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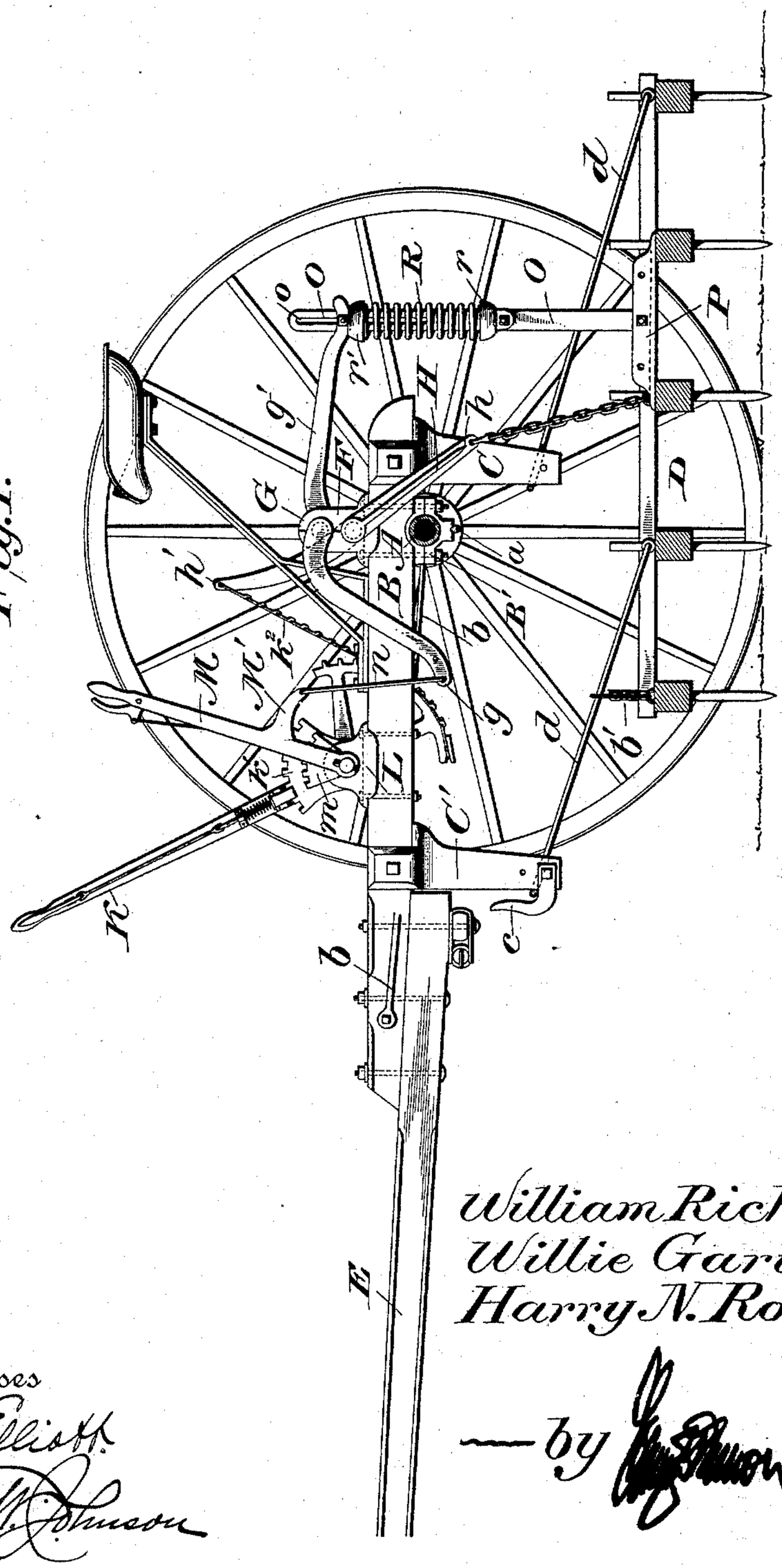
W. RICHARDS, W. GARWOOD & H. N. ROSEBROOK.

HARROW.

No. 483,501. Patented Sept. 27, 1892.

Fig. 1.



