

No. 782,046.

PATENTED FEB. 7, 1905.

J. L. OWENS.
THRESHING MACHINE.
APPLICATION FILED FEB. 12, 1901.

4 SHEETS—SHEET 1.

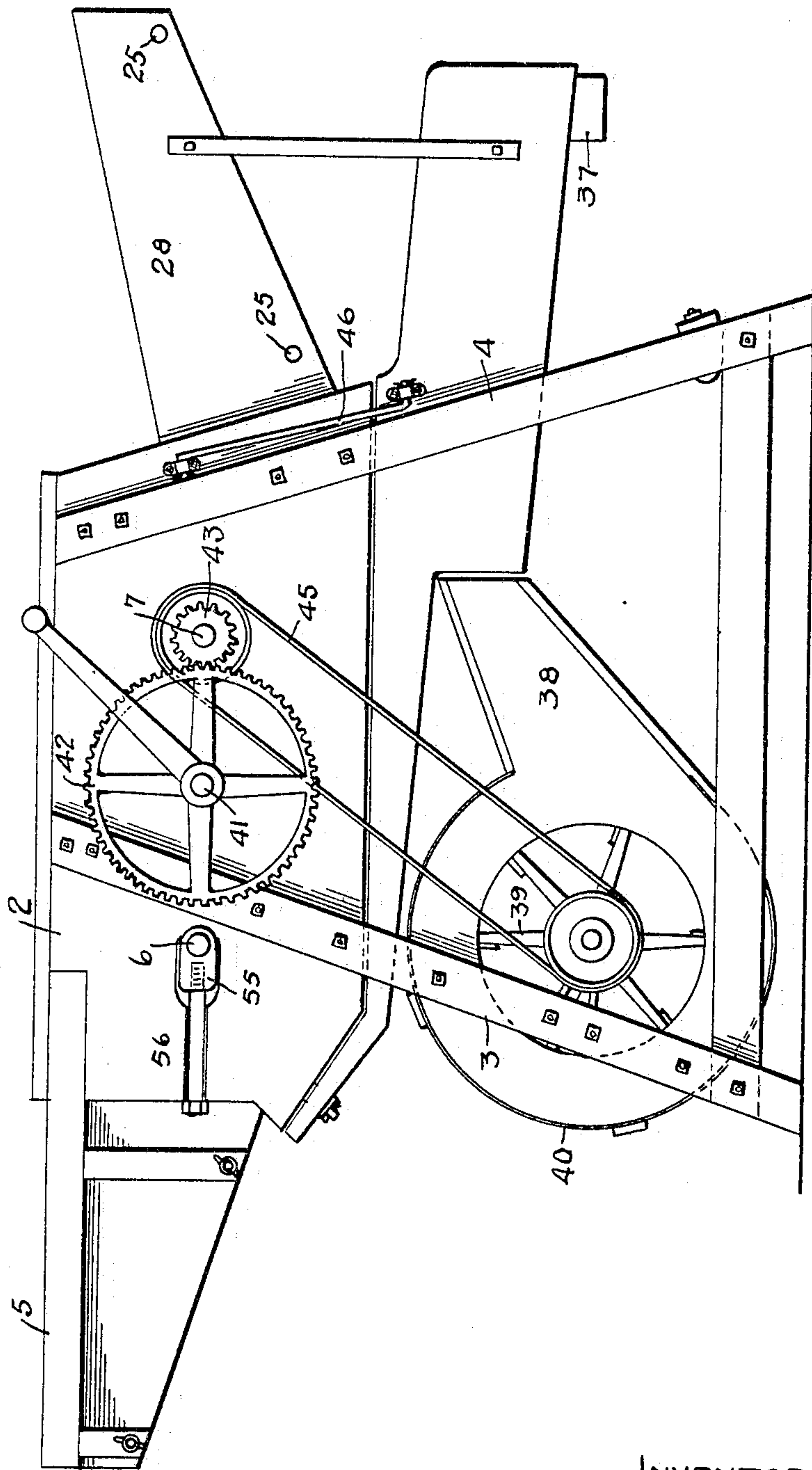


Fig. 1.

