

(No Model.)

R. RAKESTRAW.

ROTARY HARROW,

No. 364,130.

Patented May 31, 1887.

FIG. 1.

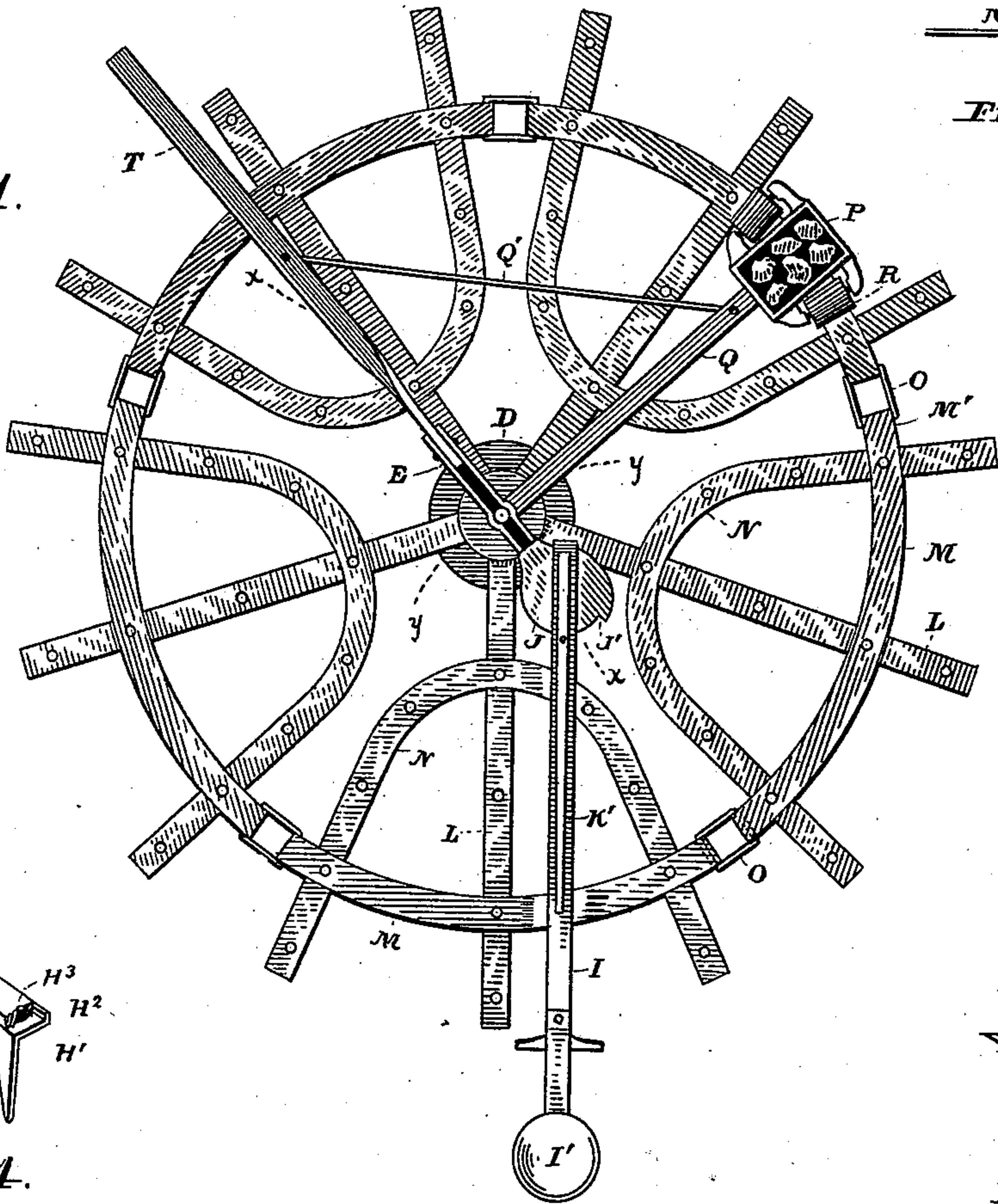


FIG. 4.

