

W. MILBRATH.
FANNING MILL.
APPLICATION FILED MAR. 12, 1908.

904,885.

Patented Nov. 24, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

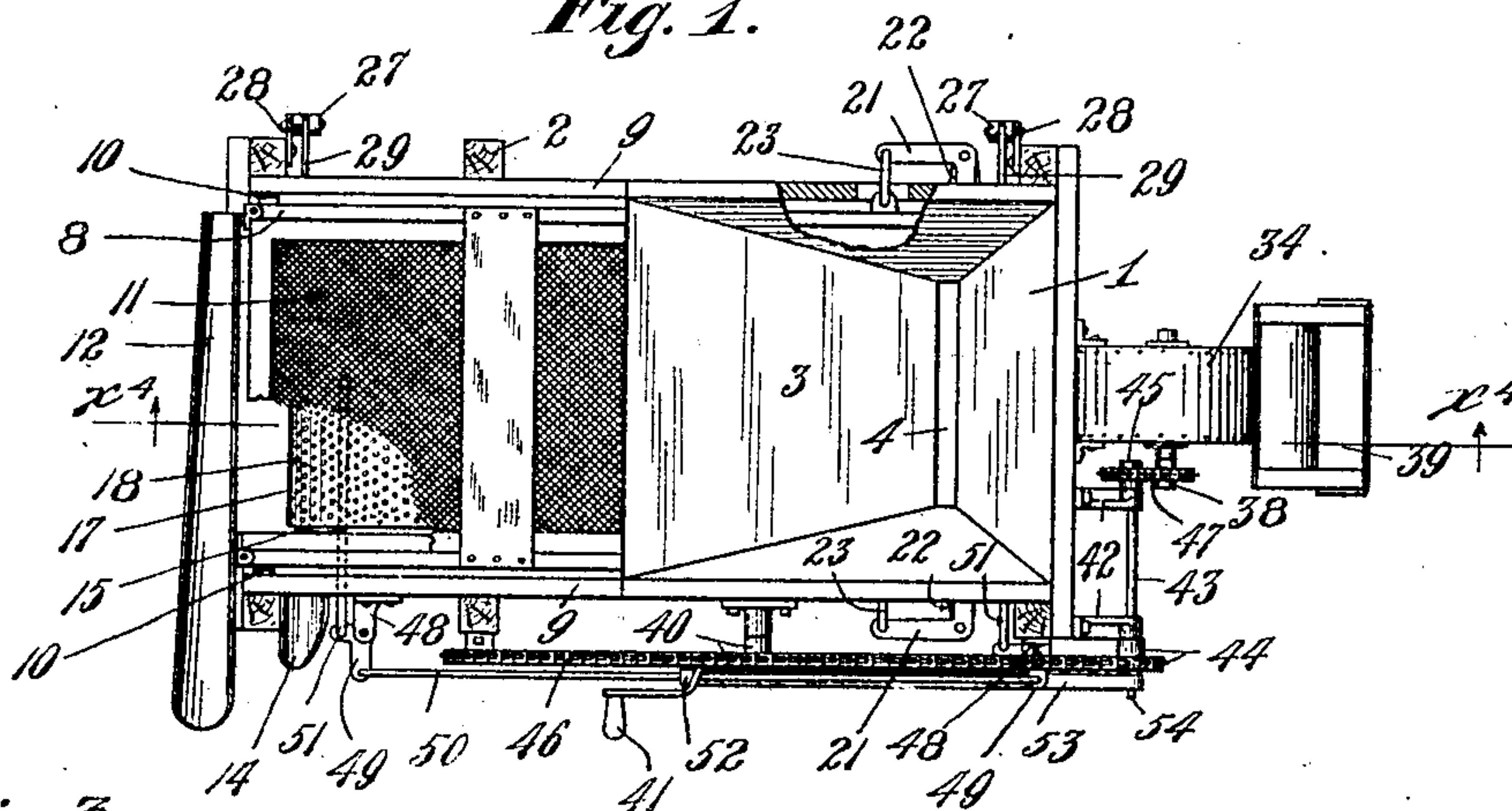


Fig. 3.

