Sept. 1, 1936. J. A. JAMES 2,053,148

THRESHING MACHINE

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Fig. 1.

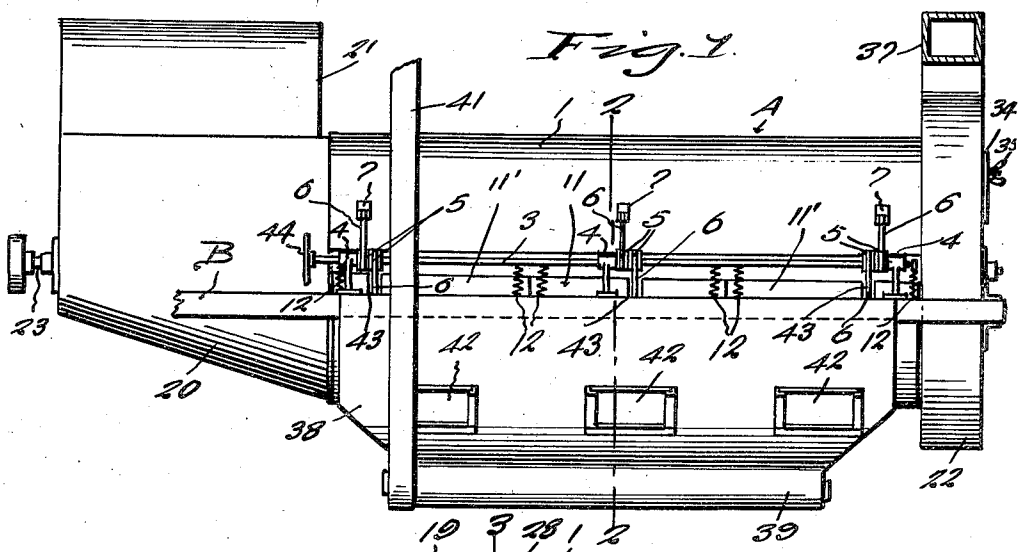


Fig. 2

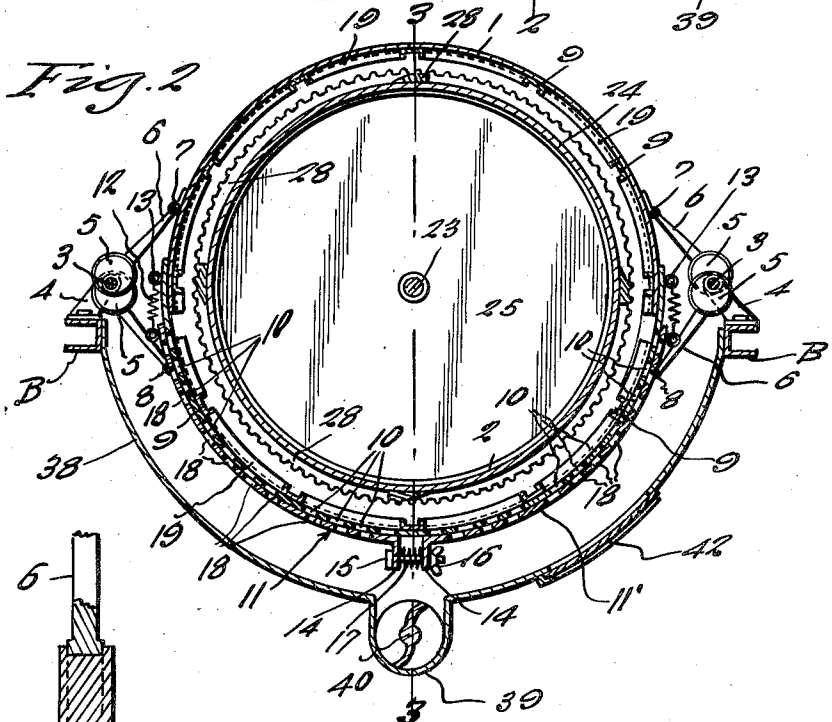
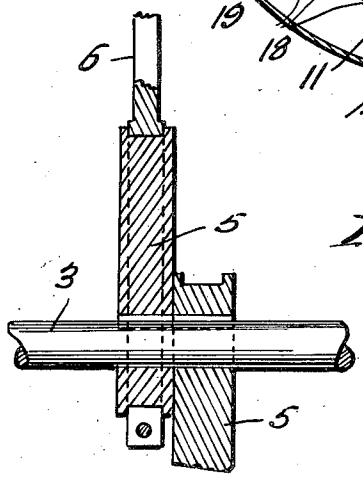


Fig. 3



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THRESHING MACHINE

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Fig. 3.