WITNESSES
E. G. Stauss
Richard Paul.

INVENTOR
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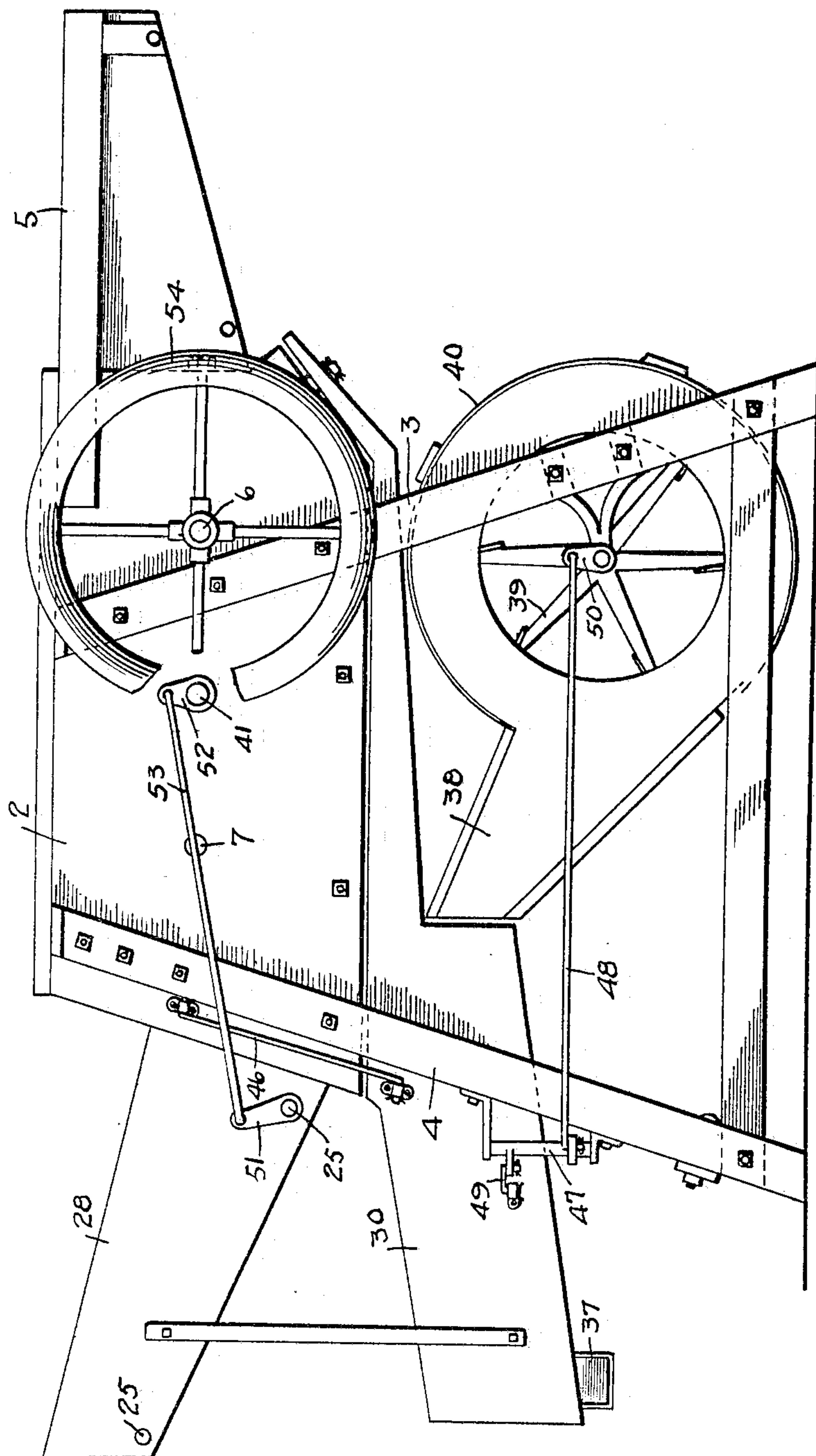


