

No. 713,049.

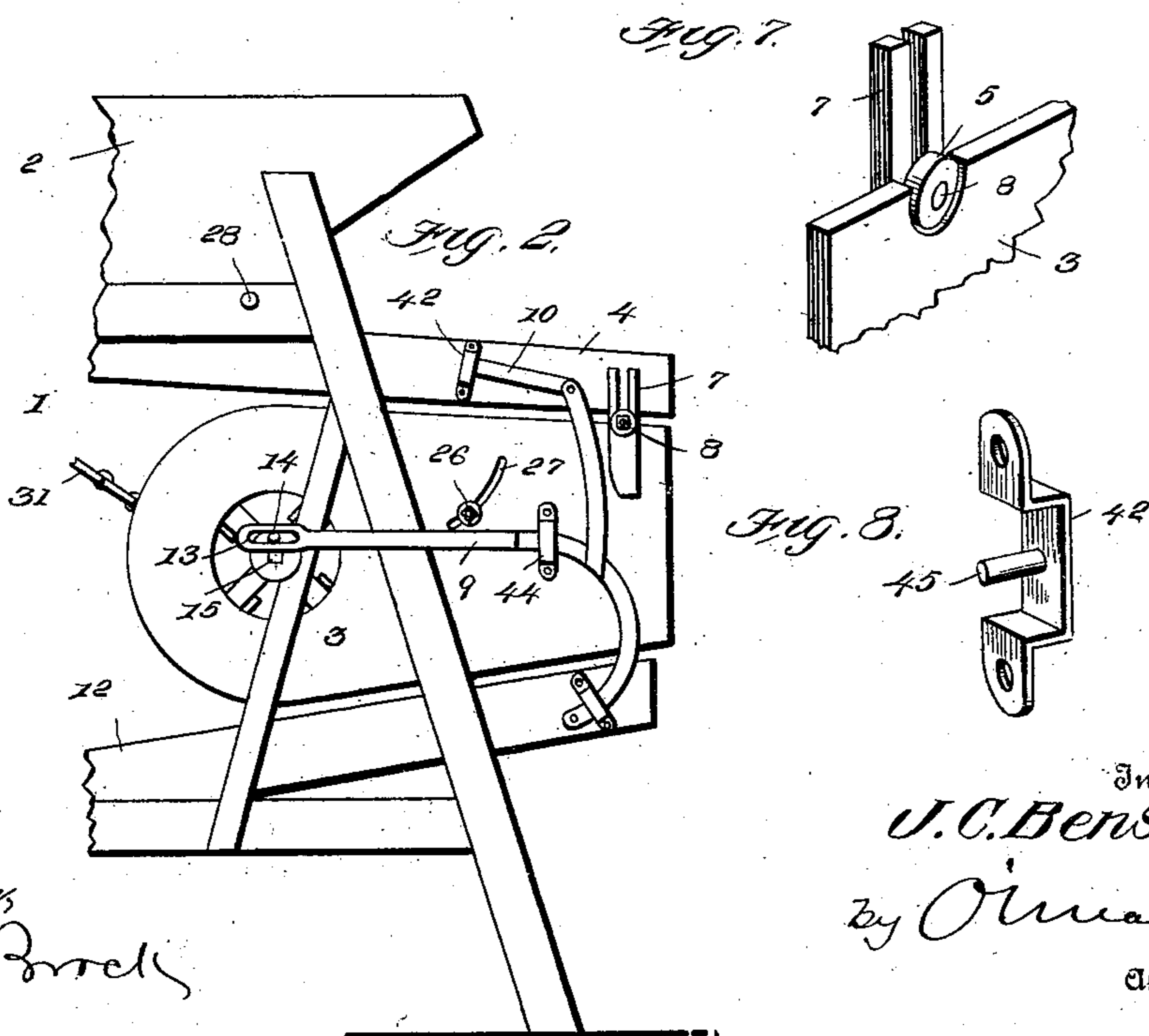