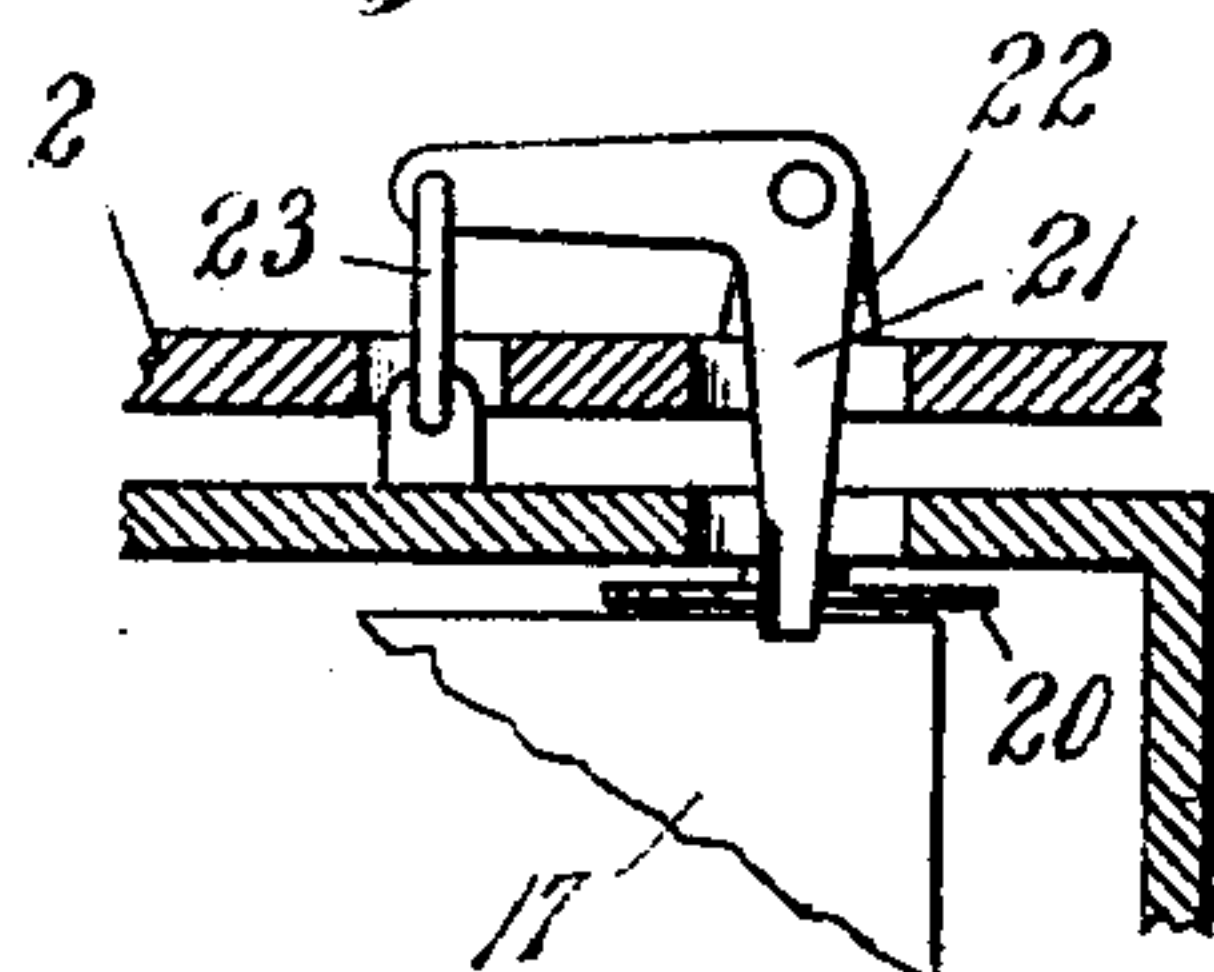