Fig. 2:

WITNESSES

E. G. Stause
Richard Paul.

INVENTOR

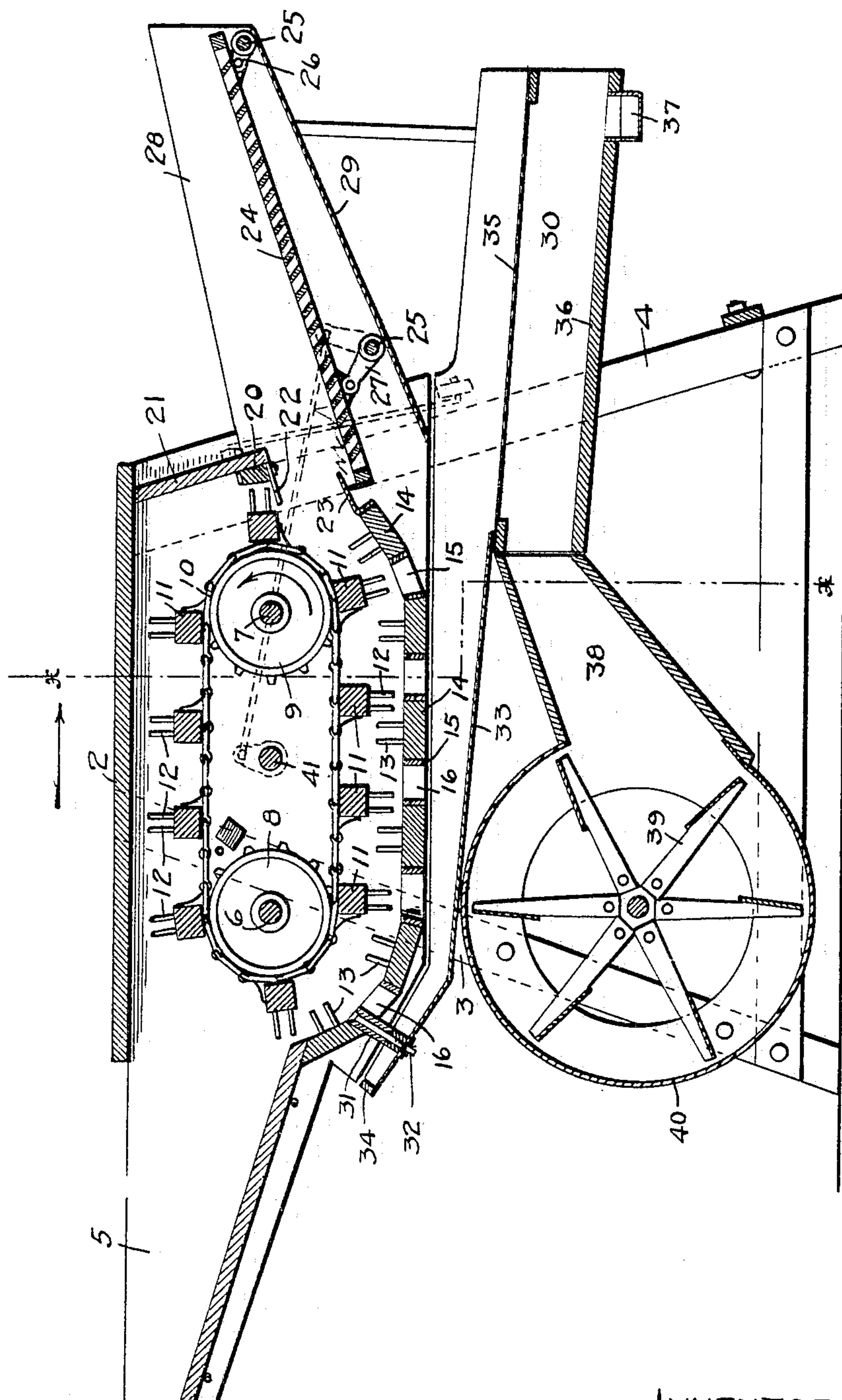
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4 SHEETS—SHEET 3.