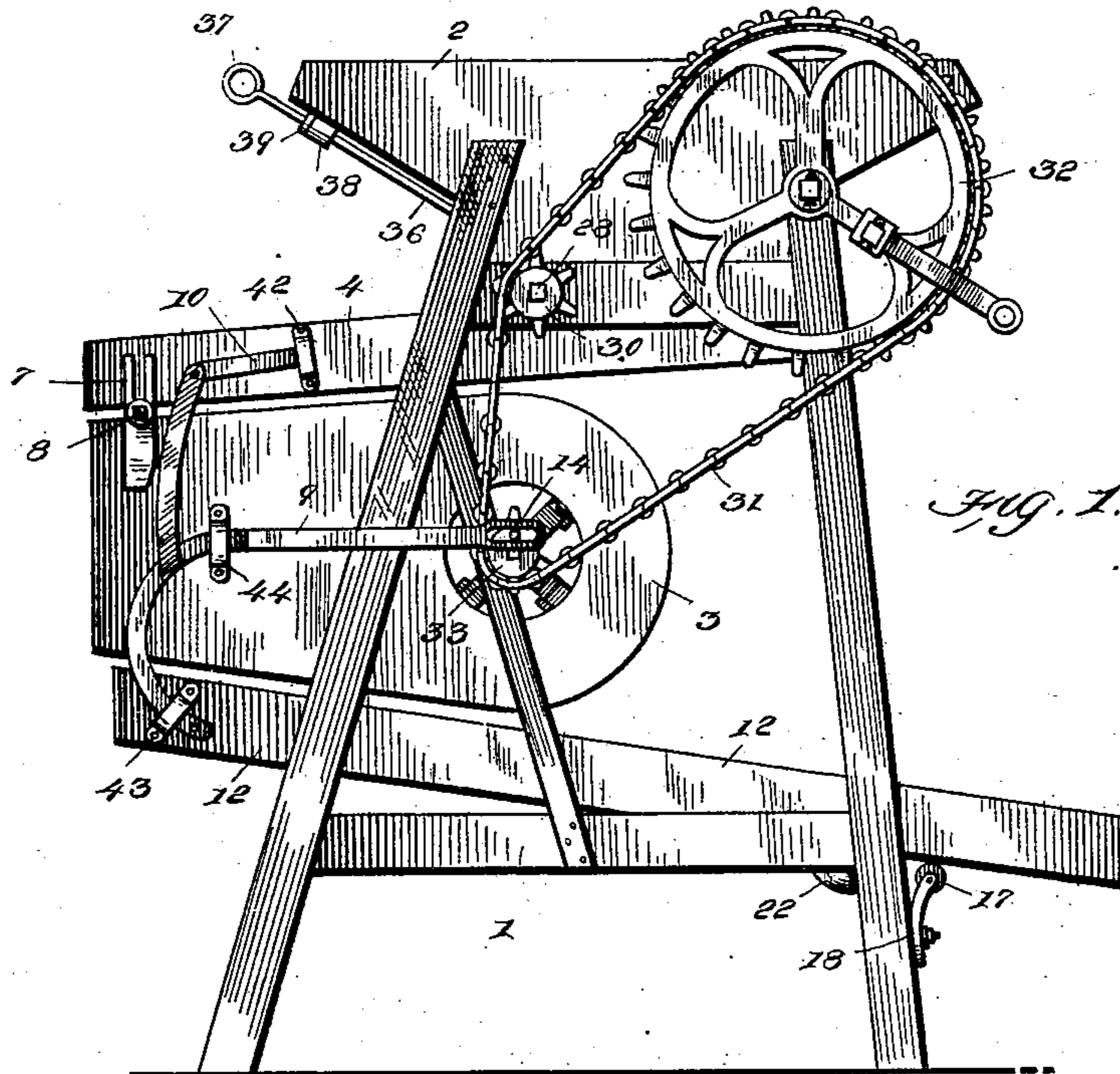
Patented Nov. 11, 1902.

