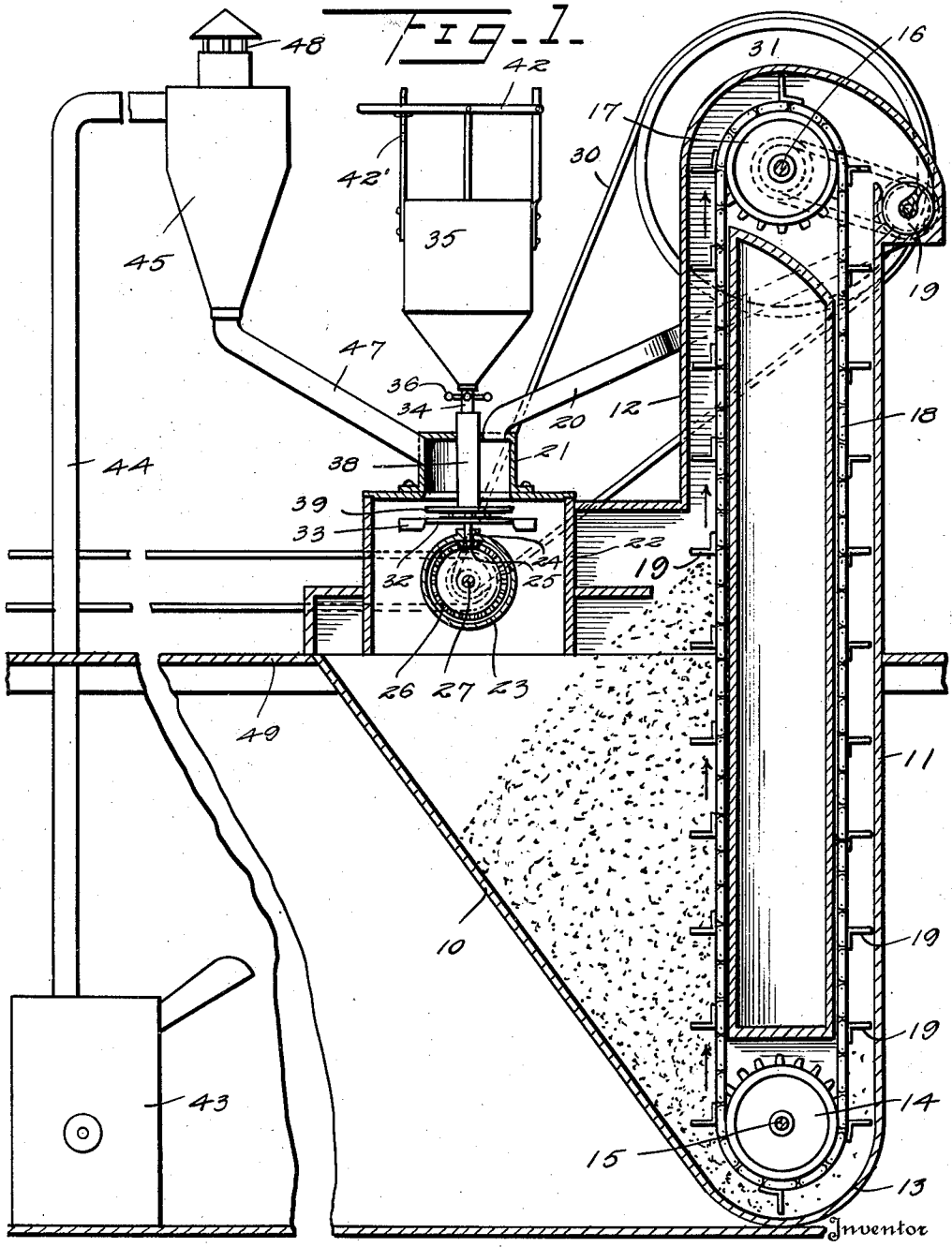
Jan. 6, 1931. D. E. SKIRVIN 1,788,345

FEED MIXER AND MOLASSIZER

Filed Dec. 26, 1929 2 Sheets-Sheet 1

Fig. 1.



