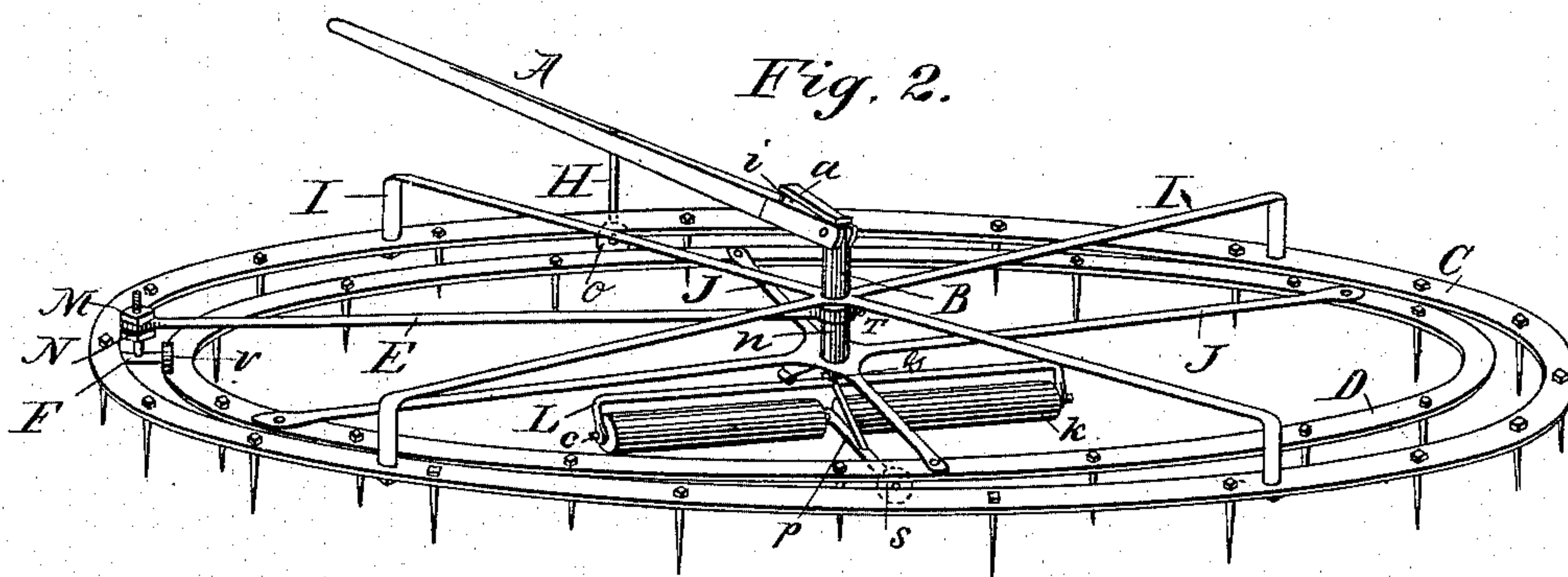