J. C. BENSON.
GRAIN CLEANER AND SEPARATOR.

(Application filed July 28, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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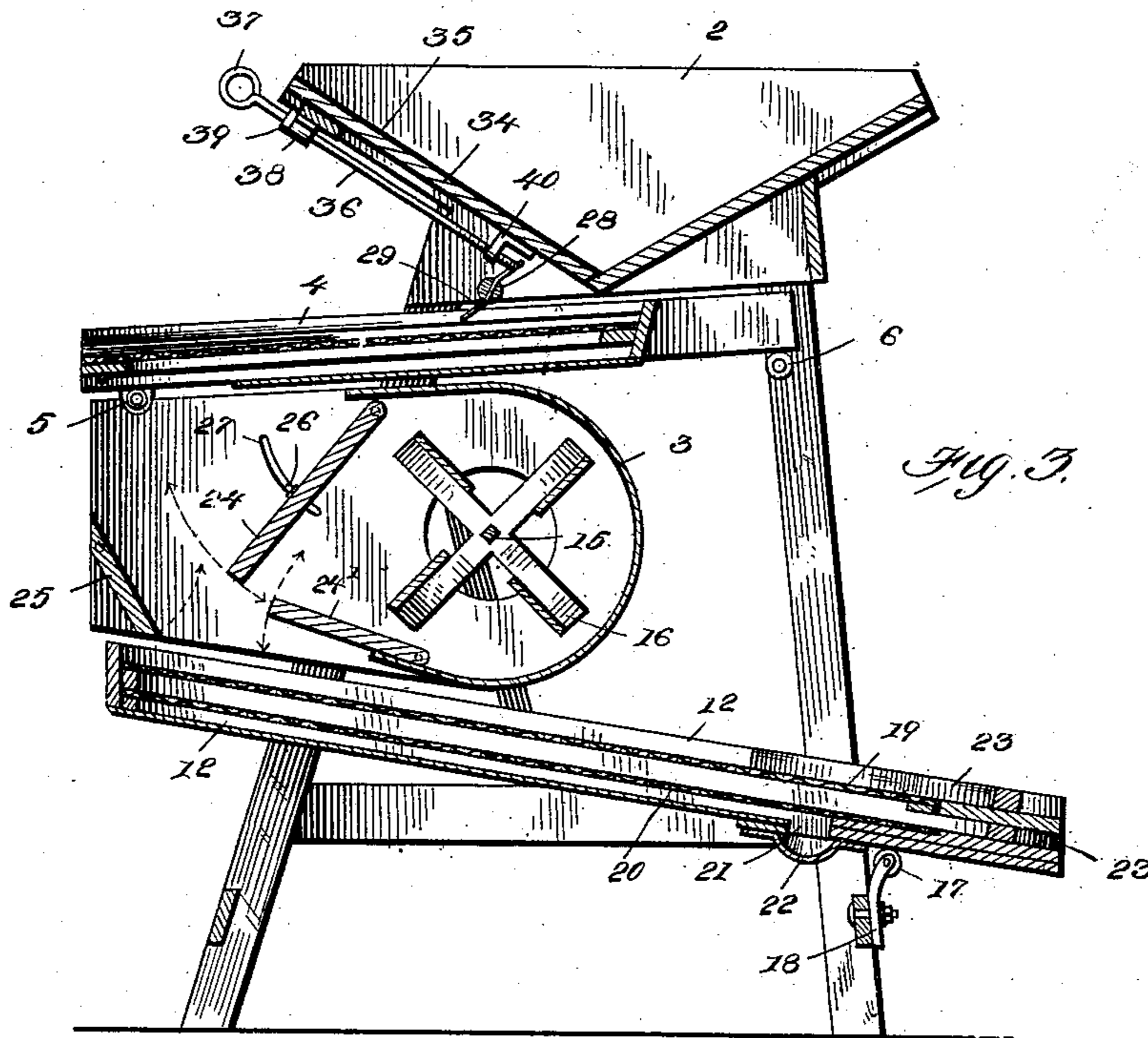


Fig. 4.

