

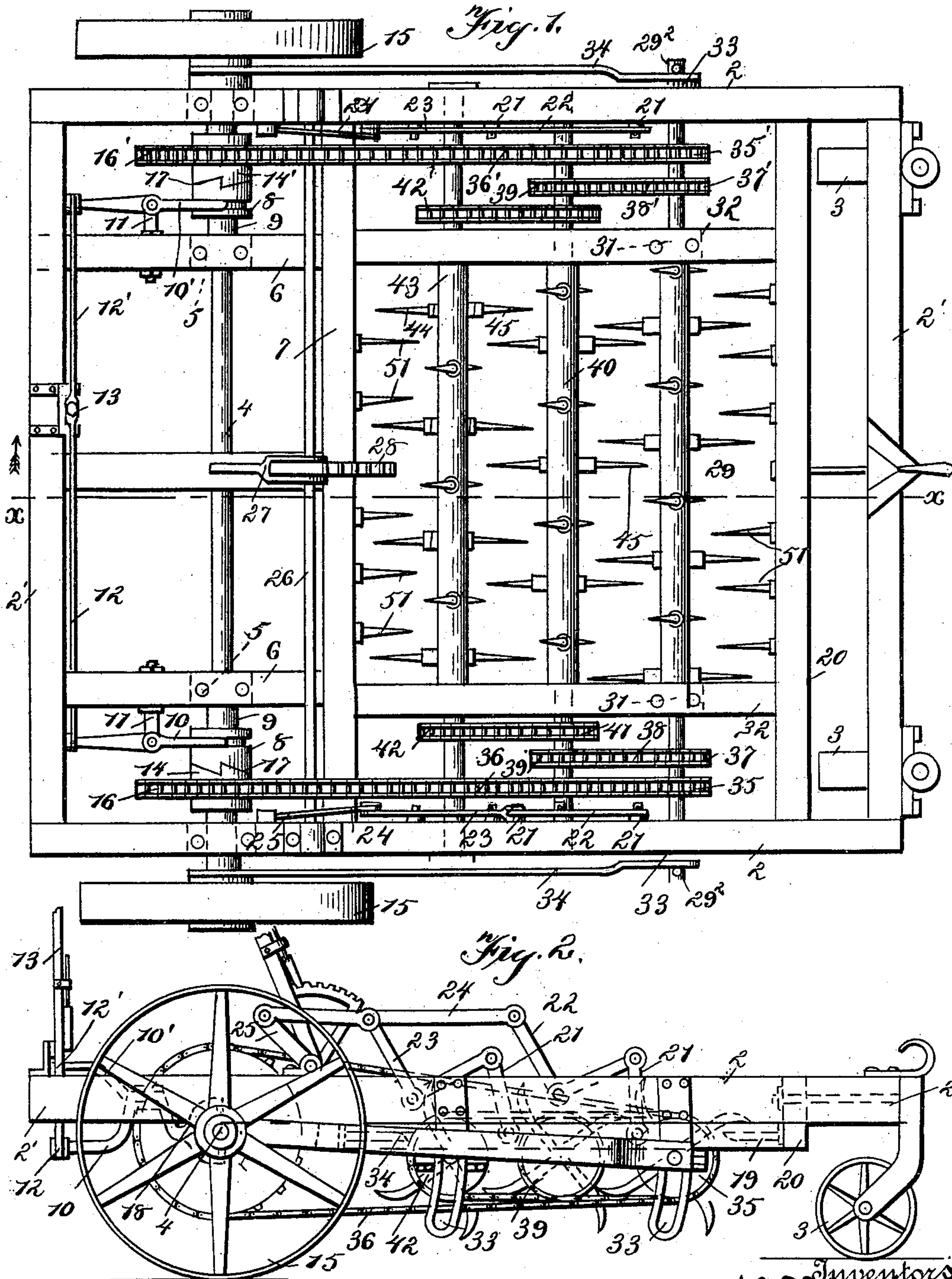
(No Model.)

2 Sheets—Sheet 1.

A. W. HAGSTROM & G. ANDERSON.  
ROLLING HARROW.

No. 583,397.

Patented May 25, 1897.



