

(No Model.)

H. J. HILF.
ROTARY HARROW.

No. 368,586.

Patented Aug. 23, 1887.

Fig. 1.

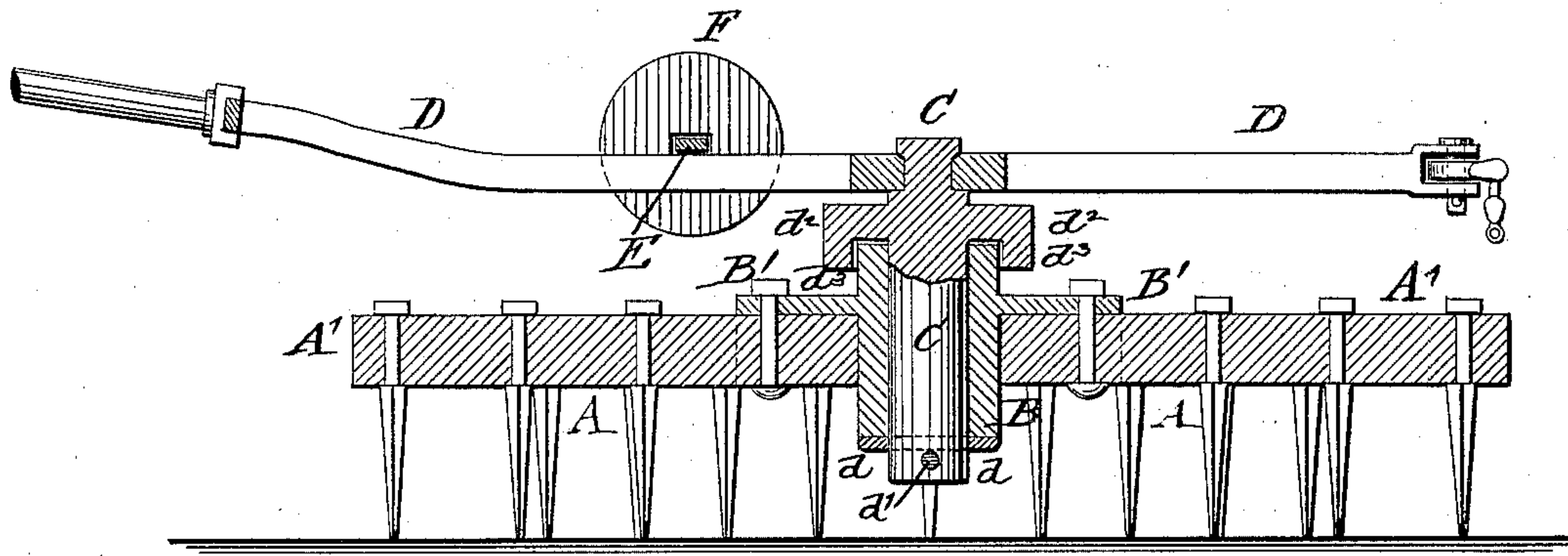


Fig. 2.

