E. W. BJORKMAN.

HARROW.

APPLICATION FILED JUNE 4, 1914.

1,183,828.

Patented May 16, 1916.

2 SHEETS—SHEET 1.

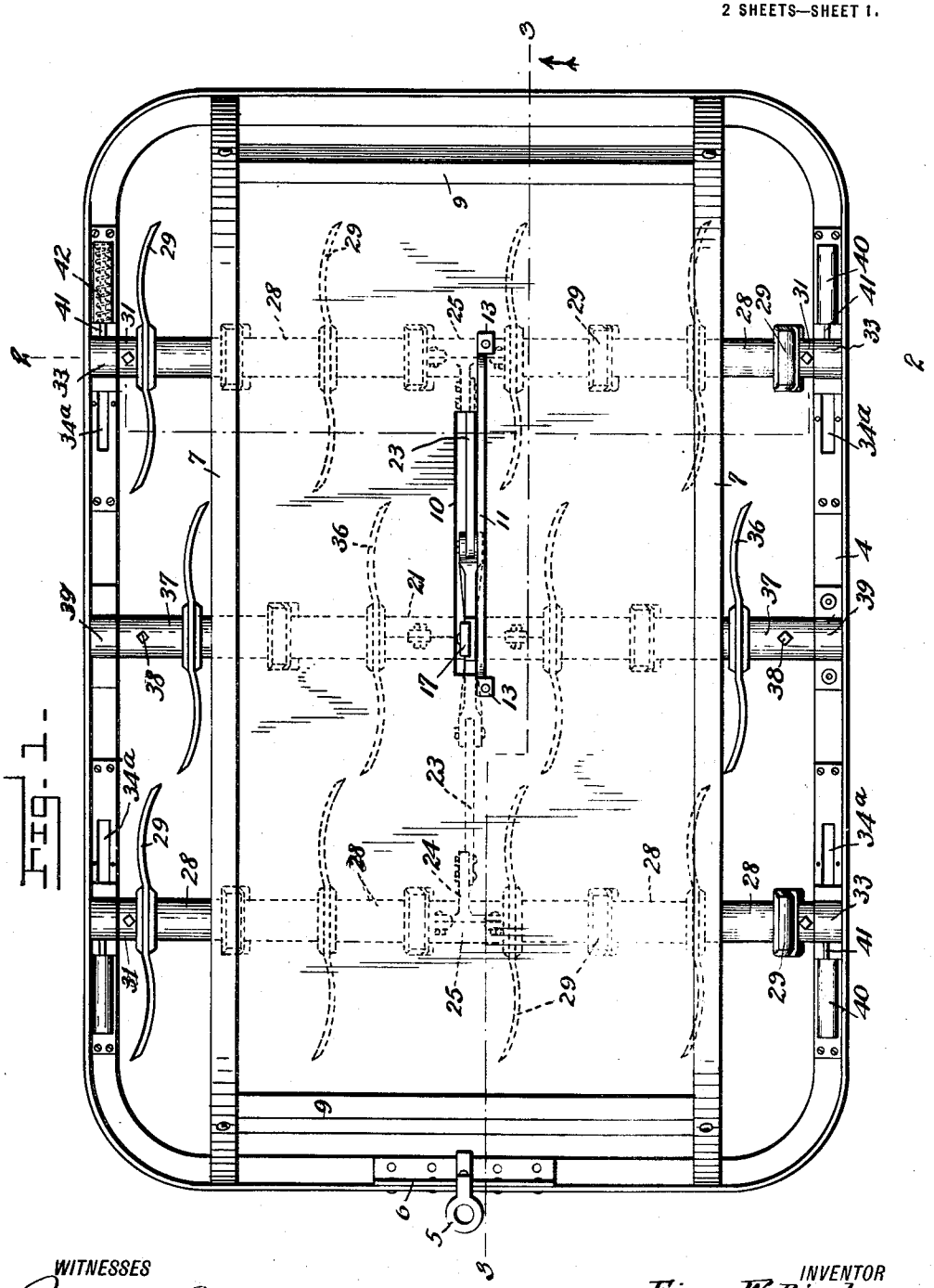


Fig. 1.