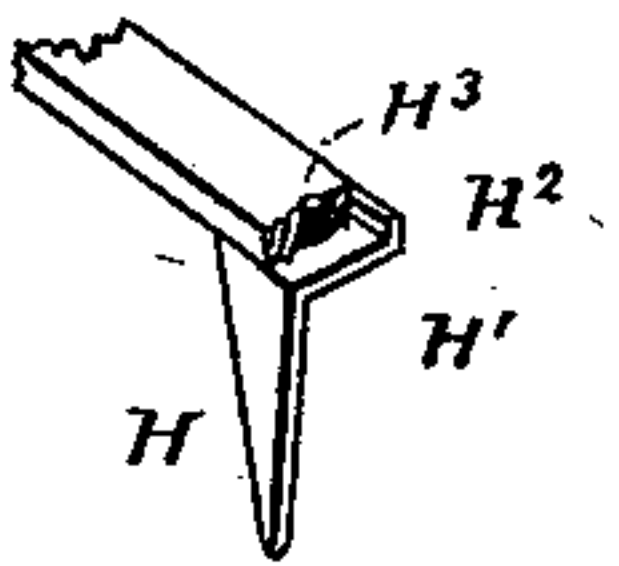


FIG. 7.

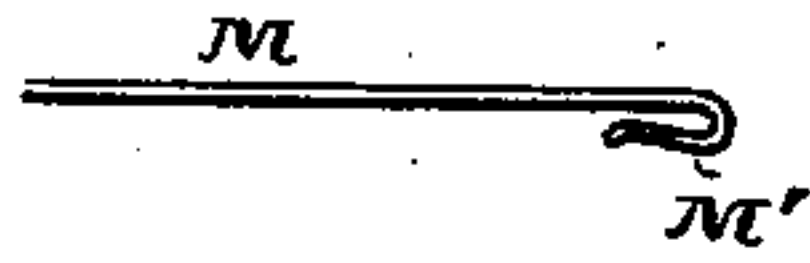


FIG. 5.

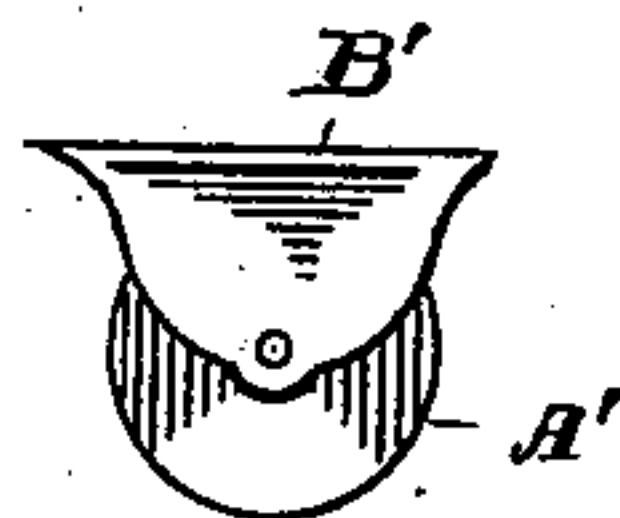


FIG. 2.