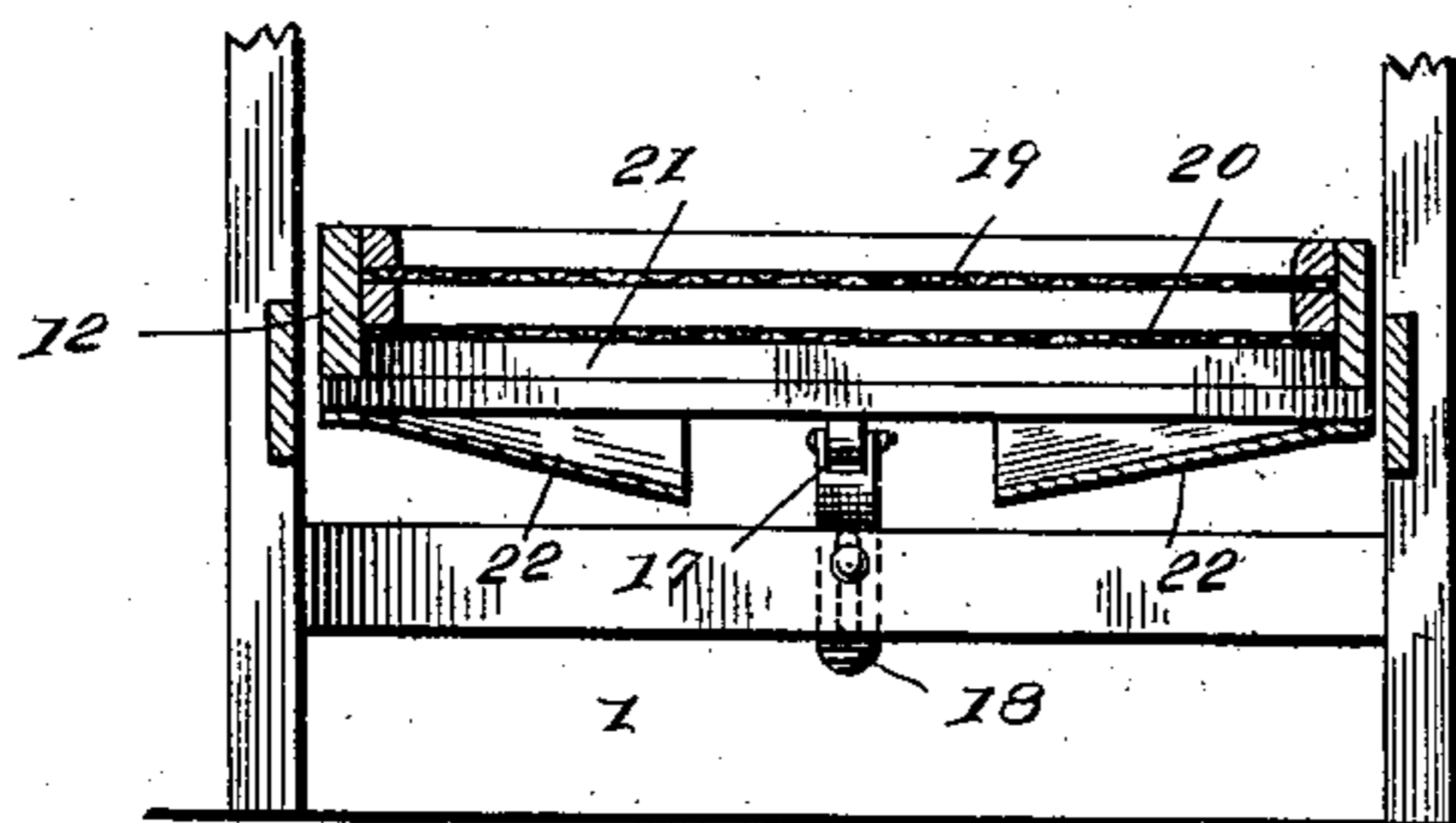


Fig. 6.