WITNESSES

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4 SHEETS—SHEET 4.

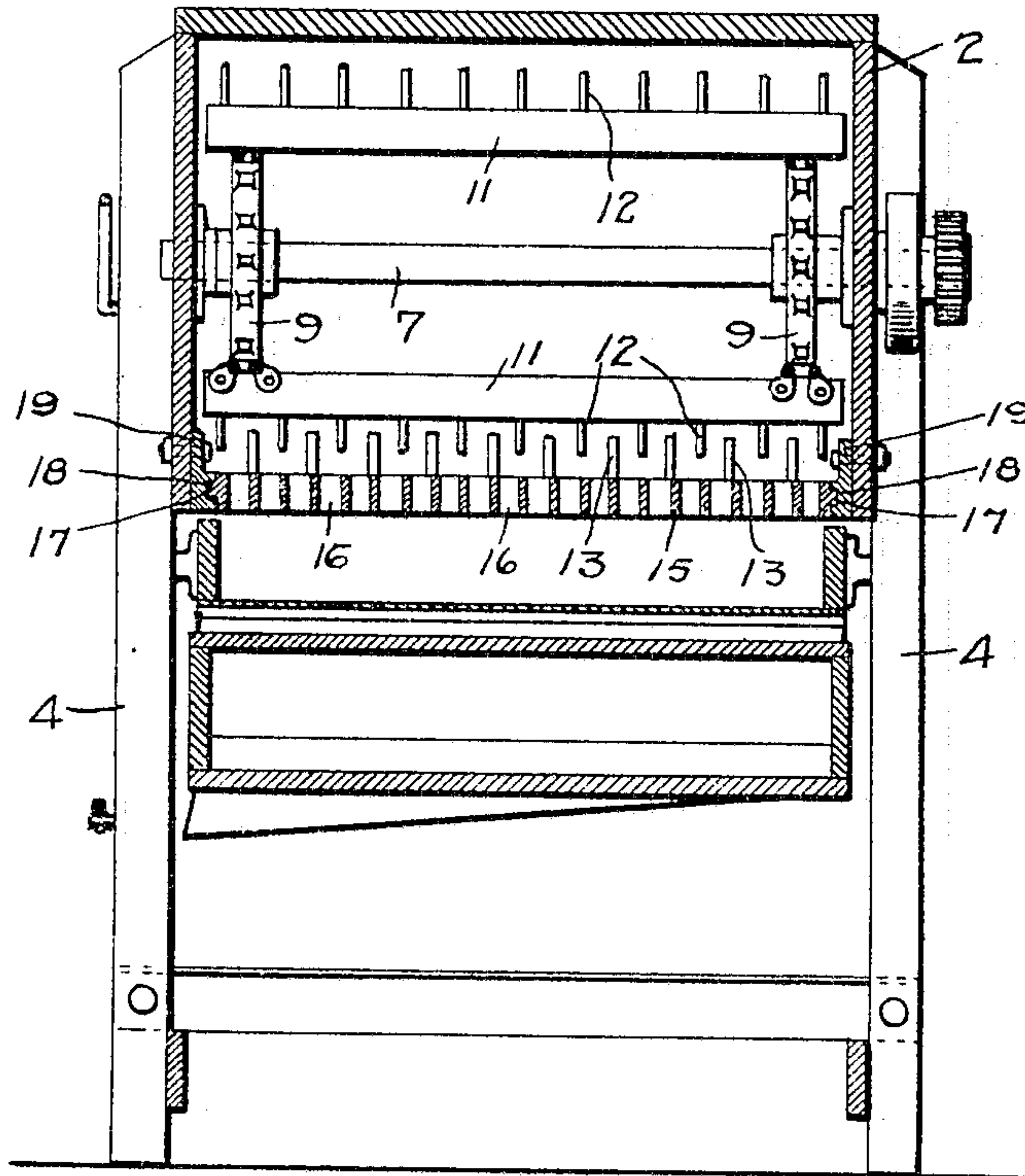


FIG. 4.