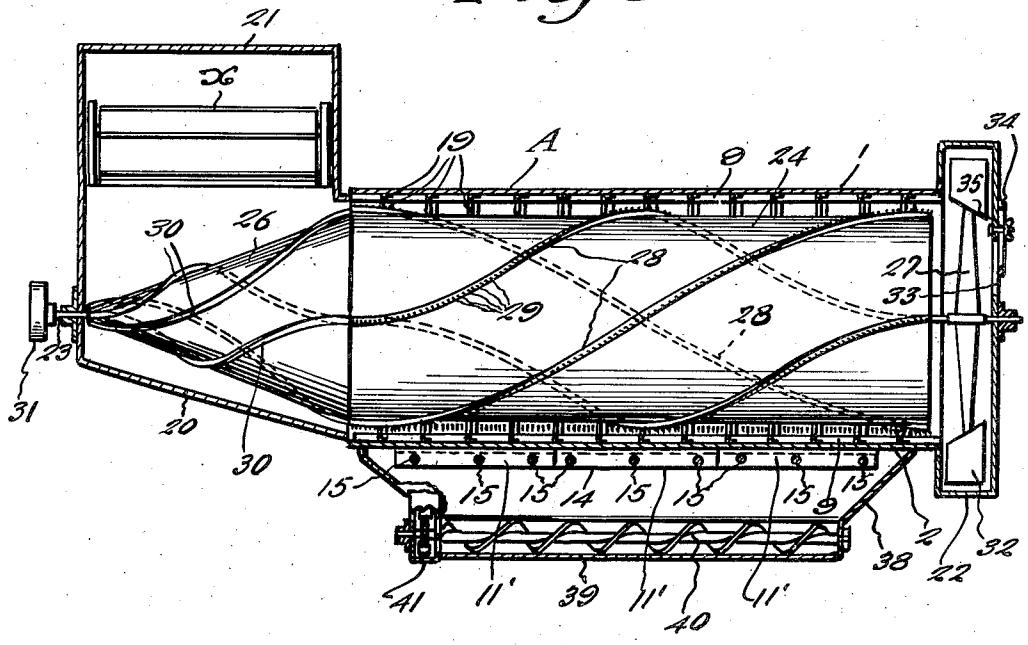


Fig. 9.

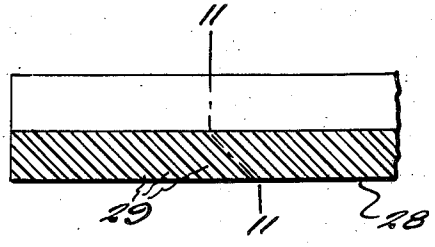


Fig. 11

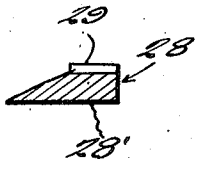
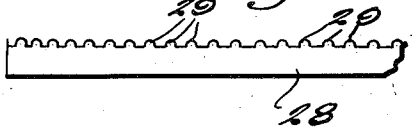


Fig. 10.



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Fig. 4.

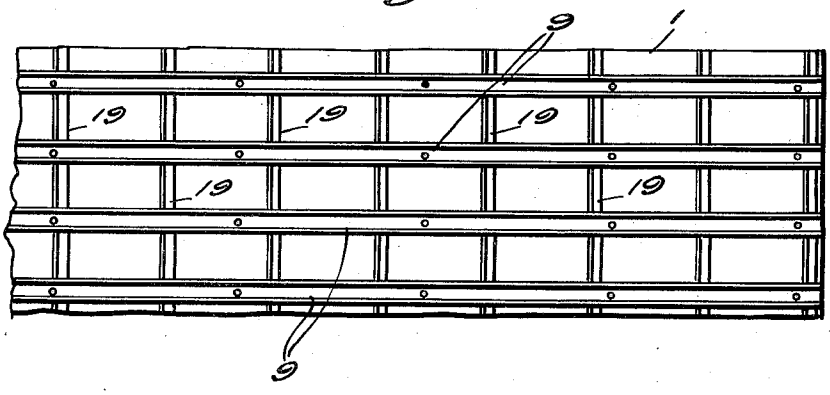


Fig. 5.

