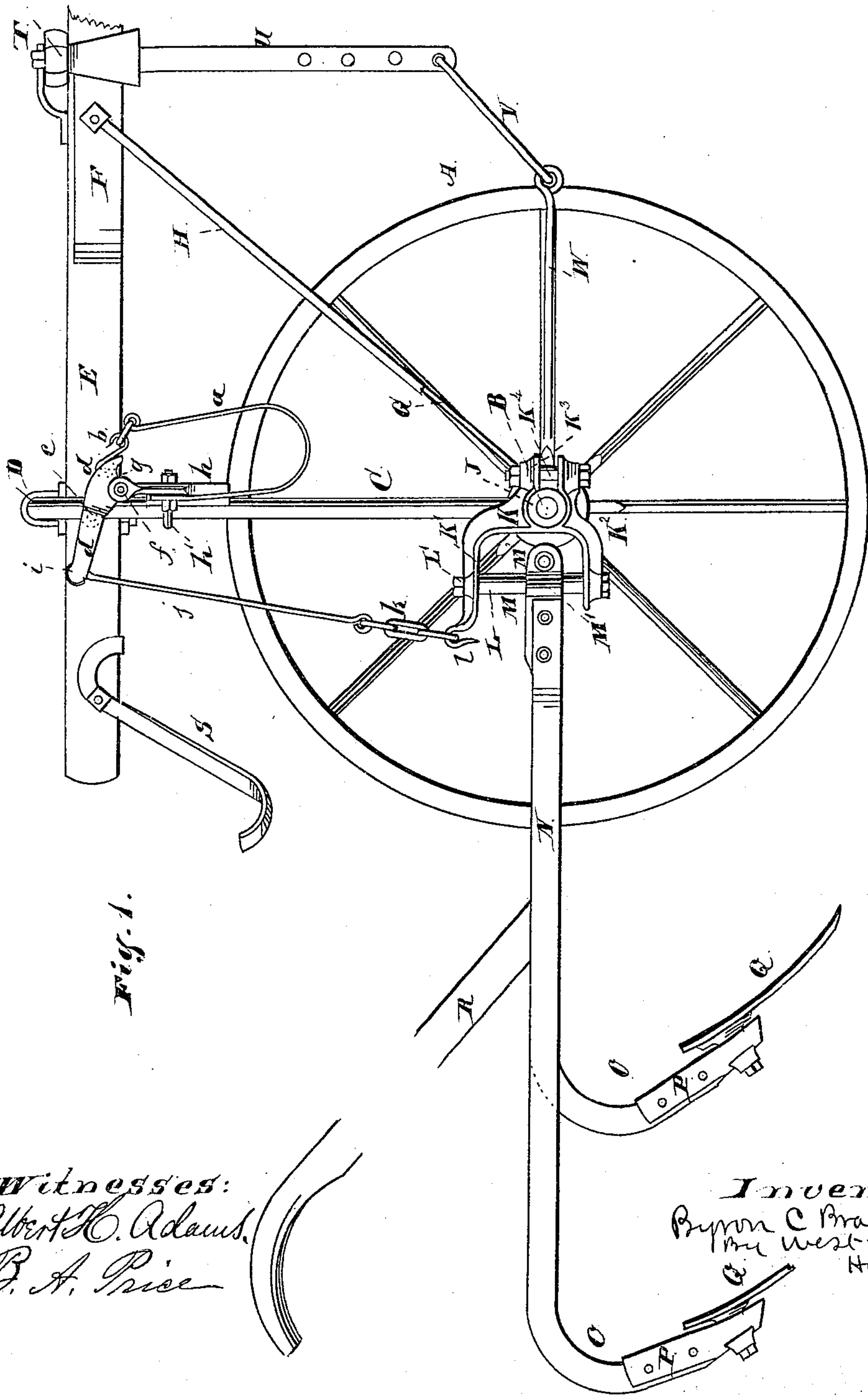
3 Sheets—Sheet 1.

B. C. BRADLEY.

CULTIVATOR.

