

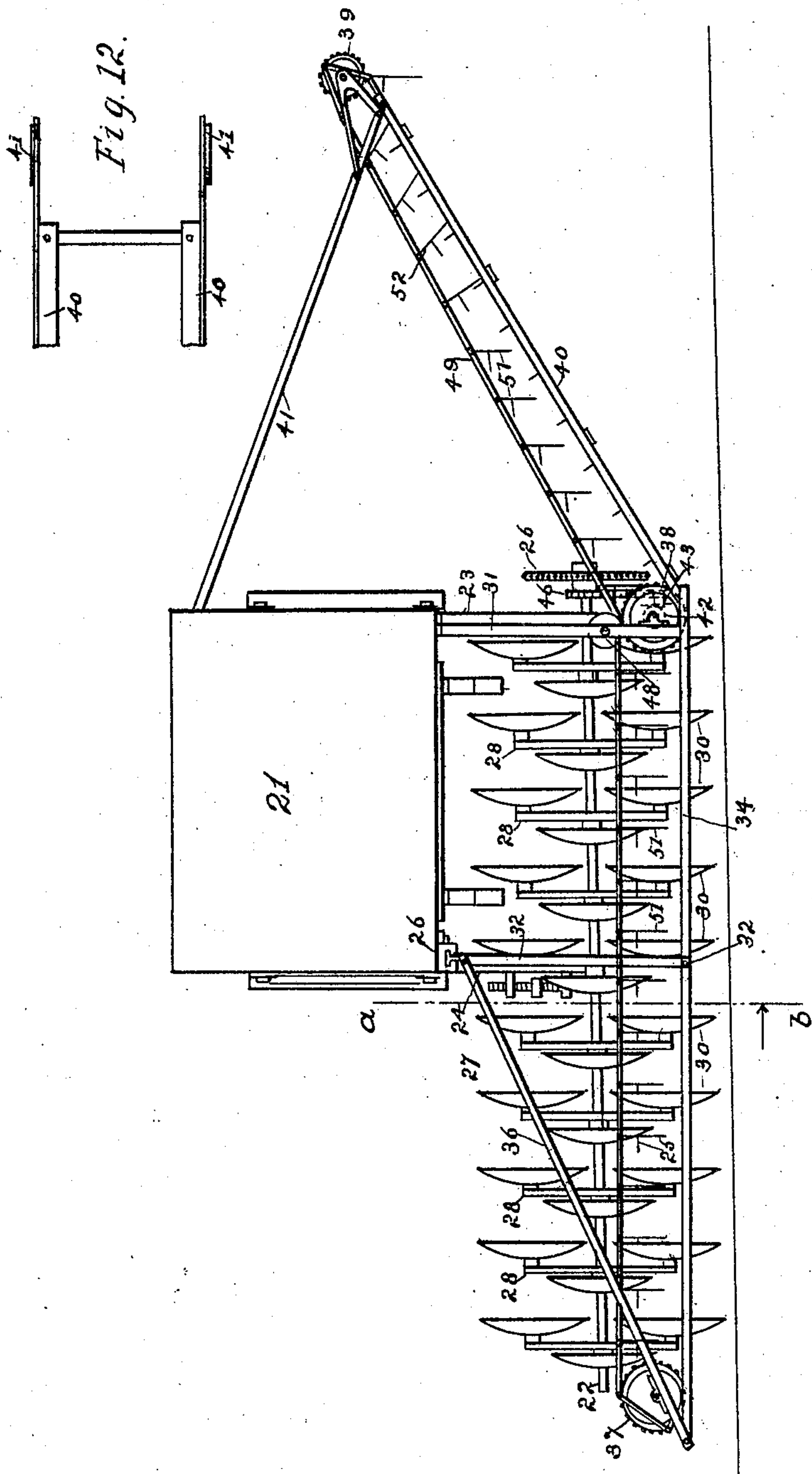
No. 772,366.

PATENTED OCT. 18, 1904.

S. MOWER.
LISTER AND GRADER.
APPLICATION FILED APR. 7, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

K.M. Imboden,
W. L. Lange

INVENTOR,

Samuel Mower,
by Higdon & Higdon,
Attys.