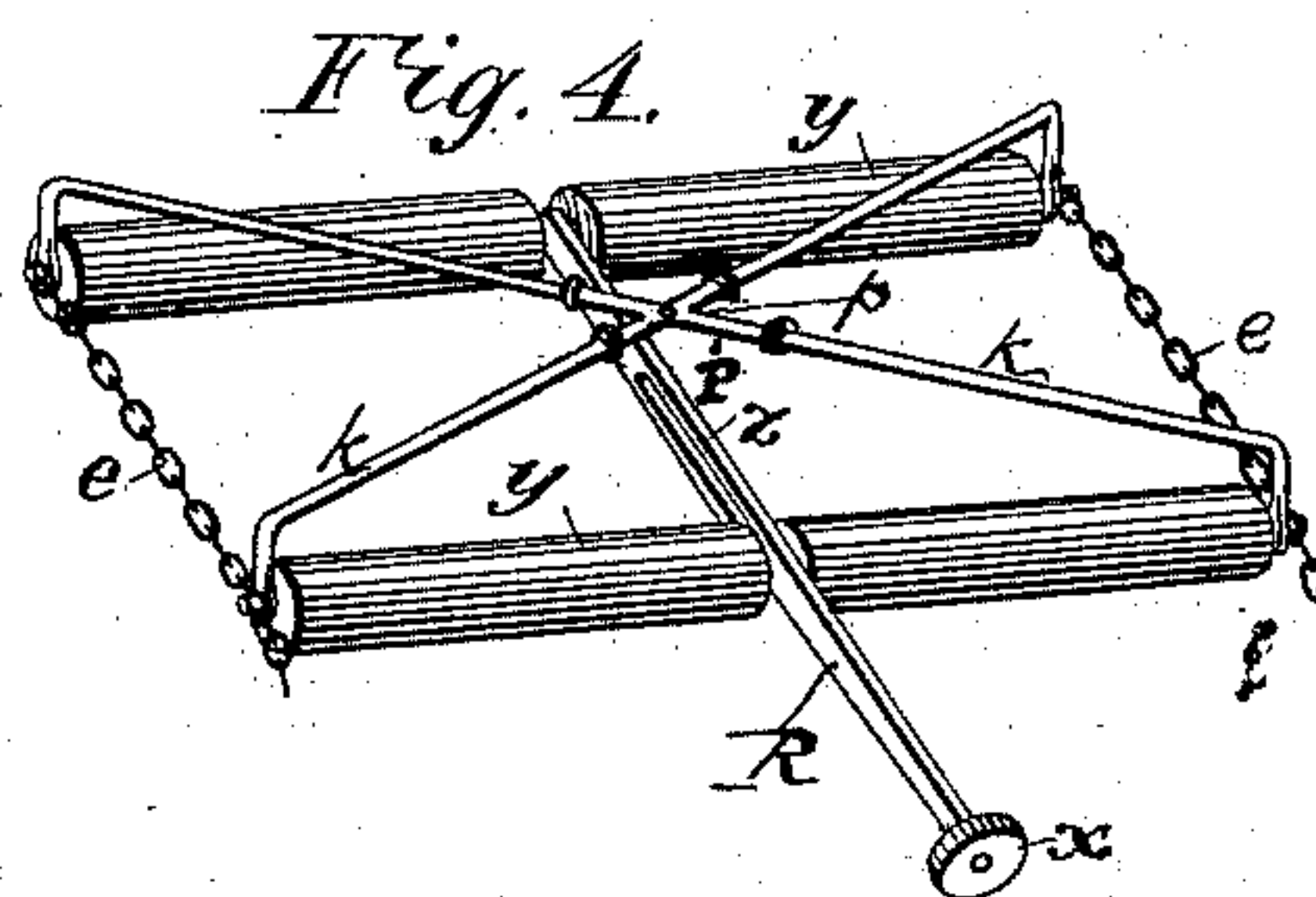
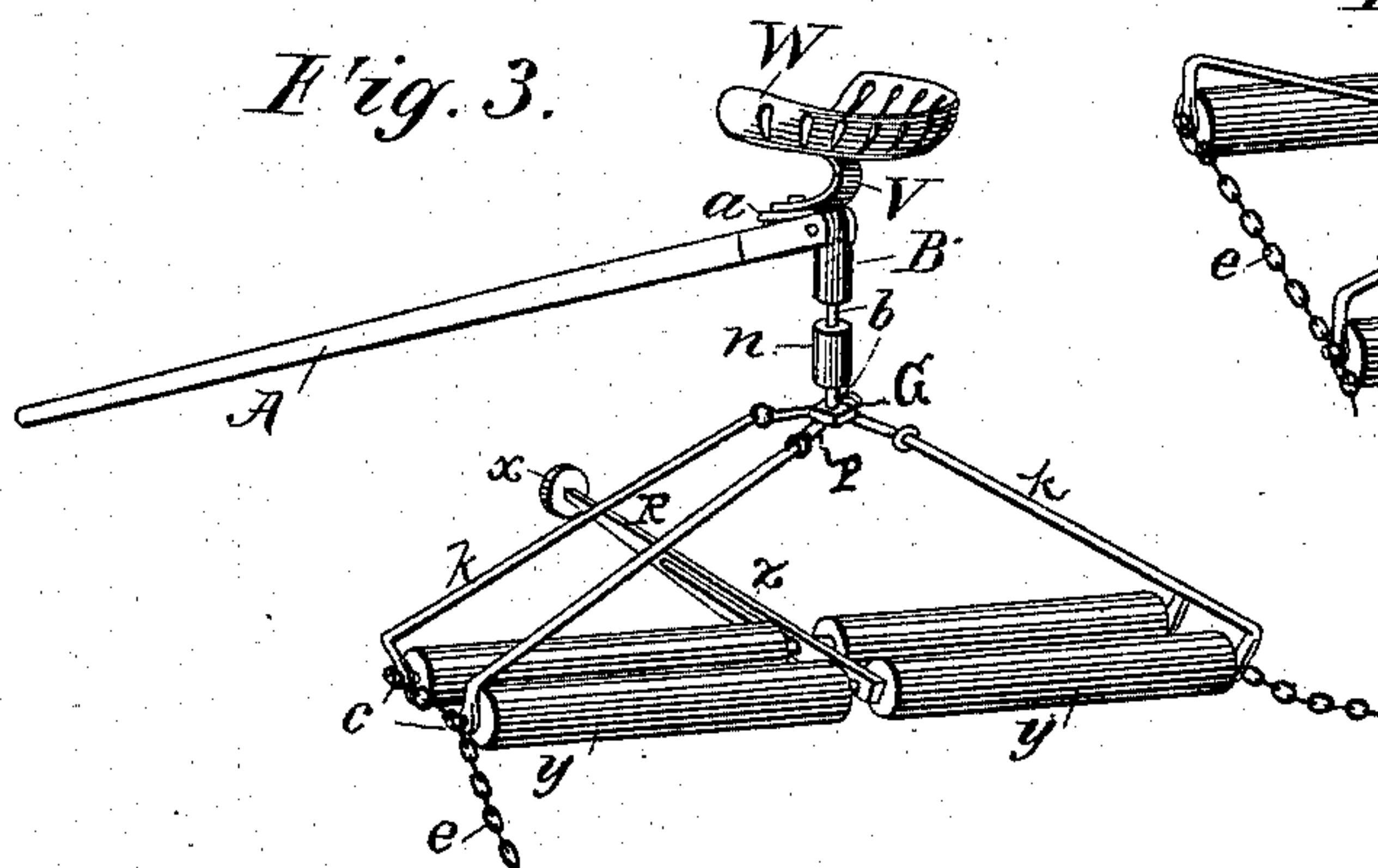