No. 270,629.

Patented Jan. 16, 1883.



Witnesses:
Albert H. Adams.
B. A. Price

Inventor:
Byron C. Bradley
Per West & Bond
His Atty.

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3 Sheets—Sheet 2

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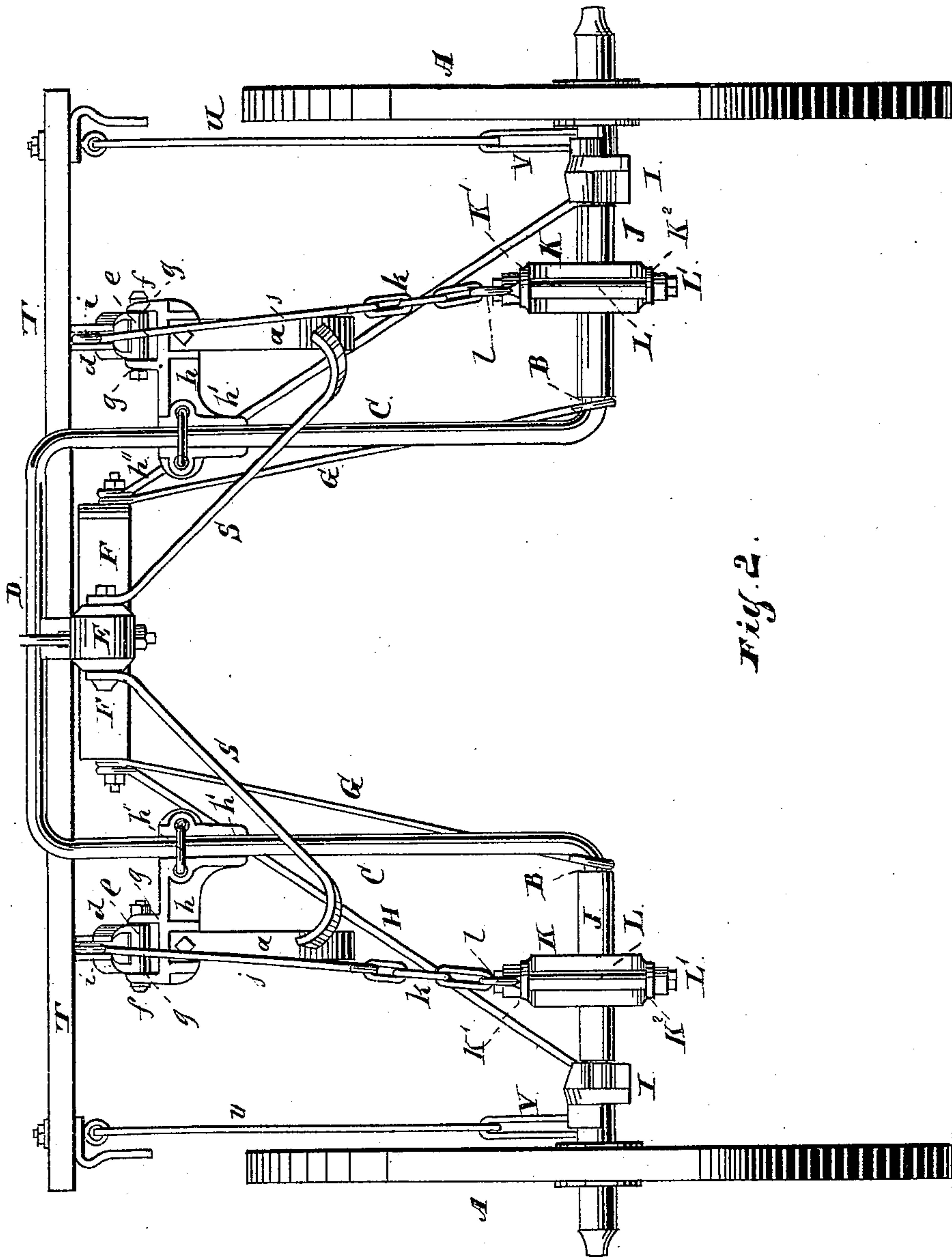


Fig. 2.