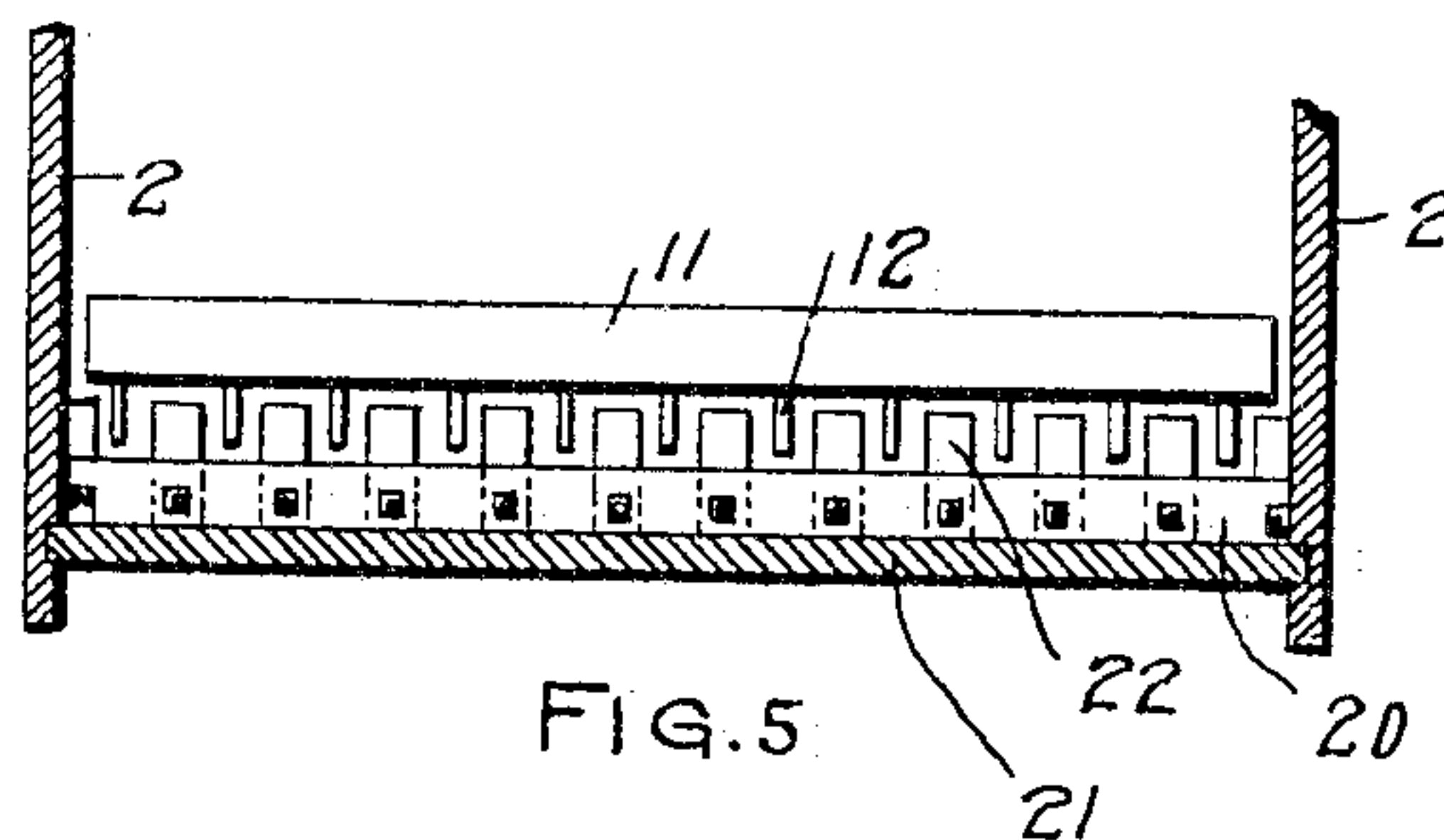


FIG. 5.

