

No. 763,731.

PATENTED JUNE 28, 1904.

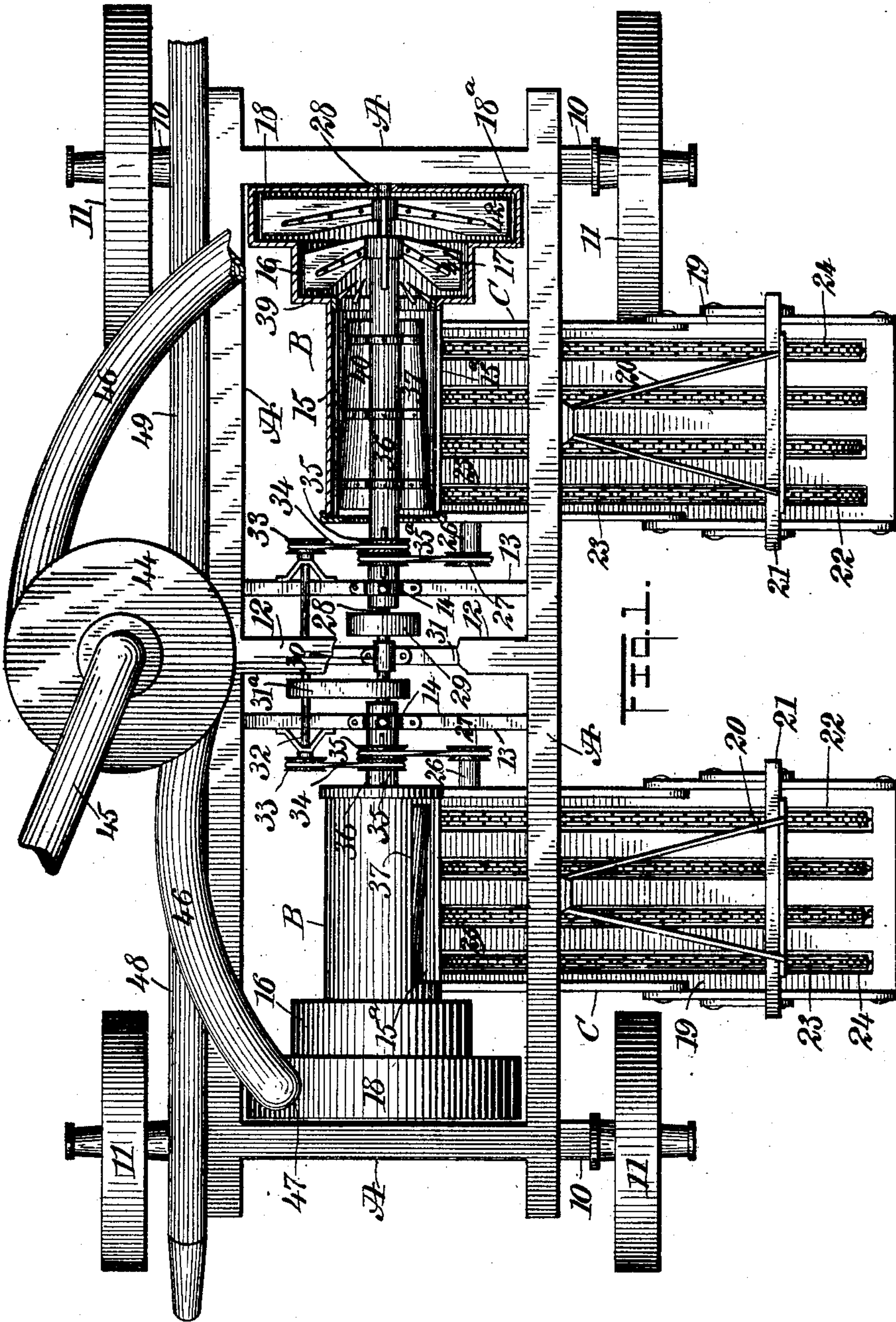
M. DAVIS & W. A. LEHENBAUER.

THRESHING MACHINE.

