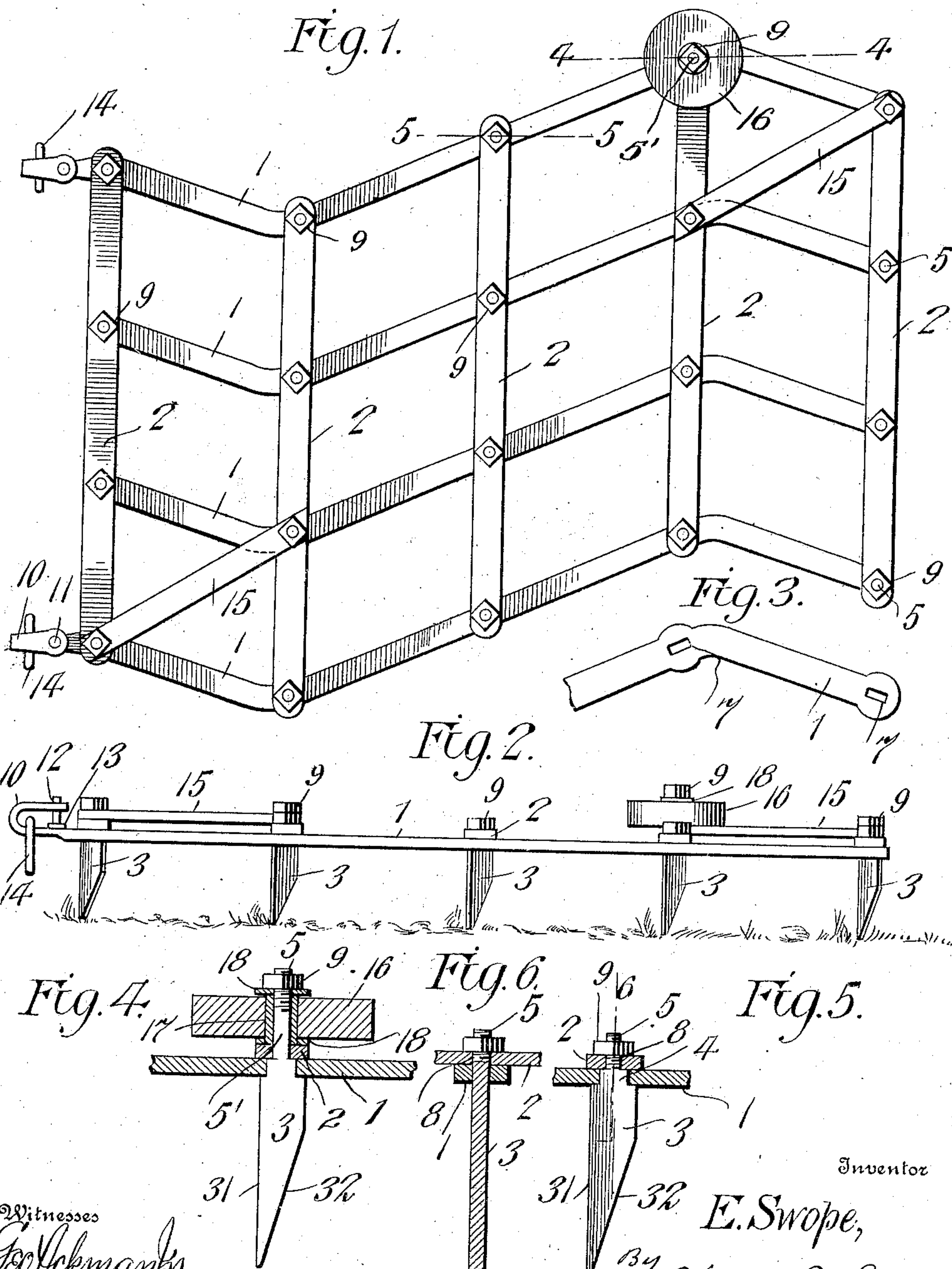


No. 883,586.

PATENTED MAR. 31, 1908.

E. SWOPE.
HARROW.

APPLICATION FILED AUG. 29, 1906.



Witnesses
Geo. Hickman
Wm. Bagger

Inventor
E. Swope,
By *Victor J. Evans*
Attorney

UNITED STATES PATENT OFFICE.

EDWIN SWOPE, OF MORGAN HILL, CALIFORNIA.

HARROW.

No. 883,586.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed August 29, 1906. Serial No. 332,523.