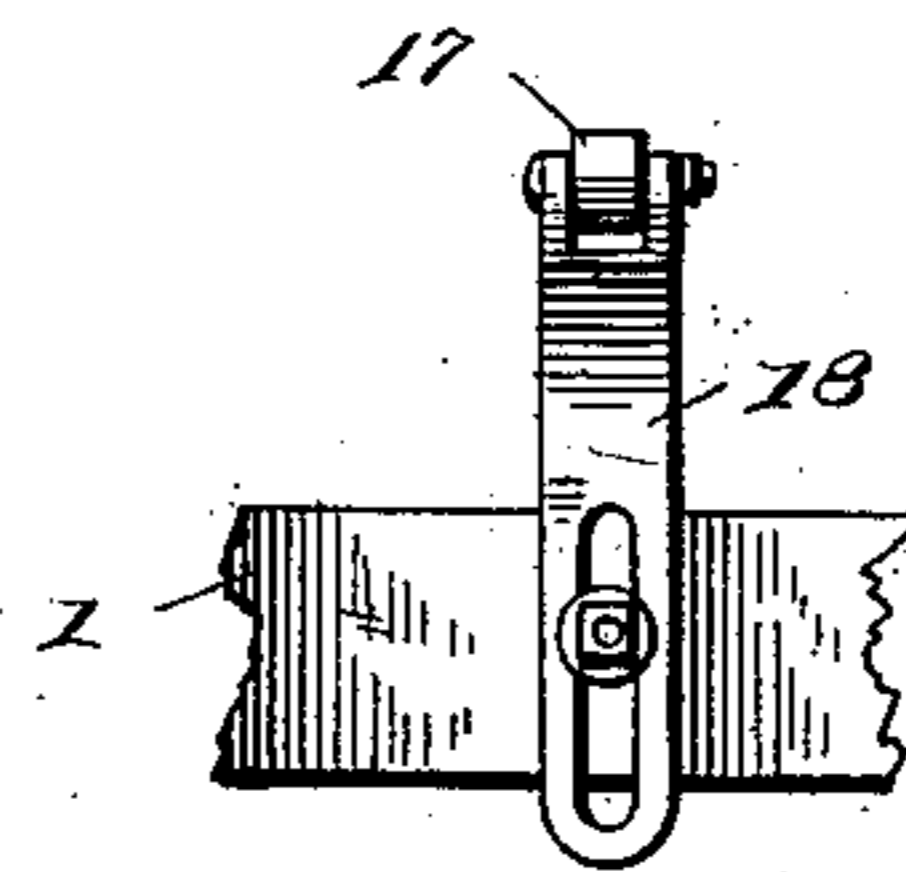
