

O. LINDQUIST.

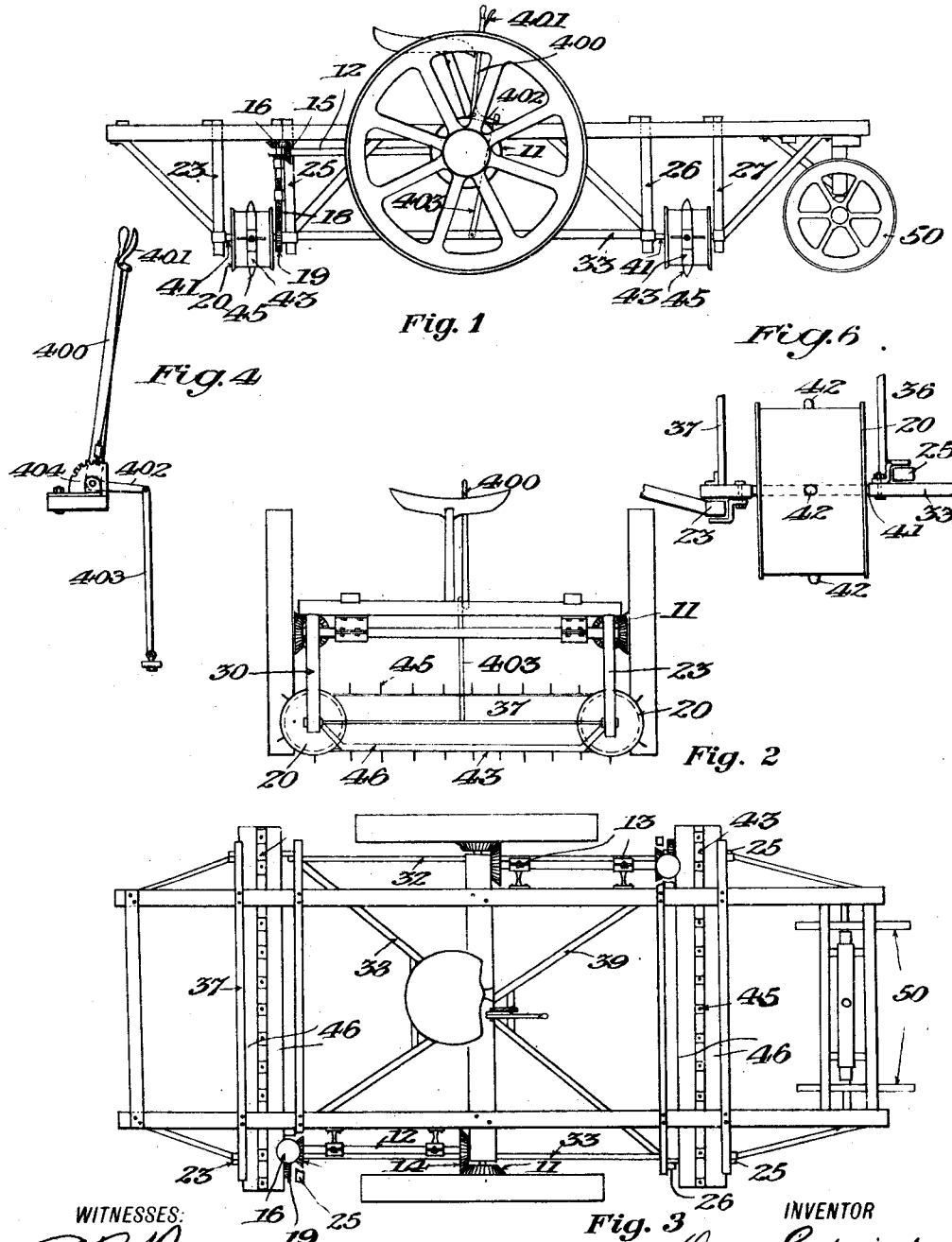
HARROW.

APPLICATION FILED JUNE 20, 1912.

1,065,536.

Patented June 24, 1913.

