

No. 642,025.

Patented Jan. 23, 1900.

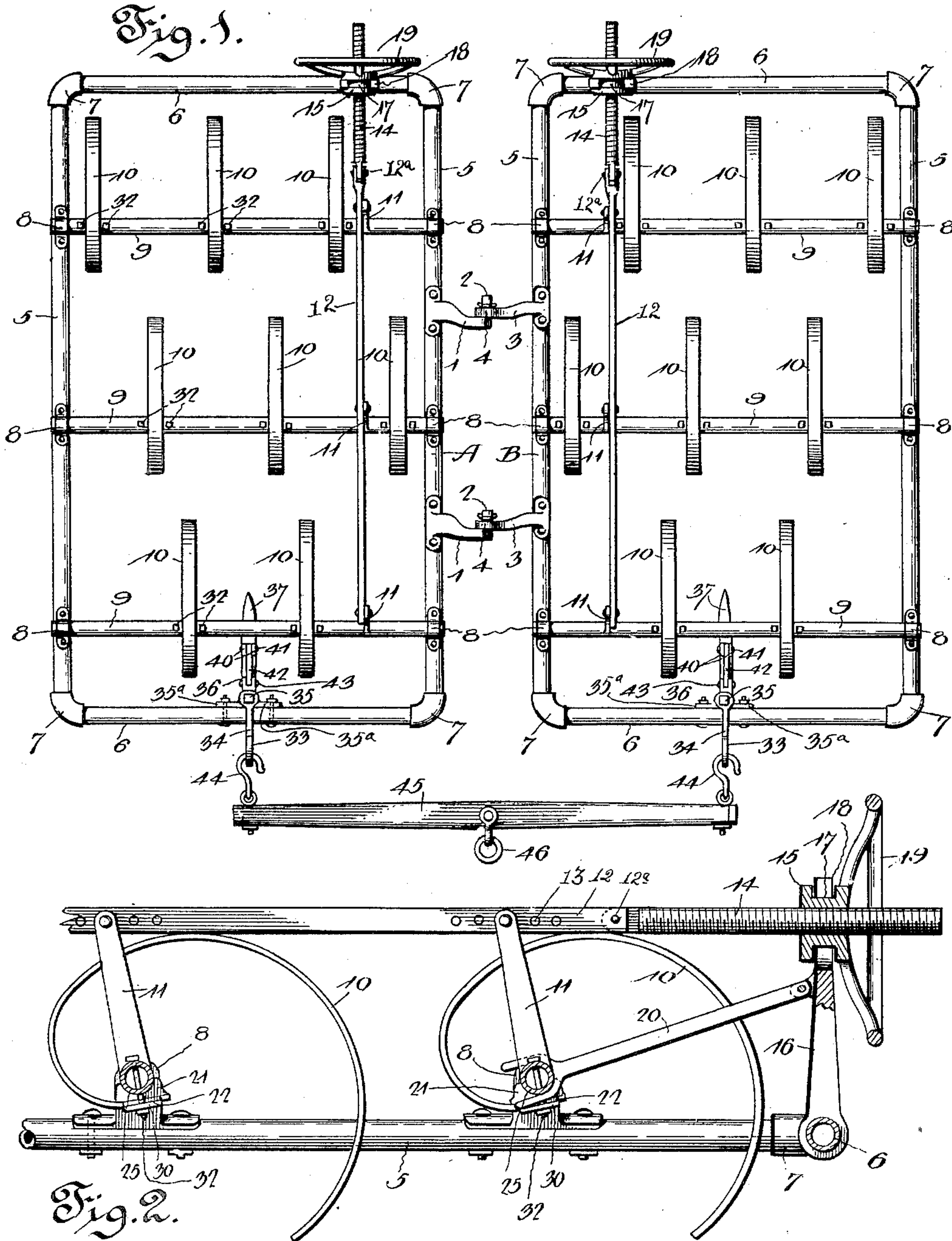
H. J. WASHBURN & C. G. CUDABACK.

