S. & A. WOODARD.

Harrow.

No. 106,908. Patented Aug. 30, 1870.

Fig. 1.

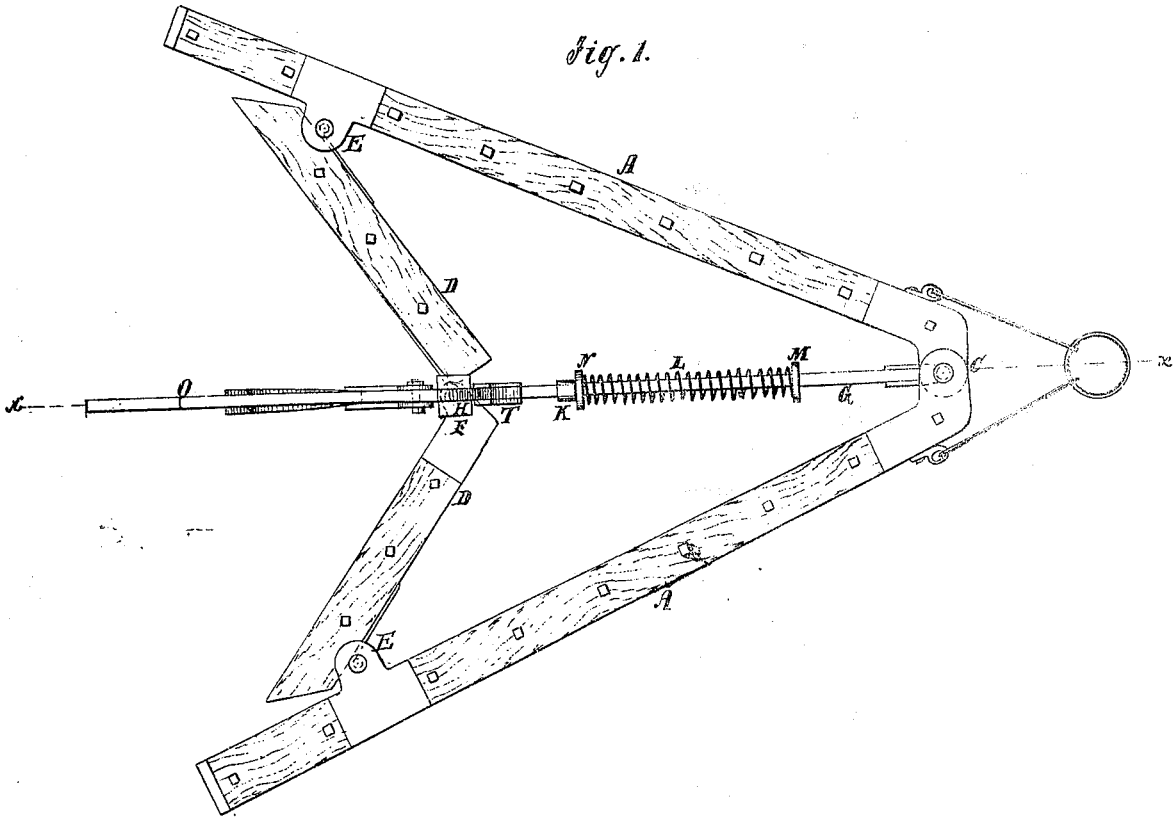
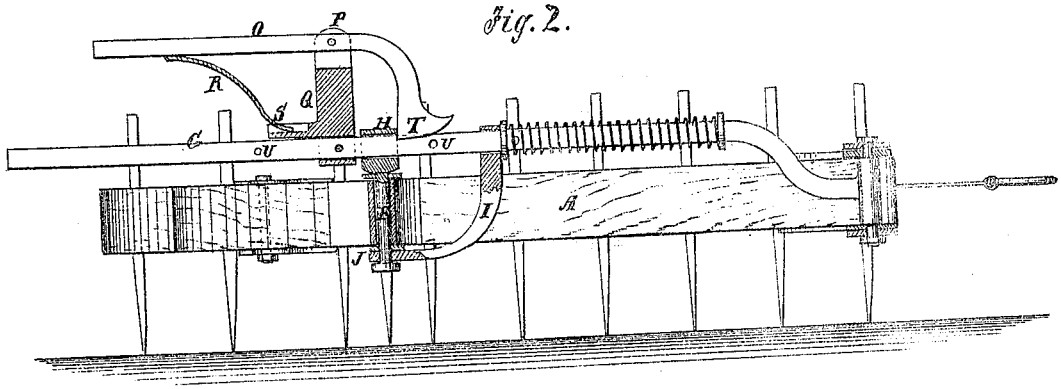


Fig. 2.