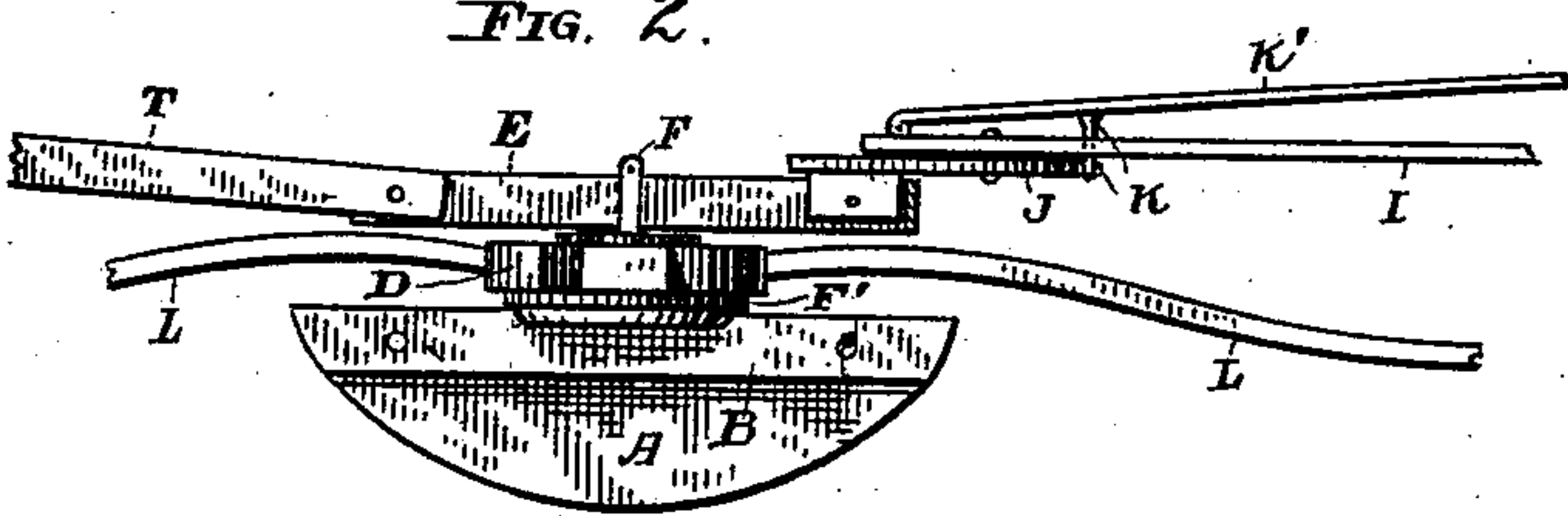


FIG. 3.

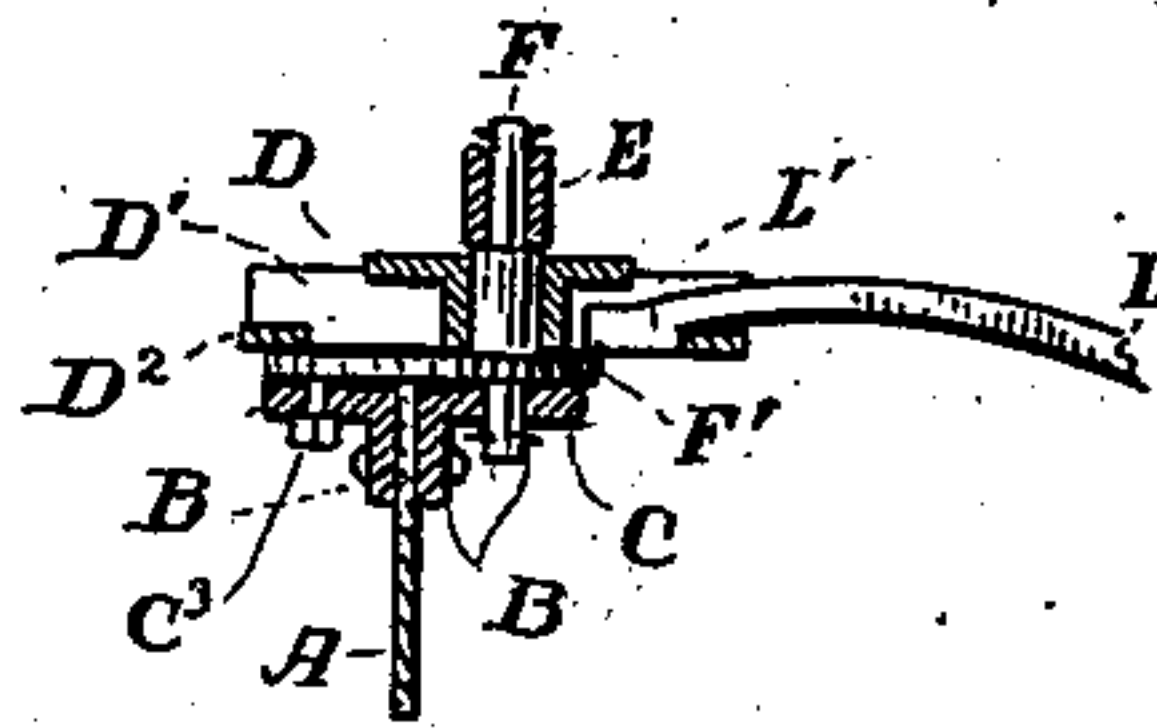
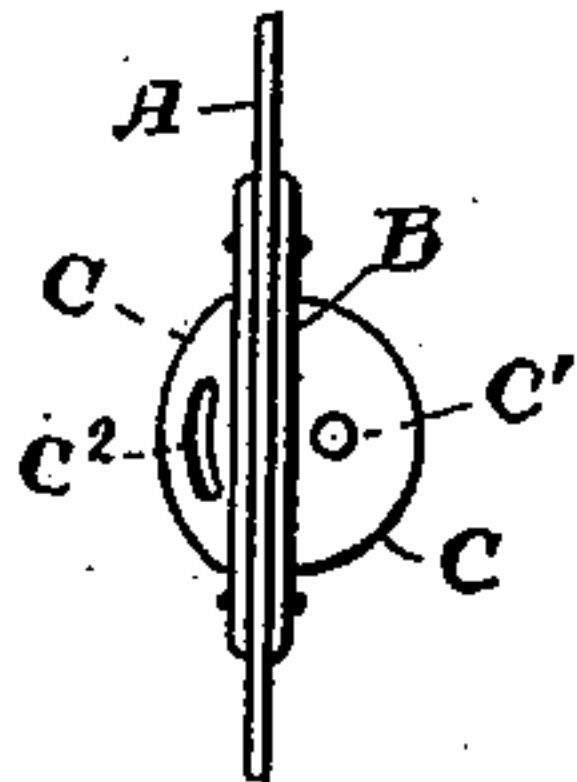