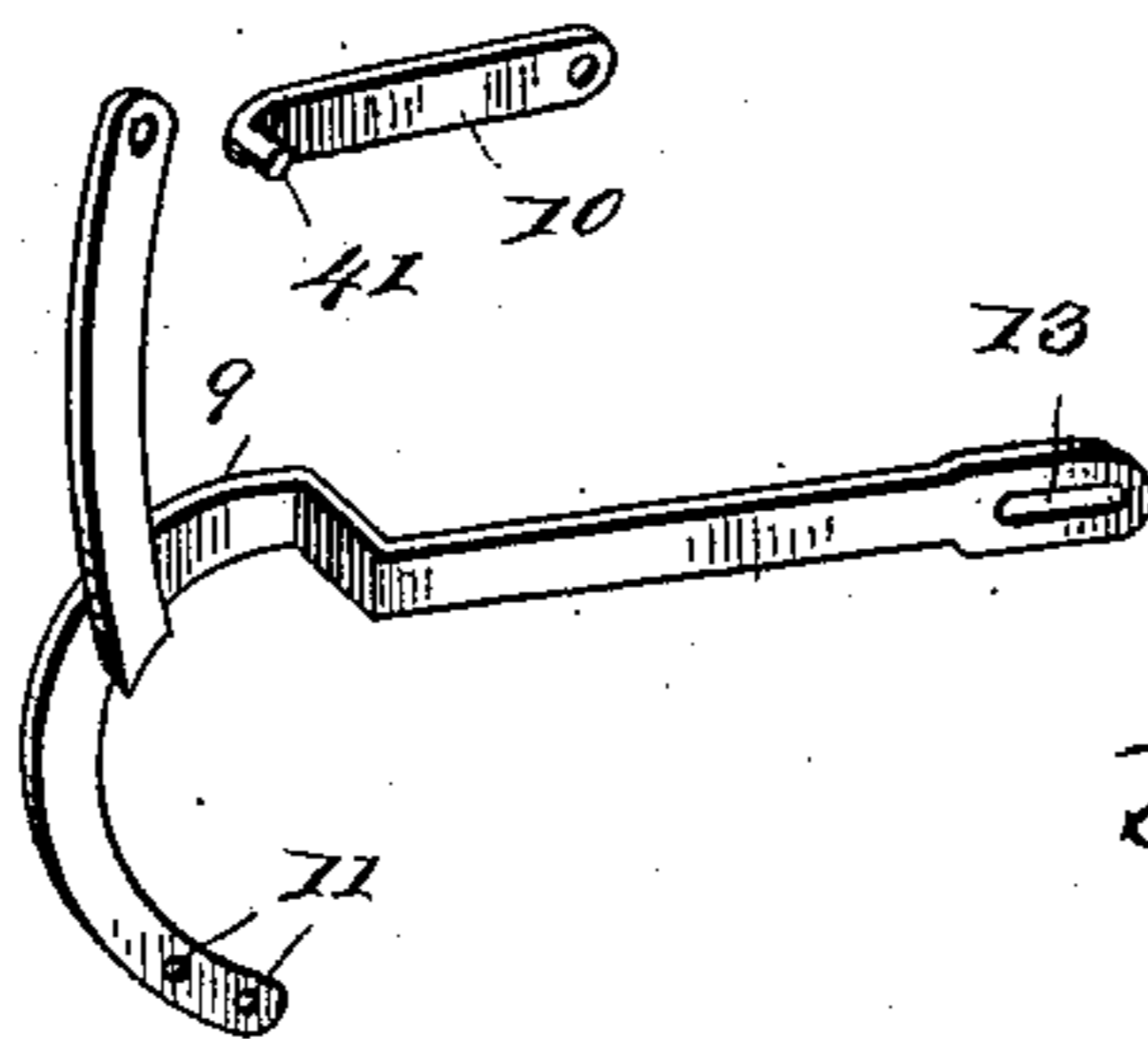