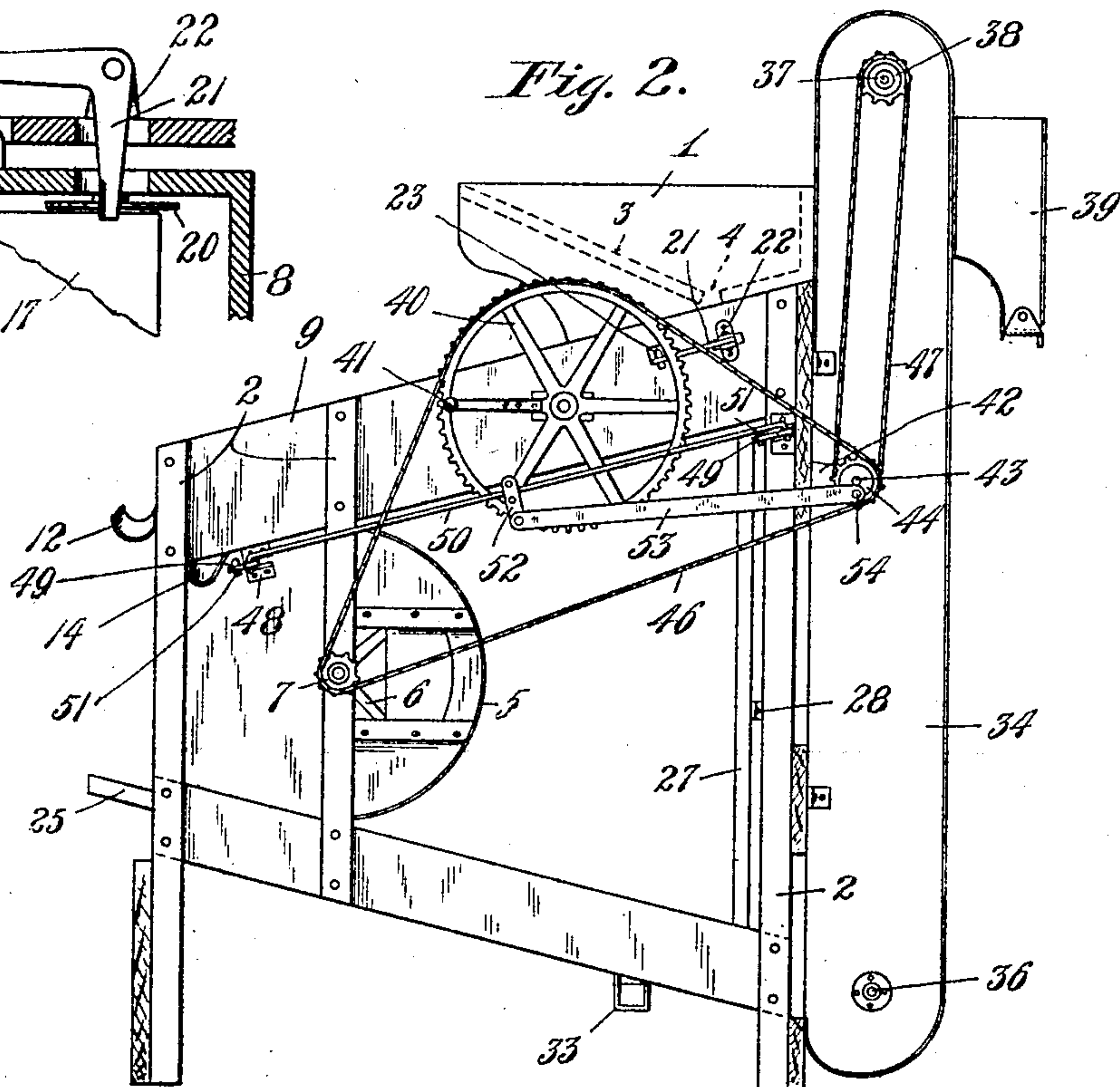