HARROW.

(Application filed June 10, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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Helum J. Washburn Inventors.

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2 Sheets—Sheet 2.

Fig. 3.

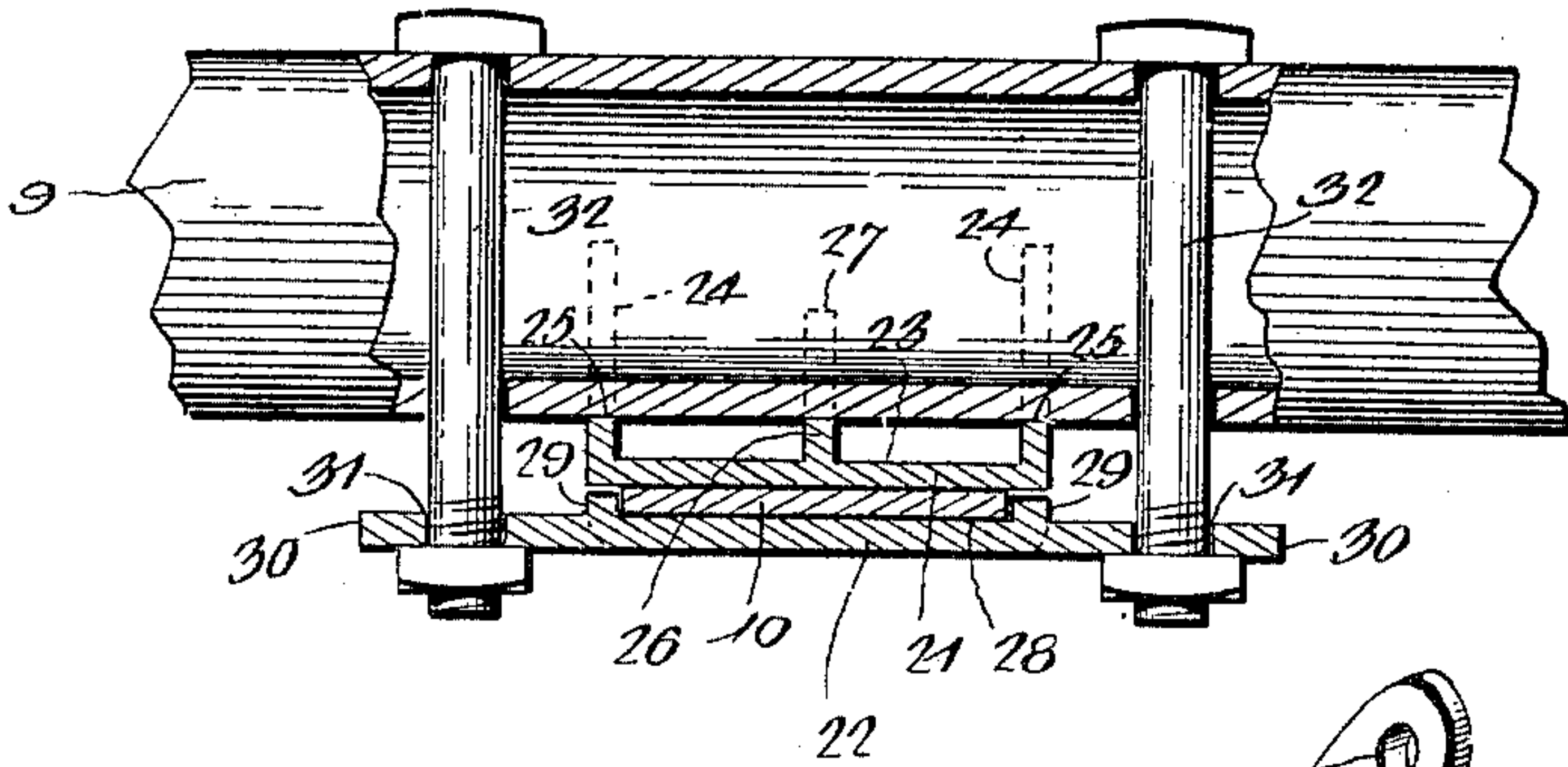


Fig. 4.