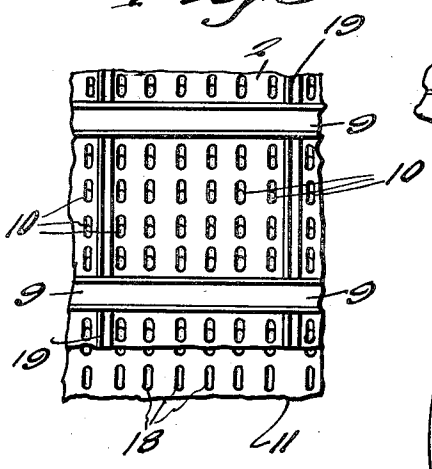


Fig. 6.

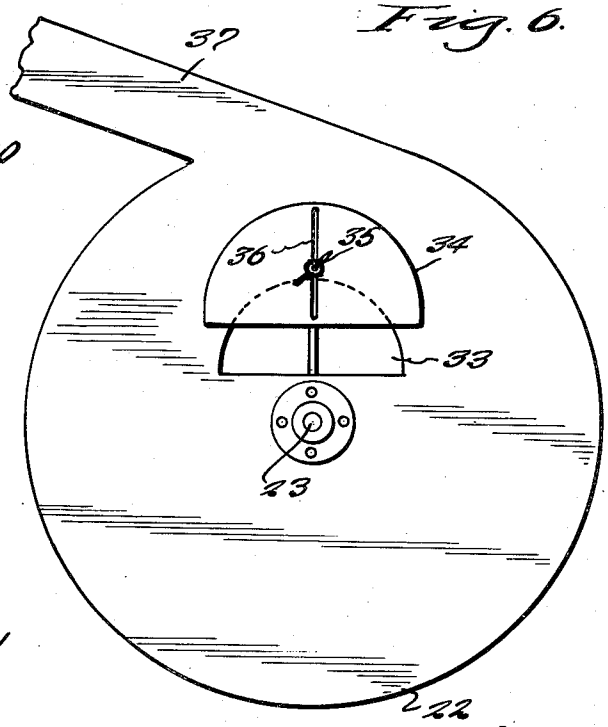
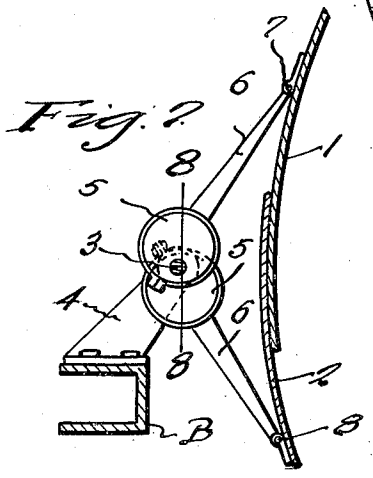


Fig. 7.



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2,053,148

THRESHING MACHINE

James A. James, Amarillo, Tex.

Application May 26, 1934, Serial No. 727,816

7 Claims. (Cl. 130—27)

This invention relates to a threshing machine, the general object of the invention being to provide a machine which is highly efficient, composed of a relatively small number of parts, so that the machine can be manufactured at low cost, and the parts of which are so arranged and constructed that they are not likely to get out of order and also to provide a machine which can be operated with the minimum amount of power.

Another object of the invention is to provide adjustment features which will enable the machine to be used for threshing different kinds of grain and different conditions of grain, such as moist and dry grain.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is an elevation of the invention.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a section on line 3—3 of Figure 1.

Figure 4 is a view looking toward the inner face of the upper part of the housing.

Figure 5 is a fragmentary view looking toward the inner face of the lower part of the housing.

Figure 6 is a view looking toward the discharge end of the housing.

Figure 7 is a view partly in section, showing the eccentric means for regulating the diameter of the housing.

Figure 8 is a section on line 8—8 of Figure 7.

Figure 9 is a fragmentary top plan view of one of the spirals.

Figure 10 is an edge view thereof.

Figure 11 is a section on line 11—11 of Figure 9.