Fig. 2.



Witnesses.

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2 SHEETS—SHEET 2.

Fig. 4.

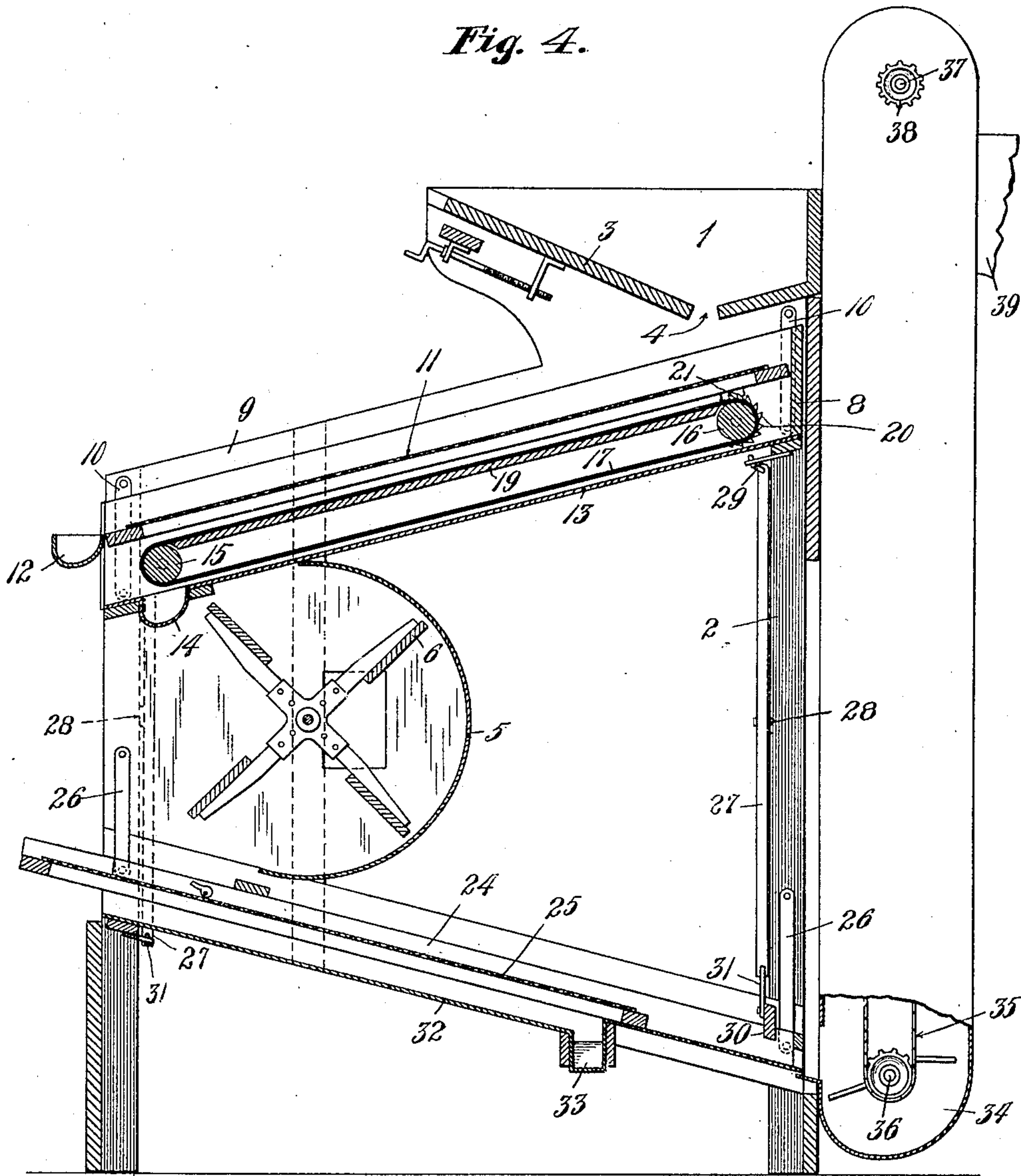
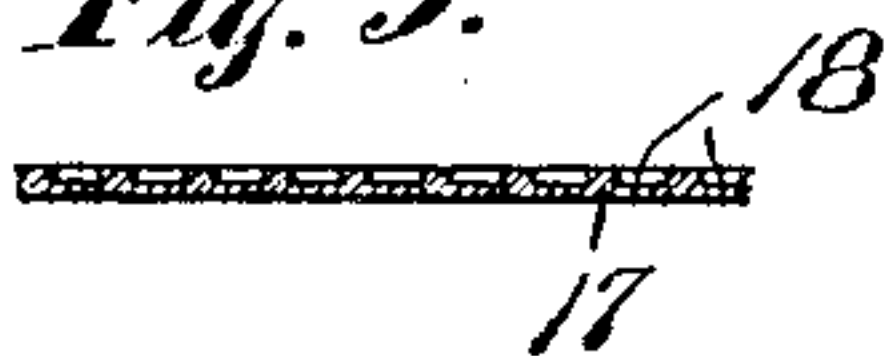


Fig. 5.