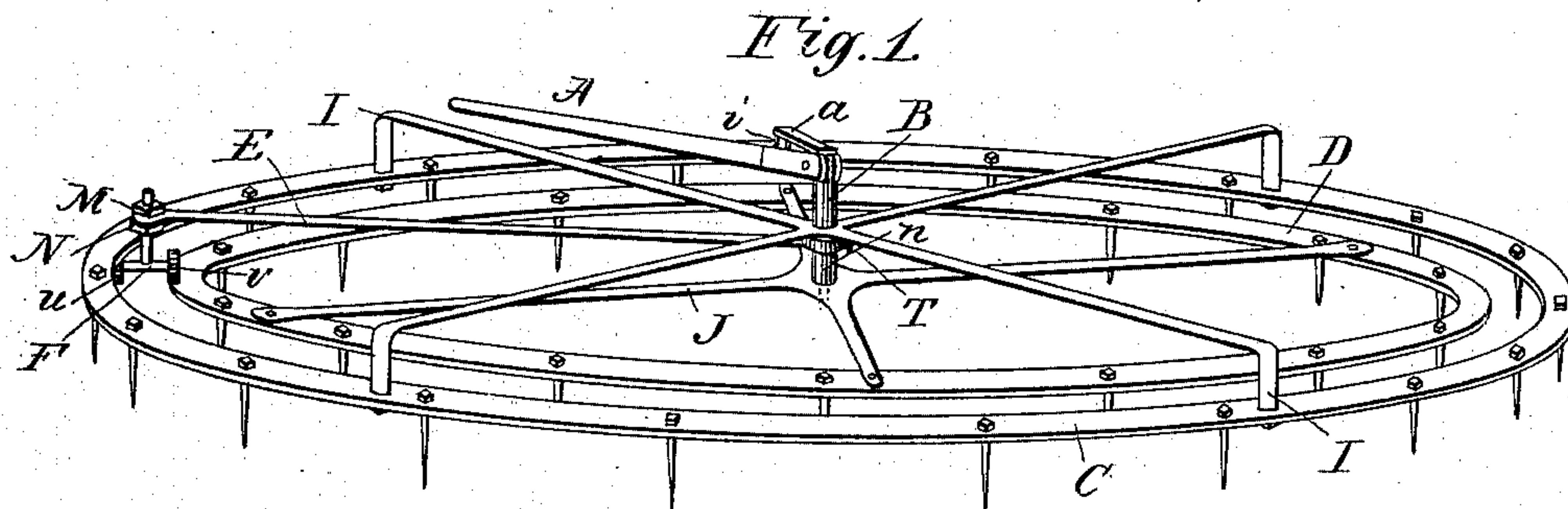