Witnesses:
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B. A. Price

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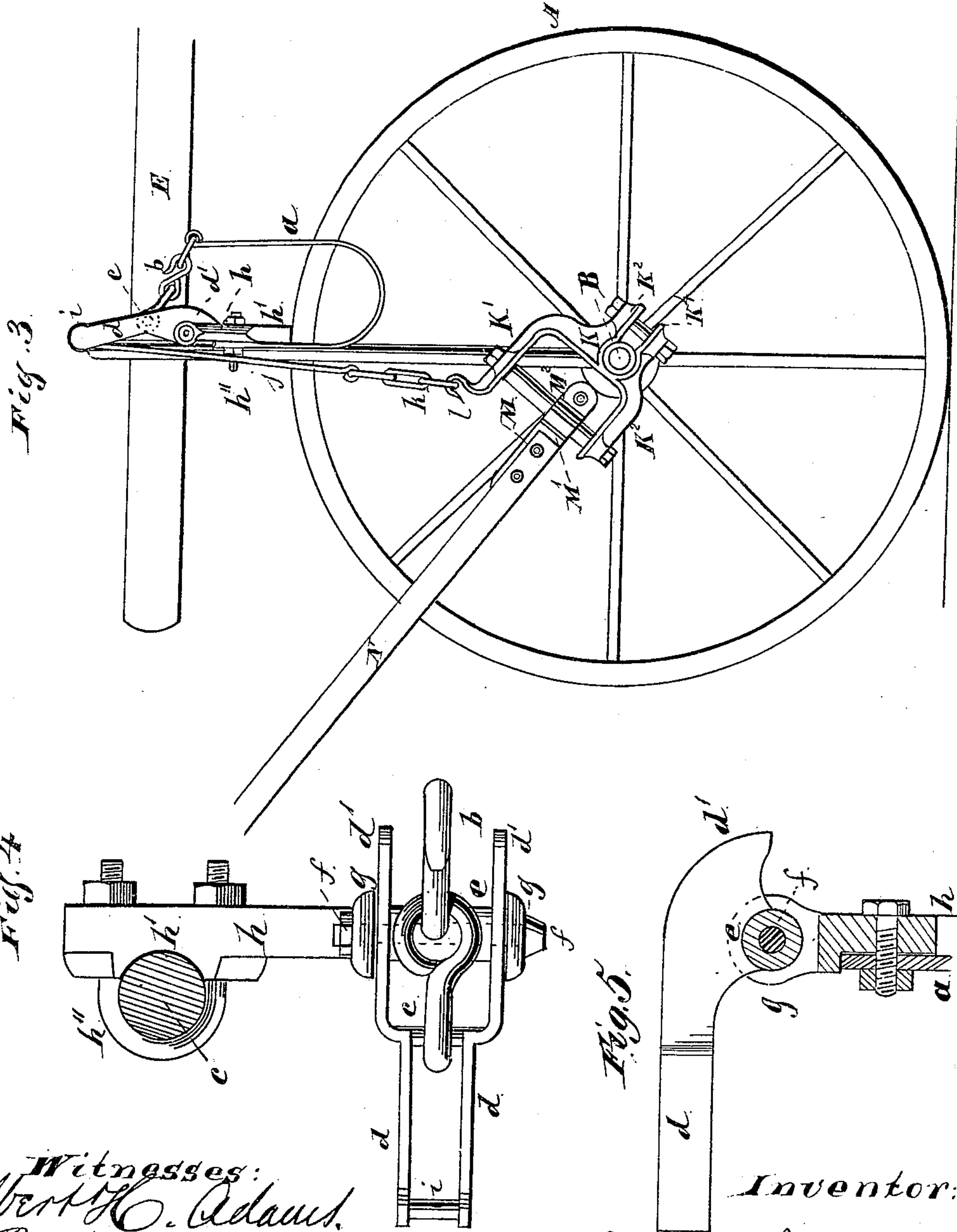
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UNITED STATES PATENT OFFICE.

