No. 775,755. PATENTED NOV. 22, 1904.

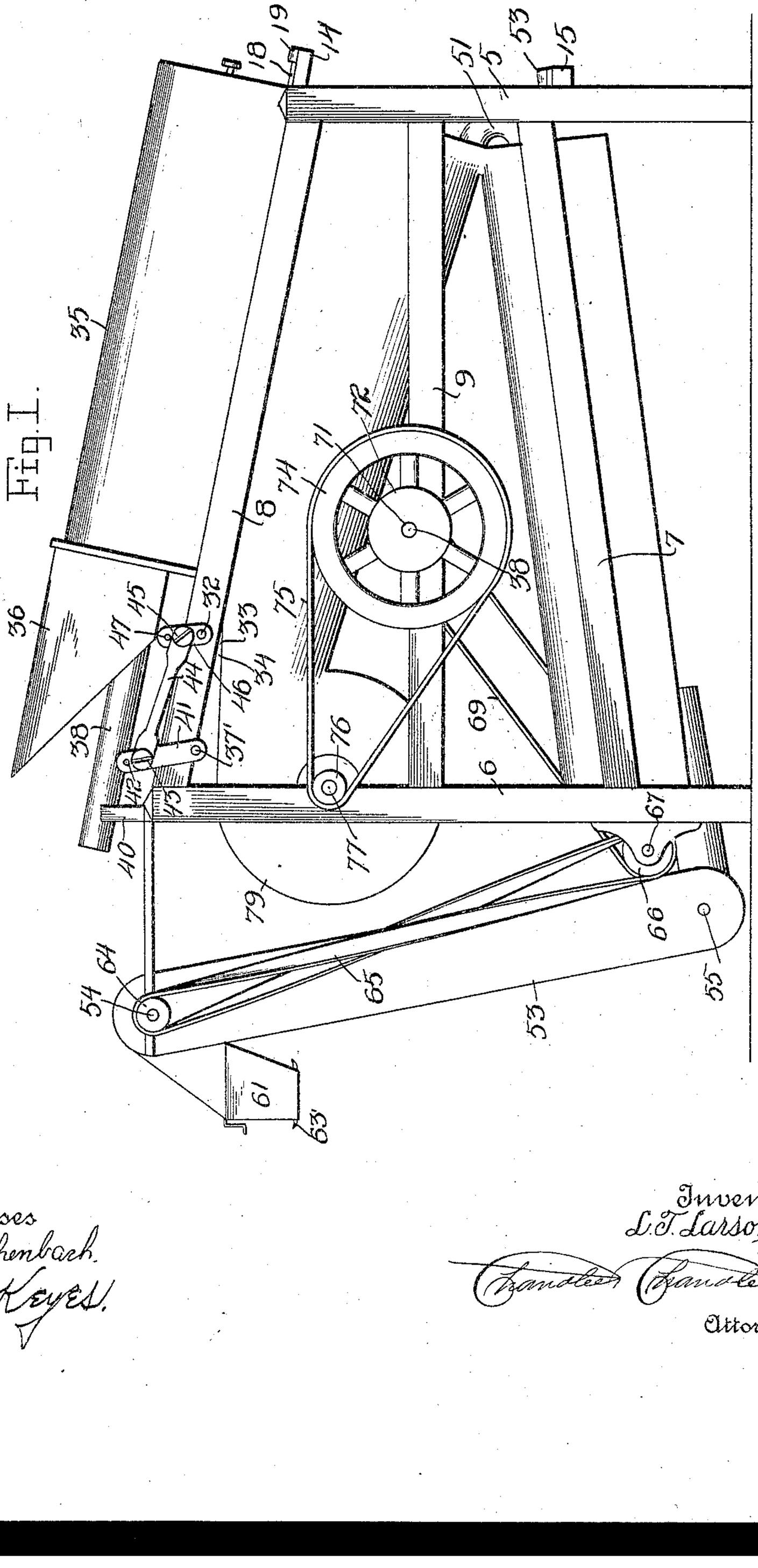
L. T. LARSON.

FANNING MILL.