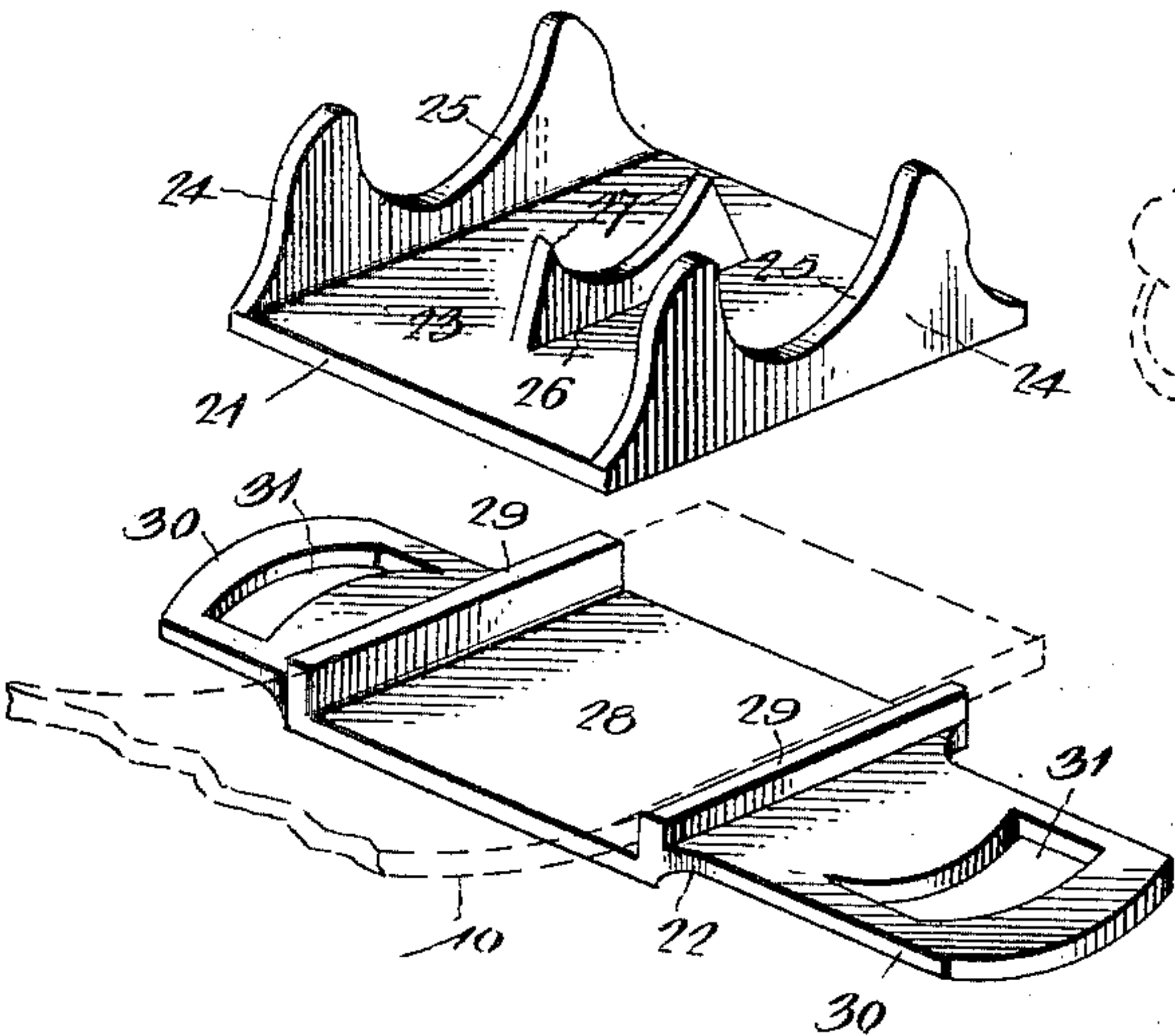


Fig. 5.