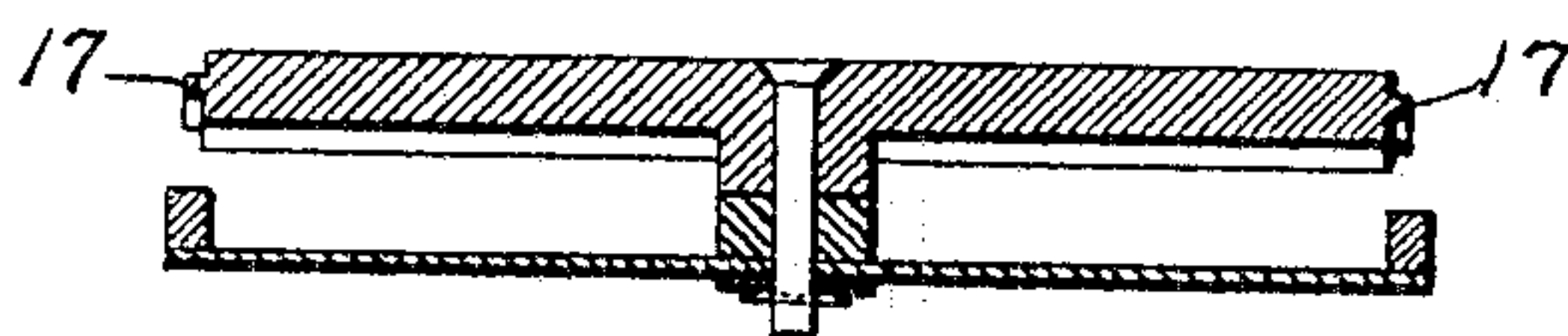


FIG. 6.

WITNESSES
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UNITED STATES PATENT OFFICE.

JOHN L. OWENS, OF MINNEAPOLIS, MINNESOTA.

THRESHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 782,046, dated February 7, 1905.

Application filed February 12, 1901. Serial No. 47,054.

To all whom it may concern:

Be it known that I, JOHN L. OWENS, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Threshing-Machines, of which the following is a specification.

The invention relates to threshing-machines, and particularly to that class used for threshing beans and peas.

10 The primary object of the invention is to provide a machine having a large threshing-surface, and in consequence a greater capacity than the cylinder-machines of this character in general use.

15 A further object is to provide a machine that is simple in construction, compact, and easily operated.

Other objects will appear from the following detailed description.

20 The invention consists generally in a threshing-machine having a fixed member or concave provided with a flat central portion and upturned ends with a series of projecting pins or teeth and with suitable slots and a cooperating flexible belt member, also provided with projecting pins or teeth and arranged to move over the fixed member with its pins or teeth traveling in the spaces between the pins or teeth on the fixed member.

30 The invention consists, further, in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a similar view of the opposite side of the machine. Fig. 3 is a longitudinal vertical section. Fig. 4 is a transverse section on the line *xx* of Fig. 3. Fig. 5 is a section on the line *yy* of Fig. 3. Fig. 6 is a detail of the means for supporting the sieve-shoe.

45 In the drawings, 2 represents a suitable casing inclosing the mechanism of the machine supported upon the legs 3 3 and 4 4. These legs are connected by suitable cross bars or braces.

5 is a hopper wherein the beans or peas to be threshed are placed, the bottom of the hop-

per being inclined toward the threshing mechanism.