APPLICATION FILED JULY 9, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



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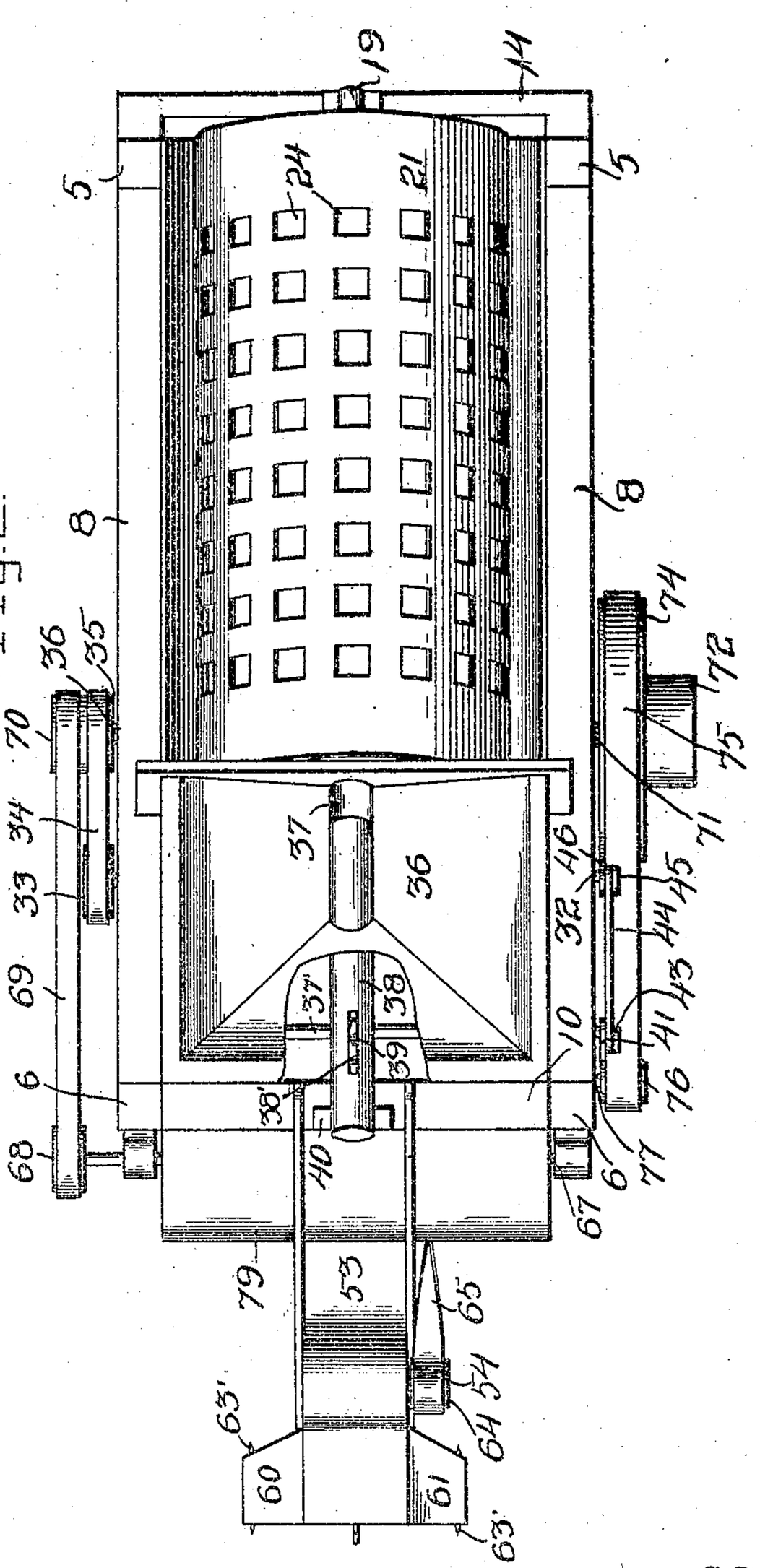
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3.