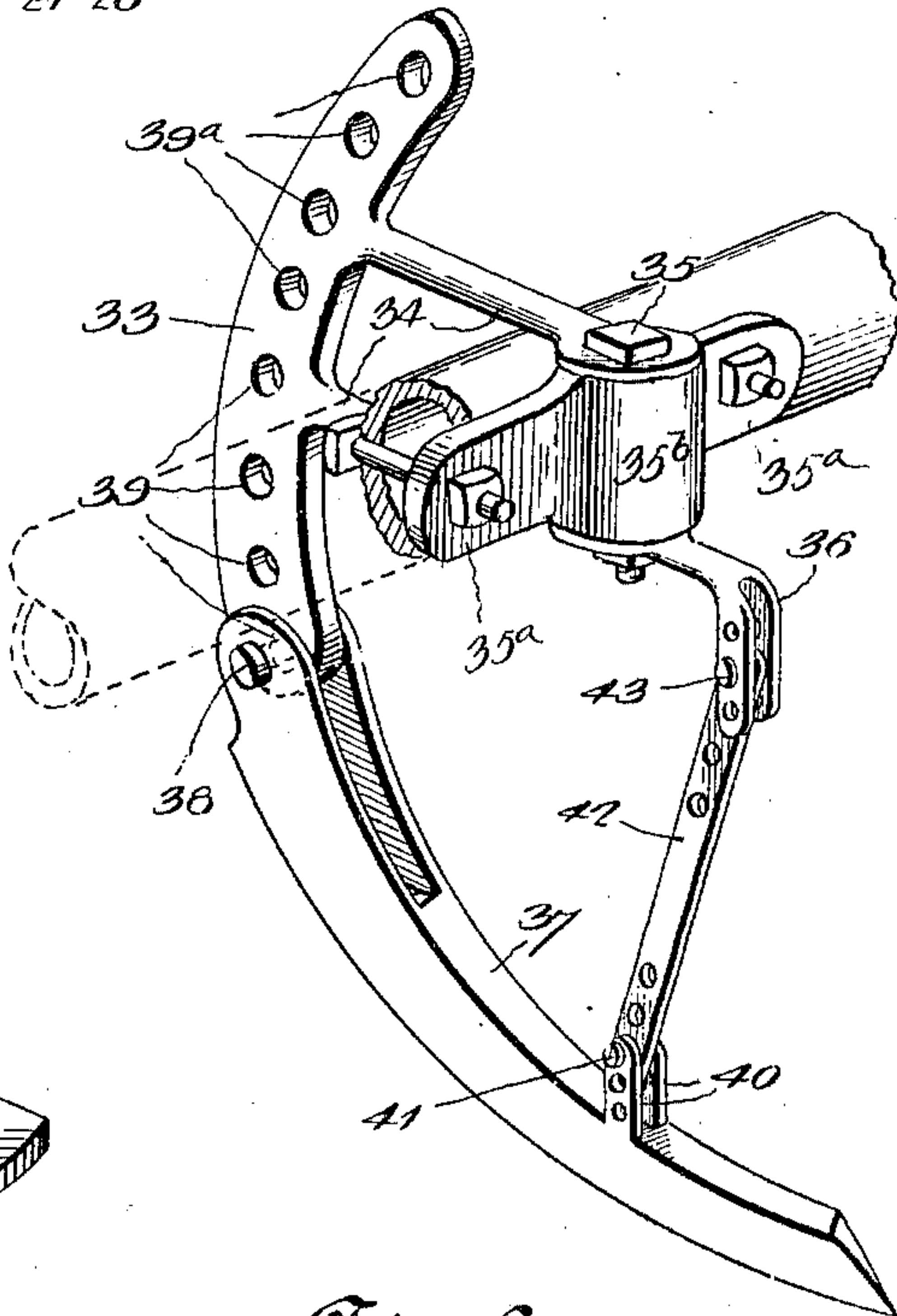


Fig. 6.