In these drawings, the letter A indicates a horizontally arranged cylindrical housing which is composed of the upper section 1 and the lower section 2, the side edges of these sections overlapping, as shown more particularly in Figure 7, and the sections are adjustable toward and away from each other to increase or decrease the diameter of the housing through means of the shafts 3 located one at each side of the machine and rotatably supported by the brackets 4 from the frame B of the machine. These shafts carry the eccentrics 5, to the straps of which the arms 6 are connected, the arms of one set of eccentrics extending upwardly and being connected to the upper section 1, as shown at 7, and the arms of the other set of eccentrics extending downwardly and being connected to the section 2, as shown at 8. Thus by turning the shafts in one direction, the two sections of the housing will be moved in a direction to increase the diameter of the housing and by rotating the shafts in an opposite direction, the sections will be moved in a direction to decrease the diameter of the housing. A plurality of spaced channel bars 9 have their bight portions connected to the inner wall of the housing and the lower section 2 of the housing is provided with the perforations 10 which permit the grain to pass from the housing and these perforations or holes can be regulated through means of the arcuate members 11 which contact the outer face of the lower section and have their upper edges connected by springs 12 with the upper edges of the lower section, as shown at 13. The lower edges of the two arcuate members are formed with the depending flanges 14 through which bolts 15 pass, each bolt having a thumb nut 16 thereon and a spring 17 is placed on each bolt between the flanges. Thus by loosening the nuts, the springs 17 and 13 will move the two arcuate members apart and by tightening the nuts, the two members are moved toward each other, so that the holes or perforations 18 in said members can be adjusted to close, partly close or fully open the perforations or holes 10 in the lower section of the housing.

Each arcuate-shaped member 11 is composed of a number of sections 11' so that different portions of the members 11 can be adjusted independently of each other, which, for instance, permits the perforations 10 in the front part of the housing to be fully opened and those in the rear or intermediate part closed or partly closed. Thus if the grain is in such condition that it will pass through the perforations in the forward part of the housing, the perforations in the rest of the housing can be closed so that the chaff remaining in the housing will not drop through the perforations and thus be mixed with the grain.

A plurality of spaced rings or bands 19 is connected with the inner wall of the housing and form internal ribs for checking the passage of the grain along the bottom part of the housing so that the passage of the grain through the perforations is facilitated by these rings.

A casing 20 is supported by the frame and the front end of the housing abuts the casing, as

shown in Figure 1, and said casing is provided with a rounded downwardly and rearwardly sloping bottom and a chute 21 delivers the material to be threshed into the casing. If desired, a conveyor X may be provided for conveying the material into the casing through the chute.

A fan casing 22 is also supported from the frame and the rear end of the housing abuts this fan casing, the adjacent face of the fan casing having an opening therein of substantially the same diameter as that of the housing.

A shaft 23 passes through the housing and the two casings 20 and 22 and is rotatably supported and said shaft supports a cylinder 24 through means of the spiders or disks 25, the cylinder being located in the housing and having a conical forward end 26 which is located in the casing 20, while a fan or bladed wheel 27 is attached to the shaft and located in the casing 22. The cylinder 24 has a plurality of spiral ribs 28 thereon, each of which extends from one end of the cylinder to the other, with the ribs starting at one side of the cylinder and terminating at the opposite side, so that each rib extends over but half of the cylinder, as shown in Figure 3. Each rib has its rear part of substantially rectangular shape, as shown at 28', with its forward part sloping forwardly and downwardly to the cylinder, as shown at 28''. Diagonally arranged ribs or teeth 29 are formed on or connected with the flat outer face of the rear part 28', as shown more particularly in Figures 9, 10 and 11. Spiral ribs 30 are also carried by the conical part 26 and each rib 30 extends from a point at one end of the conical part to a diametrically opposite point at the other end thereof.

The shaft 23 can be driven from any suitable source of power by any suitable means, a part of which is shown at 31 in Figures 1 and 3. The blades 32 are preferably shaped as shown in Figure 3, and an opening 33 is formed in the rear face of the fan casing 22 and is controlled by a gate or door 34 which is connected to the rear face of the casing by a bolt and nut 35, the bolt passing through a slot 36 in the gate or door so that by loosening the nut, the gate can be adjusted to control the opening and thus regulate the amount of air entering the fan casing under the action of the fan. The fan casing is provided with the discharge 37.

A substantially semi-circular casing 38 is supported by the frame and this casing is spaced from the lower part of the housing A and at its lower part, the casing forms a conveyor gutter 39 in which is placed a spiral conveyor 40. The ends of the casing 38 slope downwardly to the gutter so that grain passing through the perforations in the lower part of the housing and in the arcuate members 11 will drop into the casing 38 and gravitate down the same into the gutter and the conveyor 40 will move the grain to an elevator casing or housing 41 which will elevate the grain to a cleaner or to any other receiver. As shown in Figure 3, the conveyor 40 is driven by the elevator chain.