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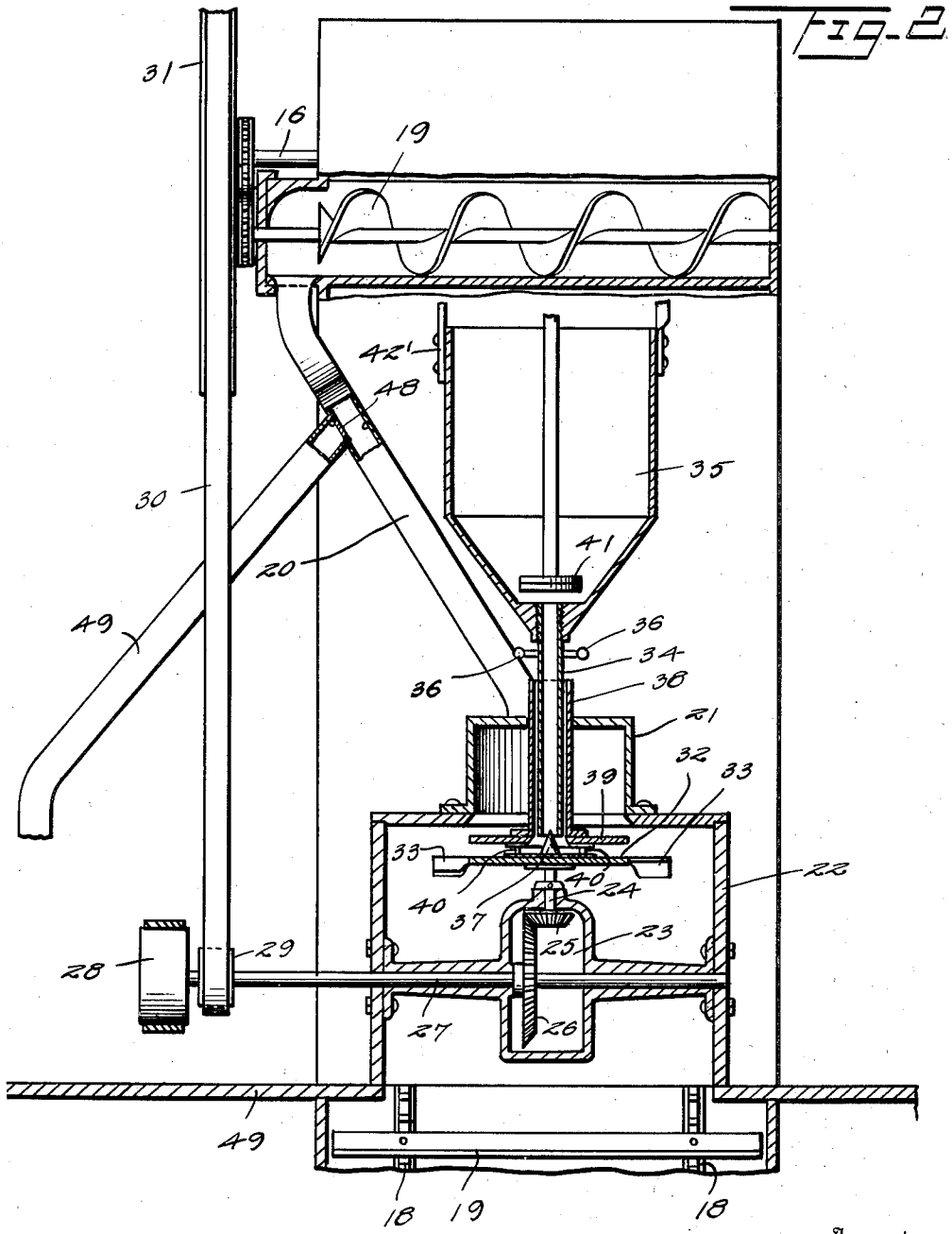
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FEED MIXER AND MOLASSIZER

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Fig. 2



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UNITED STATES PATENT OFFICE

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FEED MIXER AND MOLASSIZER

Application filed December 26, 1929. Serial No. 416,599.

This invention relates to batch feed mixers and particularly to means whereby feed not only may be mixed, but molasses may be mixed with the feed, a construction involving certain improvements upon the construction illustrated in my pending application for patent, Serial No. 385,484 filed on August 13, 1929, on molasses feed mixer.

One of the objects of the present invention is to provide means which will most effectively mix feeds so as to secure a uniform mixing of the various component parts of the feed.

A further object is to provide in connection with this mixer, means whereby molasses may be evenly and uniformly distributed throughout the feed.

A further object is to provide means whereby feed may be discharged through a spray of molasses thrown outward by centrifugal force and whereby the grain or other component material of the feed shall also be discharged outward toward the walls of the molassizing chamber with molasses.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical sectional view of a feed mixer constructed in accordance with my invention;

Figure 2 is an enlarged section on the line 2—2 of Figure 1 but also showing the auger conveyor in section and the casing for the elevator or mixer broken away.

