

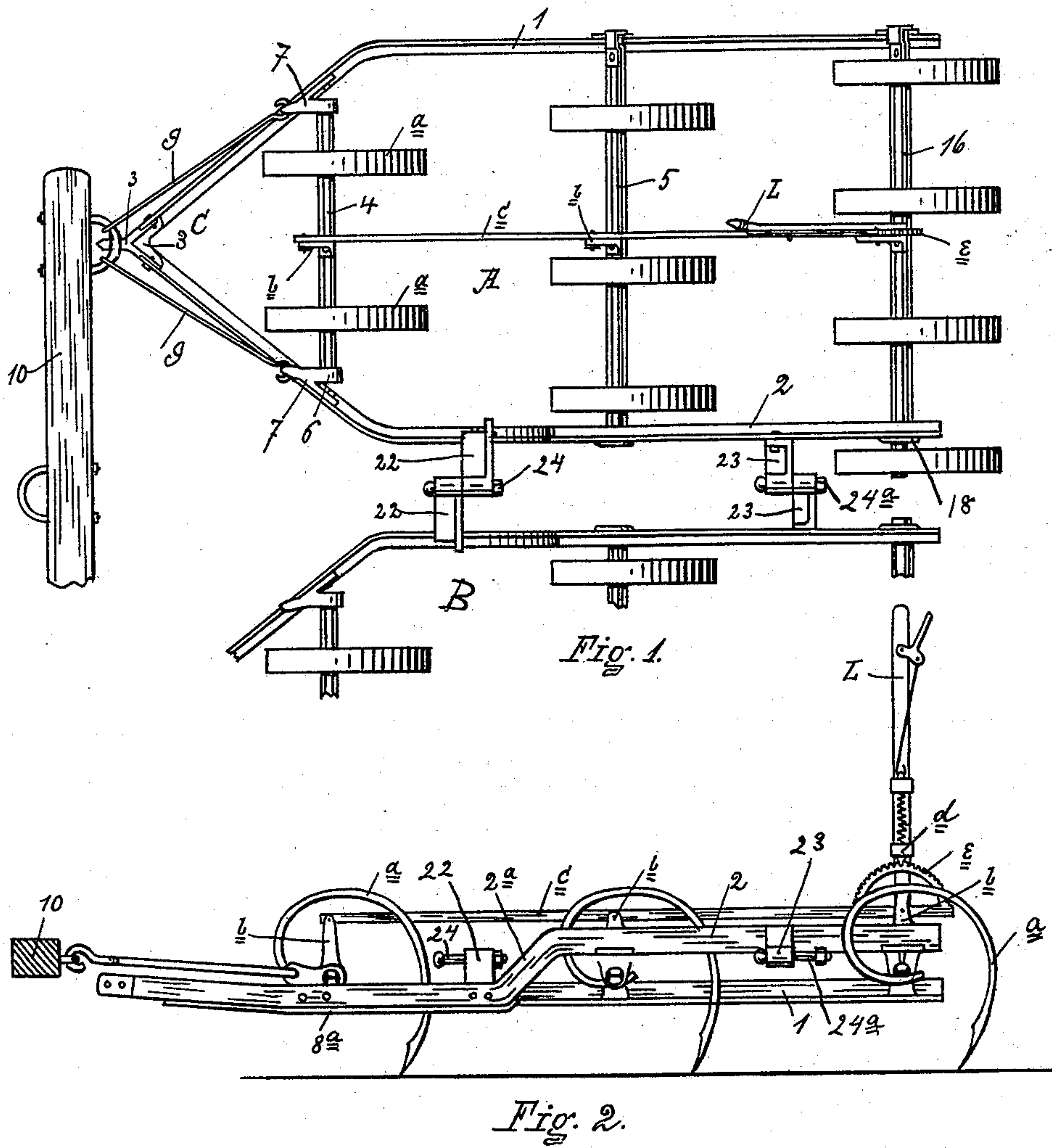
(No Model.)

2 Sheets—Sheet 1.

H. D. BABCOCK.
HARROW.

No. 604,288.

Patented May 17, 1898.



WITNESSES.
Rich. A. George.
M. A. Keller.

INVENTOR.
HENRY D. BABCOCK.
BY *Riley, Robinson & Love*
ATTORNEYS.