2 SHEETS—SHEET 1.



WITNESSES:
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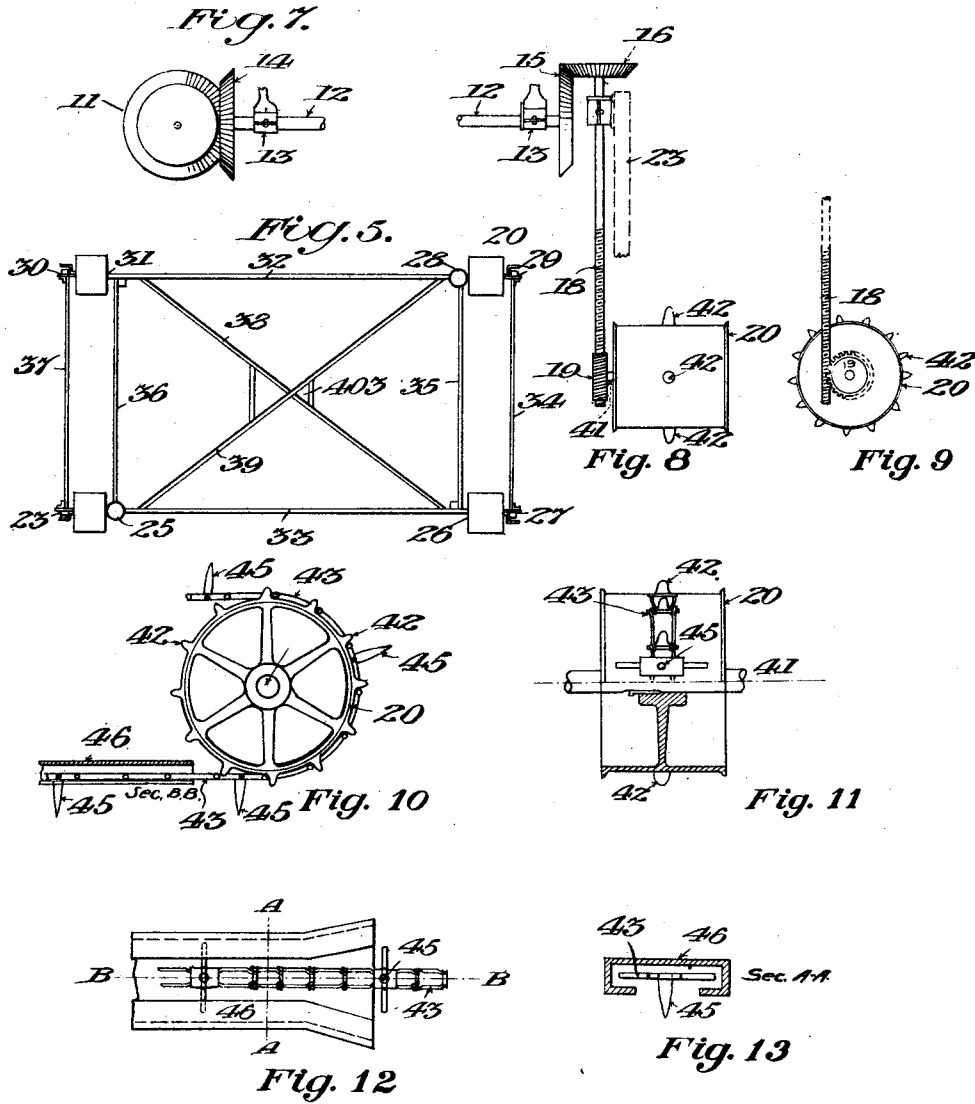
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WITNESSES:

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HARROW.

1,065,536.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, OSCAR LINDQUIST, a citizen of the United States, residing at Everett, in the county of Snohomish, State of Washington, have invented a new and useful Improvement in Harrows, of which the following is a specification.

My invention relates to harrows, and comprises the novel parts and combinations of parts which will be hereinafter described and particularly pointed out in the claims.

While the object of my invention is, in general, to provide an improved and superior apparatus, a specific object is to employ as the pulverizing or harrowing elements, endless belts which extend transversely of the path of progress of the harrow, and which are actuated by the forward movement of the harrow to move about their supporting axes, or transversely of the path of progress of the harrow, these belts having projecting teeth which engage and pulverize the soil. I preferably employ a plurality of such belts and have different belts turn in different directions.

In the accompanying drawings I have shown my invention in the form which is now preferred by me.

In the drawings Figure 1 is a side elevation of my device. Fig. 2 is a rear elevation thereof. Fig. 3 is a plan view. Fig. 4 is a side elevation of the means for raising and lowering the frame carrying the harrow elements. Fig. 5 is a plan view of the auxiliary or adjusting frame that supports the harrow elements. Fig. 6 is plan view of one of the belt drums. Fig. 7 is side elevation of bevel gears connected to the wheels and driving shafts. Fig. 8 is side elevation of the bevel gears and worm gear that operate the belt drums. Fig. 9 is end view of a belt drum showing the worm gear by which it is driven. Fig. 10 is end view of a belt drum showing belt with harrow teeth, and also sectional view of trough on line B—B of Fig. 12. Fig. 11 is side view of a belt drum, the lower half being in section on its center line. Fig. 12 is a bottom plan view of the belt guide showing belt or chain entering its flared end. Fig. 13 is a cross section of the belt guide on line A—A of Fig. 12.