BYRON C. BRADLEY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE FURST
& BRADLEY MANUFACTURING COMPANY, OF SAME PLACE.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 270,629, dated January 16, 1883.

Application filed February 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, BYRON C. BRADLEY, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented new and useful Improvements in Cultivators, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation with one of the wheels removed; Fig. 2, a rear elevation; Fig. 3, a side elevation with one of the wheels and the bracing removed, showing the plow-beam broken off and in its elevated position; Fig. 4, a detail showing the supporting arm or bracket, the pivoted arm or support, and a portion of the connection of the arm or support with the spring; Fig. 5, a detail, partly in section, of the parts shown in Fig. 4.

This invention relates to devices or means for assisting the operator in raising the plows, whereby such raising will be more quickly and easily performed without necessitating the exertion of any considerable amount of lifting force on the part of the operator, and has for its objects to give the operator the required assistance by devices or means which are simple in construction and easily applied, and which will do the required work in an effectual and reliable manner, and without interfering with the vertical and horizontal movements of the beams required by the plows to do their work; and its nature consists in providing a vibrating or swinging arm or support attached to the arch or frame of the cultivator above the axle or spindle, and connected by a flexible connection with a spring or spring-arm, and also connected by a flexible connection with the coupling by which the beam is connected with the axle or spindle, and in the several parts and combinations of parts hereinafter specifically set forth, and pointed out as new in the claims.

In the drawings, A represents the wheels, which may be of any of the usual and well-known forms of construction.

B represents the wheel spindles or axles; C, the vertical portion of the arch or frame; D, the horizontal or top portion of the arch or frame. These parts B C D may be made from a single piece of iron or other suitable material, bent as shown; or they may be otherwise

formed and arranged, so long as their form and arrangement will permit of the attachment of the lifting or raising devices.

E is the tongue, which may be of a single piece, as shown, attached at its rear end to the horizontal portion of the arch by a clip or in any other suitable manner, or which may be of some other form and otherwise attached.

F represents side pieces or blocks, secured to the side of the tongue in the form shown for attaching the upper ends of the brace-rods.

G H are the brace-rods on each side of the tongue, the inner ones, G, of which are connected at their lower ends to the respective spindles or axles at the inner ends of the socket for the beam-coupling, and the outer ones of which are connected at their lower ends to sand-boxes or guards located on the respective axles or spindles between the outer end of the socket of the beam-coupling and the hub of the wheel; I, the sand-boxes or guards. The parts represented by the letters G, H, and I may be of the construction and arrangement shown; or they may be of such other form of construction and arrangement as will adapt them for use with other forms or makes of cultivators than that shown, and for some styles or makes of cultivators they may be entirely omitted.

J represents the sleeves or pipe-boxes, one located on each spindle or axle portion to receive one section of the beam-coupling.

K K' K'' represent the forward or spindle section of the beam-coupling, the portion K having a suitable opening to receive the sleeve or pipe-box J, and the portions K' K'' forming arms or brackets, between which is located the beam-section of the coupling. The portion K on its forward face is provided with ears or lugs K'', between which is a slot, by means of which and a suitable bolt, K⁴, the coupling can be firmly attached to the sleeve or pipe-box.

L is a sleeve located between the arms K' and K'', around a bolt, L', by means of which it is held in place between the arms.

M M' M'' represent the beam-section of the coupling, the portion M of which is bolted or otherwise secured to the end of the beam, the

portion M' of which forms a socket to receive the box or sleeve L, and the portion M'' of which forms the means for attaching the coupling-section to the sleeve or box L by drawing the portion M'' around the sleeve or box L, for which purpose the portions M'' have a slot or opening between them, by means of which and a suitable bolt they can be compressed or drawn together.