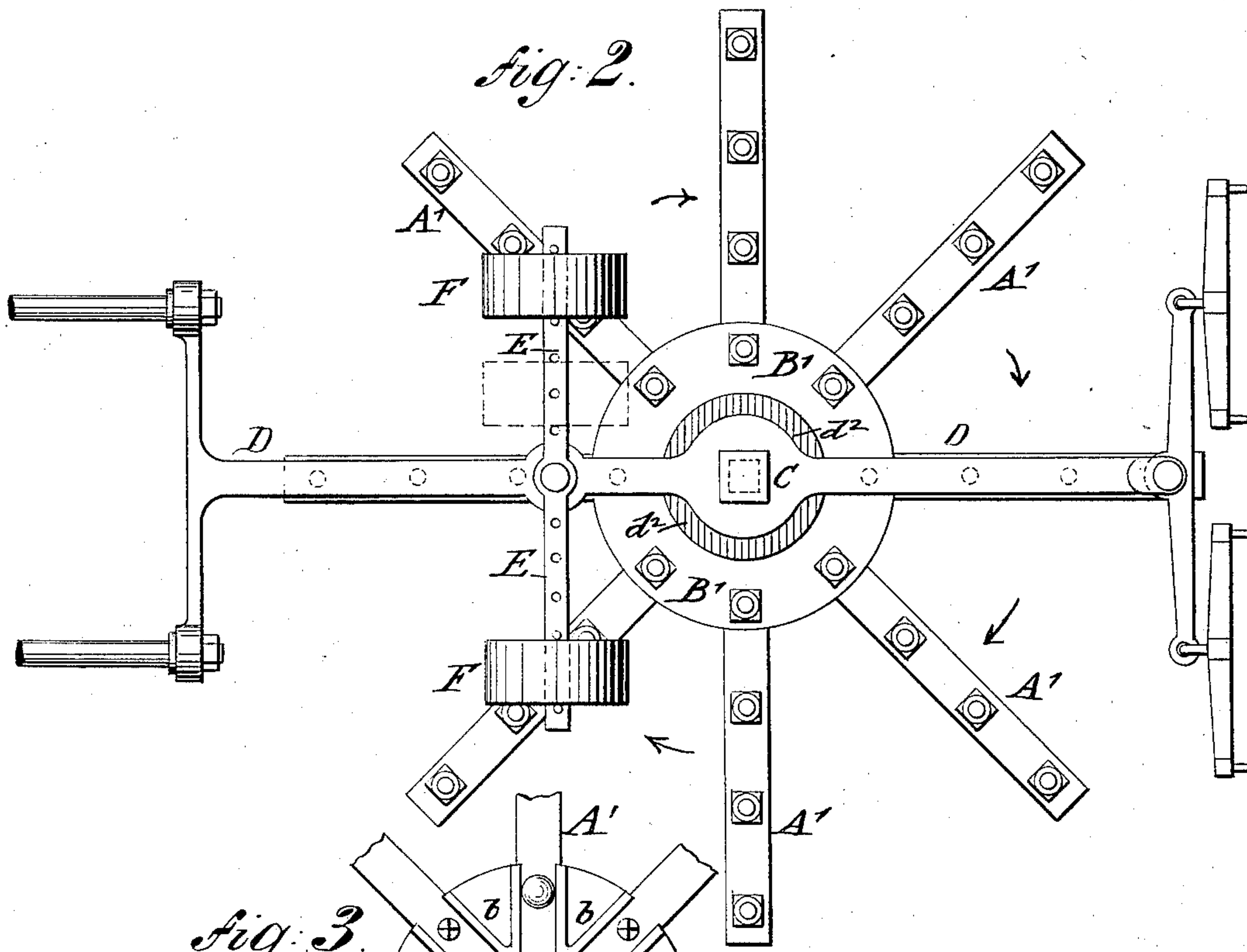