6 and 7 are shafts mounted in the wall of the casing and provided, respectively, with sprockets 8 and 9, connected by chains 10. Upon these chains at intervals I arrange a series of slats or bars 11, secured by rivets or other suitable means and provided with rows of pins 12. These pins alternate in position from one side of the bar to the other and are adapted to coact with a corresponding series of pins 13, provided in a concave beneath said bars. The sprocket-chains, bars, and pins constitute the endless flexible belt member of the threshing-machine. The concave is preferably made up of a series of sections, solid wooden bars 14 alternating with castings 15, having a series of slots or openings 16. The pins 13 are arranged in the bars 14, and each bar has tongues 17 to enter correspondingly-shaped grooves 18, provided in plates 19, that are secured to the side walls of the casing. Each casting has tongues also adapted to enter the grooves 18, and in assembling these parts of the concave I first slide one of the bars 14 into its groove or guideway, then insert one of the castings 15, followed by another wooden bar, and so on until the concave is completed. With this construction I am able to arrange two or more of the wooden bars side by side instead of alternating them with the slotted castings, and I am also able, if desired, to place two or more of the castings together. If a casting should accidentally become damaged or any of the pins in the concave bent or broken, the section can be readily removed from the concave and repaired. This concave constitutes the fixed member of the threshing-machine. The stalks of peas or beans placed in the hopper will be caught by the teeth 12 of the moving belts and carried down into the space above the concave, where the pods will be opened or broken and the peas or beans allowed to fall through the slots or openings in the casting. The concave extends nearly the entire length of the machine and in connection with the toothed threshing-belt above presents a larger threshing-surface than is found in cylinder-

machines of this character and thoroughly and rapidly threshes the material fed into the machine. Moreover, the flexible belt is capable of yielding slightly as it passes over the fixed member or concave, and thereby there is less liability to breakage than where both members are rigid.

Near the rear end of the concave I prefer to provide a bar 20, supported on a cross-plate 21 and carrying a series of plates 22, arranged at intervals and coacting with the teeth of the conveyer. These plates prevent the bean or pea stalks from being carried up into the top of the machine and back to the hopper by the teeth of the threshing-belt during their return movement. The bar 14 at the rear end of the concave is provided with a flexible plate or flap 23, overlapping a slotted or perforated shaker 24, that is connected with shafts 25 by short and long links 26 and 27. This shaker is inclined toward the concave and is arranged within a suitable box or casing 28, having an inwardly-inclined floor 29. The stalks and pods after leaving the concave and toothed belt are deposited on the shaker, and any loose beans or peas therein will be shaken out and falling through the slots in the shaker upon the floor 29 will be directed thereby back into the machine beneath the concave. To receive the beans or peas falling through the concave and from the floor 29, I provide a shoe 30, pivotally supported on a stud 31 by means of a pin 32 and having a plate or floor 33, whereon the beans or peas fall from the mechanism above. The plate 33 near the pivoted end of the shoe is upwardly inclined to conform to the curve of the concave, and a bar 34 prevents the discharge of beans or peas at that end of the plate. The inclination of the plate is toward the discharge end of the shoe, so that the material deposited thereon will be delivered to a sieve 35. The meshes of this sieve are sufficiently coarse to allow the beans or peas to fall through, while the coarse refuse material, such as pods and broken pieces of stalks, that fall through the concave or the shaker will be carried over the sieve and discharged out of the machine at the end of the shoe. The sieve may be removable, so that sieves of different mesh may be employed whenever preferred. After passing through the sieve the beans or peas fall upon a floor 36, that near the outer end of the concave is provided with a spout 37. A considerable quantity of dust and fine refuse material will fall through the sieve with the beans, and to carry this away out of the machine I provide an air-trunk 38 near the inner end of the floor 36, said trunk leading to a blast-fan 39, mounted within a casing 40. The operation of the fan will direct a blast of air under and through the sieve and through the material falling therefrom, lifting out the light dusty particles and carrying them out of the machine, so that

the beans upon reaching the spout 37 will be comparatively clean and marketable.

Any suitable means may be provided for operating the mechanism of this machine. I prefer, however, to mount a driving-shaft 41 in the casing 2, providing thereon a large gear-wheel 42, that meshes with a small gear 43 on a shaft 7, said shaft being connected by a belt 45, passing over suitable pulleys to the fan-shaft. The shoe 30 is pivotally supported on each side by links 46 and is operated through a crank 47 and pitman 48, connected, respectively, with the shoe and with the fan-shaft by a link 49 and crank-arm 50. The inner shaft of the shaker is preferably provided with a crank-arm 51, connected with a similar arm 52 on the driving-shaft by a pitman 53. The shaft 6 on one side of the machine is preferably provided with a fly-wheel 54, and said shaft is mounted in blocks 55, that are adjustable in slots in the casing by means of bolts 56. This construction is for the purpose of adjusting the shaft to tighten up or loosen the conveyer-chains.