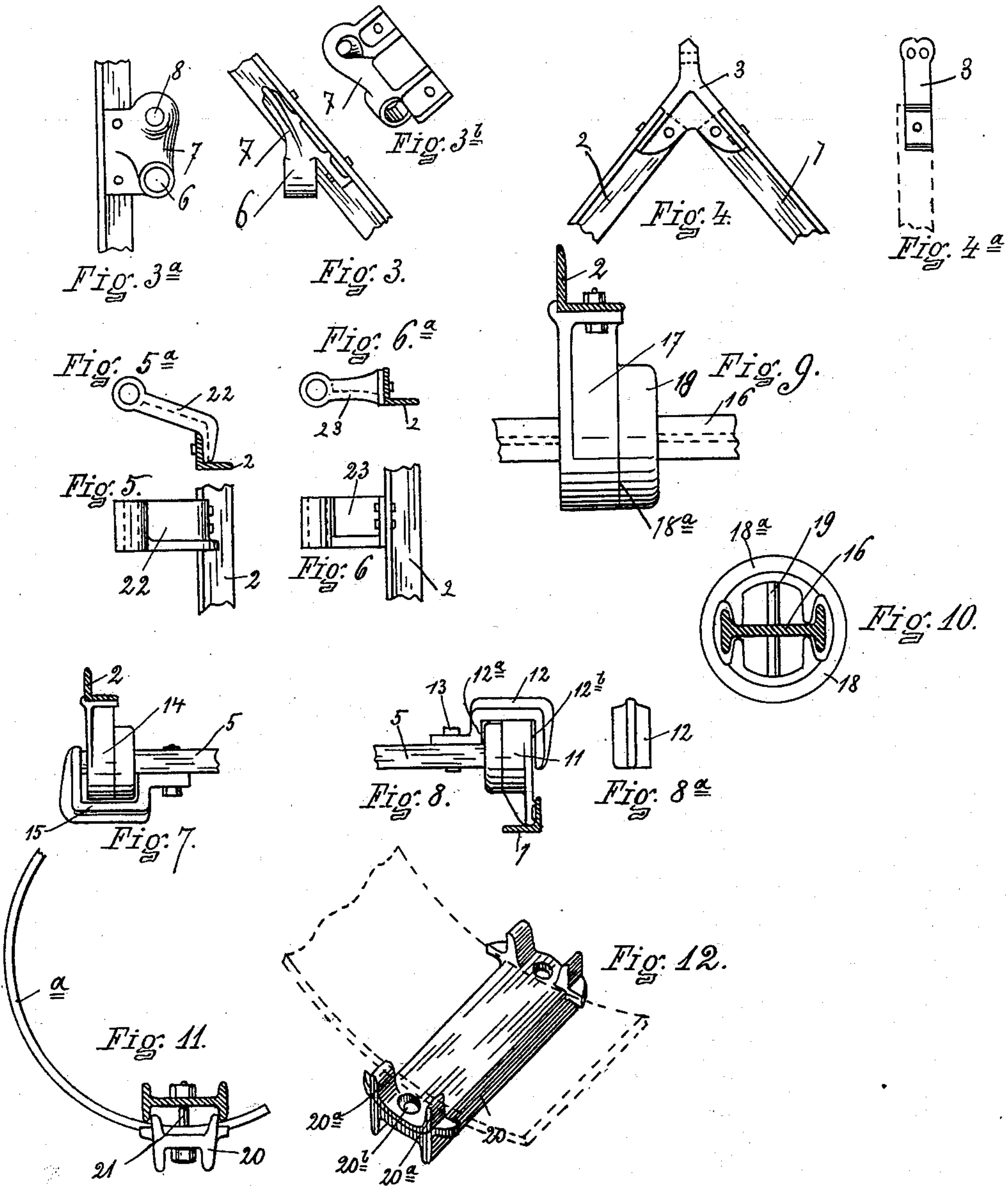
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INVENTOR
HENRY D. BABCOCK.
BY *Kirby, Robinson & Love*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

HENRY D. BABCOCK, OF LEONARDSVILLE, NEW YORK, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO THE NATIONAL HARROW COMPANY, OF
UTICA, NEW YORK.

HARROW.

SPECIFICATION forming part of Letters Patent No. 604,288, dated May 17, 1898.

Application filed December 6, 1894. Serial No. 531,067. (No model.)