In carrying out my invention I prefer to employ two harrowing belts or chains, one being placed forward of and the other rearward of the supporting and driving wheels.

These belts are herein shown as composed of link-like sections 43, hinged together and certain of them provided with projecting teeth 45 which are designed for engagement with the soil and constitute the active agents in the harrowing process. The links are provided with holes adapted to engage sprocket teeth 42 carried by the belt drums 20, to insure non-slipping. The shafts 41 extend in direction parallel with the path of progress of the harrow, or a fore-and-aft direction, and are close enough to the ground, when in use, to permit the teeth on the lower run of the belts to engage the ground. The belts are mounted in an auxiliary or adjusting frame which is capable of being raised to clear the teeth from the ground, or of being lowered to place them in working position. A frame of this character is shown separately in Fig. 5. This consists of bars 32 to 39 inclusive, and it is mounted to slide vertically and be held against horizontal movement by vertical posts, as 23, 25, 26, and 27, connected with the main frame. The adjustable frame is controlled in position by a hand operated lever 400, which is pivoted upon the main frame and has connected therewith an arm 402 which is connected by link 403 with the adjustable frame. A catch mounted on the lever 400 is adapted to engage notches in a segment 404 and is controlled by hand lever 401, so that the frame may be secured at any elevation where adjusted. The axis or shaft of one chain drum of each set is provided with a worm gear 19 which is engaged and turned by worm 18. Shaft 18 has a bevel gear 16 secured to its upper end, meshing with bevel gear 15 upon a shaft 12 which extends in a direction from front to rear, and has a bevel gear 14 on the end next the axle of the carrying or driving wheels, meshing with a bevel gear 11 connected with the said drive wheels. I have shown this mechanism for driving the belt or chain as duplicated for each belt, the same being placed on one side of the machine for one belt and upon the other side for the other belt. The threads upon the shaft 18 cover a sufficient length thereof to require no other provision to accommodate for the adjustment in height of the belt carrying frame.

The elements of which the belts or chains are composed have bases of some width whereby they may be held against rocking

over or twisting under the strain due to the engagement of their teeth with the ground. The bases of the belt sections enter a guide 46 which is shaped to form a T-shaped groove or channel, the open side being downward. This guide or channel extends between the two drums of each belt, in position to receive the lower run of the belt. Its receiving end is flared as shown in Fig. 12, whereby entrance is facilitated. One or more front supporting and guiding wheels 50 are provided to steady the frame and facilitate steering.

I claim as my invention—

1. In a harrow, in combination, an endless belt provided with projecting teeth, means for moving said belt transversely of the path of movement of the harrow, and a fixed guide for the lower run of said belt adapted to support it against the twisting action caused by the engagement of the teeth with the ground.

2. In a harrow, in combination, an endless belt provided with projecting teeth, means for moving said belt transversely of the path of movement of the harrow, and a fixed guide for the lower run of said belt adapted to support it against the twisting action caused by the engagement of the teeth with the ground, and means for raising and lowering said belt and its supporting mechanism.

3. In a harrow, in combination, a main frame, drive and supporting wheels mounted on said main frame, an auxiliary frame mounted on the main frame to be adjusted up and down, an endless belt mounted on said auxiliary frame to travel in directions transversely of the path of movement of the

harrow, said belt having teeth projecting and adapted to engage the ground, and a guide carried by the auxiliary frame and engaging the lower run of said belt to support it against the rocking action caused by their engagement with the ground.

4. In a harrow, in combination, an endless belt having outwardly projecting teeth which have a rigid base extending transversely of the belt, means for supporting and traversing said belt in a direction transversely of the path of progress of the harrow, and a guiding support for the lower run of said belt having a T-shaped groove receiving said lower run of the belt and the base of the teeth.

5. In a harrow, in combination, a frame, a pair of driving and supporting wheels journaled in said frame, an auxiliary frame mounted upon the main frame to be adjustable vertically, an endless belt mounted upon the auxiliary frame to travel transversely of the path of progress of the harrow, teeth projecting from the belt, a guide carried by said frame and embracing the lower run of said belt to prevent its rocking because of engagement of the teeth with the ground, a shaft journaled on the main frame and extending in fore-and-aft direction, bevel gears connecting said shaft with the drive wheels, a vertical shaft connected with the fore-and-aft shaft by bevel gears, and driving connection of said vertical shaft with the belts having a vertically slidable connection with said vertical shaft.

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Witnesses:

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