Witnesses  
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Inventors  
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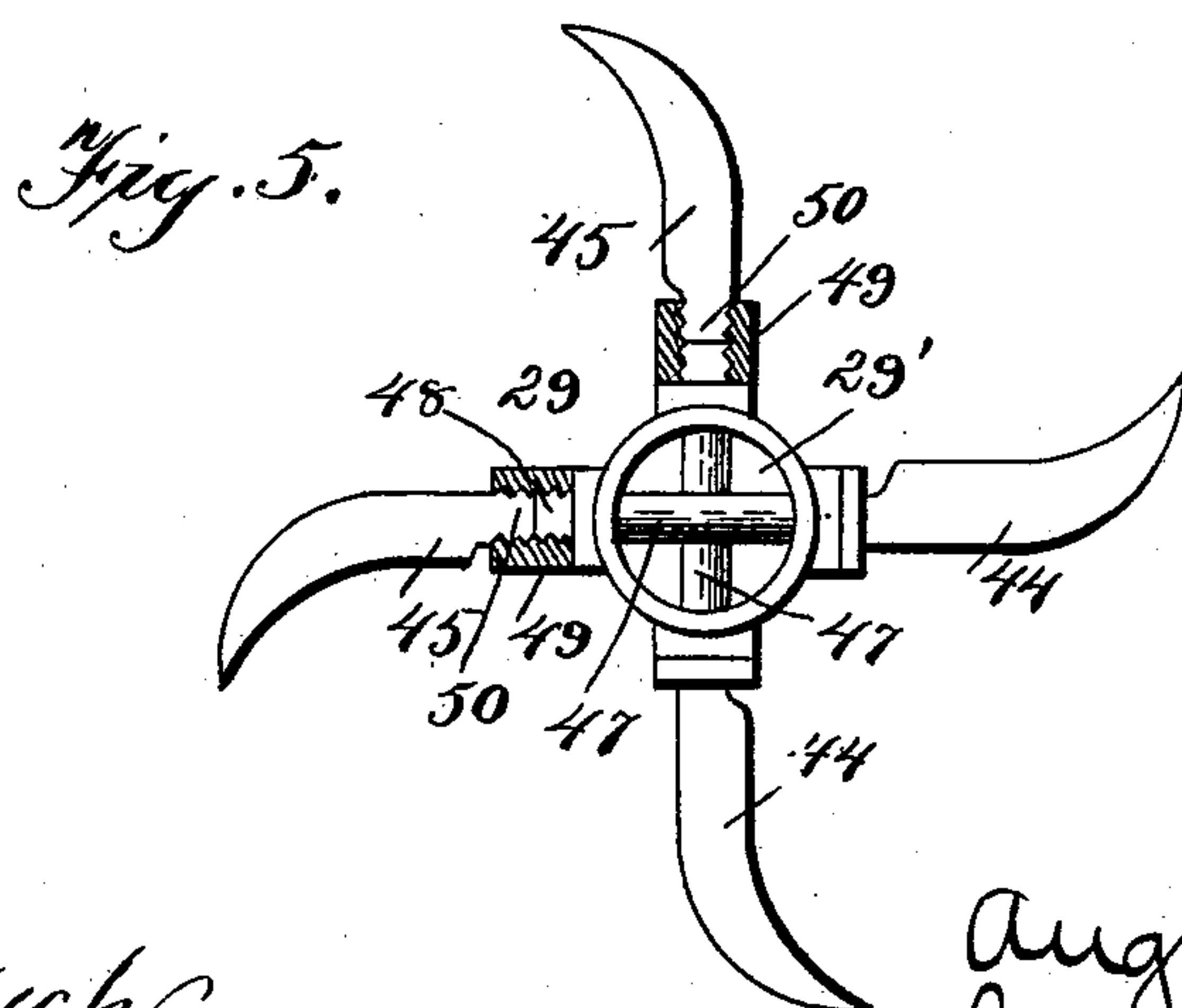