To all whom it may concern:

Be it known that I, HENRY D. BABCOCK, of
Leonardsville, in the county of Madison and
State of New York, have invented certain new
5 and useful Improvements in Harrows; and I
do hereby declare that the following is a full,
clear, and exact description of the invention,
which will enable others skilled in the art
to which it appertains to make and use the
10 same, reference being had to the accompany-
ing drawings, and to the letters and figures
of reference marked thereon, which form part
of this specification.

My invention relates to improvements in
15 harrows.

In the drawings which accompany and form
a part of this specification and in which simi-
lar letters and figures of reference refer to cor-
responding parts in the several views, Figure
20 1 shows a partial plan view of my harrow. Fig.
2 shows a side elevation of one section of the
harrow from the inner or hinged side. Figs.
3, 3^a, and 3^b show details of the bearing of the
front rocking cross-bar and the eye to which
25 the draft-links are attached. Figs. 4 and 4^a
show details of the connection between the
forward ends of the draft-bars of the frame.
Figs. 5 and 5^a show details of the front hinge
between the sections of the harrow. Figs. 6
30 and 6^a show details of the rear hinge between
the sections of the harrow. Fig. 7 shows de-
tails of the bearing of the end of one of the
rocking cross-bars, whereby it is suspended
below the frame-bar. Figs. 8 and 8^a show de-
35 tails of the bearing or mounting of the rock-
ing cross-bar where it is supported above the
frame-bar. Fig. 9 shows a bearing in which
the rocking cross-bar is supported where the
cross-bar extends beyond the frame-bar to
40 support a tooth on its end. Fig. 10 shows
further details of the bearing shown in Fig.
9. Fig. 11 shows details of the tooth-holding
device. Fig. 12 shows details of the tooth-
holding clip.

45 The harrow consists of two sections A and
B, each section being composed of an outside
draft-bar 1 and an inside draft-bar 2, extend-
ing from the rear of the frame to the front
and bent together at their front ends, form-
50 ing a nose, the two front ends being securely
held together by a nose-piece 3, which con-

forms in shape to the angle-iron of which
the draft-bars are preferably made, and is
bolted or riveted to each. The nose portion
C of the section is inclined upwardly from the 55
plane of the harrow from a point about even
with the front rocking cross-bar. The out-
side draft or frame bar 1 is extended from the
front in the plane of the harrow-frame, while
the inside frame-bar 2 is provided with an up- 60
ward bend, as shown at 2^a, which brings the
rear portion of this bar considerably above
the plane of the under surface of the harrow.
The bend 2^a in the inner frame-bar is prefer-
ably provided between the front rocking cross- 65
bar 4 and a second rocking cross-bar 5 from
the front.

On the under face of the forward portion
of the bar 2 is provided a wearing shoe or
piece 8^a, adapted to run on the surface of the 70
ground and gage the depth of cut of the
tooth, and at the same time protect the har-
row-frame at this point from wear. The for-
ward end of the frame-bar 1 may also be pro-
vided with such a wearing plate or shoe. 75

The front rocking cross-bar 4 is mounted in
eyes 6 of the bearing-pieces 7, secured on the
front portion of the section. These bearing-
pieces are also provided with eyes 8, in which
engage the draft-links 9, extending to and at- 80
tached to the evener 10. The rocking cross-
bar 5 is mounted at one end on the outside
frame-bar 1 by having its end engage in the
circular opening or eye of the bearing-piece
11, secured on the upper surface of the bar 1. 85

To prevent endwise displacement and to
also furnish a supporting connection between
the frame-bars 1 and 2, there is on the rock-
ing cross-bar 5 a hook-like clipping-piece 12,
which is secured to the bar by a bolt 13 and 90
is provided with a shoulder 12^a, adapted to
engage on one side of the bearing 11, and a
shoulder 12^b, adapted to engage on the other
side. The inner end of the bar 5 is supported
on the under side of the frame-bar 2 by a 95
suspending bearing-piece 14 similar to 11,
and the bearing is also held in engagement
with this bearing by a hook-like clip 15 simi-
lar to 12 and similarly applied, except that it
is in an inverted position from that illus- 100
trated in Fig. 8. The rear rocking cross-bar
16 is supported at its outer end in the same

manner, as illustrated in Figs. 8 and 8^a, with reference to cross-bar 5, and its inner end is extended or projected, so as to form a mounting for a tooth between the two sections of the harrow. There is a special bearing 17 provided for this bar on the rear end of the frame-bar 2. On the bar 16 is secured a collar 18 by means of a rivet 19 passing through the collar and the web of the cross-bar 16, the interior of the collar 18 being adapted to receive and hold the eye-shaped cross-bar 16. The collar 18 is partially received within the eye of the bearing 17, and is provided with a shoulder 18^a, which engages against the side of the bearing-piece 17 and secures a connection between the frame-bars 1 and 2 to prevent lateral displacement or springing.