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Attorney

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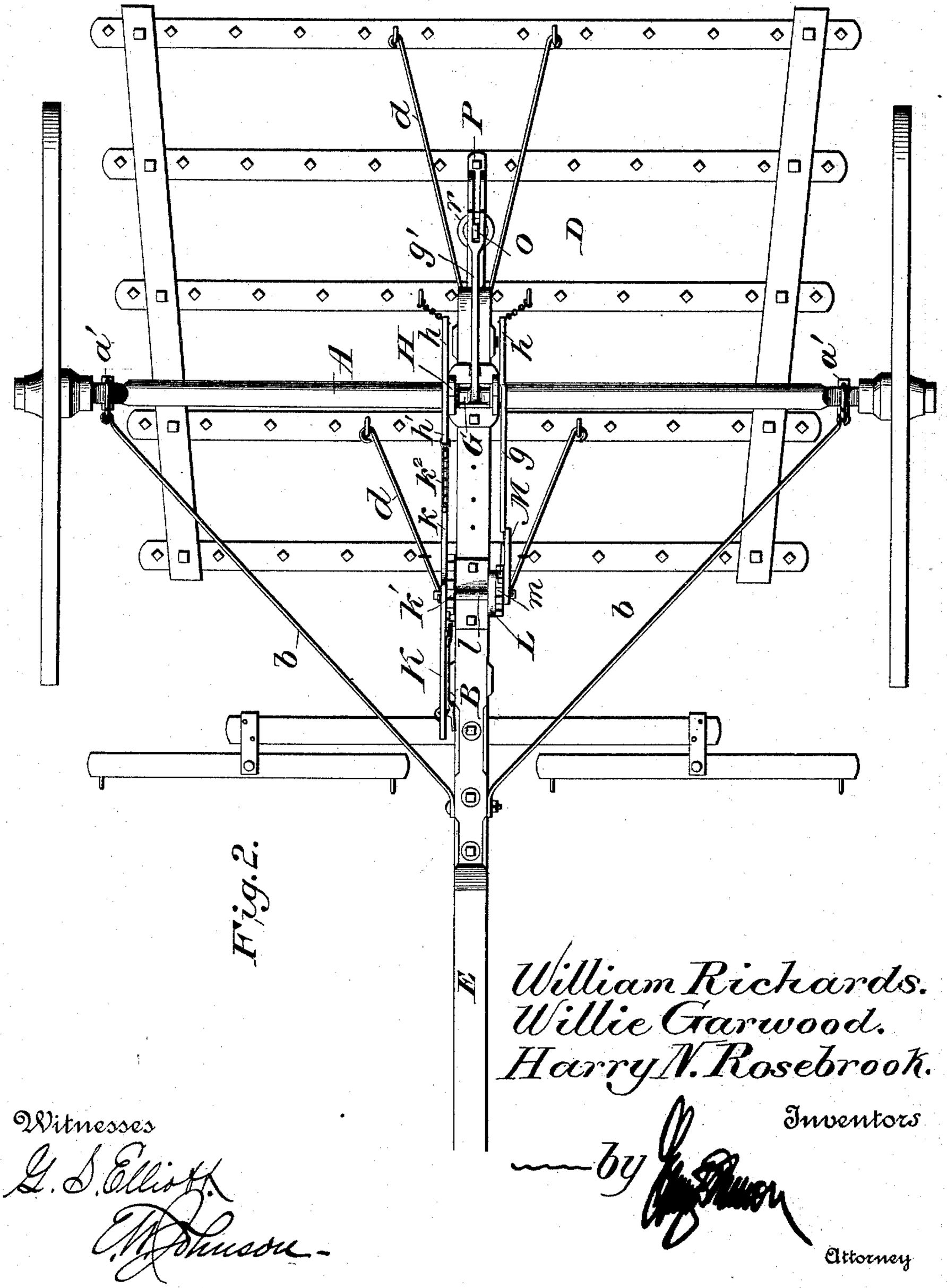

Fig. 2.

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HARROW.

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Fig. 3.