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES C. BENSON, OF ALCONY, OHIO.

GRAIN CLEANER AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 713,049, dated November 11, 1902.

Application filed July 28, 1900. Serial No. 25,148. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. BENSON, a citizen of the United States, residing at Alcony, in the county of Miami and State of Ohio, have invented a new and useful Improvement in Grain Cleaners and Separators, of which the following is a specification.

My invention relates to grain-separators, and more particularly to that class of devices in which the grain is cleaned and separated and graded at the same time; and it has for one of its objects to provide an exceedingly cheap and simple machine which will thoroughly separate all of the chaff from the grain and simultaneously separate the grain itself.

Another object is to provide an improved means for operating the grain-separating shoes and simultaneously revolving the rotary fan and operating a stirrer or agitator directly under the hopper and over the top shoe for the purpose of more thoroughly stirring the material passing through the machine to expose it to the current of air from the rotary fan.

Another object is to provide the rear portion of the machine with suitable boards and deflectors for controlling the direction of the material in its passage from the upper to the lower shoe and also in passing the current of air through the material.

Another object is to provide an improved arrangement for supporting the reciprocating shoes within the main frame and providing a supporting-roller underneath and directly in the center of the lower shoe and in providing means for adjusting the height or pitch of the rear end of both shoes.

Another object is to provide a double elbow-lever on each side of the mill in position to engage with both of the shoes and also with the operating mechanism for giving the shoes the necessary reciprocating motion.

With these objects in view my invention consists in the improved construction and novel arrangement of the various parts of a grain cleaner and separator, as will be hereinafter more fully set forth.

In the accompanying drawings, in which the same reference-numerals indicate corresponding parts in each of the views in which they occur, Figure 1 is a side view of my im-

proved cleaner and separator. Fig. 2 is a similar view of a portion of the opposite side. Fig. 3 is a vertical central sectional view, and Figs. 4, 5, 6, 7, and 8 are detail views.

In constructing my improved cleaner and separator I provide a suitable frame 1, which is preferably slightly A-shaped and of sufficient size and strength to receive the hopper 2 at the top and the fan-casing 3. A reciprocating screen 4 or shoe is secured upon rollers 5 at its rear end and upon rollers 6 at its front end, so that it can be moved back and forth directly underneath the outlet of the hopper. The rollers are adjustably secured to the sides of the fan-casing by means of vertically-slotted standards 7 and the bolts 8. The upper edge of the side of the fan-casing is preferably recessed for the reception of the rollers 5, so as to permit the edge of the shoe to come as close as possible to the upper edge of the casing.

Pivotally secured upon each side of the fan-casing is a double elbow-lever 9, the upper arm of which is perforated and connected with the upper shoe by means of a link 10. The lower arm of the lever is provided with a series of perforations 11, by means of which it is adjustably secured to the end of the lower shoe or screen-frame 12. The main portion of the lever extends forward of the fan-casing and has its end provided with a slot 13, through which projects a crank 14 on the end of the shaft 15 of the fan 16. The intermediate portion of each lever is preferably formed with a double bend to permit of the forward end extending outward, so as not to engage with the frame of the machine. The outward end of the shoe 12 is supported upon a roller 17, journaled in an adjustable bracket 18, directly at the center of the machine and slightly at the rear of the front end of the shoe. The shoe is provided with two screens 19 and 20, which extend the entire length thereof at a slight distance from each other and also at a slight distance above the bottom of the shoe, so that whatever material passes through either one of the screens can pass freely down toward the lower end or outlet of the shoe. The bottom of the shoe is provided with a transverse slot or opening 21, through which the material that has passed through both of the screens can escape into

a suitable receptacle placed therebeneath or upon the floor. Two inclined spouts 22 are secured under the opposite ends of the slot, so as to convey the material to the central portion of the shoe to discharge it as nearly at one point as possible. Secured to or directly above each one of the screens is an inclined guide-piece 23, which extends from one side of the shoe to a point a short distance beyond the center of the shoe at the end of the screen, so that any material passing down the screen will be deflected to one side of the shoe and delivered. By arranging the guide-pieces oppositely to each other—that is, to have one of them extend from one side of the shoe and the other one from the other side of the shoe—the material from the two screens will be delivered at two points entirely separate from each other, thereby permitting three grades of material to be secured by the action of the two screens and the bottom of the shoes.

Pivotally secured within the rear portion of the fan-casing are three boards or deflectors 24, 24', and 25, two of which, 24 and 24', are pivotally secured at their inner edges at the edges of the curved front wall of the casing, so as to virtually form movable extensions thereof. The free edge of the deflector 24 extends beyond the rear end of the bottom of upper shoe, which terminates at quite a distance in front of the rear end of the screen in the shoe. A bolt 26 is secured to one of the side edges of the deflector 24 and projects through a curved slot 27 in the side of the casing by means of which the deflector can be readily held in any desired adjusted position. The deflector 25 is pivotally secured at its rear edge in the sides of the fan-casing and extends forwardly, with its free edge underneath the rear edge of the deflector 24 and in position to be moved above or below the rear edge of the deflector 24' at the bottom of the curved portion of the fan-casing.