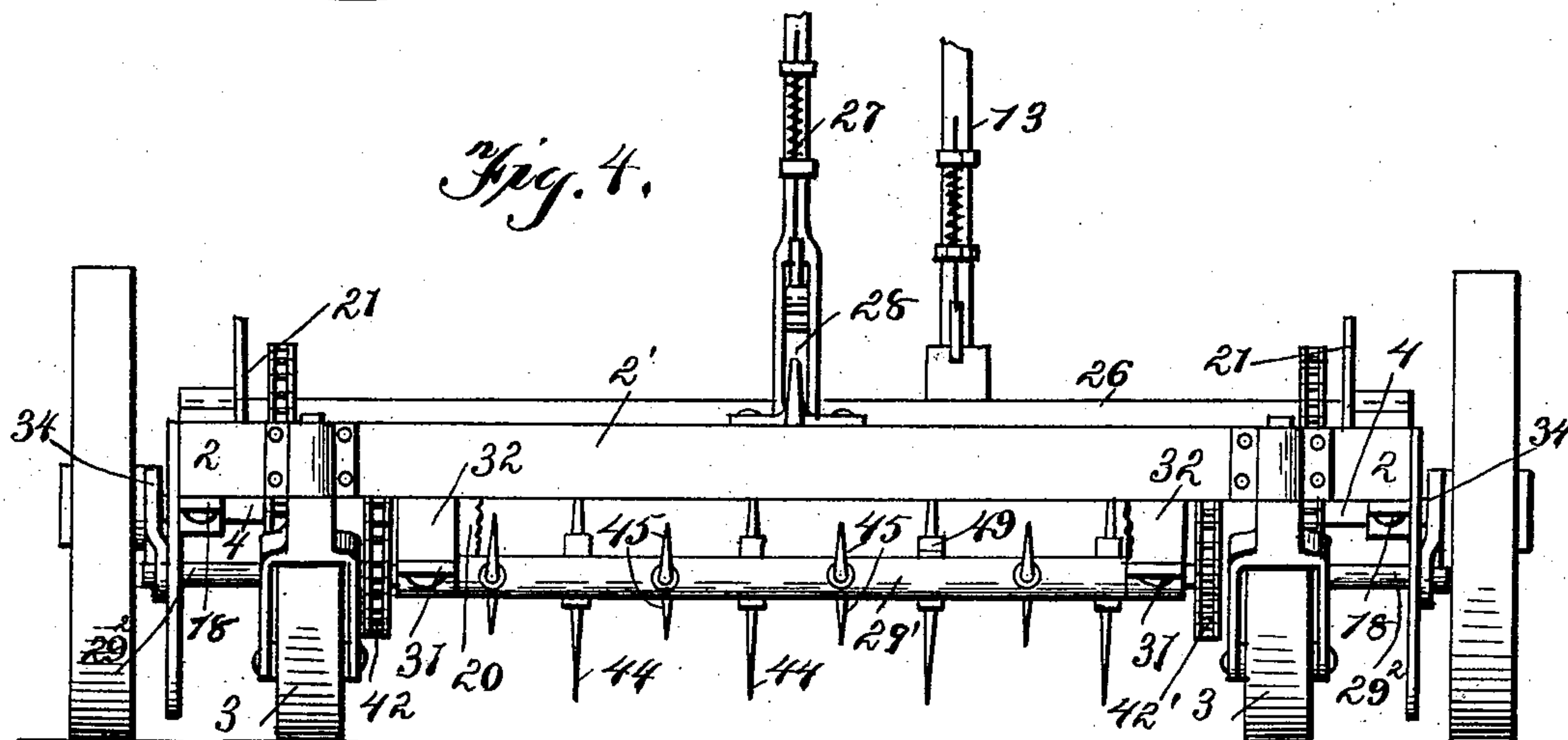
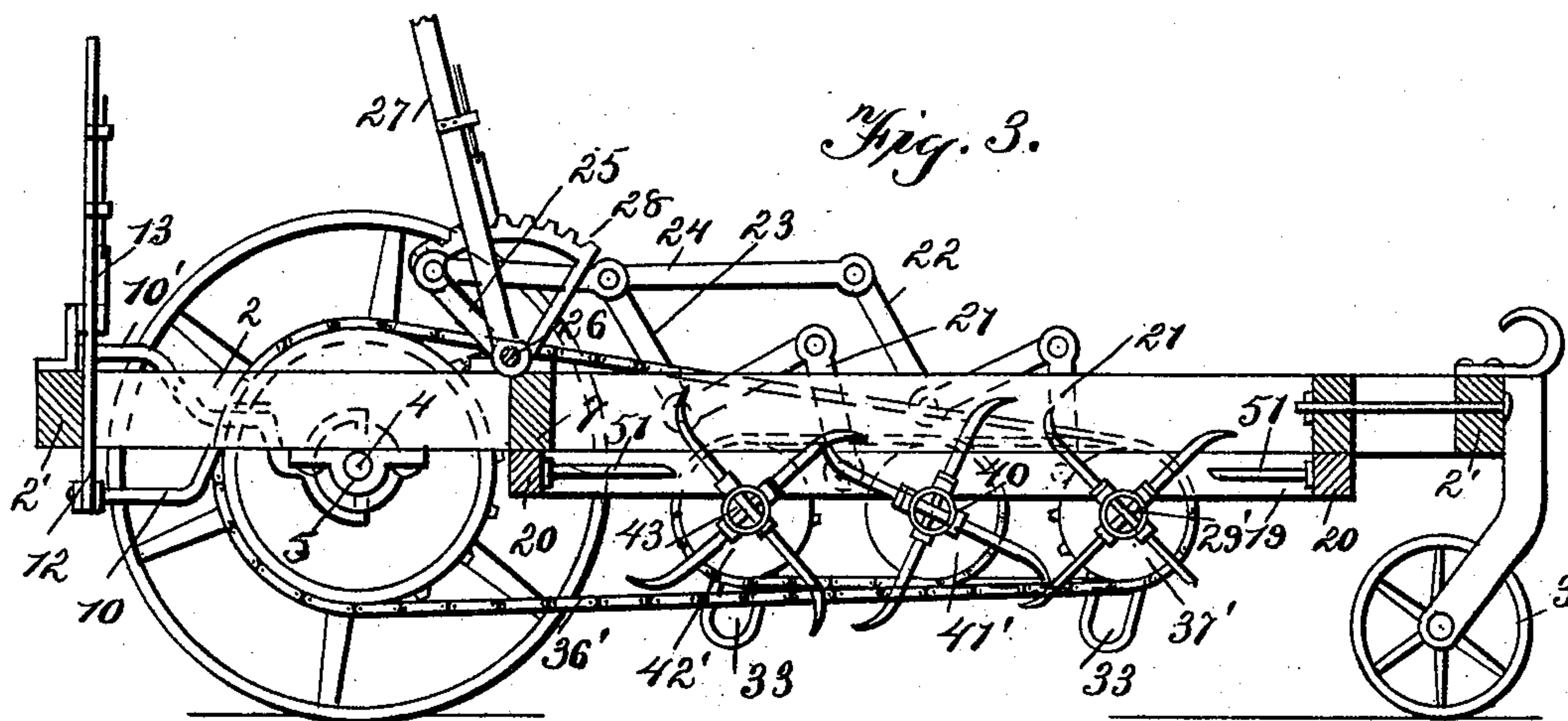
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# UNITED STATES PATENT OFFICE.