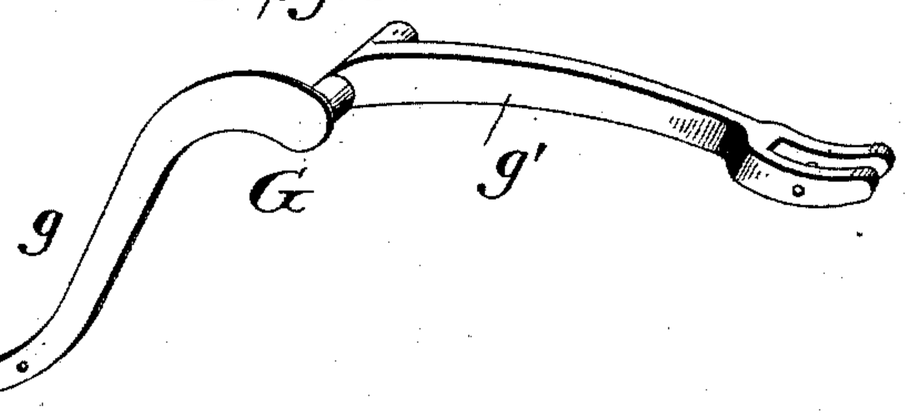


Fig. 4.

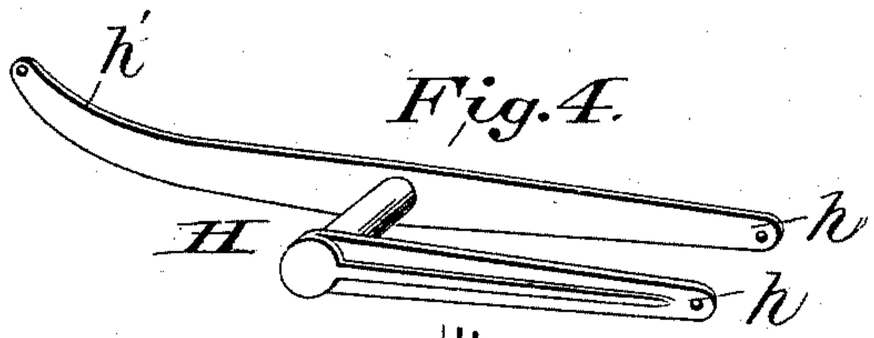


Fig. 5.

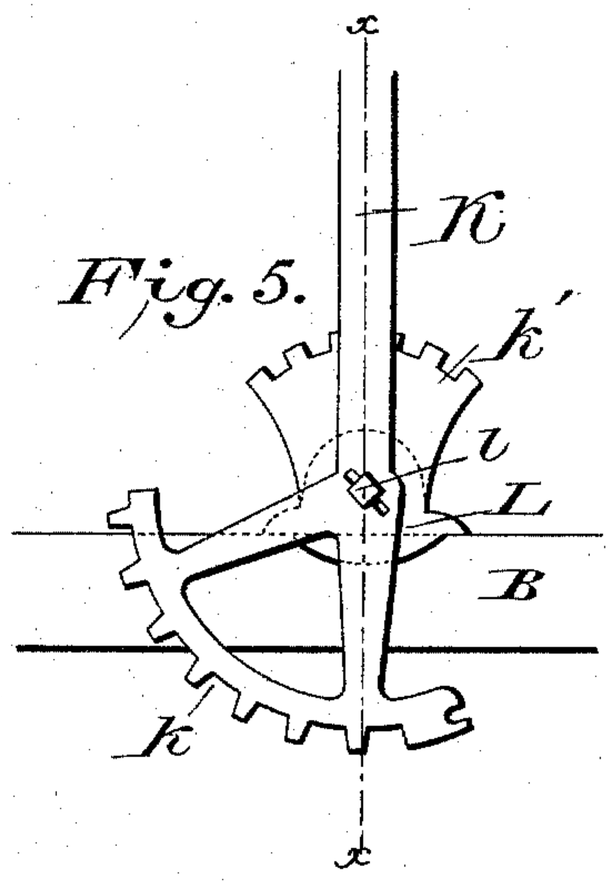


Fig. 6.