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UNITED STATES PATENT OFFICE.

HELUM J. WASHBURN AND CLINTON G. CUDABACK, OF RANSOMVILLE,
NEW YORK.

HARROW.

SPECIFICATION forming part of Letters Patent No. 642,025, dated January 23, 1900.

Application filed June 10, 1899. Serial No. 720,011. (No model.)

To all whom it may concern:

Be it known that we, HELUM J. WASHBURN and CLINTON G. CUDABACK, citizens of the United States, residing at Ransomville, in the
5 county of Niagara and State of New York, have invented a new and useful Harrow, of which the following is a specification.

Our invention relates to harrows, and has for its object to provide simple and improved
10 means for adjusting or setting the teeth of a harrow, and, furthermore, to provide an improved colter shoe or runner in connection with a tubular frame, the means of attachment of said shoe or runner being such as to
15 provide for the connection with the frame of a draft-bar.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be
20 particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of a harrow constructed in accordance with our invention. Fig. 2 is a detail sectional view
25 of a portion of the harrow, taken in the plane of one of the tooth-adjusting bars. Fig. 3 is a detail section of one of the tooth seats or clamps, taken parallel with the tooth-bar. Figs. 4 and 5 are detail views in perspective
30 of the members of the tooth-clamp. Fig. 6 is a detail view in perspective of the shoes or runner and attaching devices.

Similar reference characters indicate corresponding parts in all the figures of the drawings.
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The harrow embodying our invention is of sectional construction, comprising the members A and B, which are identical, with the exception that one is provided at its inner
40 bar with brackets 1, having pivot-pins 2, while the other is provided with brackets 3, having pivot or hinge eyes 4, and therefore it will be sufficient to describe specifically only one member of the device.

45 The frame of each member of the harrow is of tubular construction and comprises side bars 5 and end bars 6, connected by elbows 7, the extremities of the side and end bars being threaded into the arms of the elbows.
50 We have found in practice that a four-sided harrow-frame is more durable and efficient

by reason of its rigidity than one wherein the rear bar is omitted, as in the ordinary practice, and by employing tubular bars of metal we are enabled to construct a light frame
55 which is of reasonable cost, an important element of the cost in the construction of a harrow-frame—namely, bolts and similar fastening devices—being entirely dispensed with in the frame above described. 60

Attached to the side bars of the frame are bearings 8 for the tooth-bars 9, each tooth-bar carrying a desired number of spring or other harrow-teeth 10, and each tooth-bar also having an arm 11, whereby the tooth-bar may be
65 turned to vary the positions of the harrow-teeth. The several arms 11 on each harrow member are connected by an operating-bar 12, said bar having a plurality of bolt-openings 13 to provide for varying the points of
70 attachment of the arms 11 thereto. Also the operating-bar is provided with a threaded extension 14, engaged by a feed-nut 15, which is swiveled in an upright 16, preferably rising from the rear bar of the frame. In the construction illustrated the feed-nut is provided
75 with a reduced journal portion 17, engaged by a parallel-armed yoke 18 at the upper end of the standard 16, whereby vertical movement of the nut in said yoke to compensate
80 for the swinging movement of the arms 11 is possible. Each operating-bar 12 is preferably connected with its threaded extension or shank 14 by the pivotal joint 12^a, which permits the said threaded extension or shank 14
85 to more readily accommodate itself to the swinging movement of the arms 11 as well as the up-and-down play of the operating-bar 12. Various means may be provided for turning the feed-nut, such as a crank or preferably a
90 hand-wheel 19, as illustrated in the drawings. Also a brace 20 extends forward from the standard and is provided at its front end with a bifurcation to straddle the rear tooth-bar.
95