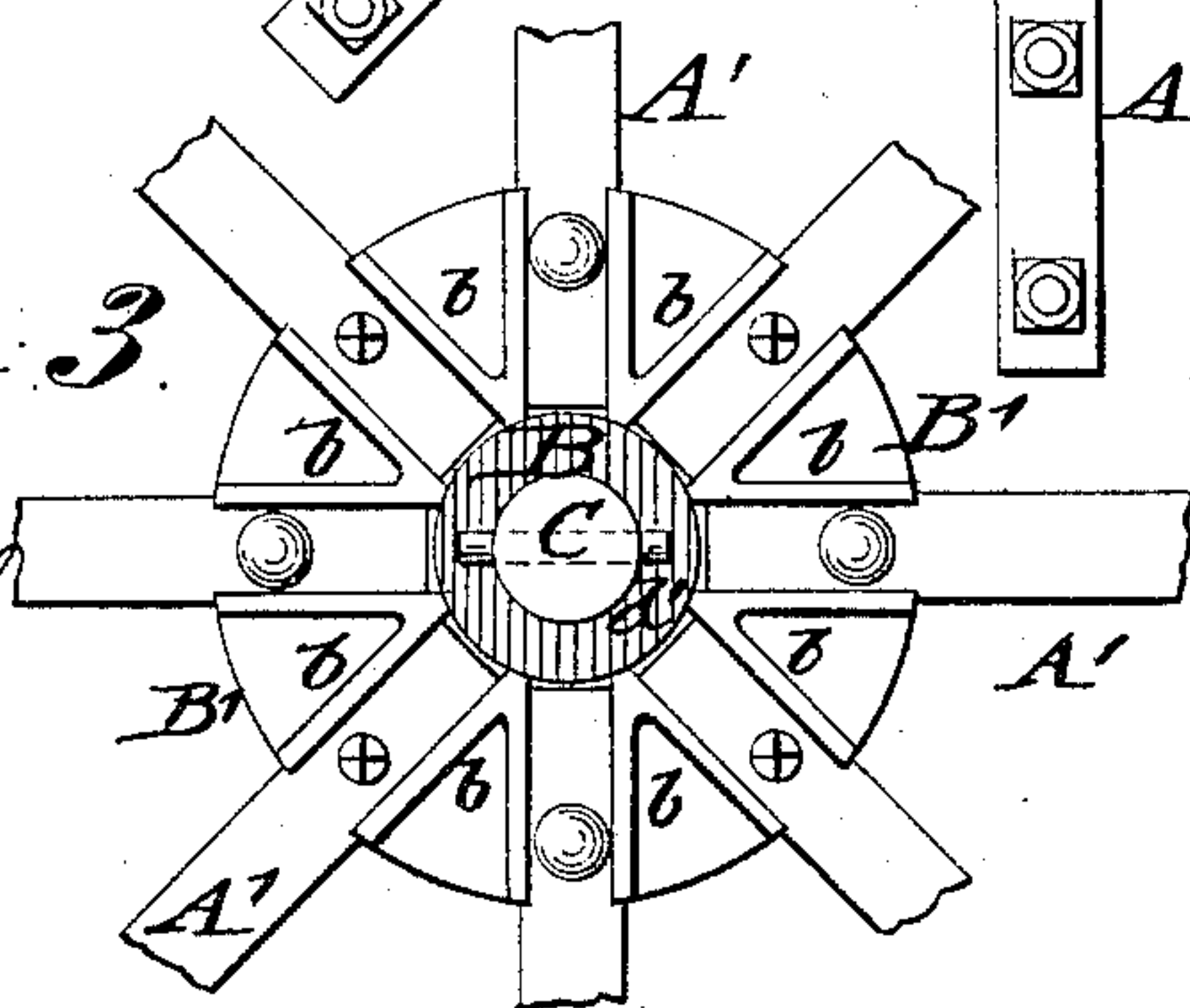