APPLICATION FILED FEB. 29, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



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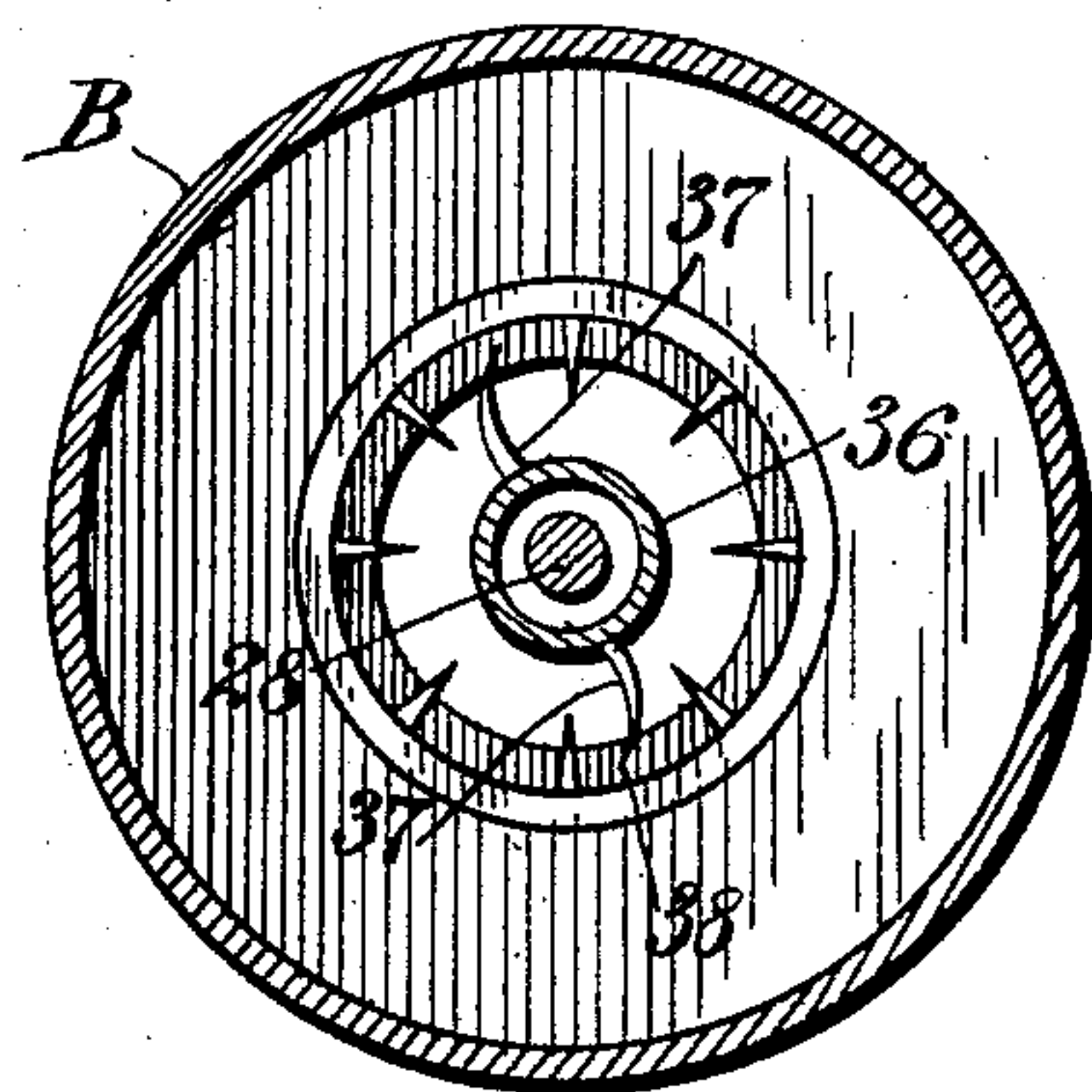
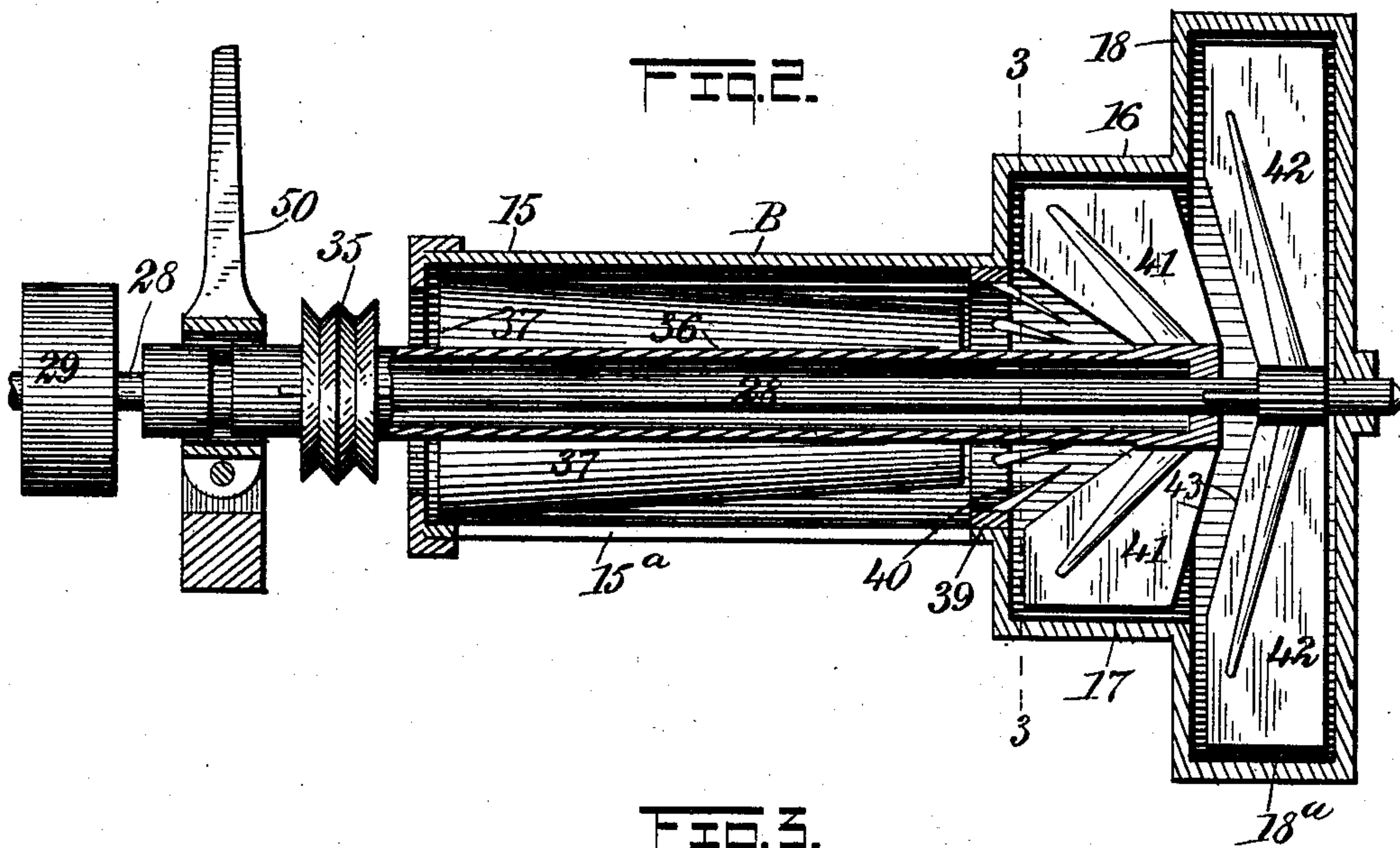
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UNITED STATES PATENT OFFICE.