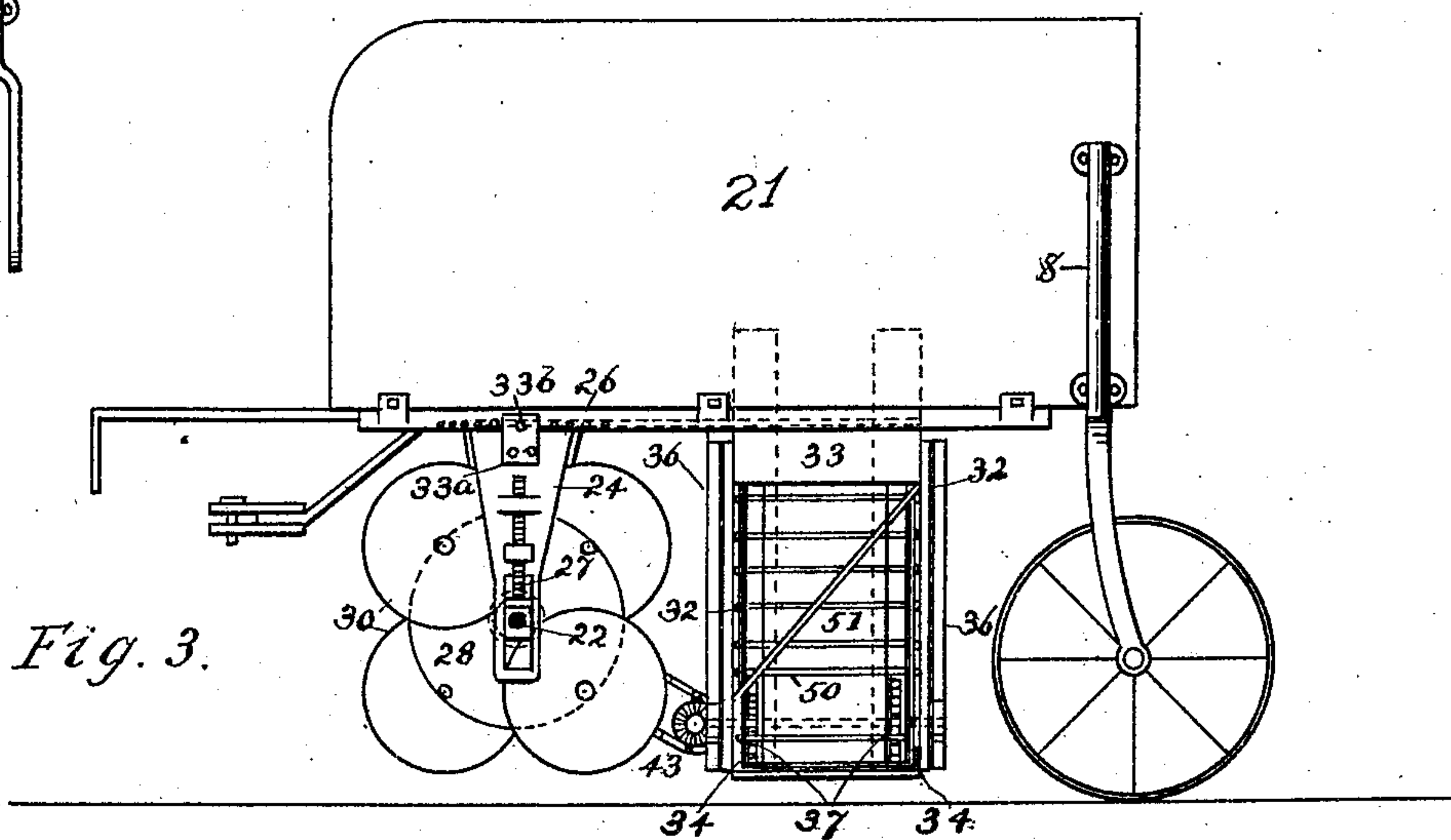
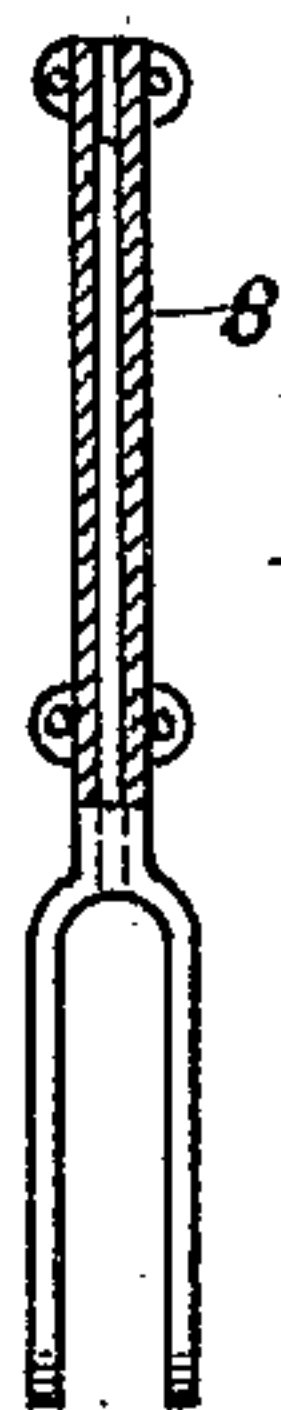
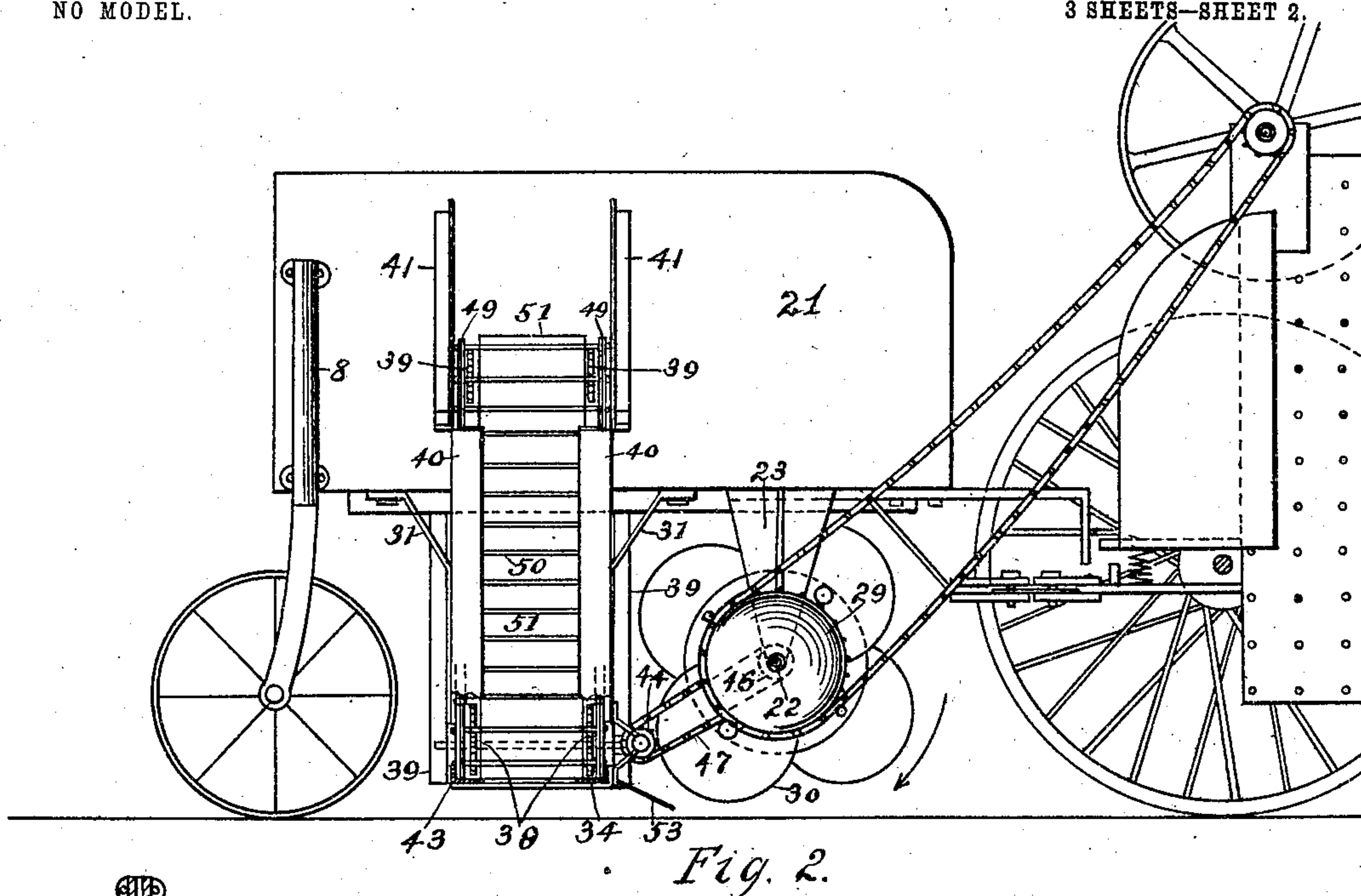
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3 SHEETS—SHEET 3.