Fig. 3.

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ROTARY HARROW.

SPECIFICATION forming part of Letters Patent No. 368,586, dated August 23, 1887.

Application filed November 17, 1886. Serial No. 219,137. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH JOSEPH HILF, of the city, county, and State of New York, have invented certain new and useful Improvements in Rotary Harrows, of which the following is a specification.

This invention relates to an improved harrow which is longitudinally rotated on a fixed central axis of the wing, so that the ground is cut up in a more effective manner than by the common harrows heretofore in use; and the invention consists of a harrow composed of a draft-beam having a fixed vertical axle, and radial arms having a number of teeth, said arms being attached to a flanged center hub turning on the axle of the beam. The beam is provided back of its axle with a fixed transverse bar and laterally-adjustable weights, by means of which the teeth of the harrow are pressed to a greater or less extent into the ground, whereby rotary motion is imparted to the arms by the joint action of the draft on the beam and the resistance exerted on the teeth by the ground.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of my improved rotary harrow. Fig. 2 is a plan, and Fig. 3 a bottom, view of the flanged hub to which the arms of the harrow are attached.

Similar letters of reference indicate corresponding parts.

My improved harrow is constructed of a longitudinal beam, D, having a fixed vertical axle, C, and a horizontally-rotating frame, A, that turns by a central hub, B, on the axle C. The rotary frame A is composed of radial arms A', that are provided with a number of teeth, a , which are rigidly secured to said arms. The inner ends of the arms A' are inserted into sockets of the hub B, said sockets being formed by angular ribs b b at the under side of a disk-shaped flange, B', on said hub, as shown in Fig. 3. The radial arms A' are bolted to the flange B', so as to be rigidly connected to the hub B. The hub B turns on the fixed vertical axle C of the beam D, and guides the hub B between a washer, d , and a transverse pin, d' , at the lower end, and a fixed cap, d^2 , having an annular flange, d^3 , at the upper end of the axle C. The flanged cap d^2 extends over the upper end of the hub C, so as

to prevent particles of earth and other matter from entering between the axle C and hub B, and increase thereby the friction between the same.

The whiffletrees, to which the draft animals are hitched, are applied to the front end of the beam D, while the handles by which the harrow is guided are applied to the rear end of the same, as shown in Fig. 2. To the rear part of the beam, back of the axle C, is applied a fixed transverse bar, E, to the ends of which are applied heavy weights F, which are capable of lateral adjustment on said bar, and which serve to press the teeth of the harrow to a certain depth into the ground. The weight F, at one side of the beam, is preferably adjusted nearer to the beam than the weight at the other side of the same, so that the teeth at one side of the longitudinal axis of the harrow are forced deeper into the ground than at the other side of the same.

When the harrow, for instance, is to be rotated in the direction of the arrows shown in Fig. 2, the weight F, at the left-hand side of the beam, is placed nearer to the beam than the weight at the other side, as shown in dotted lines in Fig. 2, which causes the teeth to enter into the ground at a lesser depth at the left-hand side of the beam, while the teeth at the right-hand side of the beam are forced to a greater depth into the ground. When the motion of rotation is to be reversed, the relative position of the weights to the axis of the beam is reversed. The adjustment of the weights on the bar E has the advantage that the teeth of the harrow enter at a lesser depth into the ground at that side of the harrow where the initiatory motion of each rotation commences than at the opposite side, where the rotation terminates, so as to overcome thereby the gradually-increasing resistance of the earth on the teeth of the harrow. The joint action of the draft exerted on the beam in a longitudinal direction, and of the resistance of the earth on the teeth of the radial arms A', imparts a rotary motion to the harrow around the central axle of the same, whereby the ground is broken up in a more effective manner, as the teeth move in cycloidal paths through the ground instead of being moved in straight lines through the same, as in the har-

rows heretofore in use. A very effective action of the harrow is thereby exerted on the ground, and the same broken up in a thorough, quick, and comparatively easy manner.

5 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of an adjustable draft-beam having a fixed vertical axle, a rotary frame composed of radial arms having teeth
10 and a central hub turning on said axle, and a fixed transverse bar attached to the beam at some distance back of the center of the axle, and provided with a laterally-adjustable weight at each side of the beam, substantially as set
15 forth.

2. The combination of a longitudinal draft-

beam having a fixed vertical axle, and an annular cap made integral therewith, a rotary harrow-frame having radial arms provided with teeth, and a center hub turning on the
20 axle within said cap, and a transverse bar attached to the beam at some distance back of the center of the axle, and provided with an adjustable weight at each side of the beam, substantially as set forth.

25 In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HEINRICH JOSEPH HILF.

Witnesses:

PAUL GOEPEL,
MARTIN PETRY.