MONROE DAVIS AND WESLEY A. LEHENBAUER, OF AMES, OKLAHOMA TERRITORY.

THRESHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 763,731, dated June 28, 1904.

Application filed February 29, 1904. Serial No. 195,811. (No model.)

To all whom it may concern:

Be it known that we, MONROE DAVIS and WESLEY A. LEHENBAUER, citizens of the United States, and residents of Ames, in the county of Woods and Territory of Oklahoma, have invented a new and useful Improvement in Threshing-Machines, of which the following is a full, clear, and exact description.

Our invention relates particularly to an improvement upon the construction of threshing-machine for which Monroe Davis applied for a patent January 28, 1903, Serial No. 140,866, and which was allowed November 11, 1903.

The purpose of the present invention is to provide a box or casing in which is located a hollow shaft carrying knives tapering in direction of the exit of the casing, which knives have their cutting edges bent over in direction of the motion of the shaft, and, further, to provide a drive-shaft which passes loosely through the tubular shaft, being turned thereon in an opposite direction, and to provide a governing or retarding comb opposite the delivery ends of the knives to prevent a too-rapid feed of the cut material to the fans and offtake mechanism employed.

A further purpose of the invention is to provide two fans at the outlet or exit end of the box or casing, one attached to each of the shafts and operating in adjoining yet connected chambers, the outer fan, or that attached to the drive-shaft, being the larger and being driven at a higher rate of speed.

Another purpose of the invention is to provide a means for regulating the distance between the two fans, whereby they may be made to run close together for fine grain and farther apart when handling the tough straw of wheat or oats.

In fact, the object of the invention is to provide a simple, economic, and durable machine wherein straw is continuously fed through devices singly or in multiple to knives and wherein the band is cut and the straw mangled and wherein, further, the grain and straw are forced against a regulating-comb located between the knives and the fans mentioned,

which latter draw the straw through the regulating-comb in the proper quantities and conduct the grain and shredded straw to a separating and dispensing device, preferably of a pneumatic character.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a partly-sectional plan view of a threshing-machine embodying the features of our invention. Fig. 2 is an enlarged longitudinal vertical section through one of the cases, boxes, or cylinders employed in connection with the machine and the parts operating therein and in connection therewith; and Fig. 3 is a transverse vertical section taken practically on the line 3 3 of Fig. 2.

A represents the frame of the machine, which may be of any desired shape, usually in the form of a parallelogram, as shown, and this frame is supported by an axle 10, in its turn supported by suitable wheels 11. At the central portion of the frame A an upper cross-bar 12 is produced, and lower cross-bars 13 are carried by the said frame A, one at each side of the center bar 12, on which cross-bars 13 are located bearings 14.

Cylinders or casings B are shown supported within the main frame A on conveyer-frames C of any suitable construction. These cylinders or casings B are at the rear portion of the conveyer-frames C, as is shown in Fig. 1. Each of these casings or cylinders B consists of a body 15, having a front or entry opening 15^a, which is at the forward portions of said bodies, and the openings occupy such positions that the material on the conveyer-tables will readily enter the said openings, as is indicated also in Fig. 1.

In addition to the body 15, having the inlet-opening 15^a, each cylinder consists of an enlargement 16 near its outer end, forming a chamber 17, adapted as a fan-chamber, to be

hereinafter specifically described, and at the extreme outer end of each casing or cylinder B another enlargement, 18, is formed, constituting a second fan-chamber, 18^a. The two fan-chambers 18^a and 17 are connected; but the fan-chamber 18^a is of greater diameter than the chamber 17.

Each conveyer-table C is made in one or more sections and comprises a horizontal body portion 19, supported usually through the medium of hangers 20, which are connected with the frame A and with cross-bars 21, spanning the forward or receiving portions of the said conveyer-tables. These conveyer-tables may be of any suitable or approved construction. Usually they are made as shown, in which the body portion 19 of each table is provided with longitudinal slots 22. At the forward portions of these slots wheels 24 are mounted to turn, over which endless chain belts 23 are passed, and these chain belts are likewise passed over sprocket-wheels or suitable pulleys 25 at the inner ends of the conveyer-tables, located on shafts 26, the inner ends of which shafts extend beyond the inner sides of the conveyer-tables, as is shown in Fig. 1. Each shaft 26 carries a pulley 27, as is also shown in Fig. 1.