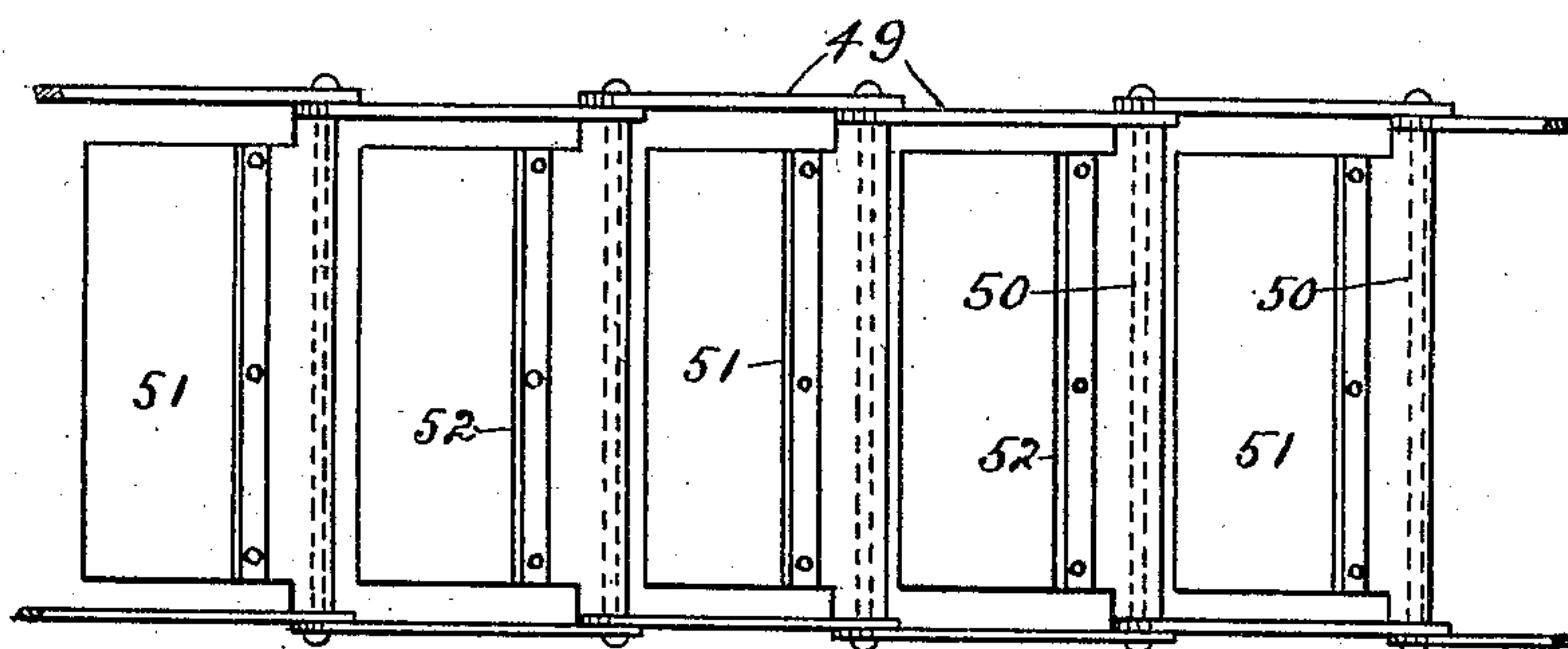


Fig. 5.



Fig. 6.