AUGUST W. HAGSTROM AND GUSTAF ANDERSON, OF CHINO, CALIFORNIA.

## ROLLING HARROW.

SPECIFICATION forming part of Letters Patent No. 583,397, dated May 25, 1897.

Application filed July 14, 1896. Serial No. 599,134. (No model.)

*To all whom it may concern:*

Be it known that we, AUGUST W. HAGSTROM and GUSTAF ANDERSON, citizens of the United States, residing at Chino, in the county of San Bernardino and State of California, have invented certain new and useful Improvements in Rolling Harrows; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention has relation to improvements in rolling harrows; and the object is to provide a harrow that will effectually break up and disintegrate the soil, and more particularly the virgin soil that has never been cultivated.

To this end the novelty consists in the construction, combination, and arrangement of the same, as will be hereinafter more fully described, and particularly pointed out in the claim.

In the accompanying drawings the same figures of reference indicate the same parts of the invention.

Figure 1 is a top plan view of our improved harrow. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional elevation on the line *xx*. Fig. 4 is a front view of the harrow, and Fig. 5 is a transverse section of one of the harrow-shafts.

2 2 2' 2' represent the rectangular main frame, and its forward end is provided with two caster-wheels 3 3, and in the side pieces 2 2, near the rear end, is mounted a driving-shaft 4, journaled in boxes 5, secured to braces 6, connecting the rear piece 2' of the frame with the cross-brace 7, secured to the sides 2 2.

8 8' are clutch-couplings sliding on the shaft 4 and revolved with it by the usual key 9 on the shaft working in a keyway in the coupling, which is operated by a forked lever 10, fulcrumed to an arm 11, secured to the brace 6. The rear end of this lever 10 is pivoted to a connecting-rod 12, secured to a hand-lever 13 above its fulcrum on the rear frame-piece, and a similar connecting-rod 12' is connected to a similarly-mounted forked lever 10' to operate a clutch-coupling 8' on the opposite end of the shaft 4.

14 14' are sleeves revolving on opposite ends

of the shaft 4, and their inner ends are provided with sprocket-wheels 16 16', the inner face of which is formed with a clutch 17, which is engaged by the sliding clutch 8. These revolve on the shaft 4, as before stated, and they are also journaled in boxes 18, bolted to the sides 2 2 of the frame.