The inner ends of the cylinders or casings B are substantially open; but their outer ends are practically closed, and in the outer end portions of the cylinders or casings B the ends of a driving-shaft 28 are journaled, the drive-shaft extending from one cylinder to the other, as is shown in Fig. 1. This drive-shaft 28 is provided with a driving-pulley 29 and is usually supported at its central portion in a bearing 30, secured upon a cross-bar 31, carried by the frame A and below the upper central cross-bar 12, as is also shown in Fig. 1.

A suitable belt-and-pulley connection 31^a is effected between the drive-shaft 28 and a shaft 32, mounted in suitable bearings on the intermediate cross-bars 13, and this shaft 32 is provided with a pulley 33 at each end. These pulleys 33 are connected by belts 34 with double pulleys 35, located on tubular shafts 36, mounted to turn on the drive-shaft 28, one within each cylinder or casing B. The said double pulleys 35 are also connected by belts 35^a with the pulleys 27 on the driving-shafts for the conveyer-tables C, as is indicated in Fig. 1. The inner ends of the shafts 36 turn in the bearings 14 on the cross-bars 13.

Each tubular shaft 36 is provided within the body 15 of the cylinder or casing B, through which the shaft passes, with one or more blades 37, which taper in direction of the outlet ends of the bodies of the said casings or cylinders, as is shown in Figs. 1 and 2 and as is illustrated in Fig. 3. The cutting edges 38 of these blades are curved in direction of the rotation thereof. These blades as the bundles are fed from the conveyer-tables into the cylinders or casings B, through the openings

15^a, cut the bands of the bundles and cut the straw and tend to thresh out the grain.

In order that the straw and the grain operated upon in the bodies 15 of the cylinders shall not pass too rapidly out therefrom and serve to clog subsequent operation, we preferably secure a ring 39 in the outer end of the body of each cylinder B, and these rings 39 are provided with teeth 40, extending outward from the ring, and said teeth are bent downward or are extended in direction of the loosely-mounted tubular shafts 36, and it may be here stated, as is evident from Fig. 1, that the drive-shaft 28 revolves in one direction and the tubular shafts 36 in an opposite direction.

Fan-blades 41 are located in the fan-chamber 17, being secured to the outer ends of the tubular shafts 36, and the inner edges of these blades adjacent to the shafts 36 are cut away, so as not to interfere with the action of the teeth 40. As the fan-blades 41 revolve they serve to draw the straw and other material from the body of the cylinder in an outward direction, delivering the said cut material and grain to the outer fan-chambers 18^a of the device, where the material is acted upon by larger fan-blades 42, and the said material is then carried out by the coaction of both sets of fan-blades at both sides of the machine to a combined separator and dispenser, which constitute the leading features of the patent referred to in the preamble and which will not be herein particularly described, it being sufficient to state that from the body of the combined separator and dispenser 44 a tube 45 is carried, adapted, for example, to be connected with a source of suction, and tubes 46 from the separator and dispenser are made to enter the larger fan-chambers 18^a through openings 47 in the said chambers, as is shown at the left in Fig. 1, and from the body of the said separator and dispenser tubes 48 and 49 are carried in opposite directions, one tube being adapted to conduct the grain from the separating device and the other tube the straw.

By reference to Fig. 2 it will be observed that the opposing edges of the blades of the two fans are oppositely inclined, so that the blade of one fan may fit close to the blade of the other fan or wherein the blades of one fan may be carried away from the blades of the opposing fan. As has been stated, this adjustment of the fans is intended to adapt the machine to successful operation in all kinds of grain or straw. This adjustment is accomplished through the medium of a shifting-lever 50, (shown in Fig. 2,) mounted on a tubular shaft 36, so that this shaft is moved in or out, as occasion may demand, to bring the fans carried by a cylinder or casing B in more or less close relation, as required. After the straw is delivered at an inlet in a cylinder it is cut by the knives 37 and mangled, and the bands are cut while the knives are

forcing the straw and grain against the comb formed by the band 39 and the teeth 40, which comb serves to keep back clots and bunches of straw, securing an even feed. The fan-blades 41 then take hold of the straw and serve to draw it between the teeth 40 of the comb and throw the straw against the outer fan 42, which is traveling in an opposite direction to the fan 41 and at a higher rate of speed, thus shredding the straw and forcing the mass of threshed grain and shredded straw through the exit 47 of the cylinder B to the separator 44.