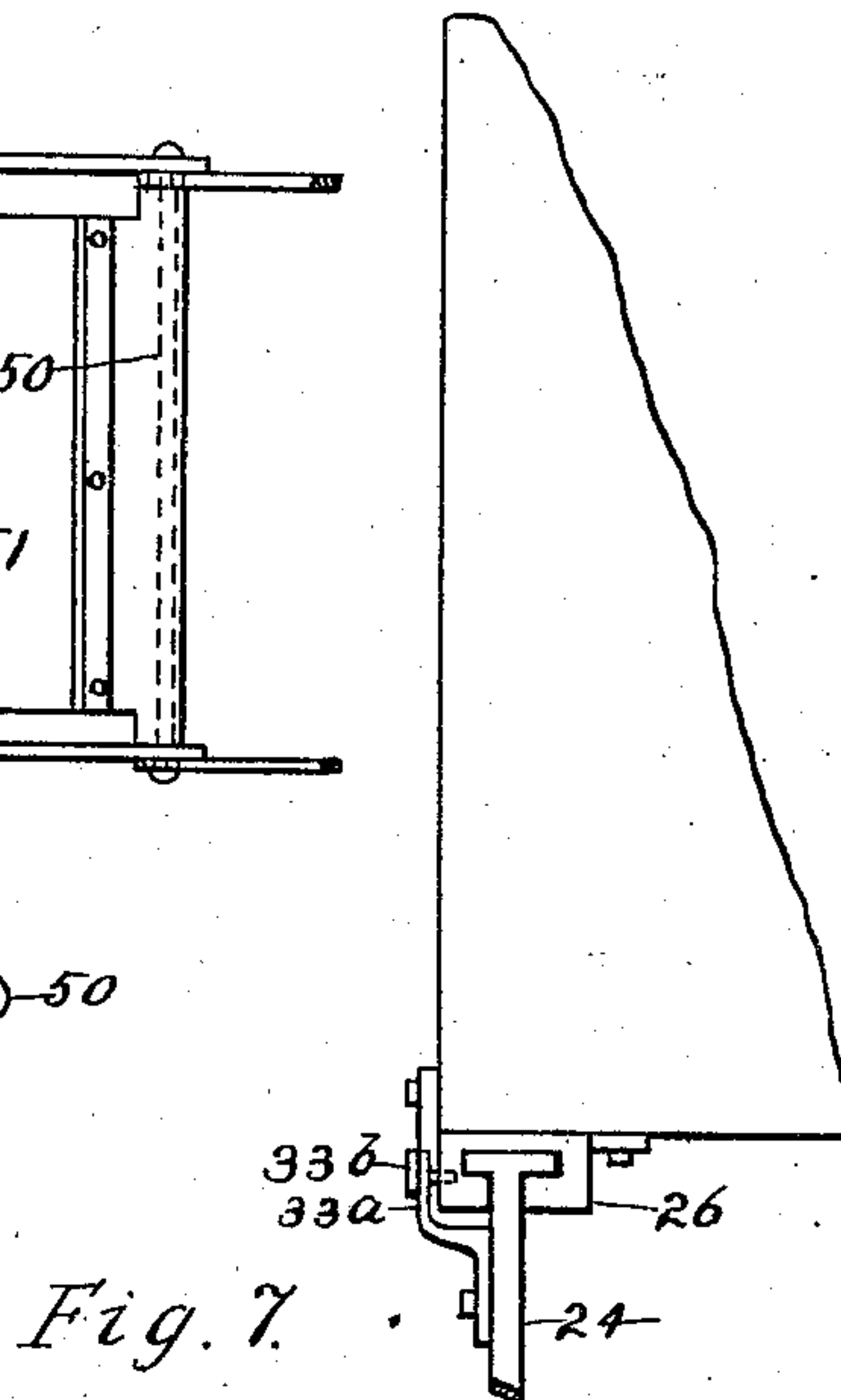


Fig. 7.

