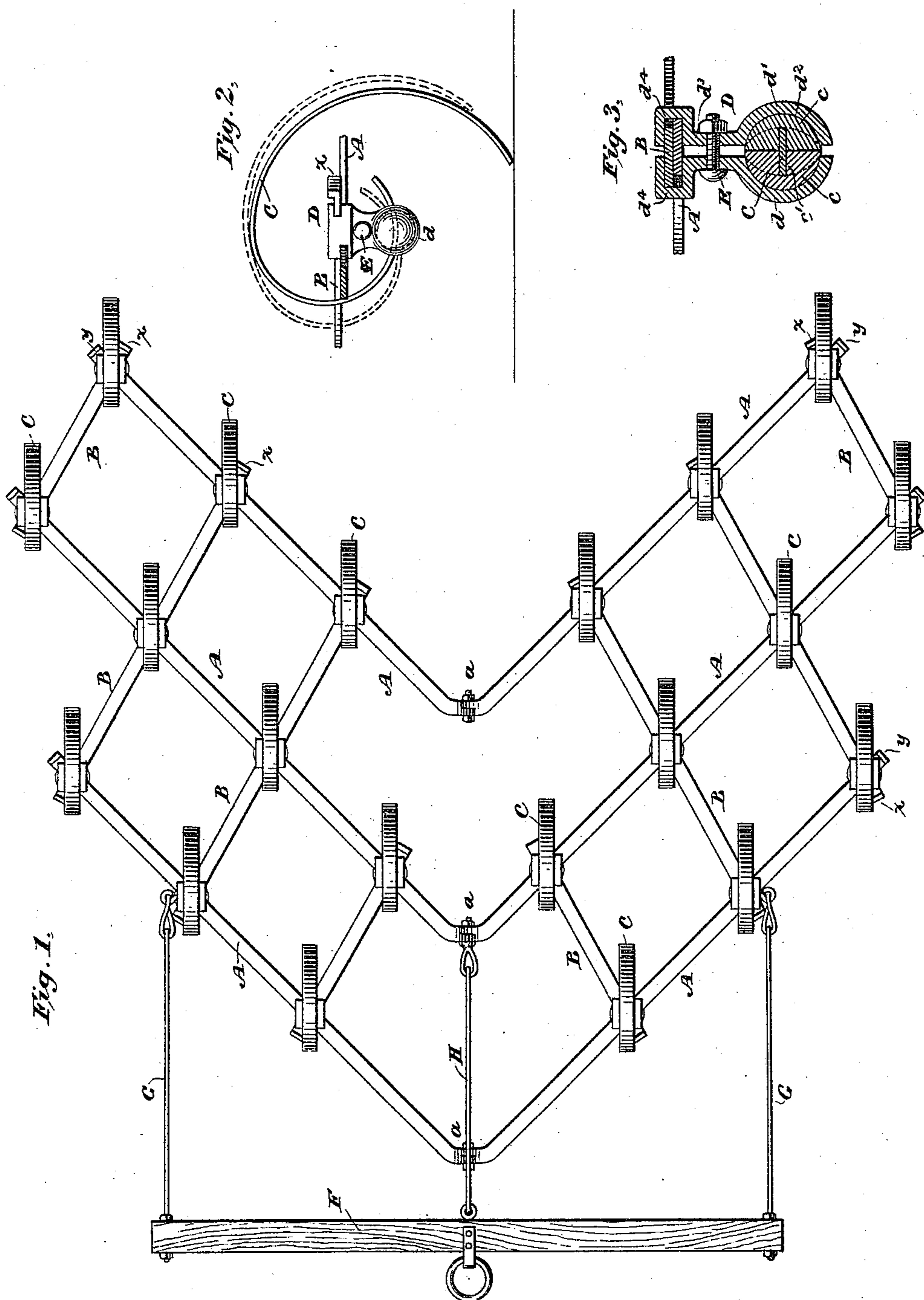


(No Model.)

C. LA DOW.
HARROW.

No. 441,367.

Patented Nov. 25, 1890.



2 Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES LA DOW, OF ALBANY, NEW YORK.

HARROW.

SPECIFICATION forming part of Letters Patent No. 441,367, dated November 25, 1890.

Application filed July 20, 1889. Serial No. 318,148. (No model.)

To all whom it may concern:

Be it known that I, CHARLES LADOW, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

My invention relates to that class of harrows in which spring-teeth are adjustably secured to a frame.

The objects of my invention are to simplify the construction of the frame, make it strong and rigid, and to provide improved devices for adjustably securing the teeth to the frame.

In carrying out my invention I preferably construct the frame of metal bars arranged at an angle to the line of draft and connected by cross-bars, to which they are secured by improved couplings, which are also constructed to support the harrow-teeth and permit their adjustment.