FIG. 6.



Witnesses:
W. L. Cleveland.
H. M. M.

Inventor,
Roland Rakestraw;
by A. B. Upham,
His Attorney.

UNITED STATES PATENT OFFICE.

ROLAND RAKESTRAW, OF WYOMING, ILLINOIS.

ROTARY HARROW.

SPECIFICATION forming part of Letters Patent No. 364,130, dated May 31, 1887.

Application filed July 31, 1886. Serial No. 269,621. (No model.)

To all whom it may concern:

Be it known that I, ROLAND RAKESTRAW, of Wyoming, in the county of Starke, State of Illinois, have invented an Improved Rotary Harrow; and I do hereby declare that the following is a full, clear, and exact description thereof.

This invention is in the line of harrows in which a centrally-impelled frame is adapted, by means of inclined teeth and their unequal action upon the ground, to give a slow rotation about said impelling center.

My improvements relate especially to means for overcoming the lateral travel which it has been found to give to the harrow as an unavoidable accompaniment of its rotation, to an improved form of harrow-tooth, to an improved construction of harrow-frame, and other minor details.

In the drawings connected with this application, Figure 1 is a plan view of my harrow. Fig. 2 is a vertical section of the same at X X in Fig. 1. Fig. 3 is a vertical section at Y Y in Fig. 1. Fig. 4 is a view of my harrow-tooth. Fig. 5 is a modified form of the guide; Fig. 6, a view of under side of guide-blade and securing mechanism; Fig. 7, a view of the hook at ends of the arcuate bars M.

My harrow-frame consists of a series of loosely-joined frames, each formed of three metallic bars, one of which is radial, one arcuate and the other approximately parabolic, rigidly secured together, the radial bars being adapted to connect with the center of the harrow, and the arcuate bars coupled together.

My arrangement for overcoming the lateral deflection of the harrow consists, essentially, of a guiding-blade rigidly connected with the harrow-tongue and adapted by its slightly-oblique cutting engagement with the ground to prevent the harrow from yielding to the tendency given thereto by its rotation to move to one side, said blade being set slightly oblique instead of in the direction of advance, so that the resultant of its lateral force and that of the teeth in the opposite direction shall be straight ahead.

Referring to the drawings, the sectional frames forming the harrow consist of the radial bars L, each connected to the center-piece D, the parabolic bars N, and the arcuate bars M,

the bars L, N, and M being rigidly fastened together by bolts or rivets to form a single section, and each end of the bar M being made into a hook, M', for permitting the rectangular link O to engage therewith, and the sections to be coupled together.

