(No Model.)

C. S. SHARP.

HARROW.

No. 589,037. Patented Aug. 31, 1897.

Fig. 1.

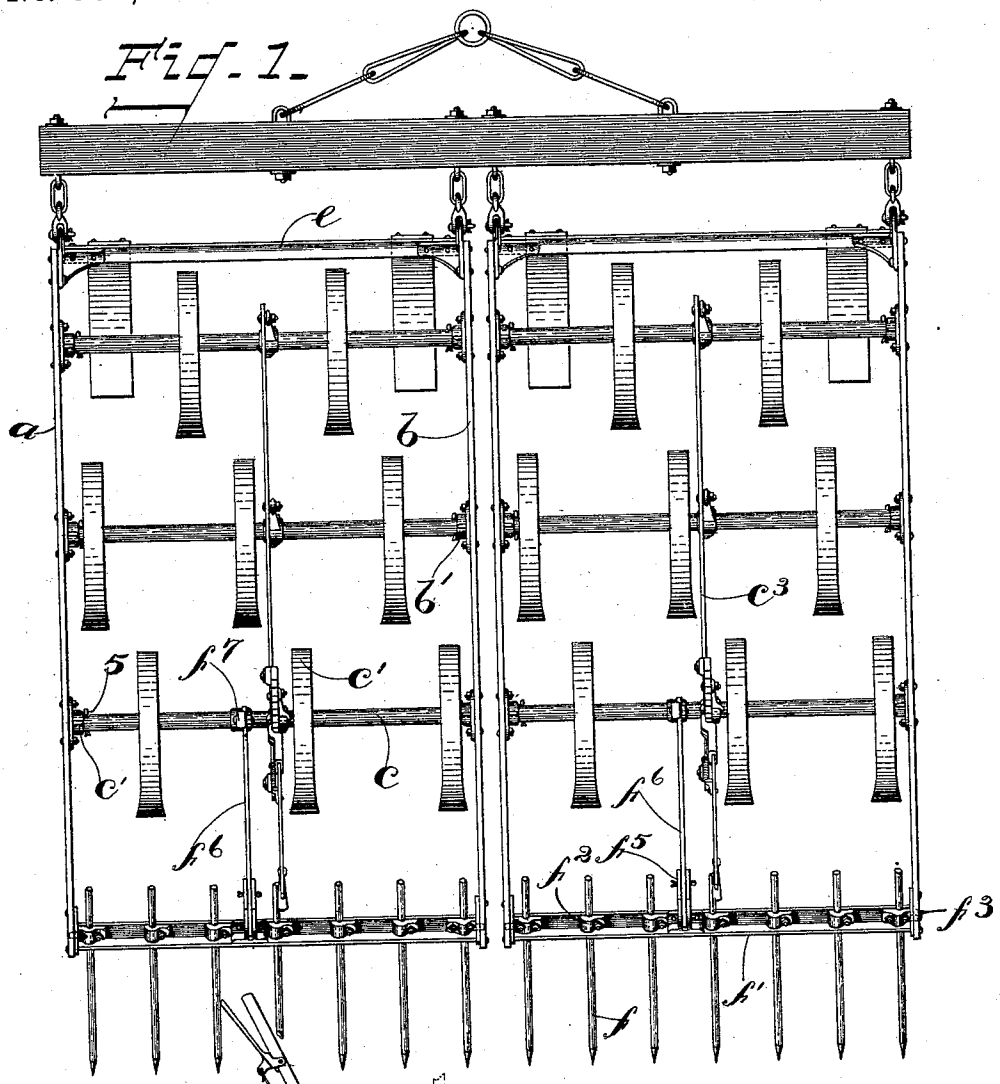


Fig. 2.