The details of construction and the subject-matter claimed are hereinafter designated.

In the accompanying drawings, Figure 1 is a plan view of a spring-tooth harrow constructed in accordance with my invention. Fig. 2 is a detail view showing one of the spring-teeth in side elevation, the frame-bars in section, and the coupling in elevation; and Fig. 3 is a vertical central section through the coupling and the frame-bars.

The frame is constructed of bars A and B. The bars A are shown as arranged on each side of the central line of draft, diverging rearwardly in opposite directions. Three such bars a suitable distance apart are in this instance employed on each side of the harrow, and are secured together by bolts *a* at their inner ends. Preferably a hinge-connection is employed to admit of the folding of the harrow for transportation. The frame-bars A are connected by cross frame-bars B, preferably arranged at about right angles to the bars A, either above or beneath them. The spring harrow-teeth C, which are of well-known construction, are secured to the frame by stationary adjusting-plates D of an improved design, which also serve to connect the frame-bars with the cross-bars. The adjusting-plates are preferably made in two parts *d d'*, which are shown as of substantially the same shape and size. Each adjusting-plate

is formed with a hollow hemispherical socket *d*², to receive a hemispherical tooth holding slotted adjusting-hub *c*, and with a shank *d*³, which is enlarged at the upper end and formed with a socket *d*⁴ for the frame-bars A and B. The adjusting-plates are secured together by bolts E, extending through the shanks *d*³. At front and rear the socket-pieces *d*² are cut away or left open, as indicated in dotted lines, to admit the inner ends of the spring teeth C, which extend through the sockets and are clamped in recesses *c' c'* in the tooth-holding adjusting-hubs *c*. The walls of the frame-bar sockets *d*⁴ are cut away at the corners to admit the edges of the frame-bars A and B, which extend through the sockets within which they are clamped one above the other and crossed, as indicated in Figs. 2 and 3. The frame-bars are thus securely fastened together and the teeth are rigidly connected therewith. The corners *x y* of the frame-bars are bent in cross-motion, so that the bars cannot move endwise relatively to each other. The teeth may be adjusted by loosening the bolts E and turning the tooth-carrying adjusting-hubs in their sockets *d d'*. The teeth may also be adjusted endwise relatively to the hubs. When the bolts are again tightened, the teeth will remain in the position to which they are adjusted. The draft-beam F is connected to each side of the harrow-frame by rods G by means of flexing draft-links *g*, and a central rod H connects the beam to the middle set of frame-bars.

A harrow thus constructed is simple, inexpensive, and readily put up and taken apart. The details of construction described need not, however, be specifically followed, as they may be varied without departing from the novel features of my invention. The same bolt that secures the frame-bars also clamps the tooth-hub, which rocks upon a horizontal axis to give one adjustment. Another adjustment is had by shifting the tooth endwise in its hub.

So far as I am aware, I am the first to employ a tooth hub or holder rocking about a horizontal axis and horizontally-acting clamping devices to secure the tooth-holder and frame-bars; and it is immaterial, so far as the broad aspect of these features is concerned, whether the tooth hub or holder be

located below the plane of the frame-bars or in or above said plane. It will be noted that the clamping-surfaces securing the tooth-hub are arranged concentrically with reference to the horizontal axis about which it is adjusted. 5 The ball-and-socket adjusting tooth-holders also allow the points of the teeth to be adjusted laterally relatively to each other.

I claim as my invention—

10 1. The combination of the frame-bars, arranged transversely to each other, the horizontally-rocking adjusting-hub and the spring-tooth held therein, the adjusting-plates between which the hub is grasped, and the 15 horizontal or transverse bolt that secures the frame-bars together at their point of intersection and holds the hub in its adjusted position, substantially as set forth.

20 2. The harrow-frame composed of straps of metal forming frame-bars, in combination with adjustable individually hinged or pivoted spring-teeth located at the contiguous parts of the straps, and horizontal securing-

bolts that serve both to hold the teeth in place and bind the straps together, substantially as 25 set forth.

3. The combination of the harrow-frame composed of straps of metal, the stationary adjusting-plates, the adjusting-hubs held between the stationary plates and rocking on 30 horizontal axes, the spring-teeth attached to said hubs, and the bolts by which the stationary plates are held in place and the frame-straps bound together, substantially as set forth. 35

4. The combination of frame-bars, couplings uniting the frame-bars at their junctions, and harrow-teeth adjustable about a horizontal axis and carried by the coupling.

In testimony whereof I have hereinto subscribed my name. 40

CHARLES LA DOW.

Witnesses:

JAMES W. EATON, Jr.,
JAMES H. MCGINTY.