The teeth H, I form from bar-iron of cross-section preferably three-eighths by three-fourths inch, the tooth portion being made tapering, and the body H' being horizontal, and provided with the upwardly-projecting rim H². Said body being riveted or bolted to the under side of a bar of the harrow, the contact of said rim and the edge of the bar enables the single bolt employed to be entirely sufficient to hold the tooth firmly in place.

The tongue or draft-beam T is pivoted at its inner end to the short split bar E, which is rigidly fastened to the king-bolt F. The latter, passing down through the center-piece D, has the guide-blade A fixed to its lower end, so that both said blade and the draft-beam are rigidly connected and must turn together independent of the harrow-frame's rotation.

The mode of attaching the guide-blade to the king-bolt is more particularly as follows: Just beneath the center-piece D, and forming a support therefor, is the horizontally-prolonged shoulder F' of the king-bolt, and to the under side of said shoulder is secured the blade-holder consisting of the jaws B bolted together with the guide-blade A between them. The upper edges of said jaws are horizontally extended into elbow-plates C, through one of which is the bolt-hole C', and the other of which is provided with the arcuate slot C², concentric with said bolt-hole. Through said bolt-hole C' extends the lower end of the king-bolt F, being held therein by a split pin, and through said arcuate slot passes the bolt C³ from the shoulder F', the object of which connection to the king-bolt being to enable the guide-blade A and the draft-beam to be relatively adjusted to obtain the required oblique direction to said blade.

Instead of the cutting-blade for guiding the harrow, I sometimes employ the disk A', mounted between jaws B', substantially similar to the jaws B, previously described. In some kinds of soil this rotating disk is superior to the fixed blade, and in other grounds

the latter is the more practicable. I do not, therefore, restrict myself to either form; but employ the term "guide-blade" to designate both.

5 To render the harrow still more perfect regarding its directness of forward travel, I reinforce the guiding-blade at the center of the harrow with a second, held at the end of a beam, I, supporting the driver. The inner
10 end of said beam I is pivoted to the disk J, held by the split bar E, and the rear end thereof supports the seat I'. Although I can employ the runner form of blade A at the rear end of this beam, I usually prefer the disk
15 form A', or two of them, so that the weight of the driver, while enabling the blades to suitably guide the harrow, shall not produce too much friction between the guide-blades and the ground.

20 To enable the harrow and the team dragging the same to be turned about for another journey across the field, the beam I and the draft-beam must be able to have sufficient relative angular motion. To this end is the said
25 beam I pivoted to the plate J. On the other hand, to enable the guide-blades of the same to suitably control the harrow, there must be no angular yielding of the beam I to the guiding tendency of its guide-blade. To overcome
30 this, the disk J is provided with the peripheral lug J', and the beam I is provided with the pin K, projecting through the beam, and adapted to engage with said lug and prevent the relative angular movement of the draft-beam and
35 seat-beam I in the direction to which the latter tends when not thus kept therefrom. Said pin being connected to the vertically-movable lever K', it can be raised above the level of the disk J, and hence free of the lug J' when
40 it is desired to turn the team toward the right.

To have the center-piece D at a sufficient height to accommodate the guide-blade A and its mechanism, the inner ends of the radial bars L are each given an upward and then a
45 downward curve, termed a "goose-neck," so that the inner ends are higher than the remainder of the frame-sections. On the under side of the inner ends of said bars are the slight shoulders L', which, after said ends are
50 inserted in the seats D' in the center-piece D engage with the cross-bars D² thereof, and are thereby prevented from being withdrawn in a horizontal direction. To insert and remove a
55 section, it must be somewhat elevated at its outer portion.

The hooks M', at the ends of the arcuate bars M, are formed in approximately a shepherd's crook, so that the rectangular links O
60 can be easily connected and disconnected therefrom, and the different harrow-sections readily detached from each other, for compactness of storage.

To aid the inclination of the harrow-teeth in their work of rotating the harrow, it is customary to load the side of the frame at which
65 the teeth are inclined toward the direction of

advance. This I have improved by providing a box adapted to receive any required amount of stone or metal, which box is mounted upon
70 two rollers traveling upon the upper side of the arcuate bars M, and is kept in position by the bars Q Q', connecting it to the draft-beam. Said box P may or may not be provided with a cover for retaining therein the weights. Still, though I show it without a cover, I usu-
75 ally prefer the same.