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UNITED STATES PATENT OFFICE.

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FANNING-MILL.

No. 904,885.

Specification of Letters Patent.

Patented Nov. 24, 1908.

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To all whom it may concern:

Be it known that I, WILLIAM MILBRATH, a citizen of the United States, residing at Lakefield, in the county of Jackson and State of Minnesota, have invented certain new and useful Improvements in Fanning-Mills; and I do hereby 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.

My invention relates to grain separators of the fanning mill type, and has for its object to improve the same in the several particulars hereinafter noted.

The invention consists of the novel devices and combinations of devices hereinafter described and defined in the claim.

In the accompanying drawings which illustrate my invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a plan view of the improved fanning mill, some parts being broken away. Fig. 2 is a side elevation of the improved fanning mill. Fig. 3 is a detail in horizontal section, illustrating a device for imparting a step by step movement to an endless separating belt, Fig. 4 is a vertical section taken approximately on the line $x^1 x^1$ of Fig. 1, some parts being left in full, and some parts being broken away; and Fig. 5 is a detail showing in section, a portion of the endless separating belt.

The numeral 1 indicates a grain supply hopper which is mounted on the upper portion of a skeleton framework 2 and is shown as provided with an adjustable bottom board 3, by means of which a discharge opening 4 at the bottom of the hopper may be varied at will.

The numeral 5 indicates a fan case secured to the frame 2, and in which works a fan head 6, the shaft of which works at one end and is provided with a small sprocket 7.

Above the fan case and below the hopper, is a vibratory shoe 8 which is mounted for reciprocating movements, transversely of the frame, or in a direction parallel to the axis of the fan shaft, the same, as shown, being supported from the side boards 9 on the upper portion of the frame 2, by means of links 10 that are adapted to yield or spring sidewise to permit vibratory movement of

said shoe. The shoe 8 is provided with an inclined screen 11 which receives directly from the hopper 1 and delivers at its lower end into a laterally extended discharge spout 12. Below the sieve 11 is an inclined imperforate deck 13 which is also carried by said shoe and is provided, near its lower end, with a transversely extended discharge spout 14. Mounted in the sides of the shoe 8, below the screen 11 and above the deck 13, is a pair of guide rollers 15 and 16, over which runs an endless separating belt or apron 17. The so-called "separating belt" 17 underlies the entire separating surface of the screen 11, and it is quite thick, preferably about one-eighth of an inch in thickness, and is provided with closely positioned cups or pockets 18 that cover its entire outer surface. As shown, the upper portion of the belt 17 runs over an inclined supporting deck 19, secured to the sides of the shoe 8. The belt 17 is preferably constructed of rubber, but it may be formed of other flexible materials, such as leather or composition materials made up of rubber, canvas, etc. The shaft of the rollers 16 is provided at one end with a ratchet wheel 20 (see particularly Fig. 3). This ratchet wheel is acted upon by one arm of a pawl acting bell crank 21 that is pivoted to a bracket 22 on one of the frame boards 9, and the other arm of which is connected by a short link 23 to one side of the vibratory shoe 8. As shown and preferred, the pawl and ratchet driving devices 20,—21—23, are duplicated on the other sides of the machine, so that the separating belt 17 will be given an advance movement in both directions of movement of the shoe 8.

Below the fan case is a second vibratory shoe 24 that is provided with a screen 25 that inclines in a reverse direction from the screen 11. This shoe 24 is supported from the frame 2, by yielding links 26. Vibratory motion is imparted to the shoe 24, from the shoe 8, through a long vertically disposed lever 27, intermediately pivoted at 28, to the frame 2. The upper end of the lever 27 is connected to the bottom of the upper end of the shoe 8 by a link 29, and the lower end thereof is connected to a transverse bar 30 of the shoe 24, by means of a link 31.