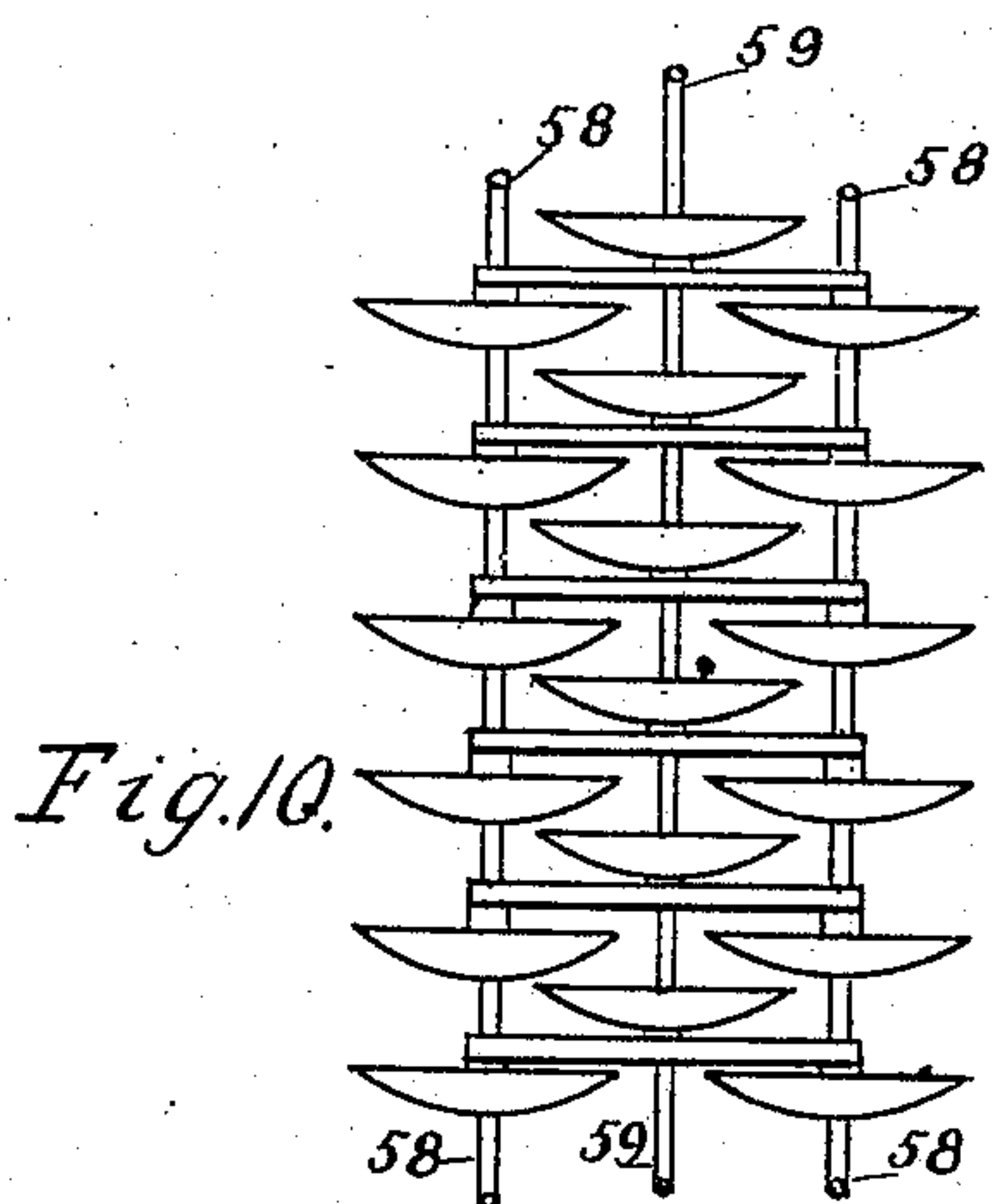


Fig. 10.

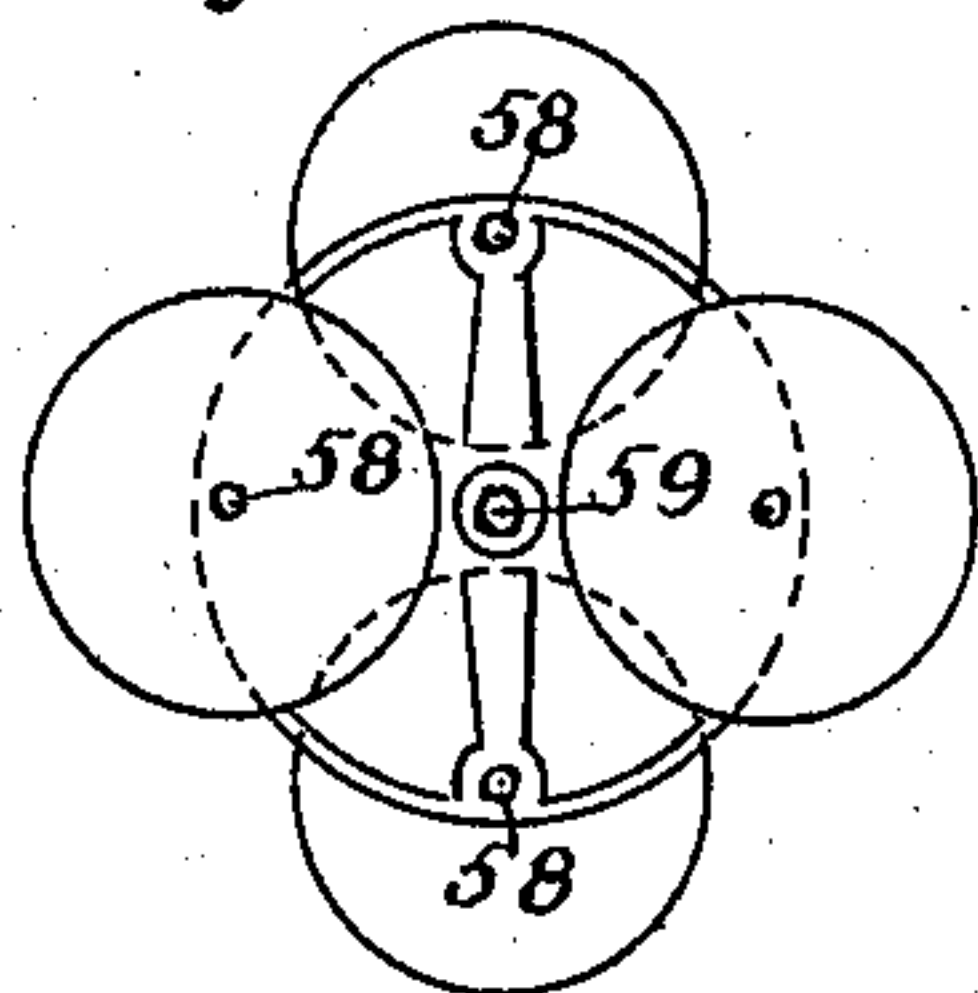


Fig. 11.