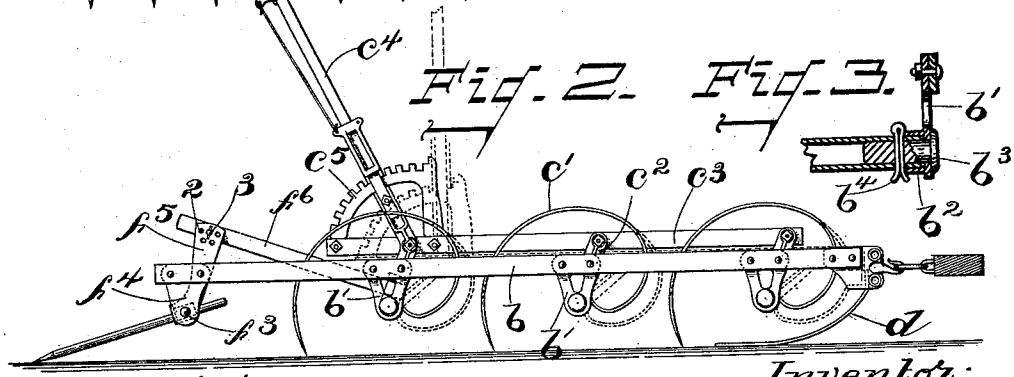


Fig. 3.

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Inventor:
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by B. J. Noyes atty.

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UNITED STATES PATENT OFFICE.

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HARROW.

SPECIFICATION forming part of Letters Patent No. 589,037, dated August 31, 1897.

Application filed January 5, 1894. Serial No. 495,826. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. SHARP, of Auburn, county of Cayuga, State of New York, have invented an Improvement in Harrows, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to improve the construction of harrows; and it consists in details of construction to be hereinafter pointed out and claimed.

Figure 1 shows in plan view a harrow embodying this invention; Fig. 2, a side elevation of the harrow shown in Fig. 1; Fig. 3, a detail to be referred to.

The side bars *a b*, arranged in parallelism, have secured to them at suitable points depending hangers *a' b'*, recessed at their lower ends or otherwise constructed and arranged to afford bearings for the shafts *c*. There are herein represented three such shafts, and for lightness and other reasons they are made cylindrical and hollow. The hangers each have an annular flange b^2 upon the inner side surrounding a circular hole made in said hanger, although said flanges are somewhat larger in diameter than said holes and receive within them the ends of the shafts *c*. A headed stud or pin b^3 is driven through the hole in each hanger and into the bore of the shaft, and a split pin b^4 or equivalent passes through the shaft and shank of the stud at the inner side of the hanger, so that by means of said headed stud b^3 and pin b^4 the end of each shaft *c* is securely connected with, but free to rotate in, the hanger, or any other means may be employed for accomplishing this result. When constructed in this manner, it will be seen that said shafts *c* likewise serve as connections between the side bars *a b*, and unless deemed desirable no other connection is absolutely necessary.

To the shafts *c* any usual or suitable form of spring-teeth are secured, as shown at *c'*.

To two of the shafts *c* an upwardly-extended arm c^2 is secured, they being connected together by a connecting rod or bar c^3, arranged in parallelism with the side bars *a b*, and extending rearwardly over the next tooth-carrying bar, and bearing at said rear end a toothed quadrant c^5, and a set-lever c^4, of any usual or suitable form or construction, is secured to said rear tooth-carrying shaft, which is loosely connected with said bar c^3, having a manually-operated spring-controlled dog or latch adapted to engage one or another tooth of the quadrant c^5. By means of this set-lever the shafts *c* may be rocked in unison to raise and lower the points of the teeth *c'* and thereby vary the depth that they shall enter the soil, as well as the angle of said teeth.

By providing depending hangers for the tooth-carrying rock-shafts the side bars *a b* may be supported in a sufficiently-elevated position to enable any clods or rubbish to pass freely beneath them.

At the front ends of the side bars *a b* one or more shoes *d* are secured, two being herein represented attached to a cross-bar *e*, which is connected with the front ends of the side bars *a b*, and said shoes are made of flat pieces of metal curved rearwardly, yet so far as my invention is concerned they may be constructed and supported in any suitable way.

When the set-lever is adjusted so that the points of the harrow-teeth *c'* are in their elevated positions, (see dotted lines, Fig. 2,) the forward end of the harrow is supported solely by said shoes *d*.