The upper end of the screen 25 stands in position to receive grain which is discharged off from the lower end of the imperforate deck 13 of the upper shoe. The lower shoe

24, below the screen 25 is an inclined imperforate deck 32 which is formed with an intermediate transversely extended discharge spout 33. The extreme lower portion of the deck 32 discharges into an elevator leg 34 in which works an endless conveyer of the usual or any suitable construction, but involves, as shown, a blade equipped sprocket chain 35, and sprocket equipped shafts 36 and 37, the sprockets of which drive the said chain. The upper sprocket equipped shaft 37, at its outer end, is provided with an additional sprocket 38. As shown, the grain elevated within the leg 34 is discharged into a bag filling hopper 39.

Power for driving the machine is, as shown, applied through a large sprocket wheel 40, mounted on one of the frame boards 9, and provided with a hand crank 41, by means of which it may be readily turned. Journaled in suitable bearings 42 on the frame 2 is a counter shaft 43 that is provided, at its outer end, with a sprocket 44, and at its inner end, with a sprocket 45. A sprocket chain 46 runs over the large sprocket 40 and over the sprockets 7 and 44. Another sprocket chain 47 runs over sprocket wheels 45 and 38. These connections impart the required motion to the fan and to the elevating conveyer within the leg 34.

Mounted on bearing brackets 48 on one of the frame boards 9 is a pair of horizontally disposed bell cranks 49, the outwardly projecting arms of which are connected by a long rod 50, and the other arms of which are connected to the bottom of the vibratory shoe 8 by connecting rods 51. On the long connecting rod 50 is a rigidly secured arm 52. A pitman 53 is pivotally connected at one end to the arm 52, and at its other end is connected to a crank pin 54 which, as shown, is carried by the sprocket 44.

Through the connections just described, the rotary motion of the crank connecting sprocket 44 will impart vibratory movements to the upper shoe 8 transversely of the machine; and through the connections previously described, such vibratory movements will be transmitted to the lower shoe 24.

A machine of the character described is particularly adapted for separating wild oats, cockle and various other materials, from wheat. The mixed material being delivered from the hopper 3 onto the screen 11, the chaff and coarse materials will be carried off over the said screen, and delivered into the discharge spout 12, while the wheat, wild oats and other materials will pass through the perforations or meshes of the said sieve and will fall upon the inclined

upwardly traveling endless separating belt 17. The small materials, such as cockle, broken wheat and small oats, will fall into the pockets 18 of the separating belt 17, and will be carried upward thereby and discharged onto the upper portion of the imperforate feed deck 13. As the belt 17 passes over the roller 16, the upper portion of the pockets 18 will be expanded, thereby releasing any of the material that otherwise would not drop out. The wild oats which has a beard or fuzz, will also adhere to the belt 17 and will be carried upward and delivered onto the deck 13. All material delivered onto the upper portion of the deck 13 will run down into the laterally extended discharge spout 14, and will be discharged thereby from the machine. The wheat will run down the inclined upper surfaces of the belt 17, will fall therefrom onto the extreme lower end of the deck 13 and from thence will be precipitated onto the upper end of the screen 25, but while making this descent, it will be subjected to a blast from the fan and all light materials will be blown therefrom. The mesh of the sieve 25 is such that it will not pass therethrough good wheat, but will permit small seeds to pass therethrough, the latter being finally caught by the spout 33, while the wheat is delivered into the elevator leg 34, and by the elevator conveyer will be delivered into the bag filling hopper 39. The machine described, while of comparatively small cost, has in practice been found efficient for the purposes had in view.

What I claim is:

In a machine of the character described, the combination with a hopper, of a vibratory shoe mounted below said hopper, a screen on said shoe, an inclined imperforate deck on said shoe below said screen, an endless separating belt made of flexible material mounted to run between said screen and said deck, and provided with pockets on its outer face, said deck having a transverse discharge spout located under said endless separating belt, guide rollers and coöperating devices for imparting motion to said endless belt, a second screen arranged to receive grain discharged from said endless separating belt, and an intermediately pivoted lever for transmitting vibratory movement from the upper shoe to the lower screen, substantially as described.

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

WILLIAM MILBRATH.

Witnesses:

THOS. GEISNETT,
O. THORESM.