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STEPHEN WOODARD AND ALBERT WOODARD, OF SARATOGA, INDIANA.

Letters Patent No. 106,908, *dated August* 30, 1870.

IMPROVEMENT IN HARROW.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that we, STEPHEN WOODARD and ALBERT WOODARD, of Saratoga, in the county of Randolph and State of Indiana, have invented a new and useful Improvement in Harrows; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to a new and useful Improvement in harrows for cultivating the soil, whereby such implements of husbandry are made much more useful, convenient, and durable, than they have hitherto been; and

It consists in making the harrow self-adjusting, by means of which it will pass between stumps, rocks, and narrow spaces, and immediately assume its full width and proper proportions, as will hereinafter be more fully described.

In the accompanying drawing—

Figure 1 represents a top or plan view of a harrow constructed according to our invention.

Figure 2 is a longitudinal vertical section of fig. 1, on the line *x x*.

Similar letters of reference indicate corresponding parts.

This harrow consists of two main side pieces A A, joined together at their forward ends by means of metallic plates, and a center bolt, as seen at C.

These side pieces A A are connected together by a jointed cross-piece, D D.

This piece is hinged at each end to the sides A A, as seen at E E, and jointed in the middle by means of metallic plates and central bolt, or by a central tooth-shank, as seen at F.

G is a horizontal bar, which is connected with the front center bolt and supported in a box, H, which is swiveled to the shank of the joint-tooth or bolt at F, so that the box freely slides on the bar.

The bar is also supported by the arm I, which is attached to the tooth or joint-bolt, as seen at J.

Its other end is curved upward, and has a mortise or band, K, through which the bar passes.

This arm in this manner also freely slides on the bar as the side-pieces A A are contracted or expanded in the process of harrowing and passing obstructions.

L is a spiral spring on the bar G.

M is a collar on the bar, against which the spring bears.

The other end of the spring bears against the end of the arm I, or rather the band K of the arm.

N is a loose washer between the band and the spring.

O is a spring lever, whose fulcrum is at P on the stand *q*. This stand is adjustably attached to the bar G.

R is a spring, which is attached to the lever, and bears on and slides in a recess in the base of the stand, as seen at S. The forward end of this lever curves down to the top of the bar G, and the tendency of the spring R is to keep it in contact therewith.

When the harrow is expanded, as when in ordinary harrowing, the end T of the lever catches over the box H, which holds the jointed cross-pieces D D rigid and in position. The jointed piece D D, or the parts of which it is composed, stand at such an angle that any lateral pressure on the sides of the harrow will throw the joint of this piece forward, and allow the side pieces of the harrow to contract or approach each other. If the joint was not held in position by the lever, the tendency of the harrow would be to collapse, except in mellow ground, where there would not be side pressure sufficient to effect the joint.

The stand *q* may be adjusted on the bar by means of the holes *u*, so as to spread the harrow more or less, as may be desired.

In operating with the harrow, if the driver sees an obstruction on either side, or a narrow space through which the harrow would not pass, he bears down with his foot on the lever O, which releases the joint F, and allows the sides of the harrow to contract and conform to the width of the space. When the obstruction is passed, the reaction of the spiral spring throws the joint and sides back to their former position.

For harrowing or cultivating the soil when rows of corn or other plants are growing, a bolt may be substituted for the joint-tooth at F, and any other teeth may be removed and the harrow adjusted to suit the particular purpose or object in view.

By this mode of construction the harrow may be used for various purposes, and on ground where the ordinary harrow cannot be used at all.

A great advantage is, the harrow is always in the ground. In passing stumps or stones it is not lifted up, but the ground is harrowed all over.

Having thus described our invention,

We claim as new and desire to secure by Letters Patent—

1. In combination with a harrow, the bar G, spiral spring L, sliding box H, arm I, and lever O, with the joints C, E E, and F, by means of which the harrow is made self-adjusting, substantially as and for the purposes described.

2. In combination with the hinged side bars A of a harrow, the bars D, a central bar, G, a spring, L, arm I, and lever O, substantially as shown and described.

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