At the rear end of the harrow shoes are also provided which support said rear end when the harrow-teeth *c'* are out of use, and, as herein shown, said shoes or supports are formed as spike harrow-teeth *f*, attached to an adjustable rod or shaft, whereby their relative angle to the harrow-frame may be varied, but normally reclining rearwardly. These spike-teeth *f* serve two important functions—viz., to act as rear shoes for the harrow and also to act as trailing teeth back of the spring-teeth *c'* to additionally break up the soil and level it. As herein shown, these spike-teeth *f* pass through holes in the rod or shaft *f'*, which is herein made L shape in cross-section, and clips f^2 are bolted to said rod or shaft, having recesses which embrace the shanks of said teeth and thereby securely hold them in place, yet permitting longitudinal adjustment thereof. The rod or shaft *f'*, which may, if desired, be differently constructed and yet

adjustably hold said spike-teeth so as to permit longitudinal adjustment thereof, has journals f^3 at the ends, which are supported in depending hangers f^4, made similar to the hangers b', and an arm f^5 is secured to and projects upwardly from said rod or shaft, the upper end of which is connected by bar f^6 with an arm f^7, loosely mounted upon the rear tooth-carrying rock-shaft c. One of the parts—as f^5, for instance—is provided with a series of holes 2, any one of which may receive an adjusting or clamping screw or bolt 3 on the part f^6 to thereby adjust the position of the rod or shaft f' so as to vary the angle of the spike or trailing teeth, thereby raising or lowering the points thereof.

Any desired number of spike or trailing teeth may be arranged upon the bar f' and disposed thereon as deemed best.

The front end of the harrow-frame, which frame may be composed of the side bars a b, with or without the front connecting-bar e, is provided with any suitable draft connection.

As herein represented two sections similarly constructed are shown independent of each other, but they may be pivotally connected together, as is common in harrows of this character. Furthermore, I desire it to be understood that on the front rod or shaft in place of the shoes d, herein shown, I may provide a series of spike-teeth reclining rearwardly, like the teeth f, and in such event they will possess all the functions of the shoes d, with the additional function which is inherent thereto, although they will not act as trailing or leveling teeth, as do the teeth f, because of their location with reference to the spring-teeth.

The shoes d and f, which serve as supporting devices for the front and rear ends of the harrow when the teeth are elevated, also serve as supports for the harrow-frame when the teeth are in use to elevate it above the ground, preventing the collection of rubbish ahead of the tooth-bearing shafts, and said shoes also serve as gages by means of which the distance that the teeth shall penetrate the soil may be determined.

I claim—

1. In a harrow, the combination of a frame, shoes at the front end thereof, and a set of rearwardly-declining spike-teeth at the rear end thereof which terminate substantially in a plane with said shoes, and a set of spring harrow-teeth supported by said frame, and means for adjusting said spring harrow-teeth whereby their ends terminate in a plane with said shoes and spike-teeth, or above or below said plane, substantially as described.

2. In a harrow, the combination of a frame, shoes at the front end thereof, and a set of rearwardly-declining spike-teeth at the rear end thereof which terminate substantially in a plane with said shoes, a shaft from which said spike-teeth rearwardly project, and an adjusting device for adjusting said shaft on its axis, and a set of spring harrow-teeth supported by said frame, and means for adjusting said spring harrow-teeth independently of the supporting spike-teeth whereby their ends terminate in a plane with said shoes and spike-teeth, or above or below said plane, substantially as described.

3. In a harrow, the combination of a frame, shoes at the front end thereof, spring harrow-teeth secured to rock-shafts supported by said frame, means for rocking said shafts to raise and lower said teeth, and for holding them in their different adjusted positions, the shaft f loosely supported by and at the rear end of said frame, spike-teeth secured to and projecting rearwardly from said shaft, and means for holding said shaft f and adjusting it on its axis consisting of the arm f' projecting from the shaft, arm f^7 loosely supported on the rear rock-shaft and connecting-rod f^6, one of said members being provided with a series of holes and the bolt 3, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES S. SHARP.

Witnesses:
WALTER H. BECK,
M. J. LOWER.