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

1. In a threshing-machine, a cylinder, knives mounted to revolve in the cylinder, a substantially conical comb for the material cut in the cylinder, and fans mounted to revolve in the cylinder and arranged one for withdrawal action relative to the comb and the other for raising and dispensing said material, as described.

2. In a threshing-machine, a cylinder, a feed for the same, tapering blades mounted to revolve in the cylinder, having their cutting edges curved in direction of the rotation of the blades, and receiving and dispensing fans operating relatively to the blades and arranged for coaction, as described.

3. In a threshing-machine, a cylinder, a feed for the same, cutters in the cylinder, mounted to revolve, a comb adjacent to the delivery ends of the cutters, fans in the cylinder in juxtaposition to each other, one fan being in close relation to the comb, and means for driving the two fans in opposite directions, the fan adjacent to the comb turning in the same direction as the direction of rotation of the cutters, as set forth.

4. In a threshing-machine, a cylinder, a feed for the same, cutters in the cylinder mounted to revolve, a comb adjacent to the delivery ends of the cutters, extending outward, the teeth being in conical arrangement, fans mounted to revolve within the cylinder adjacent to each other and one of them adjacent to the comb, means for revolving the two fans in opposite directions, and one of them in the same direction as the cutters, one fan being adapted to run at a greater rate of speed than the other, as set forth.

5. In a threshing-machine, a cylinder and two shafts mounted to revolve in the said cylinder, one within the other, means for turning the shafts in opposite directions, blades secured to the outer shaft within the said cylinder, said blades having tapering and curved cutting edges, a comb in the cylinder, extending outward from the ends of the blades, the teeth of the comb having conical arrangement, a fan located on the shaft carrying the blades, and a larger fan adapted for more rapid speed located on the inner shaft, both

of the fans being located within the cylinder, as set forth.

6. In a threshing-machine, a cylinder comprising a main compartment and two fan-chambers at the rear end of the main compartment, in communication one with the other, one fan-chamber being larger than the other, the larger fan-chamber being provided with an exit, a tubular shaft mounted to turn in the smaller fan-chamber and the body of the cylinder, cutting-blades secured to the said shaft, comb-teeth in conical arrangement, extending outward from the delivery end of the body of the cylinder into the smaller fan-chamber, a fan carried by the plate-shaft, which fan faces the said comb-teeth, the facing edges of the blades of the fan having likewise conical arrangement, a second shaft mounted to turn in the cylinder, a fan on the second shaft, located in the larger fan-chamber, and means for turning the two shafts in opposite directions and one at greater speed than the other.

7. In a threshing-machine, a cylinder comprising a main compartment and two fan-chambers at the rear end of the main compartment, in communication one with the other, one fan-chamber being larger than the other, the larger fan-chamber being provided with an exit, a tubular shaft mounted to turn in the smaller fan-chamber and the body of the cylinder, cutting-blades secured to the said shaft, comb-teeth in conical arrangement, extending outward from the delivery end of the body of the cylinder into the smaller fan-chamber, a fan carried by the blade-shaft, which fan faces the said comb-teeth, the facing edges of the blades of the fan having likewise conical arrangement, a second shaft mounted to turn in the cylinder, a fan on the second shaft, located in the larger fan-chamber, means for turning the two shafts in opposite directions and one at greater speed than the other, a separator connected with the exit of the larger fan-chamber, and tubes extending from the separator, one being adapted to discharge grain and the other the straw, as set forth.

8. In a threshing-machine, a cylinder, knives mounted to revolve in the cylinder, a comb for all material cut in the cylinder, fans mounted to revolve in the cylinder in opposite directions, one fan in the same direction as the knives, which latter fan is in close relation to the comb, and means for adjusting the fans to and from each other, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

MONROE DAVIS.

WESLEY A. LEHENBAUER.

Witnesses:

A. WILLIAMSON,

W. B. WILLIAMSON.