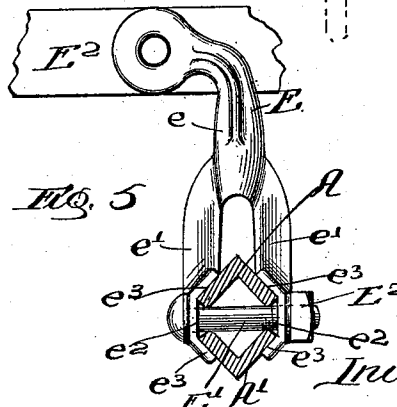
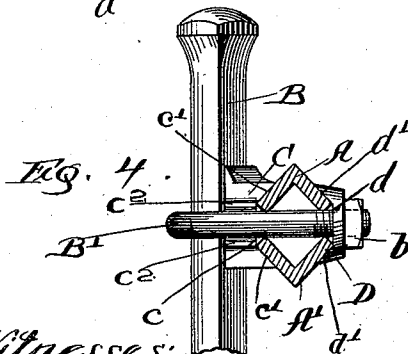
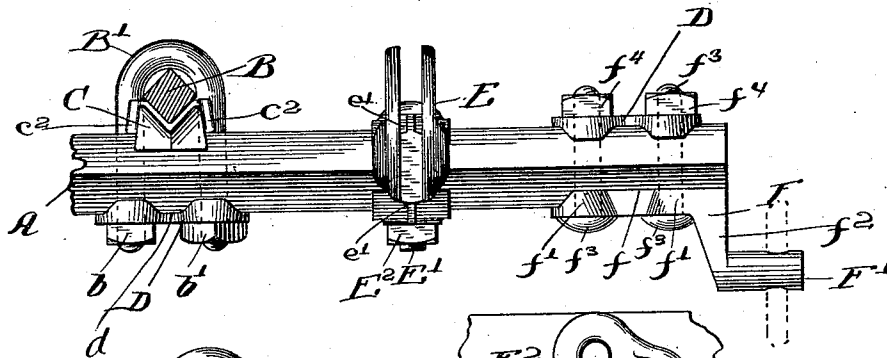
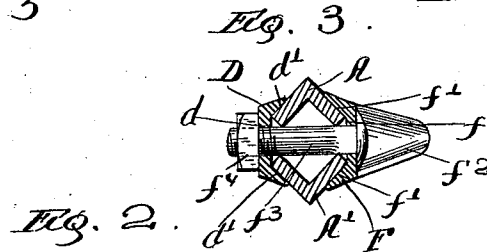
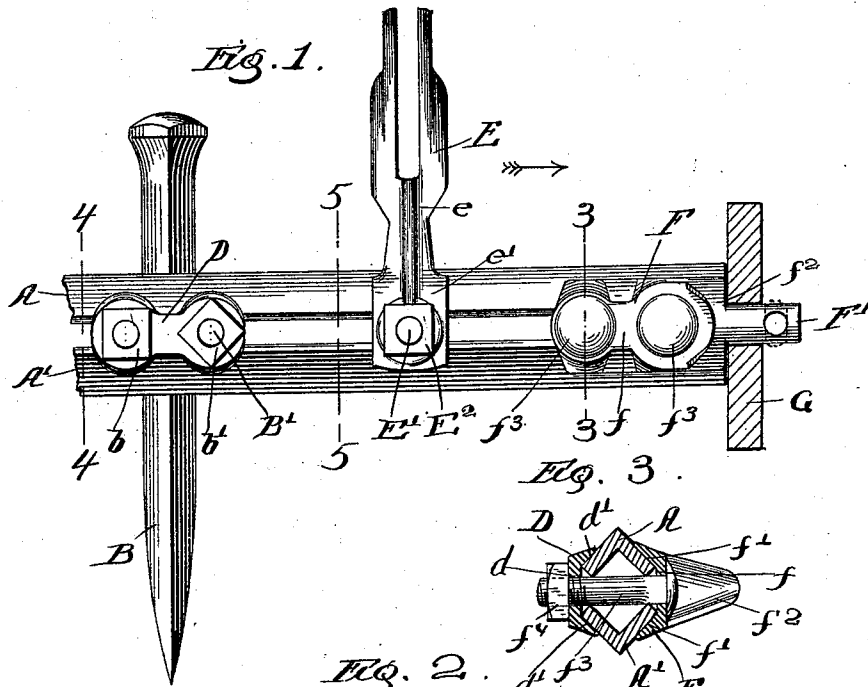


(No Model.)

H. L. FERRIS.
HARROW FRAME.

No. 569,913.

Patented Oct. 20, 1896.



Witnesses:

Chas. O. Hursey
A. H. Ebbesch

Inventor:

Harry L. Ferris
by Miles M. Smith
His atty

UNITED STATES PATENT OFFICE.

HENRY L. FERRIS, OF HARVARD, ILLINOIS.

HARROW-FRAME.

SPECIFICATION forming part of Letters Patent No. 569,913, dated October 20, 1896.

Application filed May 31, 1895. Serial No. 551,156. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. FERRIS, a citizen of the United States of America, residing at Harvard, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Harrow-Frames, of which the following is a specification.