(No Model.)

J. R. BANE.
ROTARY HARROW.

No. 272,112.

Patented Feb. 13, 1883.



Witnesses.

George Leaman
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Inventor.

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UNITED STATES PATENT OFFICE.

JAMES R. BANE, OF GILROY, CALIFORNIA.

ROTARY HARROW.

SPECIFICATION forming part of Letters Patent No. 272,112, dated February 13, 1883.

Application filed May 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. BANE, of Gilroy, county of Santa Clara, State of California, have invented an Improved Rotary Harrow; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain new and useful improvements in rotary harrows, and more especially to that class in which concentric rings are made to revolve in opposite directions.

These improvements consist in the means by which the opposite rotation is effected, and in a means for supporting the harrow-rings to limit the depth to which the teeth may penetrate and to prevent friction.

The object of my invention is to provide an effective and simple harrow.

Referring to the accompanying drawings, Figure 1 is a perspective view of my harrow as it appears when at work. Fig. 2 is a perspective view of same, showing rollers underneath to prevent friction. Fig. 3 is a perspective of double rollers closed. Fig. 4 shows same open.

Let C D represent concentric rings or bands, provided suitably with harrow-teeth, as shown.

J represents the arms or spokes of the interior ring, D, and I those of the exterior ring, C, these being bent upward to pass above the others. Through the arms J and the arms I, at the center, loosely passes a vertical spindle or axle, *b*, having a sleeve or collar, *n*, between the two sets of arms, to hold them apart. The spindle receives a nut, G, below arms J, and has another collar, B, above arms I. By this construction the rings C D are journaled separately upon a central spindle, and may revolve without interference. The upper end of the spindle *b*, or of the collar B, is flattened on the sides, and has an arm, *a*, extending at right angles from it.

A represents the tongue or draft-bar. The inner end of this bar is slotted, and fits upon the flat portion or top of spindle *b*, as shown in Figs. 1 and 2. It is provided with pins *i*, which, when the bar is raised, are adapted to enter sockets in the arm *a*, and thus to secure the tongue to the spindle. The object of this construction is to provide a connection between the tongue and spindle which shall be operative only when the harrow is in actual

use, but which shall immediately become disconnected when not in use. This is to prevent the undue weight of the tongue upon the harrow. When the tongue is raised to the neck-yoke the pins *i* engage arm *a*, and the tongue is fast to the spindle; but when it is dropped the pins become disengaged and the tongue may be removed.

E is an arm or rod, the head of which is journaled upon the spindle *b* and firmly secured thereto by a set-screw, T. This arm projects to the space between the two rings C D, and there receives the leg of an inverted-T shaft, (marked F,) and secured by two nuts, M and N, as shown. The arms of this T-shaft carry rollers *v* and *u*, the former of which presses upon top of the ring D and the latter presses up under ring C, as shown in Fig. 1. The rings C and D are by this means elevated at opposite sides, and in their travel against the rollers are made to revolve in opposite directions.

I have thus far described no means for transporting the device with facility, or for limiting the depth of the teeth and preventing friction.

In Figs. 3 and 4 I show a set of rollers, *y y*, journaled on rods *c c*, the ends of said rods having bearings in the ends of rods *k k*, whose ends are brought toward a center and fastened by ball-and-socket joints to a frame or spider, P, which has a central opening, *p*, to receive the lower end of spindle *b*. The ends of the rods *c c* are provided with chains, *e e*, which connect them and control the distance between them. At the center of one of the rods *c* is journaled the end of a bar, R, which is provided with a longitudinal slot, *z*, through which passes the other rod *c*, and on the end of said bar R is a small roller, *x*, which rests beneath ring C and aids in supporting it. A rod, H, extends down from draft-tongue A, and carries a roller, *o*, upon its end, which lies beneath ring C and aids in supporting it. When the rollers *y y* are brought toward each other the central spider, P, which supports the spindle, is raised by means of rods *k k*, and the tooth-carrying rings are raised or lowered to any desired degree to control the depth to which the teeth will enter the ground, or to raise them entirely above the surface when the harrow is to be transported by running on the rollers *y y*.

In Fig. 2 is shown a support, L, with single rollers, and an arm carrying a rod, S, which may be used in lieu of the double rollers to regulate the depth of the teeth. The bar R, by means of the slot *z*, limits the degree of approach or separation of rollers *y y*.

A seat, W, may be bolted by means of a spring, V, to the arm *a* of the spindle, and the weight of the driver be sustained during transportation.

It is obvious that by placing the rollers *v* and *u* both above or both below the rings these latter may be made to revolve in the same direction. This is preferable on side hills.

I am aware that harrows have been known in which concentric rings are made to revolve in opposite directions by means of elevating or depressing opposite sides of the rings, and I am also aware that there have been wheeled harrows. I do not claim these features, broadly; but

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

1. The concentric harrow-rings C D, having arms I J, and the central spindle, *b*, upon which they are independently journaled, in combination with the arm E, fixed to the central spindle, *b*, and the inverted-T shaft F, secured by its leg in the outer end of arm E, and having on its arms rollers *v u*, pressing one above and the other below said rings, substantially as and for the purpose herein described.

2. The concentric harrow-rings C D and central spindle, *b*, upon which they are journaled, in combination with the rollers *y y*, having a support, *k*, and a slotted arm, R, with a roller, *x*, fitting under and supporting one of the rings, and the tongue A, having a rod, H, with a roller, *o*, fitting under and supporting the other ring, substantially as and for the purpose herein described.

In witness whereof I hereunto set my hand.
JAS. R. BANE.

Witnesses:

EDWARD H. FARMER,
CHARLES H. REMINGTON.