WITNESSES

Ikgan C. Baker Jr.

Walton Hamilton

INVENTOR

Einar W. Bjorkman

BY

Munn & Co

ATTORNEYS

E. W. BJORKMAN.

HARROW.

APPLICATION FILED JUNE 4, 1914.

1,183,828.

Patented May 16, 1916.

2 SHEETS—SHEET 2.

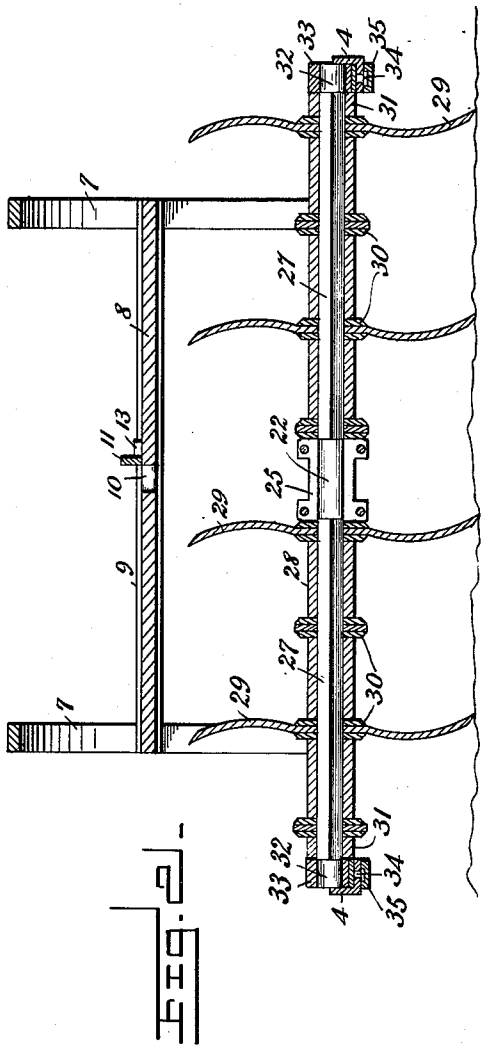


Fig. 2.

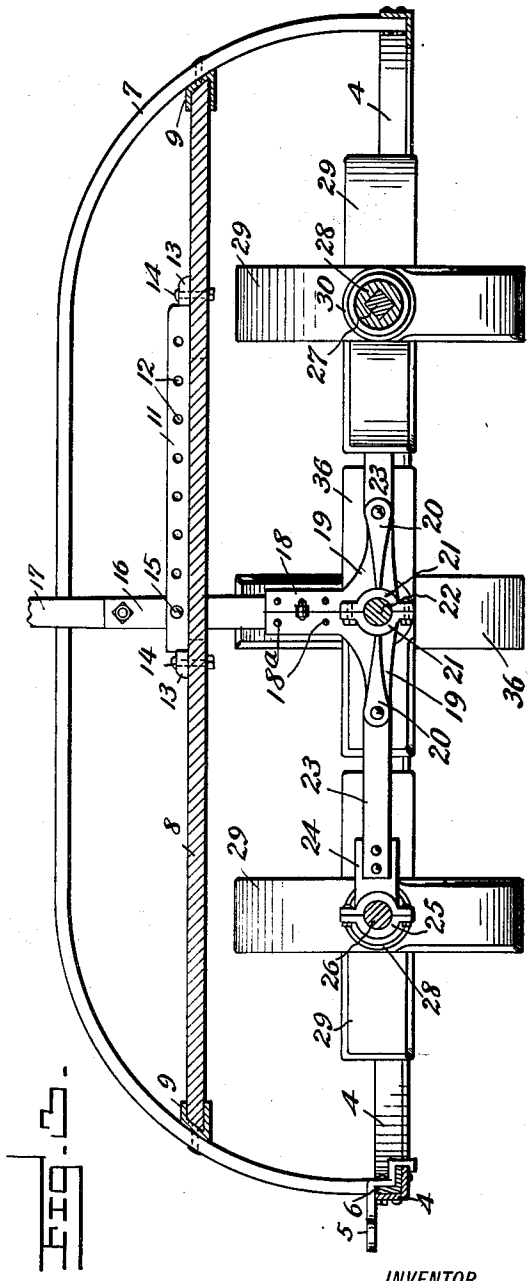


Fig. 1.