Various modifications in the threshing mechanism and in the manner of driving the same will suggest themselves to any one skilled in this art, and I do not, therefore, wish to confine myself to the details herein set forth.

By employing an endless toothed belt or apron in place of the usual threshing-cylinders I am able to provide a large threshing-surface within a comparatively small space. When material to be threshed enters the machine, it is caught by the teeth of the belt and carried for a considerable distance over the toothed plate or concave, and this distance may be readily increased by providing a belt of greater length and a concave having a correspondingly-increased threshing-surface. To provide as large a threshing-surface as I am able to employ by the use of the toothed belt in a cylinder-machine, would necessitate the use of cylinders of such diameter as would be impracticable.

This machine besides being used for threshing beans and peas is also particularly adapted to threshing flax or grass seed, in which case I prefer to provide a greater number of teeth on the belt and on the concave and arrange them nearer together. In other respects the mechanism of the machine would remain substantially the same. It is obvious that instead of providing all the teeth on the wooden bars and all the slots in the castings of the concave I may provide slots as well as pins in the wooden bars and form pins on the castings alternately with the slots therein.

The advantages of this machine are, first, large threshing capacity in compact form; second, capability of having its threshing members enlarged or decreased by inserting or removing sections in the concave or fixed member and lengthening or shortening the

flexible belt member; third, the capability of yielding possessed by the flexible belt member while coöperating with the concave or fixed member. These advantages are all pos-
 5 sessed by this machine, which is also simple and cheap in construction, easily operated, and easily repaired.

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

10 1. In a threshing-machine, the combination, with a fixed member having a straight or flat middle portion and provided with projecting pins or teeth, of a flexible belt member provided with projecting pins or teeth, and means
 15 for supporting said belt member and moving it over said fixed member with its pins or teeth traveling in the space between the pins or teeth throughout its length of said fixed member.

20 2. In a threshing-machine, the combination, with a fixed member having a straight or flat middle portion and upturned ends, and provided with projecting pins or teeth, of a flexible belt member, provided with projecting
 25 pins or teeth, and means for supporting said belt member and moving it over said fixed member with its pins or teeth traveling in the spaces between the pins or teeth on the fixed member.

30 3. In a bean or pea threshing machine, the combination, with a casing having a suitable hopper, of shafts provided in said casing, wheels thereon, belts connecting said wheels, bars connecting said belts at intervals, pins
 35 provided in said bars and alternately arranged near the opposite outer edges thereof, a slotted concave provided beneath said belts comprising wooden and metal bars alternately ar-

ranged, and pins arranged in pairs in said wooden bars and adapted to coact with the
 40 pins of said belts.

4. In a pea and bean threshing machine, the combination of the slotted concave provided with upwardly-extending teeth, and an endless flexible belt provided with tranverse toothed
 45 bars spaced to leave intervals between them of greater width than the width of the bars and arranged to travel over the concave, substantially as described.

5. In a pea and bean threshing machine, a
 50 concave formed of alternate wood and metal slats or bars one set of which is slotted, teeth projecting from the upper face of the bars or slots, and an endless flexible belt provided with transverse toothed bars and arranged to
 55 travel above the concave and have its teeth co-operate with the teeth of the concave to hull the peas or beans, substantially as described.

6. In a threshing-machine, the combination, with a fixed member having a straight or flat
 60 middle portion and provided with projecting pins or teeth and with discharge-openings for the seed at intervals between said teeth, of a flexible belt member provided with project-
 65 ing pins or teeth, and means for supporting said belt member and moving it over said fixed member with its pins or teeth traveling in the spaces between the pins or teeth of said fixed member.

In witness whereof I have hereunto set my
 70 hand this 5th day of February, 1901.

JOHN L. OWENS.

In presence of—

RICHARD PAUL,
 M. C. NOONAN.