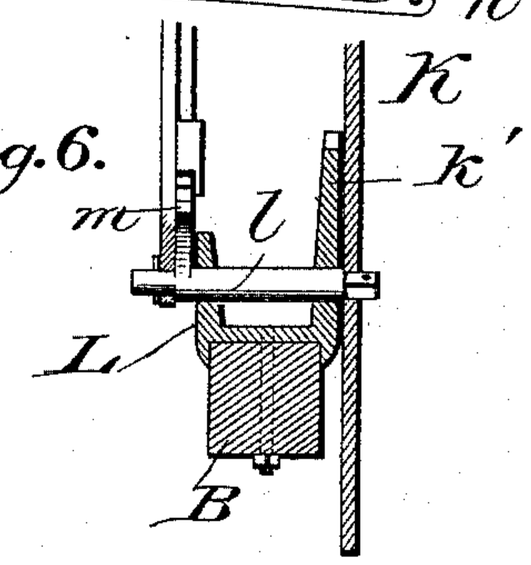


Fig. 7.

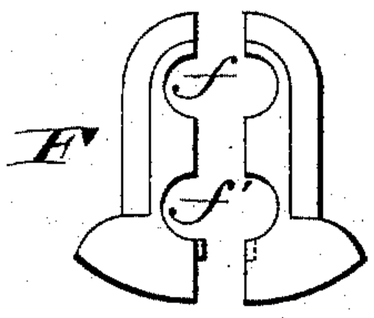


Fig. 8.

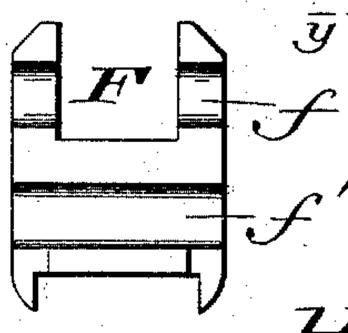


Fig. 9.

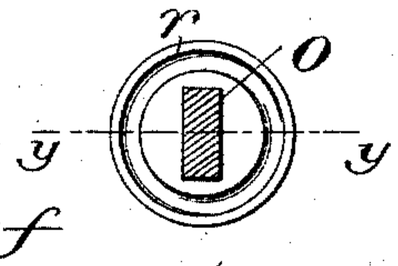
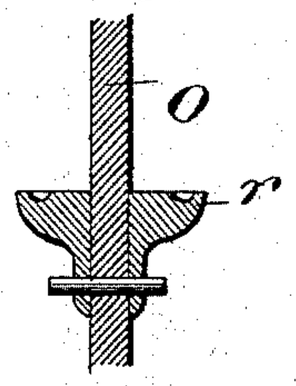


Fig. 10.



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Willie Garwood.
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Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM RICHARDS, WILLIE GARWOOD, AND HARRY N. ROSEBROOK, OF BIG SPRINGS, OHIO; SAID RICHARDS ASSIGNOR TO SAID GARWOOD AND SAID ROSEBROOK.

HARROW.

SPECIFICATION forming part of Letters Patent No. 483,501, dated September 27, 1892.

Application filed March 3, 1892. Serial No. 423,612. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM RICHARDS, WILLIE GARWOOD, and HARRY N. ROSEBROOK, citizens of the United States of America, residing at Big Springs, in the county of Logan and State of Ohio, have invented certain new and useful Improvements in Harrows; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in sulky-harrows.

The object of the invention is to provide a sulky-harrow of improved construction, in which the harrow-frame can be raised and lowered with respect to the supporting-frame and when lowered can be caused to enter the ground deeper than if the weight of the harrow alone was utilized, spring-pressure being provided between the frame and the harrow; and the invention consists in the construction and combination of the parts, as will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation, partly in section. Fig. 2 is a plan view. Figs. 3 to 10, inclusive, are detail views, reference being made to said views hereinafter.

A designates a tubular axle, the ends of which are suitably swaged and provided with spindles, upon which the supporting-wheels are mounted. This axle is provided on its under side with a truss-rod *a*, which is secured to the swaged portions of the axle by the clips *a'* and bears centrally against a depending lug formed on the bearing at the central part of said axle.