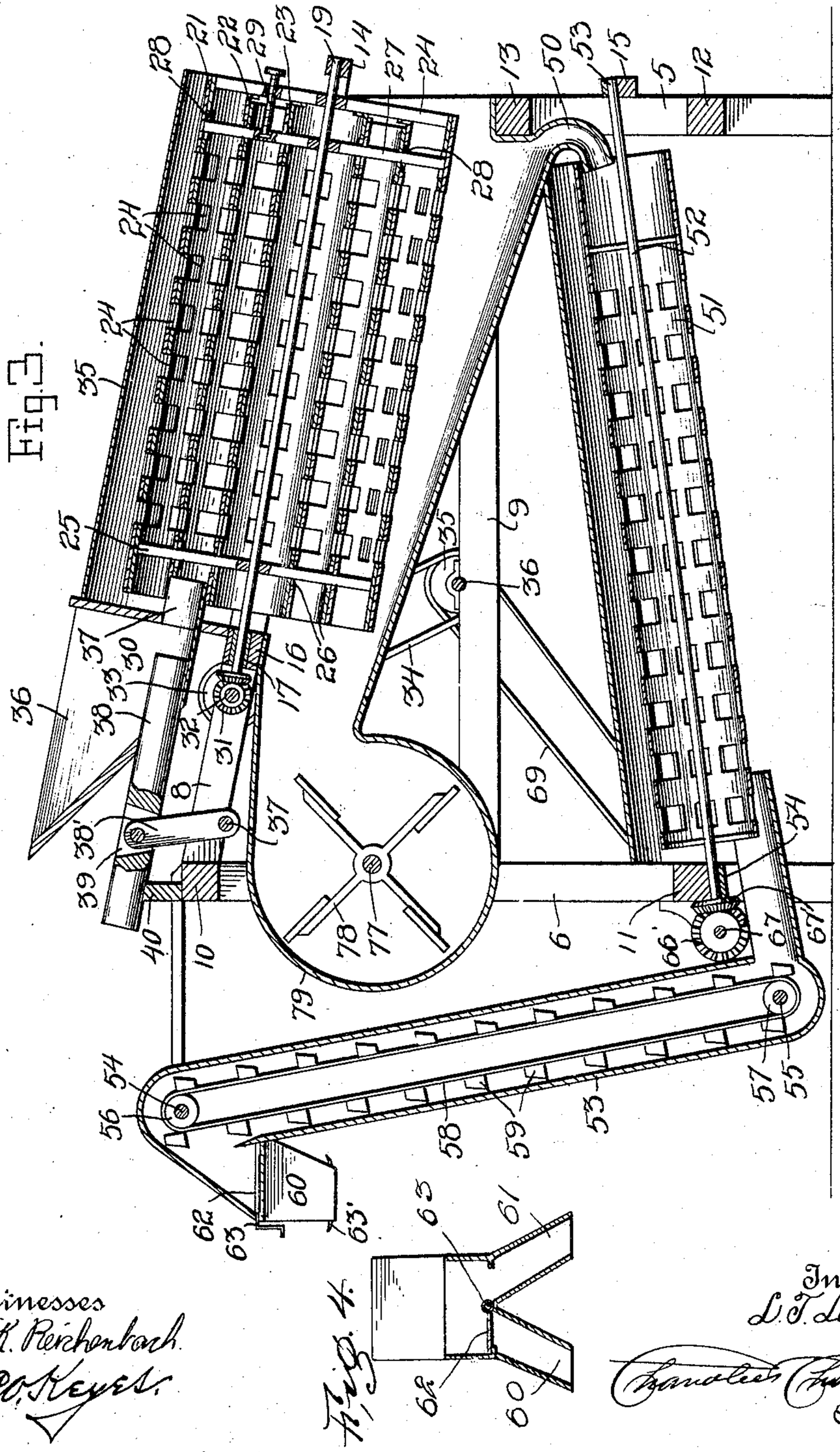

Fig. 4.

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No. 775,755. Patented November 22, 1904.

UNITED STATES PATENT OFFICE.

LEWIS T. LARSON, OF CLARKFIELD, MINNESOTA.

FANNING-MILL.

SPECIFICATION forming part of Letters Patent No. 775,755, dated November 22, 1904.

Application filed July 9, 1904. Serial No. 215,853. (No model.)

To all whom it may concern:

Be it known that I, LEWIS T. LARSON, a citizen of the United States, residing at Clarkfield, in the county of Yellow Medicine, 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.

This invention relates to fanning-mills for cleaning grain of different kinds, the object of the invention being to provide a construction embodying rotary screens in the place of reciprocating screens and to so construct the screens that they may be adjusted to vary the sizes of the meshes or openings to suit different materials.

A further object of the invention is to provide a simple and efficient means for feeding the material from the hopper into the screen, other objects of the invention having reference to details of structure and being understood from the following description.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a side elevation of the machine. Fig. 2 is a top plan view of the machine with the top of the cylinder-casing and a portion of the hopper removed. Fig. 3 is a vertical section taken longitudinally through the machine. Fig. 4 is a detail view of the valve.