The teeth *a a* are suitably placed over the several rocking cross-bars to most effectively do their work and cover the entire surface over which the harrow may be drawn and are secured on the cross-bars by a clip 20. The teeth are supported on the edges or walls of the eye-iron of which the cross-bars are formed. The clip is provided with ears 20^a, which are so disposed as to be received between the heads of the eye-iron and also form walls for the lateral edges of the teeth to prevent lateral displacement or twisting in the clip. The clip is held to the cross-bar by bolts 21 passing through the holes 20^b in the clip and holes in the web of the cross-bar. The width of the body of the clip 20 is less than the distance between the walls of the eye-iron on which the tooth is held, so that it is held under spring tension, thus obviating any tendency to work loose, and the tooth is adjustable on its seat by loosening the bolts which hold the clip and sliding it through under the clip.

On the middle of each of the rocking cross-bars 4, 5, and 16 is secured an upright post *b*, and extending from front to rear and pivoted to the upper end of each of these posts is a connecting-rod *c*, by means of which the several rocking tooth-bars of each section may be simultaneously moved. The rear post *b* is extended, forming a lever-handle *L*, which is provided with a spring-actuated catch *d*, adapted to engage in a semicircular rack *e* on the rear end of the bar *c* and secure the rocking bars and the teeth thereon in any of their adjusted positions. Suitable means are also provided for operating the catch *d*.

The sections of harrow are hinged together by the front hinges 22 and rear hinges 23 engaging each other from the opposite sections of harrow and being formed substantially as shown in Figs. 5 and 5^a for the front hinge and Figs. 6 and 6^a for the rear hinge, whereby the eyes of the front and rear hinges are brought into the same line. The hinges are provided with pintles 24 and 24^a.

By the construction of frame herein shown, with the outer draft-bar of each section of the frame lying substantially in the plane of the

under surface of the harrow and the section of the frame being pointed at the front, any clods or debris with which the harrow comes in contact on the outer side of the middle line of each section is passed outward and around the harrow as it is at work. By the bend or deflection of the rear portion of the middle frame-bars to a higher plane than that of the under surface of the harrow a clearance is given in the middle of the harrow, so that any clods or obstructions to the harrow may be readily cleared and not be carried or dragged along by the frame, thus clogging the harrow and reducing its efficiency.

By the arrangement of bearings and clips hereinbefore described the draft-bars are securely stayed and held by the rocking cross-bars without the use of additional pieces or parts for this purpose and the weight and expense of the harrow-frame are reduced to the minimum.

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

1. In a sectional harrow the following elements in combination: draft-bars parallel in portions of their length deflected upwardly at their front ends; a wearing or reinforcing shoe conforming to the angle of the draft-bars; turnable tooth-bars and lever-operating mechanism for the purposes stated.

2. In a sectional harrow the following elements in combination: parallel draft-bars in portions of their length; turnable tooth-bars at substantially right angles to the draft-bars; tooth-bar sockets or clips secured at one end to the draft-bars and provided with tooth-bar sockets at their free ends and arms carried by the tooth-bars and overlapping said clips for holding the tooth-bars from end thrust, and lever mechanism for operating the turnable tooth-bars as set forth.

3. The combination in a harrow, of turnable tooth-bars, draft bars or runners integral in their length, the inner draft-bars deflected at their rear into a plane above the other portions of the draft bars or runners, substantially as described.

4. In a harrow, the combination of turnable tooth-bars, draft-bars provided with tooth-bar sockets rigidly secured thereto, and clips secured to the tooth-bars and arranged to overlap portions of the tooth-bar sockets on the outer sides thereof, substantially as described.

5. In a metal-frame harrow, the combination of draft-bars parallel in portions of their length and deflected at their front into engagement with a nose-piece to which they are rigidly secured, and the nose-piece, substantially as described.

In witness whereof I have affixed my signature in presence of two witnesses.

HENRY D. BABCOCK.

Witnesses:

E. WILLARD JONES,
GEORGE C. CARTER.