10 N is the plow-beam, which may be of the form shown or any other suitable form; O, the plow-standards; P, the shovel-flocks; Q, the shovels; R, the handle; S, pendants or hangers for holding the plow-beams in their elevated position when desired; T, the double-tree; U, the draft-bar; V, the link connecting the draft-bar with the draft-rod; W, the draft-rod, connected at its rear end, in the form of construction shown, with the guard or sand-box I.

20 The parts so far described and referred to may be severally of the forms of construction and arrangement shown pertaining to the style of cultivator shown; or they may be severally of other forms of construction and arrangement pertaining to other well-known styles of cultivators, and they are only shown and described for the purpose of showing the application of the lifting devices to one form or style of cultivator, such lifting devices being applicable to other forms or styles of cultivators.

Referring to the drawings, the parts constituting the lifting devices are as follows:

30 *a* represents a bar or spring made of a piece of steel or other suitable material possessing considerable elastic property. As shown, the piece is flat; but it may be of other shape, and it is to be bent into a U or bow shape having two arms or sides, one of which is to be securely attached, the other standing or remaining free.

40 *b* is a connection formed of links or S-hooks, connected at one end with a ring or loop attached to the upper end of the free arm of the spring by turning such free end over and forming an eye to receive the loop or ring. This connection *b* may be otherwise formed and attached to the free end of the spring *a*, so as to be practically flexible.

50 *c* is a cross-bar or pin on the swinging arm or support, to which the other end of the connection *b* is attached by securing the link or end of the connection to the bar or pin.

55 *d* is the swinging arm or support, which may be formed, as shown, of two side pieces bent or curved inward above their pivotal ends, or in some other suitable manner adapted for the attachment of the beam-connection to the outer or free end of the support, and the attachment of the connection with the spring or spring-arm between the point of lift and the pivotal point. As shown, the side pieces extend beyond the pivotal point, and these extensions *d'* form stops to prevent the lifting-arm from being thrown too far forward with the recoil of the spring; but other means may be used for this purpose, in which case the side pieces, *d*, could terminate at the pivotal point.

e is a sleeve formed with or suitably secured to the side pieces, and forming the bearing on which the lifting-arm rocks or swings.

70 *f* is a bolt, the shank of which passes through the opening in the sleeve or bearing *e*, and forms the pivot for the lifting-arm. In place of this bolt, a suitable pin or trunnion could be used.

75 *g* represents ears on the bracket or support, having suitable openings for the passage of the bolt or pin *f*, and between which the lifting arm or support is located.

80 *h* is the bracket or support, on the outer end of which are the ears *g*, and the free end *h'* of which is elongated or widened, and one face is provided with a circular recess, as shown, to receive the vertical portion C of the arch, to which the bracket or support is attached by means of a suitable clip, *h''*, which passes around the portion C, with its ends passing through suitable openings formed in the portion *h'* of the bracket or support, and projecting beyond the face of *h'* a sufficient distance to receive nuts, by means of which the bracket or support is firmly attached in position. This mode of attachment permits of the adjustment of the bracket or support on C at the proper height to locate the lifting-arm in proper relation to the beam-coupling. The attached end of the spring *a* is secured to the outer end of the bracket or support *h* by means of bolts, or in any other suitable manner, which arrangement of the bracket or support attaches also the spring and the lifting arm or support in their proper position. As shown, the ends or extensions *d'* of the lifting arm or support come in contact with the face of the bracket or support *h* to limit the upward movement. The portion *h'* of the bracket or support may be of some other form than the form shown, to adapt it for attachment to the arch or frame of the machine, and it may be secured or held in position by means of bolts, or in some other suitable manner.

110 *i* is a pin or cross-bar at the outer end of the lifting arm or support. As shown, the side pieces, with the pins or cross-bars *ci* and sleeve or bearing *e*, are formed from a single piece; but they may be formed of independent pieces, the cross-bars or pins and the sleeve or bearing being suitably secured to the side pieces.

115 *j* is a hook or rod, the upper end of which is hooked over or otherwise connected with the pin or cross-bar *i*, the connection being one that will allow the link or rod to swing.