Referring to these drawings, 10 designates a hopper-like receptacle having a downwardly slanting side wall and a vertical wall 11 opposed to the slanting side wall, this vertical wall 11 extending upward and forming with the vertical wall 12 a casing for an elevator, the lower end of the inclined wall and the vertical wall being connected by a curved portion 13 while the upper end of the wall 12 curves over and extends beyond the wall 11.

Disposed in the lower end of the hopper 10 are a pair of sprocket wheels 14 mounted upon a shaft 15. Disposed in the upper end of the casing defined by the walls 11 and 12 is the shaft 16 carrying upon it the sprocket wheels 17. Over these sprocket wheels passes sprocket chains 18 connected by transverse angle irons 19. This elevator may be driven by any suitable means connected to either one of the shafts 15 or 16, such a means being obvious. The blades or angle irons 19 bear against the curved wall 13 and the vertical wall 11 and against the wall 12. The curved wall 12 at its upper end discharges into the casing of an auger conveyor 19, which, as illustrated in Figure 2, extends laterally and discharges into a chute or spout 20. This chute or spout 20 extends downward, as shown in Figure 1, and discharges into the upper end of a casing 21. This casing 21 forms the upper end of a larger casing or drum 22 whose lower end opens into the hopper 10.

The chute 20 may be provided with a valve, as will be later described, or other means might be provided whereby the material conveyed by the auger conveyor may be discharged exteriorly of the mixer when mixing has been completed.

Disposed within the drum 22, as shown most clearly in Figure 2, is a housing 23, which supports a vertical shaft 24. This vertical shaft is driven by a beveled gear wheel 25 meshing with a beveled gear wheel 26 on a transverse shaft 27 which extends out through the wall of the drum 22 and carries upon it a pulley 28 driven by a belt from any suitable source of power. Mounted upon the shaft 27 is a pulley 29 or belt wheel whereby a belt 30 drives a band wheel 31 mounted upon the shaft 16. Sprocket wheels upon the shaft 16 and upon the shaft of the auger 19 drive the auger.

Carried upon the vertical shaft 24 is a disk 32 having blades 33 at intervals around its periphery. Extending downward through the casing 21 is a pipe 34 which constitutes the discharge of a molasses tank 35. The feed pipe 34 has screw-threaded engagement with the tank 35 and this feed pipe is provided with handles 36 whereby it may be raised or lowered to raise the lower end of the feed pipe from or shift it toward a conical distributing member 37 carried at the center of the disk 32. Surrounding this feed pipe is a

sleeve 38 terminating at its lower end in a disk 39 which is connected by connecting members 40 to the disk 32 so that the disk 39 and the sleeve 38 rotate with the disk 32, the sleeve 38 loosely surrounding the feed pipe 34.

Preferably I provide a valve 41 for controlling the discharge from the tank 35, this valve being mounted upon a stem in turn mounted upon a lever 42 pivotally supported upon the wall of the molasses tank 35, this lever constituting a handle and being held in adjusted positions by engagement with a ratchet rack 42 also mounted upon the wall of the hopper as shown in Figure 1. By adjusting this valve 41 the flow of molasses may be entirely cut off or may be reduced.

By adjusting the feed pipe 34, the flow of molasses may also be controlled or entirely cut off.

The blades 33 are preferably in the form of propeller blades and inclined so as to cause a downward suction as the disk 32 is driven at a high speed. Assuming that it be desired to mix the feed with molasses, then it will be seen that the feed is carried by the auger to the chute or spout 20. It is discharged from this spout through the disk 32 and on to the rotating disk 39. It is thrown outward by centrifugal force by this disk and at the same time the molasses passing down through the pipe 34 is also thrown outward in the form of a fine spray or mist. The blades 33 act to draw the grain downward past this spray or mist so that every particle of grain or every particle of feed is thoroughly coated with or mixed with the molasses. The mixed feed or molasses then is discharged past the housing 23 down into the hopper 10 and is then carried back by the blade 19 on the elevator.

The feed will pile up in the bottom of the hopper, particularly as shown in dotted lines in Figure 1 and I have found in actual practice that the angle iron blades 19 mounted upon the chains 18 constitute a most effective means for mixing the feed. It is to be understood that it is not necessary under all circumstances to use the syrup or molasses tank 35 as under some circumstances, it may not be desired or necessary to molassize the feed, but in this case the blades 19 mounted upon the chains 18 constitute means whereby various kinds of grains or feeds may be thoroughly mixed with each other.