B designates the main beam of the sulky-frame, which is rigidly bolted to the central part of the axle A by the two-part bearing B', said beam being further braced to the axle by rods *b b*, which extend from the clips *a'* to near the front end of the beam. To this beam, in the rear of the axle and adjacent thereto, is secured a hanger C, the lower end of which is apertured for the reception of a transverse pin, and near the front end of said beam is a similar hanger C', which carries a hook *c*, adjustably secured thereto in any suitable manner. Rods *d d* engage with these hangers by being looped around the same. Said rods diverge from the hangers and are secured to the transverse bars of the harrow-frame D. The rods *d*, connected to the hanger C', are engaged by short sections of chain *b'*, which extend to the front bar of the harrow-frame.

E designates the tongue, which is preferably bolted to the under side of the beam B, and carries the singletree to which the whiffletrees are attached.

The harrow-frame may be of any suitable construction and provided with either rigid or spring teeth.

Immediately above the axle A and upon the beam B is secured a two-part bearing F. (Shown in detail in Figs. 7 and 8 of the drawings.) This bearing-box has two apertures *f* and *f'*, within which are journaled levers G and H. The lever H is provided with two arms *h h*, which extend on each side of the bearing-box F and straddle the beam B, the rear ends of said arms being connected to the harrow-section by chains or flexible connections, as shown, and the end *h'* of this lever is connected with a segment *k*, formed on the lower end of the lever K, said lever being pivoted to the beam B and provided with a sliding catch, which engages with a curved rack-bar *k'*, as shown. The casting L, which has the curved rack *k'* formed thereon, has upwardly-projecting portions, through which passes a shaft *l*, key-ended at one end to receive the lever K, having the segment *k*, which is connected to the lever H by a chain or flexible connection k^2. The construction of the casting L and lever K are shown in detail in Figs. 5 and 6 of the drawings. The shaft *l* carries a projecting toothed segment *m*, beyond which the shaft is rounded to receive a lever M, said lever carrying a pawl, which en-

gages with the segment. This lever above its pivot has a projecting arm M′, to the end of which is attached a rod *n*, said rod being also attached to the forward end of the member *g* of the lever G. This lever G, as shown in Fig. 3, consists of the member *g*, which extends forward of the pivot, and a member *g′*, having a bifurcated rear end. This lever is journaled in the apertures *f* of the bearing-box F, and the rear bifurcated end thereof embraces a bar O, the connecting-pin passing through a slot *o* in said bar. The lower end of this bar is pivotally attached to a plate P, suitably secured to the harrow-frame, said plate having several perforations to permit of the bar being attached to different parts thereof. The bar O, which is preferably rectangular in cross-section, carries cups or movable blocks *r* and *r′*, the lower one being held in rigid connection with said bar by a pin or bolt, as shown in Fig. 10, while the upper one *r′* is free to slide upon the bar. These cups are grooved for the reception of the ends of a helical spring R, and the rear member of the lever G bears upon the upper cup for compressing the spring and forcing the harrow into the ground.

In operation, when it is desired to elevate the harrow from the position shown in Fig. 1 of the drawings, the lever K is grasped to throw the pawl out of engagement with the rack and is then drawn toward the driver, which movement will elevate the arms *h h* and raise the harrow. It will be noted that as this lever is fixed to the shaft *l* the movement thereof will operate the lever M to rock the lever G. When it is desired to lower the harrow, the operation is reversed, and should the harrow-teeth not enter the ground to a sufficient depth the lever M can be manipulated so as to release the pawl from the ratchet-plate *m* and moved forward so as to cause the rear end of the rock-lever G to bear upon the cup or sliding block *r′* and compress the spring to the desired extent.

By providing the bars *d d* the harrow is prevented from swinging and an upward movement of the front and rear ends is caused when the harrow is raised. By this construction the desired tension can be given to the spring irrespective of the mechanism employed for raising and lowering the harrow.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a sulky-harrow, a frame provided with rock-levers G and H, journaled to the frame one above the other and connected to means for moving the same in unison or independently, the rearwardly-projecting portions of the rock-levers engaging with a depression-bar and with flexible connections for elevating the harrow-section, substantially as shown.