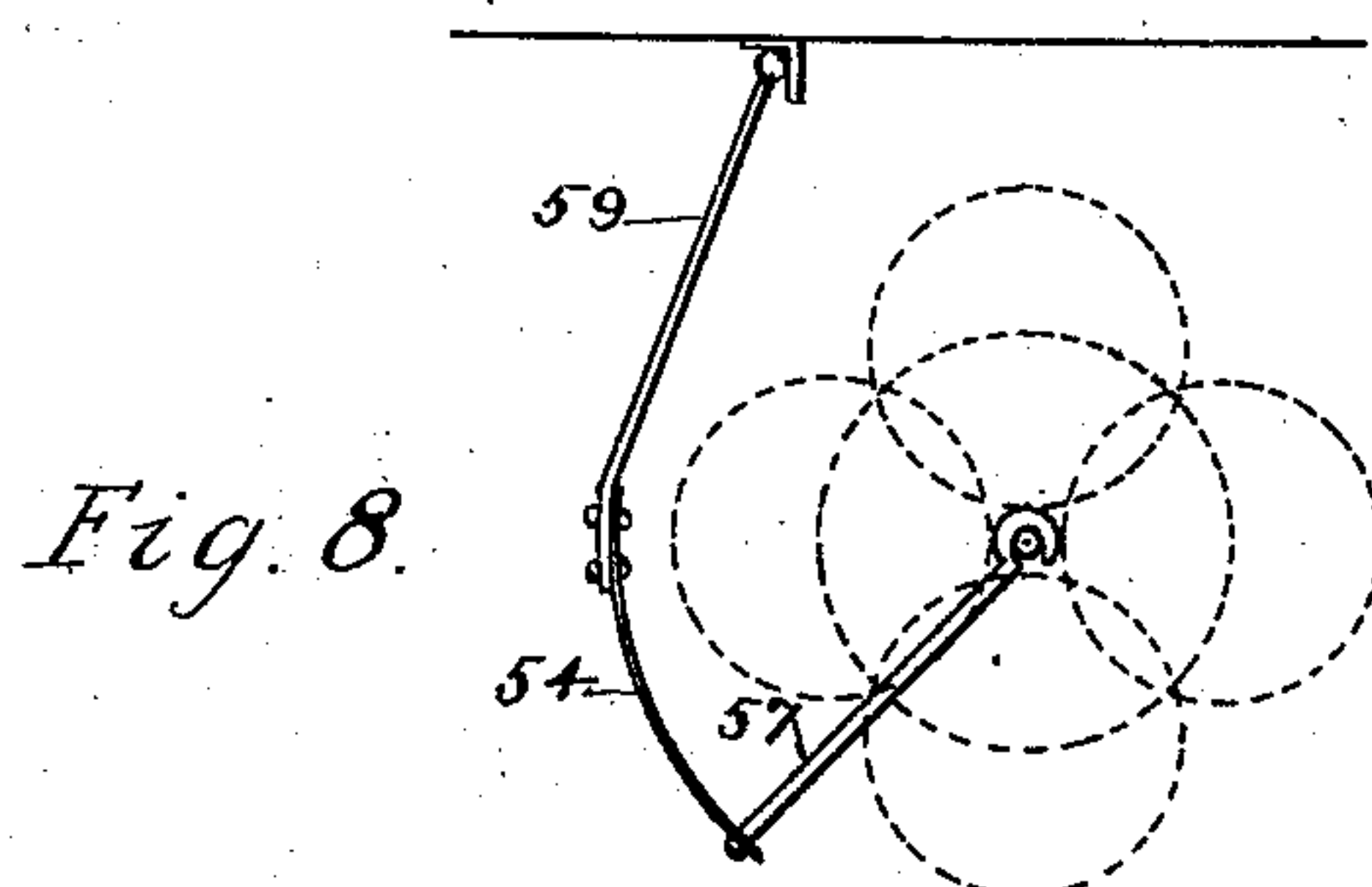


Fig. 8.

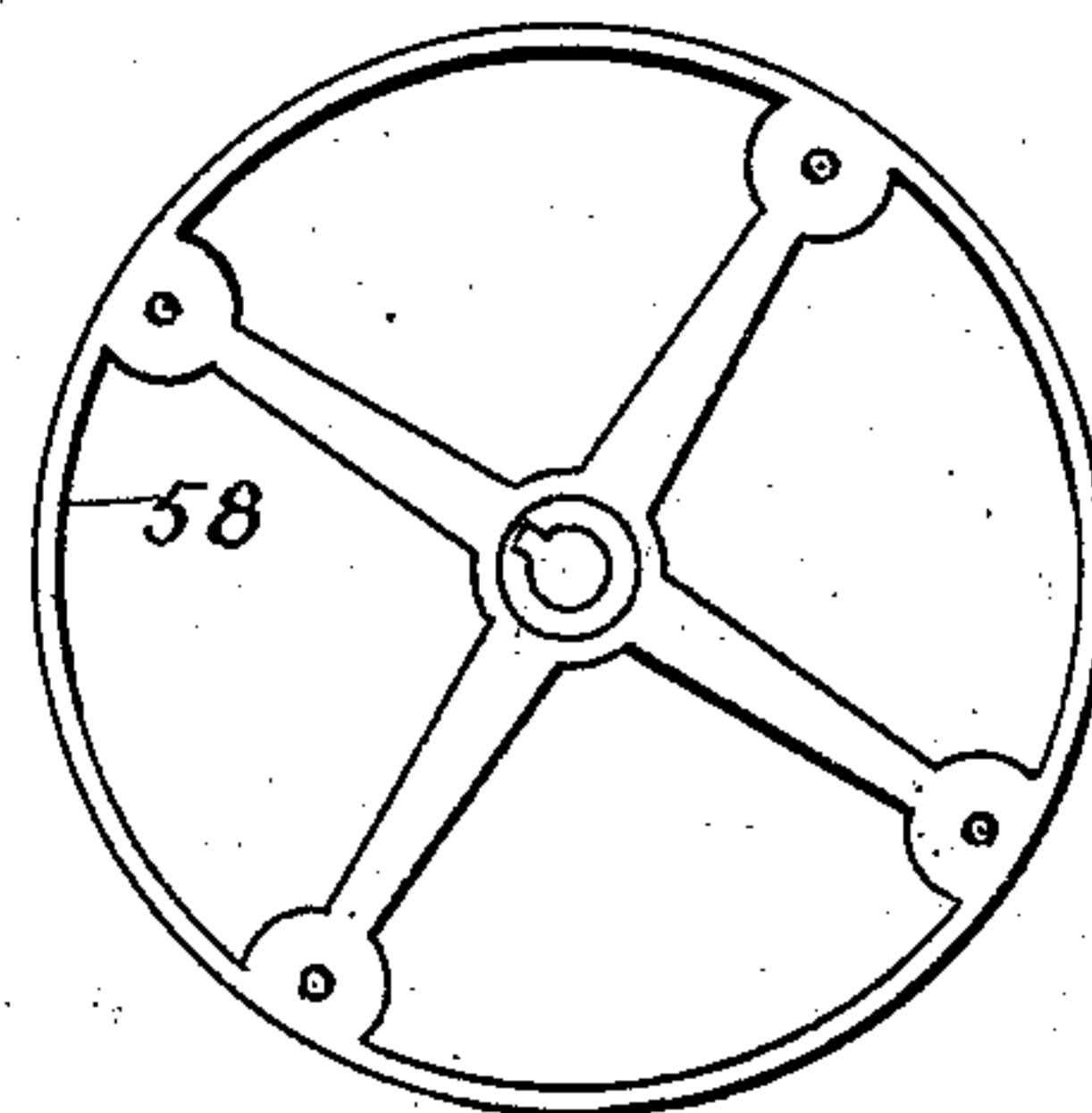


Fig. 9.