To all whom it may concern:

Be it known that I, EDWIN SWOPE, a citizen of the United States, residing at Morgan Hill, in the county of Santa Clara and State of California, have invented new and useful Improvements in Harrows, of which the following is a specification.

This invention relates to harrows and it has particular reference to so called orchard harrows which are lightly constructed so as to be readily operable among the trees.

The present invention has for its object to simplify and improve the construction and operation of this class of harrows and with these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention; it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be made when desired.

In the drawings: Figure 1 is a top plan view of a harrow constructed in accordance with the principles of the invention. Fig. 2 is a side elevation of the same. Fig. 3 is a detail plan view of a portion of one of the longitudinal harrow bars. Fig. 4 is a sectional detail view taken on the line 4—4 in Fig. 1. Fig. 5 is a sectional detail view taken on the line 5—5 in Fig. 1. Fig. 6 is a sectional detail view taken on the line 6—6 of Fig. 5.

Corresponding parts in the several figures are denoted by like characters of reference.

The frame of the improved harrow is composed of a plurality of longitudinal bars 1, 1 of zigzag shape and a plurality of straight transverse bars 2, 2. The frame bars 1, 1 and 2, 2 are assembled by means of teeth 3, 3 which consist of flat chisel shaped blades which are provided near their upper ends with shouldered or reduced portions forming oblong or approximately elliptical bosses 4 above which extend the screw threaded shanks 5 which are integral with the teeth or blades.

The longitudinal harrow bars 1 are provided at intervals with oblong or elliptical apertures 7 for the reception of the shouldered portions or bosses 4 of the teeth or blades; in the formation of the apertures 7 no metal is removed from the bars 1, the metal of the latter being upset laterally when the holes are being punched; I am thus enabled to use comparatively light material, since the strength thereof is not materially reduced by the formation of the apertures. The cross bars 2, 2 are provided with apertures 8 for the passage of the shanks of the teeth.

In assembling the parts of the harrow, the bosses of the teeth are fitted in the apertures 7 of the bars 1, and the stems 5 are extended through the perforations 8 in the cross bars 1, after which nuts 9 are placed upon the stems and tightened, thus securely assembling the parts. The teeth are disposed in staggering relation, those of the several rows breaking joints with each other so as to operate effectively upon the soil.

Two of the longitudinal frame bars 1, 1 have been shown provided at their front ends with hooks 10 for the attachment of the draft. These hooks are formed by bending the extended front ends of the bars 1 in an upward and rearward direction, the hooks thus formed being provided with apertures 11 in which are placed pins 12 having heads 13 that are disposed within the hooks so as to prevent withdrawal of the pins. The latter will thus constitute simple and effective gravity devices that serve to prevent accidental displacement of the draft links or clevises 14 upon the hooks 11.

To prevent collapse of the harrow frame, diagonal braces 15 are employed; said braces being suitably mounted upon the stems of the harrow teeth.

For the purpose of avoiding the barking of trees or other injury thereto by the harrow, a rotary guard 16 is employed, said guard being fitted upon the upwardly extending threaded stem of one of the teeth, said stem being made of sufficient length for the purpose as specially indicated at 5' in Fig. 4 of the drawings. Upon said stem is placed a bearing sleeve 17 which may consist of a short length of gas-pipe, and washers 18 are employed to prevent undue friction. The rotary guard 16 is mounted in such a

position as to project laterally from the harrow frame so as to contact with the trunks of trees that are in the path of the harrow, and protect such trees from injurious contact
5 with the harrow frame.

The peculiar chisel shape of the teeth employed in connection with the improved harrow is found extremely effective in treating the soil; said teeth having straight vertical
10 front edges 31 and inclined rear edges 32, as clearly seen in Figs. 4 and 5 of the drawings. Of this peculiar shape the teeth will dig effectively into the soil, and will readily discharge rubbish instead of permitting the
15 latter to accumulate beneath the harrow.

The operation and advantages of the invention will be readily understood from the foregoing description taken in connection with the drawings hereto annexed.

20 The improved harrow is simple, inexpen-

sive, durable, and thoroughly efficient for the purpose for which it is provided.

Having thus described the invention what is claimed is:

In a harrow of the class described a frame 25 comprising longitudinal and transverse bars the longitudinal bars having oblong apertures, teeth secured at the intersections of the longitudinal and transverse bars and having oblong bosses engaging the apertures 30 in the longitudinal bars and threaded stems extending through the transverse bars, a bearing sleeve upon one of the stems and a guard roller journaled upon said sleeve and projecting beyond the harrow frame.

EDWIN SWOPE.

Witnesses:

C. MYERS,

E. W. BAGWILL.