Referring now to the drawings, there is shown an embodiment of the invention including a frame comprising uprights 5 and 6 at opposite ends of the frame, the uprights at each side being connected by a lower beam 7, an upper inclined beam 8, and an intermediate beam 9. The uprights 5 and 6 at the higher end of the frame are connected by the upper and lower cross-beams 10 and 11, while the uprights at the opposite or lower end of the frame are connected by a lower cross-beam 12, an upper cross-beam 13, and upper and lower bearing-supporting beams or cross-pieces 14 and 15.

Connecting the beams 8, near their higher ends, is a beam 16, having a bearing 17, in which is received the shaft 18, the opposite end of which engages a bearing 19 on the support 14, this shaft being designed to carry the main rotary screen. The main screen consists of a plurality of pairs of foraminous cylinders, which in the present instance are three in number and are illustrated at 21, 22, and 23, the several cylinders being concentric and the cylinders of each pair being in sliding contact. The openings 24 of the cylinders of each pair are adapted to aline, and by shifting one cylinder of a pair longitudinally of the other cylinder of that pair the perforations or openings may be brought to aline or register more or less perfectly, one cylinder serving to cover to a greater or lesser degree the openings of the other cylinder of the pair.

At the lower end of the cylinder-shaft is a spider 24, to the arms of which are secured the inner cylinders of the pairs 21 and 23 and the outer cylinder of the pair 22. A second spider, 25, is mounted upon the shaft near to the upper end of the rotary screen, the arms of the spider 25 being fastened securely to the inner cylinders of the pairs 21 and 23 and to the outer cylinder of the pair 22, the arms of the spider 25 passing through longitudinal slots 26 in the inner cylinder of the pair 22 and the outer cylinder of the pair 23 to permit of longitudinal movement of said slotted cylinders. To move the shiftable cylinders of the several pairs, a spider 27 is provided, which is slidably mounted upon the shaft 18, and the arms of which are attached to these slidable cylinders and are engaged or passed through longitudinal slots 28 in the fixed cylinders of the pairs 22 and 23. An adjusting-screw 29 is screwed through the spider 24 and is swiveled in the spider 27, so that by rotating the screw in one direction or the other the spider 27 will be slid along the shaft 18 and the movable cylinders will be correspondingly shifted. In this way the meshes or openings in the multiple rotary screen are varied in size to suit different conditions of operation.

To rotate the screen, the shaft 18 is provided with a beveled gear 30 at its upper or higher end, with which is engaged a beveled gear 31 on a shaft 32, journaled in bearings carried by the beams 8. The shaft 32 has a belt-pul-

ley 33 at one end, with which is engaged a belt 34, leading to a belt-pulley 35 on a shaft 36, which may be rotated in any desired manner from any suitable source of energy. A casing 35 is provided for the screen and is secured to the beams 8 and 13, the lower side portion of this casing being slanted toward the lower end of the frame at a somewhat greater angle than the shaft 18, so that the materials that drop through the screen may feed readily by gravity to the lower end thereof. It will be noted that the bearing-support 14 projects beyond the uprights 5, so that the rotary screen may extend sufficiently far to direct the discharge from the end thereof outwardly over the beam 13.

To feed the material to be fanned into the innermost foraminous cylinder of the screen, a hopper 36 is provided, from which leads a spout 37 into the upper end of the innermost cylinder of the screen. The spout, which is semicylindrical in form, extends beneath the opening of the hopper, and in this spout or trough is slidably mounted a cylindrical plunger 38, which when drawn rearwardly permits the grain to pass from the hopper into the spout or trough and when it is moved in the opposite direction forces or shoves the grain down the spout, which is inclined, and from its lower end into the screen. To reciprocate this plunger-feeder, a rock-shaft 37 is mounted in bearings carried by the beams 8 and is provided with an upwardly-directed arm 38′, which is pivoted in a slot 39 in the plunger. When the shaft is rocked or oscillated, the plunger is reciprocated, the outer end of the plunger, which projects from the end of the trough or spout beneath the hopper, being slidably mounted upon a block 40 on the beam 10. The rock-shaft is provided at one end with a crank-arm 41, having a longitudinal series of perforations 42 therein to interchangeably receive a crank-pin 43, the perforations and pin being threaded, so that the pin will be held securely and may be readily shifted. A pitman 44 is engaged with the crank-pin and with a second pin 45, which is screwed into the crank-arm 46 on the shaft 32. This second crank-arm is provided also with a longitudinal series of threaded perforations 47 to interchangeably receive the crank-pin. By forming the crank-arms and pin for adjustment of the pins the throw of the plunger-feeder may be varied, so that a greater or lesser quantity of grain may pass into the spout or trough at each reciprocation of the plunger.