Each tooth-clamp consists of a seat member 21 (shown in detail in Fig. 4) and a cap member 22, (shown in Fig. 5,) the former having a flat-surfaced seat-plate 23 and lateral up-
100 standing flanges 24, which are cut away in transverse alinement to form tooth-bar seats 25. These tooth-bar seats are rounded and

are adapted to bear outwardly against the under side of the tooth-bar, and when the latter are of round or tubular construction, as illustrated in the drawings, said seats snugly fit the same. To provide, however, for fitting the clamp to flat or angular tooth-bars, we preferably provide the plate 23 at an intermediate point between the flanges 24 with an upstanding ear 26, having a concaved upper edge terminating in spurs 27. When the clamp is applied to an angular tooth-bar, these spurs engage the surface of the bar, and thus prevent rocking or displacement of the seat member thereon. The cap member of the clamp is provided with a flat-surfaced seat portion 28, which is adapted to bear against the under surface of a tooth arranged in contact with the tooth-seat formed by the under side of the plate 23, and at the sides of said seat portion 28 are projecting flanges 29, arranged in contact with the side edges of the tooth. Also beyond the body portion of the cap are formed ears or extensions 30, having segmental slots 31, through which extend bolts 32, arranged in registering openings in the tooth-bar at opposite sides of the plane of the seat member of the clamp. The seat portion 23 of the seat member of the clamp is of greater area than the seat portion of the cap member, and by loosening the bolts 23 the cap member may be turned or arranged obliquely with relation to the seat member to dispose the tooth obliquely with relation to the direction of movement or path of the harrow, the object of such adjustment being to cause a cutting action of the teeth in passing through the soil. We have found in practice that in harrowing after broadcast sowing in mellow soil spring-teeth which are approximately two inches in width leave furrows or ridges, which are objectionable under certain circumstances and frequently necessitate the subsequent working of the field with a smoothing-harrow; but by adjusting the harrow-teeth to occupy oblique positions this objection is avoided. Furthermore, the angular disposition of the harrow-teeth is of advantage in harrowing bluegrass soil, for the reason that the teeth then penetrate the tough roots of the grass, and thus serve to break up the soil more efficiently than when arranged to face in the direction of movement.

The specific type of tooth-clamp just described has been found best adapted for use in carrying out the invention; so it will be understood that the said tooth-clamp has been fully disclosed for illustrative purposes and does not form the subject-matter of any claims in the present application.

Pivotally mounted upon the front bar of the harrow-frame is a clevis 33, having tongues 34 straddling said front bar and engaged at their rear ends by a vertical bolt 35, the lower tongue being extended to form a bifurcated bracket 36. Secured to the rear side of the front frame-bar of the harrow is a plate 35^a, having a bearing 35^b for the bolt

35, which performs the function of a pivot or a king-bolt.

37 is a colter shoe or runner having its bifurcated front end engaged by a horizontal bolt 38 at the lower end of the clevis, the latter having a plurality of bolt-openings 39 below the plane of the frame to receive said bolt, whereby the front end of the shoe may be adjusted vertically. The shoe is provided with perforated ears 40 for engagement by a bolt 41 to connect therewith the lower end of a link 42, of which the upper end is connected by a bolt 43 with the bracket 36. The link, bracket, and ears 40 are each provided with a plurality of bolt-openings, whereby suitable adjustment of the rear end of the runner may be accomplished. The clevis is also provided above the plane of the frame with bolt-openings 39^a, with which may be engaged a hook 44 at one end of a draft-bar 45, having a draft-ring 46. A similar hook at the other end of the draft-bar is engaged with the clevis secured to the front bar of the twin harrow member.