The rollers R are connected to the box P by bearings projecting therefrom both fore and aft, thereby bringing one roller in front of the box and the other behind. This enables the
80 box to traverse more easily the top of the bars M, and to pass from section to section with one-half the jar that would result were there but one supporting-roller.

Although I have described the guide-blade
85 A as being slightly oblique relative to the direction of the harrow's travel, I do not restrict myself to said position, as in some kinds of soil it is better to adjust the said blade so that it shall be parallel to the direction of advance.
90

What I claim as my invention, and for which I desire Letters Patent, is as follows, to wit:

1. In a revolving harrow, the combination, with the harrow and the draft-beam pivoted thereto, of the guide-blade rigidly connected
95 to said draft-beam and adapted to engage with the ground over which the same is being dragged, and to overcome the side-draft of the harrow, substantially as described.

2. In a revolving harrow, the combination,
100 with the harrow and the draft-beam, of the king-bolt rigidly fastened to and projecting from said beam through the center of the harrow, and the guide-blade rigidly fixed to the lower end of said king-bolt, substantially as
105 described.

3. In a revolving harrow, the combination, with the harrow and the draft-beam pivoted thereto, of a guide-blade rigidly but adjustably
110 connected with the draft-beam and adapted to engage the ground over which the harrow passes, and means for varying the angle of the guide-blade with reference to the draft-beam.

4. In a revolving harrow, the combination, with the harrow and the draft-beam, of the
115 king-bolt connected therewith, as set forth, and having the shoulder F', the clamping-jaws B, adjustably secured to said shoulder by the bolt and curved slot, and the guide-blade A, held by said jaws, for the purpose set forth.
120

5. In a rotary harrow, the combination, with the draft-beam and a revolving harrow pivoted thereto, of two guide-blades, one beneath the center of the harrow and the other near the
125 periphery thereof, and normally parallel or approximately parallel to the first, together with means, substantially as shown and described, for temporarily varying the position of the second guide-blade with reference to the first.
130

6. The combination, with the revolving harrow having the guide-blade held at the center

thereof, of the beam I, the seat thereon, the guide-blade fixed to the rear end of said beam, and a lock for securing said beam from angular movement relative to the draft-beam of the harrow, substantially as described.

7. The combination, with the harrow and its draft-beam, of the guide-blade connected to the center of the harrow and rigidly held by said draft-beam, the seat-beam I, the disk J, secured to the draft-beam, and having lug J', said beam being pivoted to said disk, the pin K, engaging with said lug, and the lever K', for removing the pin, for the purpose specified.

8. The harrow-frame consisting of the sections each formed of the radial bar L, arcuate bar M, and parabolic bar N, firmly secured together, said radial bars being connected together, and the arcuate bars being loosely coupled to each other, substantially as and for the purpose set forth.

9. The combination, with the center piece and the draft-beam connected thereto, of the harrow-sections formed of the radial bars connected to said center-piece, the arcuate bars loosely coupled together, and the parabolic bars firmly secured to the said radial and

arcuate bars, said harrow-sections being furnished with inclined teeth, and said draft-beam pivoted to the center-piece, for the purpose set forth.

10. The combination, with the harrow-frame consisting of the sections having the radial bars L, the inner ends of said bars being made goose-neck shaped, of the center-piece D, receiving said inner ends of the radial bars, the split bar E, and the draft-beam pivoted thereto, the king-bolt F, uniting said split bar and center-piece, and the guide-blade A, rigidly connected with the lower end of said king-bolt, for the purpose set forth.

11. The combination, with the centrally-united radial bars L, the parabolic bars N, and the arcuate bars M, having hooks M', of the rectangular links O, for coupling said bars M together, as set forth.

In testimony that I claim the foregoing invention I have hereunto set my hand and seal this 21st day of July, in the year 1886.

ROLAND RAKESTRAW. [L. S.]

Witnesses:

LEWIS A. CASTLE,
A. G. HAMMOND.