Journaled transversely of the machine at a point slightly to the rear of the outlet of the hopper and above the top of the upper shoe is a shaft or agitator 28, with fingers or stirrers 29. One end of the shaft is extended and provided with a sprocket-wheel 30, by means of which it is rotated by the chain 31, which passes over the drive-wheel 32, and a sprocket-wheel 33 on one end of the fan-shaft 15. The outlet to the hopper is controlled by a slide 34, which is moved back and forth in suitable guides—as, for instance, grooves 35—upon the inner face of the sides of the hopper. The rod 36 is provided at one end with a handle 37 and a stop or shoulder 38, which is adapted to engage with a bearing 39, within which the rod is journaled, and the opposite end of the rod is screw-threaded and engages with a screw-threaded bracket 40 upon the under side of the slide.

In operating my improved cleaner and separator the slide is adjusted by means of the screw-threaded bracket, so as to permit the

desired quantity of material to pass through to the upper screen, which is properly adjusted by means of the bolts 8 in the slotted standards 7 to give it the desired pitch or angle. The deflectors at the rear end of the fan-casing are adjusted so as to cause the material which passes through the upper screen to be delivered in such a manner and at such a point closer to or farther from the rear end of the machine to permit the blast of air from the fan to properly separate the chaff and light material which has passed through the upper screen from the grain and blow it beyond the tail of the machine. After the lighter material has thus been separated the heavier portion of the grain passes on to the screens in the lower shoe and from there into the different receptacles provided for their reception. Any straw or other particles which might have a tendency to clog the machine and prevent the passage of the material from the hopper to the upper screen is constantly moved and thrown by the action of the fingers or stirrers upon the agitator. As the main wheel is rotated motion will be transmitted to the fan-shaft and the stirrers, and from the fan-shaft it will be transmitted to the shoes through the double elbow-lever at the sides of the casing. As the cranks on the fan-shaft are revolved each of them will alternately pass from one end to the other of the slot 13 and will raise or depress the end of the lever in such passage, thereby causing the ends of the arms of the lever to be moved back and forth, with the pivotal point of the lever as a center. By means of the link at the upper end of the upper arm the rear end of the upper shoe may be adjusted vertically without interfering with its connection with the upper arm of the lever, one end of the link being provided with a stud or pin 41, which fits in the perforation of the lever, and the other end being pivotally secured by means of the bracket 42. The lower arm of the lever is preferably curved to the rear, so that its free end can be adjustably secured to the rear end of the lower shoe by means of the bracket 43 without materially affecting the inclination or pitch of the shoe. The central portion of the lever is pivotally secured to the sides of the casing by means of a bracket 44, all of said brackets being the same in construction and each one of them having a short lug 45 projecting from its inner face in position to enter the respective perforations in the lever when the ends of the bracket are screwed or otherwise secured to the side of the casing or the shoe.

As above described, it will be seen that my improved grain cleaner and separator can be manufactured very cheaply and that it will be so compact as to require but little space, and the parts are so adjusted relatively to each other that but little power will be required to operate it, and that power can be positively applied through the medium of the sprocket-chains and sprocket-wheels.

While I have shown what I consider to be the most desirable form of constructing my cleaner and separator, yet I reserve to myself the right to make such changes and alterations therein as will come within the scope of my invention.

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

10 In a grain-cleaner, the combination with a hopper, of a fan-casing secured beneath the hopper, a rotary fan in the casing, a reciprocatory shoe intermediate the hopper and casing, an agitator at the hopper-outlet, a
15 downwardly rearwardly inclined deflector

pivoted in the rear of the fan, a deflector secured in the lower portion of the hopper in advance of the first-named deflector and extending rearwardly and slightly upwardly, a third deflector positioned in the rear end of the casing and inclined upwardly and rearwardly, whereby grain falling from the hopper is caused to pass through a current of upwardly-moving air when the fan is in motion, substantially as described.

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