From the lower end of the cylinder-casing, above described, there leads a spout 50, which is returned upon itself beneath the casing and projects with its discharge end into a foraminous cylinder 51, which is mounted upon a shaft 52, journaled in bearings 53 and 54, carried by the support 15 and beam 11, respectively, the shaft and cylinder being slanted downwardly in the direction of the beam 11. The extreme upper end portion of the cylinder 51 is not perforated, the grain as it falls from the spout 50 falling upon this unperforated portion of the cylinder 51, so that there is no danger of the grain lodging in the meshes or openings of the cylinder.

The lower end of the cylinder 51 is the discharge end, and a chute is disposed beneath the discharge end in position to receive grain therefrom, the chute slanting downwardly toward its outer end and leading into the casing 53 of an elevator or bagger. In the casing 53, at the upper and lower ends thereof, are shafts 54 and 55, carrying drums 56 and 57, on which is disposed a belt 58, provided with buckets 59, which latter scoop up the grain from the bottom of the casing and carry it to the top of the latter and discharge it finally into the diverging spouts 60 and 61, from which it may pass into bags, which may be held in any suitable way to receive from them. In order that the discharge may be from either of the spouts 60 and 61, a valve 62 is mounted upon a rock-shaft 63 at the meeting-line of the spouts, and when rocked from one side to the other covers the corresponding spout, and any grain that may fall upon the valve is deflected to the uncovered spout. By this means one bag may be filling while another is being tied up, the spouts being illustrated as provided with hooks 63′ for engagement with the bags to hold them in position for filling. To operate the elevator, the shaft 54 is provided with a belt-wheel 64 at one end, with which is engaged a belt 65, leading to a belt-wheel 66 on a shaft 67, which is mounted in horizontal position near the bottom of the casing 53 and is provided with a bevel-gear 66, which engages a corresponding gear 67 on the lower end of the shaft 52 for rotating the cylinder 51. The shaft 67 is provided with a belt-wheel 68, which carries the belt 69, which engages a belt-wheel 70 on the drive-shaft 71, mounted in suitable bearings on the beam 9, said shaft having at its opposite end a belt-pulley 72 to receive a belt from any suitable motor. On the shaft 71 is also a large belt-pulley 74, with which is engaged a belt 75, that engages a pulley 76, mounted upon a shaft 77, journaled in bearings upon the upright 6, and which shaft carries a fan 78, having a casing 79, which communicates with the lower portion of the casing cylindrical screen to direct an air-blast through the screen to some extent and principally between the screen and the bottom of its casing. Connecting the pulley 70 and a pulley 80 on the shaft 32 is a belt 81.

With the construction above described it will be understood that the grain fed into the hopper will pass into the upper screen and through the meshes of the concentric cylinders thereof to the bottom of the casing and will pass from the latter to the lower screen, where

it will be finally sifted and discharged into bags.

What is claimed is—

1. A fanning-mill comprising an upper rotatable screen including a plurality of pairs of concentric foraminous cylinders, one cylinder of each pair being adjustable to cover and uncover the openings of the other cylinder of that pair, means for adjusting the cylinders, a casing for the screen having a discharge-spout, a fan disposed to force a blast through all of the said screens and through the casing below them, a second rotatable inclined screen into which said spout leads, means disposed to receive and convey material from the second screen, a hopper having a spout leading into the upper screen and means for feeding material through the spout of the hopper.

2. In a fanning-mill, a screen comprising a plurality of pairs of concentric foraminous cylinders and mounted for adjustment of one cylinder of each pair to register its openings with those of the other cylinder of the pair to a greater or lesser degree, and a single means for adjusting said cylinders simultaneously.

3. A fanning-mill comprising an upper rotatable screen including a plurality of pairs of concentric foraminous cylinders, one cylinder of each pair being adjustable to register its openings with those of the other cylinder or to cover said openings, means for adjusting the cylinders, a casing for the screen inclined and having a discharge-spout at its lower end, a fan disposed to force a blast through all of the said screens and through the casing below them, a second rotatable foraminous screen below the first screen and into which said spout extends, a spout disposed to receive from the second screen, an elevator disposed to receive from the spout, said elevator being provided with discharge-spouts, a hopper, a spout leading from the hopper into the upper screen, a reciprocatory plunger in the spout of the hopper arranged to force material therethrough, and means for reciprocating said plunger.

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

LEWIS T. LARSON.

Witnesses:
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GEORGE J. RIERSAL.