2. In a sulky-harrow, a beam or frame provided with rock-levers G and H, journaled to the beam or frame one above the other, said levers having forwardly and rearwardly projecting members, the rear members being connected to the harrow-section, levers K and M, attached to the same rock-shaft, the lever K, having a toothed segment *k*, over which a chain passes for engagement with the forwardly-projecting end of the lever H, and a bar connecting the lever M to the lever G, substantially as shown, and for the purpose set forth.

3. In a sulky-harrow, the combination, with a harrow-section and main beam or frame, of levers G and H, having portions which extend on each side of their journals, the rear portion of one of said levers engaging with a depression-bar, flexible connections attached to the harrow-section and to the rearwardly-projecting member of the lever H, a shaft *l*, journaled to the frame and provided with a toothed segment, a lever M, pivoted to the shaft *l* and provided with a pawl for engagement with the segment of said shaft, and a lever K, keyed to the shaft *l* and provided with a pawl for engagement with a fixed segment, the levers K and M being connected to the forward members of the levers G and H, substantially as shown, and for the purpose set forth.

4. The combination, in a harrow constructed substantially as shown, of a two-part bearing-box F, having bearings *f f′*, one above the other, and levers G and H, journaled therein, said levers having front and rear extending members which project above and below the bearings, the rear ends being connected to the harrow and the front ends to adjusting-levers K and M, for the purpose set forth.

5. A lever-support for the purpose set forth, consisting of a casting L, having bearings, and a segmental projecting portion *k′*, adapted to sustain a shaft *l*, having toothed segment *m* and levers K and M, one of said levers being loosely mounted on the shaft *l* and the other held in rigid engagement therewith, said levers carrying pawls, substantially as shown.

6. The combination, in a sulky-harrow, of a beam or frame B, carrying a two-part fixture F, having bearings *f* and *f′*, rock-levers G and H, journaled in said bearings, the rear members of said levers being connected to the harrow-frame, a lever K, rigidly attached to a shaft *l*, carried by the beam and provided with a pawl for engaging with a rack, and a lever M, loosely mounted on the shaft *l* and provided with a pawl which engages with the toothed segment formed on or attached to said shaft, said lever being connected to the rock-lever G, substantially as shown, whereby when the lever K is swung upon its pivot it will move in unison therewith, substantially as shown, and for the purpose set forth.

7. In a sulky-harrow provided with means for elevating the harrow-section and holding the same depressed, a lever, as K, rigidly attached to a shaft *l*, said shaft being mounted in bearings, the fixture having the bearings being provided with a toothed segment *k′*, the shaft having a rounded end and toothed

segment *m*, and a lever M, mounted on the rounded end of the shaft and provided with a pawl for engagement with the toothed segment, substantially as shown, and for the purpose set forth.

8. The combination, in a sulky-harrow, of a two-part bearing F, having apertures one above the other, rock-levers G and H, having portions located in said apertures and members which extend forward and rear of the bearing, flexible connections attached to the rear ends of the lever H, and a spring-encircled bar O, to which the rear end of the lever G is attached, the forward ends of the rock-levers being connected with means for manipulating the same in unison or independently, substantially as shown, and for the purpose set forth.

9. The combination, in a sulky-harrow having levers for elevating or depressing the harrow-section, substantially as shown, of a bar O, having a block *r* and a sliding block *r'*, between which is interposed a helical spring, said bar having a slotted upper end to receive a bolt which connects the same to the lever G, substantially as shown, and for the purpose set forth.

10. The combination, with a sulky-harrow constructed substantially as shown, of a tubular axle A, having a central bearing to which is clamped the beam B of the harrow-frame, the ends of said tubular axle being swaged to be rectangular in cross-section and provided with clips *a'*, rods *b b*, attached to said clips and connected at their forward ends to the beam B, and a truss-rod *a*, also connected to the clips and adapted to engage with a depending portion on the two-part bearing by which the beam is connected to the axle, substantially as shown, and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM RICHARDS.
WILLIE GARWOOD.
HARRY N. ROSEBROOK.

Witnesses:
W. E. SIMPSON,
THOS. W. GARWOOD.