120 *k* are chain-links or rings, the upper one of which is hooked into or otherwise connected with the lower end of the link or rod J, the connection, as shown, being made by forming an eye or loop in the lower end of the link or rod to receive the first link of the chain.

125 *l* is a hook formed with or secured to the upper arm or rearward extension, K', of the axle-section of the beam-coupling, with which hook the links or rings *k* can be connected by passing the link or ring thereover, or in some other manner.

The device is attached to each side of the cultivator by securing a bracket or support, *h*, having thereon the spring or spring-arm, and the lifting arm or support to each vertical side piece of the arch or to the frame on each side at the proper height for connecting the link or rod *j*, attached at its upper end to the lifting arm or support, with the hook *l* by one of the chain-links or rings *k*, the lifting arm or support being also connected with the spring-arm by the connection *b*.

In use, when the beam is down, so that the plows are in position for work, the parts composing the lifting device will be in the position shown in Fig. 1, the outer end of the lifting arm or support *d* being drawn down by the descent of the hook *l* through the turning of the coupling *K K'* on the axle or spindle as the plow-beam is lowered, and such turning down of the free end of the lifting arm or support will, through the connection *b*, draw the free end of the spring or spring-arm *a* inward, producing a tension or resistance of the spring or spring-arm; and when the beam is raised the parts composing the lifting device will be in their normal position, as shown in Fig. 3, the lifting-arm being raised by the action of the spring or spring-arm *a*.

The lifting or raising arm *d* and the spring or spring-arm *a* are arranged in such relation to each other that when the lifting-arm is depressed and passes below the dead or balance point the resistance of the spring is overcome, and the spring becomes essentially non-acting, the result being that the plows, when at work, are in no wise affected by the lifting devices, but are free to be controlled by the operator as desired to do the work, while at the same time the spring retains its full force or resistance, ready for action when needed, and exerts its force in assisting to elevate the beam, for which purpose the relation between the elevating or raising arm *d* and the spring or spring-arm *a* is such that the spring or spring-arm acts as soon as the lifting or raising arm, in its ascent, passes above the dead or balance point, returning the parts to their normal position, with the beam in its elevated or raised position, where it will be held by reason of its weight alone being insufficient to act on the arm or support *d* and draw such arm or support down, the arm or support being above or forward of the plane or point

where the weight of the beam would act thereon. This arrangement of the lifting or supporting arm interposed between a spring and the cultivator-beam and connected with the beam through its coupling produces a result by which the spring acts as required to assist in elevating, and is non-acting when the beam is down in position for the shovel to work, and by placing the arm or support and its operating-spring on a bracket or support which can be attached to the side of the cultivator the arrangement is one which is very compact, and which enables the attachment to be easily and readily made, and which secures the devices in position where they will not interfere in any manner with the operation of the cultivator, and the arrangement is one at the same time which produces the best results.

Other means than the form of flexible connection shown between the lifting-arm and the beam-coupling may be used, and the attachment of such connection to the coupling may be made in some other manner than by the hook *l*.

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

1. The combination, with the coupling which connects the beam with the axle, of the vibrating lifting or raising arm *d*, having one end joined to the end of the spring *a* by a flexible connection, *b*, and the flexible connection attached at one end to the coupling which connects the beam to the axle, and at its other end attached to the end of the vibrating or raising arm, substantially as described.

2. The coupling which connects the beam to the axle, provided with the hook *l*, in combination with the flexible connection *j* and *k*, attached at one end to the hook on the coupling and at the other with a vibrating or raising arm, *d*, hung on the arch or frame, and which connects by a flexible connection, *b*, with the spring *a*, substantially as described.

3. The combination, with the arch or frame, of the horizontal bracket or support *h*, attached to the said arch or frame, the spring *a*, the flexible connection *b*, and the interposed vibrating arm *d*, hung on the bracket or support *h*, substantially as described.

BYRON C. BRADLEY.

Witnesses:

J. H. BRADLEY,
O. W. BOND.