To the outer ends of the shaft 4 are secured the traction-wheels 15 15, and, as they rotate the shaft 4, the said shaft at all times rotates the clutches 8 8. These clutches engage the clutch on the sprocket-wheels 16 16' when the lever 13 is operated to throw them into gear, and, reversely, the sprocket-wheels remain stationary on the shaft when the lever 13 is thrown in the opposite direction.

19 19 20 20 represent the side and end pieces of the harrow-shaft frame, suspended immediately below the main frame by pitmen 21 21, pivoted to the outer ends of the bell-crank levers 22 23, the upper ends of which are pivoted to pitmen 24, the rear ends of which are connected to the upper ends of the crank-arms 25, secured to the outer ends of the shaft 26. About midway of this shaft 26 is secured an operating hand-lever 27, engaging the usual semicircular tooth-rack 28 to adjust the harrow-shaft frame to the proper depth or to raise it, so that the harrow-teeth will clear the ground when the harrow is being taken from place to place.

The forward harrow-shaft 29 consists of the sleeve 29', provided with the solid ends 29<sup>2</sup> 29<sup>2</sup>, and it is journaled in boxes 30 30, secured to the sides 19 19 of the harrow-shaft frame. It is also provided with bearing-boxes 31 31, secured to the longitudinal braces 32 32, secured to the front and back pieces 20 20 of said frame. The outer ends of this shaft 29 and the rear shaft 43 project through arc-shaped guides 33, secured to the side pieces of the main frame, and the extreme ends rotate in a flat strap 34, running back to the main driving-shaft 4, its end being journaled thereon between the inner face of the hub of the traction-wheel and the outer edge of the sprocket-sleeve.

Upon each end of the harrow-shaft 29, just inside of the frame, is secured a sprocket-wheel 35 35', over which runs a sprocket-chain 36 36' to the sprocket-wheels 16 16' on



the main driving-shaft 4, and from the sprocket-wheels 37 37' on the shaft 29 similar chains 38 38' run to the sprocket-wheels 39 39 on the second harrow-shaft 40, and by its sprocket-wheels 41 41' motion is transmitted to the sprocket-wheels 42 42' on the rear harrow-shaft 43, so that all three harrow-shafts are rotated simultaneously in the same direction. These harrow-shafts are all constructed alike and any number of them may be used, according to the nature of the soil and the work to be performed, the teeth of course on one shaft being arranged to follow in the spaces between the teeth on the other shafts, so that no two lines of teeth will follow in the same plane.

The teeth on the forward shaft 29 and the rear shaft 43 pass between a series of stationary teeth 51, secured to the front and rear of the harrow-shaft frame, and they serve to remove any soil that may adhere to the revolving teeth on these shafts when the machine is in operation.

The similar-shaped harrow-teeth are constructed in pairs, as shown in Fig. 5, 44 and 45 being mates. The tooth 44 is formed with a rigid collar 46 and an elongated shank 47, which extends diametrically through the hollow harrow-shaft, and its projecting end 48 is screw-threaded, which receives the elongated nut 49, which is screwed on tightly to hold the tooth 44 rigidly on the shaft, and the screw-threaded shank 50 of the opposite tooth 45 is then secured in the nut, as shown.

A clevis of the usual form is attached to

the front end of the machine, to which the team is hitched to draw the same.

Although we have specifically described the construction and relative arrangement of the several elements of our invention, we do not desire to be confined to the same, as such changes or modifications may be made as clearly fall within the scope of our invention without departing from the spirit thereof.

Having thus fully described our invention, what we claim as new and useful, and desire to secure by Letters Patent of the United States, is—

A rolling harrow comprising the main frame, the driving-shaft, its traction-wheels secured thereto, and the sprocket-wheels mounted thereon and adapted to be driven by the clutches on said shaft, in combination with the adjustable harrow-shaft frame comprising the harrow-shaft 29, its ends provided with sprocket-wheels operated by chains driven by the sprocket-wheels on the driving-shaft, and having its ends projecting through arc-shaped guides secured to the main frame, and connected to said driving-shaft by strap connections, substantially as shown and described.

In testimony whereof we hereunto affix our signatures in presence of two witnesses.

AUGUST W. HAGSTROM.  
GUSTAF ANDERSON.

Witnesses:

W. K. GIRD,  
J. E. WALKER.