My invention relates to certain improvements in harrow-frames; and to such end it consists in certain novel features of construction which will be fully described in this specification, and more particularly pointed out in the appended claims.

My invention is illustrated by means of five figures, of which—

Figure 1 is an elevation of a portion of a harrow-frame. Fig. 2 is a plan of the same. Fig. 3 is a cross-section in line 3 3 of Fig. 1. Fig. 4 is a section in line 4 4 of Fig. 1, and Fig. 5 is a section in line 5 5 of Fig. 1.

Harrows of this class are generally made up of a number of bars having their ends pivoted in a suitable frame and provided with some means for tilting them at different angles, as may be desired. In the drawings a portion of a bar, its pivot, a crank-arm, and one tooth are shown. In the complete harrow these parts are simply duplicated, and it is thought not necessary to show more than one set, as they fully illustrate the invention.

Referring to the drawings, A A' are a pair of angle-irons, arranged one above the other and having their troughs facing each other and held together by clamps, which will hereinafter be more fully described.

The tooth B may be of any desired form, the one shown being a long bar of rectangular cross-section and sharpened at one end to a point. A staple B' (see Fig. 2) encircles the tooth and passes between the angle-irons, beyond which it is screw-threaded to receive nuts b b'. Between the tooth and the angle-irons is interposed a block C, (see Figs. 2 and 4,) having in one of its faces a V-shaped groove in which the tooth rests, and the opposite face has a short straight portion c (see Fig. 4) and two beveled portions c' c', conforming to the faces of the angle-irons. The sides of the block are provided with ears c² c², adapted to lie on each side of the staple, which assists in securing the staple in place.

Between the angle-irons A A' and the nuts b b' is interposed a block D, having also a substantially straight portion d and two beveled portions d' d', conforming to the faces of the angle-irons.

The staple passes through holes provided in the block D, and when the nuts b b' are screwed down upon the ends of the staple the tooth is securely held in place between the groove in the block C and the loop in the staple, and the angle-irons are prevented from spreading apart by the beveled portions c' c' d d' of the blocks C D, respectively.

The crank-arm shown at E consists of a shank e, (see Fig. 5,) to which is pivoted a bar E². This is the connecting-bar, which connects all of the crank-arms of the harrow together, and is provided with a suitable lever by which the bars may be tilted. The lower end of the crank-arm is forked, as shown at e' e', (see Fig. 5,) and has substantially straight portions e² e² and beveled portions e³ e³. A bolt E' is passed through the straight portions e² of the fork and slipped between the two angle-irons and a nut E² screwed tightly down upon the same.

The pivot consists of a plate F, (see Figs. 1 and 3,) having a short straight portion f and beveled portions f' f', adapted to lie against the faces of the angle-irons, and a lug f², extending out a short distance at right angles to the main portion and bearing a short cylindrical portion F', which forms the pivot upon which the angle-irons turn. A block D, similar to the one shown in connection with the tooth B, is placed upon the opposite side of the angle-irons, and bolts f³ f³ are passed through the plate F and block D and between the angle-irons, and nuts f⁴ f⁴ screwed tightly down upon them.

A portion of one of the side bars which connects the harrow-frame together is shown at G, Fig. 1, and through this the pivot F' passes. A split pin is inserted in the hole provided in the end of the pivot, which prevents any displacement of the same.

The beveled portions of the respective pieces prevent the angle-irons from spreading apart, and when the nuts are screwed down tightly they spring the edges of the angle-irons slightly together and the tension or thrust against the bolt heads and nuts has

the effect of forming a nut-lock, which prevents the nuts from being accidentally loosened.

5 The construction shown is extremely simple, strong, and durable, and the teeth and crank-arms can be moved along the angle-irons to any desired position to suit the different kinds of soil without the necessary drilling of holes for each piece, as in the case
10 of the ordinary constructions.

I have shown the bars A A' as angle-irons, but their exact shape is immaterial to my invention in its broadest construction, as the bars may be of a semicircular, channel, or
15 other adaptable cross-section.

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

1. The combination in a harrow-frame with a pair of angle-irons, of a plate clamped thereto
20 by bolts passing between the angle-irons and having beveled portions lying against the faces of the angle-irons and preventing their separation, said plate being provided with an arm substantially at right angles thereto and

bearing a cylindrical lug adapted to serve as the pivot for the bars; substantially as described. 25

2. In a harrow-frame, the combination with a pair of angle-irons arranged one above the other and with their angles extending away from each other, of a square tooth, a pair of blocks, one on each side of said angle-irons and having beveled portions conforming to and lying against the outer faces of the angle-irons, one of said blocks being provided with a vertical groove adapted to receive one of the corners of the tooth, and a staple partially encircling said tooth, passing between the angle-irons and through the second block and clamping all of the parts tightly together, whereby the tooth is wedged into one of the blocks and the angle-irons are wedged tightly toward each other and against the staple; substantially as described. 30 35 40

HENRY L. FERRIS.

Witnesses:

A. MILLER,
L. P. CARD.