WITNESSES

Jno. C. Baker Jr.

Walton Harrison

INVENTOR

Einar W. Bjorkman

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

EINAR WILHELM BJORKMAN, OF FITCHBURG, MASSACHUSETTS.

HARROW.

1,183,828. Specification of Letters Patent. Patented May 16, 1916.

Application filed June 4, 1914. Serial No. 843,034.

To all whom it may concern:

Be it known that I, EINAR WILHELM BJORKMAN, a citizen of Finland, and residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

My invention relates to harrows of the type in which revolving teeth are employed, and embraces a number of distinct objects, among which are the following:—To enable the operator to control the general relative positions of certain revoluble shafts, provided with teeth, from a point approximating the middle portion of the harrow. To so position the revoluble shafts relatively to other parts as to balance the shafts as far as practicable, so that in shifting the relative positions of the movable shafts the tendency is to move both ends of the shaft equally. To provide various other improvements for increasing the efficiency of different parts of the harrow.

Reference is made to the accompanying drawings forming a part of this specification, and in which like characters indicate like parts.

Figure 1 is a plan view of my improved harrow; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a section on the line 3—3 of Fig. 1, looking in the direction of the arrow.

A frame 4 is made of angle iron and carries an eye 5, serving the purpose of a clevis. A strengthening bar 6 is secured to the frame 4 adjacent the eye 5, for the purpose of strengthening the frame at this point. Two arch bars 7, each having substantially the form shown in Fig. 3, are mounted rigidly upon the frame 4, and disposed parallel with each other as may be understood from Fig. 2. A platform 8 is secured to the arch-bars 7 by angle irons 9, and constitutes a part of the general framework. The platform 8 is provided with a slot 10 located near the middle of the machine. A bar 11 which, because of its function, we designate as a sector bar, is located in registry with one edge of the slot 10. The sector bar is provided with holes, and with eyes 13, these eyes being secured to the platform by bolts 14. A locking pin 15 fits into any one of the holes 12, and may be shifted from one of these holes to another. A bar 16, constituting part of a hand lever, extends through the slot 10 and is provided with a hole through which the locking pin 15 may be thrust. Another bar 17 constituting another part of the hand lever, is secured rigidly to the bar 16. The bar 16 is connected with a T-shaped rocking member 18, by bolts 18^a. The T-shaped rocking member 18 is provided with oppositely extending portions 19, the latter having strengthening ribs 20 integral with them. The rocking member 19 is further provided with a two-part bearing 21, which encircles a rounded portion 22 of the middle shaft. Pivotally connected with the extending portions 19 are two links 23 and mounted upon the latter are two heads 24. These heads carry two-part bearings 25, which encircle rounded portions 26 of the front and rear revoluble shafts. Each of these shafts is provided with portions 27 of angular cross section, as may be understood from Fig. 2. Fitted upon the angular portions 27 are a number of sleeves 28 and revoluble teeth 29, the latter being provided with hubs 30 for this purpose.

Fitted upon the angular portions 27 are two set collars 31 for holding the sleeves and teeth in position. The outer ends of the two shafts in question are provided with journal necks 32, which fit into slides 33, the latter being fashioned into bearings. Each slide 33 is provided with a guide pin 34, the guide pins extending through slots 34^a in the frame 4. Guide plates 35 are mounted upon the frame 4 for protecting the guide bolts 34.