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UNITED STATES PATENT OFFICE.

SAMUEL MOWER, OF SPRINGHILL, KANSAS.

LISTER AND GRADER.

SPECIFICATION forming part of Letters Patent No. 772,366, dated October 18, 1904.

Original application filed October 20, 1902, Serial No. 128,043. Divided and this application filed April 7, 1903. Serial No. 151,478. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL MOWER, a citizen of the United States, residing at Springhill, in the county of Johnson and State of Kansas, have invented new and useful Improvements in Listers and Graders, of which the following is a specification.

My invention relates to a propelled disk machine adapted for grading roads or land or for listing.

The advantages of my herein-described grading-machine over the usual plowshare-graders are that the soil may be cut to any desired depth and the grading can be accomplished much more rapidly than with the usual plowshare-graders.

My original application for United States patent upon this grading-machine was filed October 20, 1902, Serial No. 128,043. Said application was divided, and this application is a part of the same.

I will now describe my invention with reference to the accompanying drawings, in which—

Figure 1 is a rear elevation of a grading-machine or lister embodying my invention, the caster-wheels and the scoop being omitted. Fig. 2 is a side elevation of the machine, showing also the rear portion of a traction-engine employed for drawing the machine and revolving its disks. Fig. 3 is a sectional elevation of the opposite side of the grader detached from the engine, the disk-shaft being cut on a line corresponding to line *a b* of Fig. 1. Fig. 4 represents one of the caster-wheel forks with its bearing-sleeve in section. Fig. 5 is an enlarged detail view of a portion of the elevator or conveyer. Fig. 6 is a further enlarged edge view of one of the elevator-plates. Fig. 7 is an enlarged detail view, in rear elevation, of the means for supporting the slidable shaft-hanger. Fig. 8 represents an attachment to be used alternatively to the elevator or conveyer. Fig. 9 is an enlarged face view of one of the disk-carrying wheels. Figs. 10 and 11 are a plan view and a side elevation of a modified arrangement of disks and disk-bearing wheels. Fig. 12 is an enlarged detail plan of the upper end portion

of the elevator-frame, the braces 41 being in section.

22 is a transverse shaft which is supported by a rigid hanger 23 and a slidable hanger 24. Said hangers depend from opposite sides of a box or tender 21. Hanger 24 is mounted slidably in a bar 26, having a T-groove therein, (see Fig. 7,) said bar being secured to the tender. The shaft 22 passes through a block mounted to slide vertically in its hanger 24, and said block is supported adjustably by a right-and-left screw 27. Thus the angle of shaft 22 may be changed either vertically or laterally by adjusting the hanger 24 and the screw 27.

The disks 30 are secured on alternate sides of the disk wheels 28, and their concave faces all face in the direction in which the soil is to be conveyed. Hence the hubs of half the disks are attached to their concave faces, and the hubs of the remaining disks are attached to their convex faces. The planes of these disks are preferably parallel to the planes of the wheels which carry them.

A sprocket-wheel 29 is secured on shaft 22, near the stationary hanger 23, to receive a driving-chain, by which said shaft may be rotated by an engine and the disks 30 thereby revolved.

The caster-wheels are placed at or near the back of the tender, as shown, to provide space for an elevator, which may be constructed as follows: At the side of the tender from which the stationary hanger 23 depends are secured a pair of hangers 31 31. At the opposite side of the tender a pair of hangers 32 32 are secured to a shoe 33, which depends from the slotted bar 26 aforesaid. Connecting the lower ends of hangers 31 to the lower ends of hangers 32 are angle-beams 34 34, which form parts of the elevator-frame. These angle-beams extend laterally behind and below the disks, as shown, and their outer ends are connected by braces 36 to the hangers 32. On said braces are bearings for a shaft carrying sprocket-wheels 37 37, over which passes the elevator, described hereinafter. Secured to the opposite ends of the angle-beams 34 are a pair of obliquely-rising angle-beams 40

40, which form extensions of the horizontal beams 34. The upper ends of the inclined beams 40 are braced by braces 41 41, secured to the side of the tender. Bearings for a shaft carrying sprocket-wheels 39 are secured to beams 40 and braces 41. Secured to hangers 31 are bearings for a shaft carrying driving-sprockets 38 38, which drive the elevator by engaging the cross-rods thereof. On said shaft is a bevel-pinion 42, which is driven by a bevel-pinion 43 on a short shaft on which is fixed a sprocket-wheel 44. On the disk-shaft 22, in alinement with sprocket 44, is a sprocket-wheel 46, and said sprockets are connected by a chain 47. Depression-rollers 48 48 are employed to hold down the upper run of the elevator, so that the upper run will be substantially parallel to the lower run. The elevator itself passes over the elevated sprockets 39 and is composed of a pair of chains 49 49, connected by cross-rods 50, and sheet-iron plates 61, hinged, respectively, on said rods. (See Figs. 9 and 10.) The plates 51 are cut away at their sides, as shown, so that they will not ride over the sprockets at the ends of the elevator. The sprockets work just inside the links 49—that is, between the links and the plates 51. Secured to one face of each plate 51 is a flight 52, the action of said flights being to engage the soil which is thrown upon the plates by the disks 30. Said flights are of course on the upper sides of said plates in the lower run. In the upper run the plates hang from the rods 50, as shown in Fig. 1.

Secured in any suitable manner to the forward horizontal beam 34 of the elevator-frame is a scoop 53. (Shown in Fig. 2.) The rear edge of this scoop is raised above its front edge, and the scoop is arranged to catch the soil, which would otherwise drop to the ground in front of the elevator when the disks are in action. The soil so caught will work back upon the elevator-plates by the kicking action of the disks.