As will be seen, the material to be threshed is fed into the casing 20, where it is acted on by the spirals of the cone 26, which feed the material into the annular space between the housing A and the cylinder 24 and the material is threshed by the revolving cylinder and its spirals and the flanges of the channel members 9 carried by the housing. The grain passes through the perforations 10 of the lower section of the housing and the perforations of the arcuate members 18 and drops into the casing 38, which discharges the grain into the gutter, from which the grain is moved to the elevator by the conveyor 40. The straw is fed into the fan casing by the revolving cylinder and the fan forces the straw and chaff from the fan casing through the outlet or discharge 37. The gate 34 should be so adjusted as to prevent a suction being created in the housing A by the revolving fan, as the straw and chaff is forced into the fan casing by the revolving cylinder and the fan simply acts to force the material through the discharge 37. As will be seen, the cylinder, the fan and the feeding cone 26 are all revolved by the one shaft 23.

By adjusting the diameter of the housing A through means of the eccentrics and shafts, the machine can be used for threshing different kinds of grain and this use of the machine for different kinds of grain is also made possible by adjusting the perforations 10 through means of the perforated arcuate members 11. The latter means, together with the individually adjustable sections 11' of the arcuate members, also permits the machine to be efficiently adjusted for moist and dry grain and the transverse ribs 19 facilitate the passage of the grain through the perforations, as these ribs prevent the grain from moving along the lower part of the housing without dropping through the perforations.

Openings covered by sliding doors 42 are provided in the casing 38 so that by opening these doors, the nuts 16 can be adjusted, and slots 43 are formed in the arcuate members 11 for the passage of the lower arms 6.

The shafts 3 may be rotated by hand in any suitable manner, such, for instance, by the handles 44 placed on the ends of the shafts.

It it thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What is claimed is:—

1. A threshing machine of the class described comprising a horizontally arranged stationary housing, a casing at one end thereof, means for feeding the material to be threshed thereinto, a fan casing at the other end of the housing, a shaft passing through the two casings and the housing, means for rotating the shaft, an imperforate cylinder carried by the shaft and located in the housing, said cylinder having a conical end located in the first casing, a fan located in the second casing and connected with the shaft, spiral ribs on the cylinder and its conical part, the lower part of the housing having perforations therein, longitudinally extending ribs on the inner wall of the housing for cooperating with the spiral ribs of the cylinder in producing the threshing action, a casing for receiving the grain passing through the perforations, conveying means carried by the casing last mentioned, a plurality of spaced transversely arranged ribs in the housing for checking the longitudinal flow of grain through the housing and the rear part of the fan casing having an air opening therein located above the center of the casing, and means for regulating the size of the opening to prevent the fan from creating a suction in the housing.

2. In a threshing machine, a housing, a cylinder rotating in the housing, cooperative threshing

means carried by the cylinder and housing, the lower half of the housing having perforations therein, a longitudinally extending row of arcuate perforated members movably arranged on the perforated part of the housing, and means for individually adjusting said members to vary the size of the perforations at different points in the length of the housing.

3. A machine of the character specified comprising a rotary threshing member, a housing enclosing the threshing member and comprising similar upper and lower sections having their longitudinal edge portions overlapping, shafts at the sides of the housing, eccentric connections between the shafts and the respective sections of the housing, a feeder for supplying the material to the space between the threshing member and housing, and a fan at the delivery end of the housing.

4. A machine of the character specified comprising a rotary threshing member, a housing enclosing the threshing member and having its bottom portion provided with openings, independent members in the length of the housing and having openings to register with the openings in the bottom thereof, means for adjusting said members to vary the size of the outlets at different points in the length of the housing to adapt the machine to the nature and condition of the grain to be threshed, a feeder at the receiving end of the housing, and a fan at the delivery end.

5. A machine of the character specified comprising a rotary threshing member, a housing enclosing the threshing member and having its bottom portion provided with openings, members adjacent the bottom portion of the housing and having openings registering with the openings thereof, yieldable connections between the upper edge portions of said members and the housing, yieldable and adjustable connections between the lower edge portions of corresponding members, a feeder at the receiving end of the housing, and a fan at the delivery end.

6. A threshing machine comprising a cylinder, spiral ribs thereon, a housing enclosing the cylinder, and longitudinal and circular ribs on the inner side of the housing to coact with the spiral ribs of the cylinder.

7. A threshing machine comprising a threshing cylinder, a housing therefor having openings in its bottom, members adjacent the bottom side of the housing and having registering openings, connections yieldably and adjustably connecting opposite and adjacent members to admit of varying the openings at different points in the length of the housing and having door controlled openings opposite the respective connections to provide ready access thereto for adjusting the aforesaid members.

JAMES A. JAMES.