The teeth of the middle shaft are shown at 36. For holding these teeth in position, two set collars 37 are provided, these set collars being held in position by set screws 38. Fixed bearings 39 carried by the frame 4 are used for supporting the middle shaft. Adjacent the bearings 33 are casings 40 of substantially cylindrical form and extending into each casing is a rod 41, which is connected with the bearing. A spring 42 encircles the rods 41 and is protected by the surrounding casing 40. The purpose of the springs 42 is to render the mounting of the forward and rear shafts comparatively resilient, and also to maintain these shafts in normal position when there is nothing to disturb them.

The operation of my device is as follows:—The parts being assembled and arranged as indicated, the operator grasps the hand lever and after withdrawing the pin

15, he turns the hand lever angularly to any desired extent permitted by the length of the sector bar 11, and then thrusts the pin 15 through the adjacent hole 12 in the bar 11, and also through the hole in the bar 6. This causes the rocking member 9 to assume a position having more or less angular displacement relatively to its normal position. The result is that the front and rear shafts are moved slightly in relation to the general framework. The teeth 29 are thus shifted bodily in relation to the teeth 36, and the harrow is thus adapted for work upon different kinds of land, or at least upon lands which require different treatment. The lever section 17 may be disconnected from the section 16, and the entire harrow may be turned over, so as to rest upon the arch bars 7. This being done, the harrow, may be drawn along over the ground, after the manner of a sled, the teeth not coming into engagement with the earth. When the harrow is not used for operating upon the soil, the revoluble teeth upon any particular shaft cannot be displaced relatively to each other, either by differences in torque applied to the teeth, or by lateral strains tending to move the teeth bodily in the general direction of their axes of rotation.

I do not limit myself to the precise construction shown, as variations may be made therefrom without departing from the spirit of my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:—

1. A harrow comprising a frame, a pair of arch bars connected rigidly thereto and disposed parallel with each other, a platform mounted upon said arch bars and provided with a slot disposed adjacent the proximate middle of said platform, a plurality of shiftably mounted revoluble shafts journaled to turn in said frame, links connected with said shafts, a rocking member pivotally connected with said links and a hand lever extending through said slot in said platform and connected with said rocking member for actuating the same to shift the shafts.

2. In a harrow the combination of a frame, slides carried by said frame and movable relatively to the same, said slides being arranged in pairs, the slides of each pair being disposed upon opposite sides of the frame, revoluble shafts journaled to said slides and movable bodily therewith, a rocking member mounted upon one of said shafts; mechanism connected with said rocking member and also connected with some of said shafts for shifting the same in a direction lateral to the general direction in which said shafts extend, and mechanism controllable at the will of the operator for actuating said rocking member.

3. In a harrow, the combination of a frame, a plurality of slides mounted thereupon and arranged in pairs, a shaft supported by each pair of slides, another shaft journaled upon said frame and free to rock, but having no lateral movement relatively to said frame, a rocking member mounted upon said last mentioned shaft, and connections from said rocking member to each of said first mentioned shafts, for shifting the same bodily in relation thereto.

4. In a harrow, the combination of a frame, slides carried by said frame and movable relatively thereto, said slides being arranged in pairs, the slides of each pair being disposed upon opposite sides of the frame, revoluble shafts journaled in said slides and movable bodily therewith, a rocking member, a revoluble shaft supporting said rocking member so as to enable the latter to rock independently of the rotation of the shaft upon which it is supported, mechanism controllable at the will of the operator for actuating said rocking member, and links connected with said rocking member, said links being also connected with said slides.

5. In a harrow, the combination of a frame, a pair of horizontally shiftable revoluble shafts carried thereby, a single revoluble unshiftable shaft carried by the frame between the pair of shiftable shafts, a plurality of soil working elements rigidly carried by each of said shafts, and means controllable at the will of the operator for adjusting the general position of the shiftably mounted shafts relatively to the unshiftable shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EINAR VILH BJORKMAN.

Witnesses:

JOHN A. LARSON,

EMIL TORGALSEN.