The purpose of the upwardly-inclined extension of the elevator is to raise the soil high enough to dump it into wagons, if desired. The upper ends of the inclined beams 40 are cut away, as shown in Fig. 12, to permit the elevator-plates to drop before the chains commence to round the sprockets. In the entire lower run of the elevator the plates 51 are supported by the lower flanges of the angle-beams 34 and 40. The inclined extension of the elevator may be detached, if not required, and the elevator shortened to pass around sprockets 38. Moreover, the entire elevator and scoop may be detached from the tender. In that case I would employ behind the disks an arcuate curved plate 54, Fig. 8, supported by rods, as 59, depending from the cross-beam secured to the bottom of the tender and braced by rods, as 57, the upper ends of

which are attached to the disk-shaft 22. The purpose of the plate 54 is to prevent the soil from being thrown back by the revolution of the disks.

Referring to Figs. 10 and 11, these views represent a modification of my system of disks as attached to wheels, the modification consisting of running a plurality of eccentric shafts 58 through the wheels parallel to the central shaft 59. The disks are mounted upon these eccentric shafts. This construction might be somewhat stronger than that shown in Fig. 1 with respect to the connections between the disks and their carrying-wheels.

The herein-described grading-machine may be employed for listing also. Hence in the appended claims I would term it a "lister" or "grader."

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A lister or grader comprising a vehicle-frame, a transverse shaft carried thereunder, disk-carrying wheels fixed on said shaft, means for raising and lowering one end of said shaft, and an elevator supported by the vehicle partially behind the disk-carrying wheels, substantially as described.

2. A lister or grader comprising a vehicle, a transverse shaft supported thereby, disk-carrying wheels secured on said shaft, a transverse elevator supported by the vehicle partially behind said disk-carrying wheels, and gearing connecting said shaft to the driving-shaft of the elevator, substantially as described.

3. A lister or grader comprising a vehicle, a transverse shaft supported thereby, disk-carrying wheels secured on said shaft, a transverse elevator supported by the vehicle partially behind said disk-carrying wheels, a scoop secured to the front of the elevator-frame and inclined downwardly toward said disk-carrying wheels, and gearing connecting said shaft to the driving-shaft of the elevator, substantially as described.

4. The combination, with the tender, of hangers secured to opposite sides of the tender, one of said hangers being adjustable forward and back, a transverse shaft supported by said hangers, disk-carrying wheels fixed on said shaft, and an elevator positioned partially behind the disk-carrying wheels; substantially as described.

5. The combination, with the tender, of hangers secured to opposite sides thereof, a vertically-adjustable bearing in one of said hangers, a shaft supported by said bearing and the other hanger, disk-carrying wheels fixed upon said shaft, and an elevator positioned partially behind the disk-carrying wheels, substantially as described.

6. The combination with a tender of a traction-engine, of hangers secured to opposite

sides of the tender, one of said hangers being adjustable forward and back and containing a vertically-adjustable bearing, a transverse shaft supported by said hangers, disk-carrying wheels secured on said shaft, a transverse elevator supported by the tender behind said wheels, said elevator being actuated from said shaft, and a scoop arranged between the disk-carrying wheels, and the elevator, substantially as described.

7. The combination with a tender of a traction-engine, of hangers secured to opposite sides of the tender, one of said hangers being adjustable forward and back and containing a vertically-adjustable bearing, a transverse shaft supported by said hangers, said shaft being extended from one side of the tender, disk-carrying wheels secured on said shaft, a transverse elevator supported by the tender behind said wheels, said elevator being actuated from said shaft, and a scoop arranged between the disk-carrying wheels and the elevator, substantially as described.

8. The combination, with a vehicle, of a transverse rotatable shaft carried thereunder, disk-carrying wheels secured on said shaft, a transverse elevator supported by the vehicle partially behind said disk-carrying wheels, that portion of the elevator directly behind said wheels being approximately horizontal, and the remaining portion of the elevator being extended past one side of the tender and inclined upwardly from said horizontal portion thereof, substantially as described.

9. The combination with a vehicle, of a transverse rotatable shaft carried thereunder, said shaft being extended beyond one side of the tender, spaced disk-carrying wheels secured on said shaft substantially from end to end thereof, a transverse elevator supported by the tender, a portion of said elevator being behind and approximately parallel to said transverse shaft, and another portion of the elevator being inclined upwardly and extending in the opposite direction from that in

which said shaft is extended, substantially as described.

10. In a lister or grader, a vehicle, and a conveyer, in combination with an adjustable shaft, a plurality of spaced wheels fixed thereon, and a plurality of disks mounted on each of said wheels, said disks being arranged alternately on opposite sides of each wheel, but all disks facing in the same direction, substantially as described.

11. A lister or grader comprising a vehicle, and a conveyer, in combination with a rotatable shaft, a plurality of spaced wheels secured concentrically on said shaft, an eccentric shaft passing through said wheels parallel to the aforesaid shaft, and disks mounted on said eccentric shaft, all of said disks being faced in the same direction, substantially as described.

12. A lister or grader comprising a conveyer and a tender, in combination with a traction-engine, a transverse rotary shaft carried by the tender, said shaft being extended beyond one side of the tender, means for raising or lowering the extended end of said shaft, disk-carrying wheels, and means whereby the said shaft is driven from the crank-shaft of the engine, substantially as described.

13. The combination, with a traction-engine and its tender, of a transverse rotatable shaft supported by the tender, a plurality of disk-bearing wheels secured on said shaft, a transverse elevator carried by the tender adjacent to said disk-bearing wheels in position to receive material thrown up by the disks on said wheels, a driving connection between said shaft and the engine, and a driving connection between said shaft and the elevator, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

SAMUEL MOWER.

Witnesses:

K. M. IMBODEN,
M. L. LANGE.