From the above description it will be seen that the harrow embodying our invention is of simple construction, while at the same time it is of sufficient strength to resist the strains to which devices of this class are subjected in use. Furthermore, the described construction of colter shoe or runner provides for driving the harrow with facility and causing it to follow the movements of the draft-animals. The adjustment of the harrow-teeth may be accomplished, as in the ordinary practice, from the rear of the sections or members, and the described construction of means whereby this is accomplished is such that no locking devices are required. The adjustment may be accurately accomplished to produce the desired penetration of the teeth, and when the movement of the feed-nut ceases the harrow-teeth are rigidly held in the desired positions.

It will be understood, furthermore, that in practice various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described our invention, what we claim is—

1. In a harrow, the combination with rocking tooth-bars, of a feed-screw, connections between the feed-screw and the tooth-bars, and a feed-nut mounted upon the frame of the harrow and engaging said feed-screw, substantially as specified.

2. In a harrow, the combination with rocking tooth-bars having arms, of an operating-bar connecting said arms, a feed-screw carried by said bar, and a feed-nut swiveled upon the harrow-frame and engaging said feed-nut, substantially as specified.

3. In a harrow, the combination with rocking tooth-bars having arms and an operating-bar connecting said arms, of a feed-screw

connected with said operating-bar, a bearing carried by the frame of the harrow, and elongated in the plane of swinging movement of said tooth-bar arms, and a feed-nut mounted in said bearing and engaging the feed-screw, whereby the feed-nut is capable of movement in its bearing to compensate for the swinging movement of said arms, substantially as specified.

4. In a harrow, the combination with rocking tooth-bars having arms, and an operating-bar connecting said arms, of a standard rising from the harrow-frame and provided with a parallel-armed yoke, a feed-nut having a reduced journal portion mounted in said yoke for vertical movement, and a feed-screw connected with said operating-bar and engaged by the feed-nut, substantially as specified.

5. The herein-described harrow having tubular side and end bars connected by elbows, rocking tooth-bars mounted in bearings upon said side bars, a standard rising from the rear bar of the frame, a brace extending forward and downward from said standard and having a bifurcated front end engaged with the rear tooth-bar, an operating-bar pivotally connected with arms on said tooth-bars, a feed-nut mounted in a bearing in said standard, and a feed-screw connected with said operating-bar and engaged by the feed-nut, substantially as specified.

6. The combination with a harrow-frame, of a clevis provided with means for engagement with a member of said frame, a colter shoe or runner pivotally mounted at its front end upon the lower end of said clevis, and means for maintaining the rear end of said shoe or runner in an adjusted position, substantially as specified.

7. The combination with a harrow-frame, of a clevis having rearwardly-extending arms connected by a securing-bolt, a bracket on one of said arms, a colter shoe or runner piv-

otally mounted upon the lower end of said clevis, and a link connecting the rear end of said shoe or runner with said bracket, substantially as specified.

8. The combination with a harrow-frame, of a clevis provided with means for attachment to a member of the harrow-frame, and also provided above and below the plane of the harrow-frame with openings, a draft-bar having a hook for engagement with clevis-openings above the plane of the frame, a colter shoe or runner provided at its front end with means for engaging clevis-openings below the plane of the frame, and adjustable means for securing the rear end of the shoe or runner in its adjusted positions, substantially as specified.

9. The combination with a harrow-frame, of a clevis pivotally mounted upon the frame for horizontal swinging movement, a colter shoe or runner having pivotal connection with the clevis for vertical swinging movement at its rear end, and means for securing the rear end of the colter shoe or runner in an adjusted position, substantially as specified.

10. The combination with a harrow-frame, of a clevis pivotally mounted upon said frame for horizontal swinging movement and provided with means for the attachment of a draft-bar, a colter shoe or runner having pivotal connection at its front end with said clevis, and an adjustable brace connecting the rear end of the shoe or runner with the clevis to secure the shoe in an adjusted position, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

HELUM J. WASHBURN.
CLINTON G. CUDABACK.

Witnesses:

FRANCES A. SANFORD,
HEMAN N. IRISH.