The ascending blades moving through the grain or feed tends to mix the component elements of the same by carrying upward a certain portion of the mixture, permitting the material in the hopper to continually sink downward toward the elevator or toward the bottom of the hopper as the feed carried upward by the elevator is again discharged through the spout 20 into the hopper. This is continued for as long a time as may be desirable until the feed has been thoroughly mixed. The same is true with regard to mixing feed or grain with molasses or other syrup. The feed may be mixed with molasses until the contents of the molasses tank 35 has been discharged and then the mixing process may continue until the various component parts of the feed have been thoroughly intermingled with each other and the feed turned over and over so as to secure a thorough intermixture of the molasses with the feed. Then the molassized feed may be discharged from the machine.

In Figure 1 I have illustrated diagrammatically means whereby my mixer may be connected to a grinder designated generally 43 of any suitable character which may be connected by an elevator, the casing of which is designated 44 to a hopper 45 provided with a ventilator 46 whereby dust passing up through the grinder may pass off. The grain then passes by the chute 47 into the casing 21. After passing into the casing 21 and after the proper amount of feed has been passed into the grinder through the dust collector and into the casing, this feed is mixed by being carried up by the elevator any desired number of times and again discharged into the hopper any desired number of times.

After the feed has been fully mixed whether with or without being molassized, the mixed feed is allowed to pass off. This may be accomplished by providing a valve designated 48 in the chute 20, which valve will divert the grain into a chute or spout 49 whereby the grain may pass into a bagger. When the valve is turned to close the spout 49, it will permit the feed to pass from the auger back into the casing 22, into the mixing hopper 10, then back again and so forth to complete its cycle but when the feed has been completely mixed and is ready to be discharged from the mixing machine, which valve 48 may be turned to discharge the grain through the spout 49 into the bagger. It will be understood that I do not wish to be limited to this particular means for discharging the grain, as the auger beyond its point of delivery into the hopper may be connected to a chute discharging into a bag.

It will be noted that the chain elevator is exposed to the feed in the hopper from the bottom of the hopper clear to the top of the hopper, that is, to a point about three feet above the floor 49 or for a distance of about nine feet. This enables the chain elevator to turn the contents of the hopper rapidly, mix it quickly and thoroughly. I have found in actual practice that this chain conveyor or elevator mixes the feed more quickly and requires less power than any other mixer of which I am aware. My machine may be used either for forming a dry mix or mixing the feed with syrup or molasses. By my mechanism, the feed is not only thoroughly mixed, but it is passed one or more times

through the molassizer as desired so as to secure a greater or less molassizing of the feed with a thorough mixing thereof.

Obviously modifications might be made in the details of construction and arrangement of parts without departing from the spirit of the invention as defined in the appended claims.

I claim:—

1. A feed mixer and molassizer comprising a hopper, horizontally disposed rotatable spaced disks disposed in the upper portion of said hopper, the uppermost disk being annular, means for rotating said disks at a high speed, means for discharging syrup through the central opening of the annular disk on to the lower disk whereby the syrup will be discharged outward by centrifugal force in the form of a spray, a vertically disposed elevator mounted in the hopper and extending into the lower portion thereof and extending upward to the top of the hopper, a conveyor into which said elevator discharges, said conveyor discharging the grain into the hopper above said rotating disks whereby the grain in passing downward into the hopper will pass through the spray of syrup.

2. A feed mixer and molassizer comprising a hopper, a drum forming part of the top of the hopper, a vertical shaft disposed within said drum, means for rotating the shaft at a high speed, upper and lower disks mounted upon said shaft for rotation therewith, the lower disk being larger than the upper disk and provided with propeller blades, the upper disk being annular to provide a central opening, a syrup tank having a discharge pipe discharging through said central opening in the disks, means controlling the discharge of syrup through said pipe, an elevator mounted in the hopper and extending above the same, a conveyor into which the elevator discharges, and means for conducting feed from said conveyor and discharging the feed on to the uppermost disk or discharging the feed exteriorly of the hopper.

3. In a feed mixer, a receptacle for the feed, a vertical shaft disposed in the top of said receptacle, two spaced disks carried by said shaft and rotatable therewith, the upper disk being annular, the lower disk having propeller blades at its margin projecting beyond the upper disk, a syrup tank having a feed pipe discharging through the central opening of the upper disk on to the lower disk, the lower disk carrying a conical distributing member disposed immediately below the feed pipe and the feed pipe being adjustable toward or from this conical member, and means for discharging grain on to the uppermost disk.

4. In a feed mixer, a receptacle for the feed, a vertical shaft disposed in the top of said receptacle, two spaced disks carried by said shaft and rotatable therewith, the upper disk being annular, the lower disk having propeller blades at its margin projecting beyond the upper disk, a syrup tank having a feed pipe discharging through the central opening of the upper disk on to the lower disk, the lower disk carrying a conical distributing member disposed immediately below the feed pipe and the feed pipe being adjustable toward or from this conical member, an adjustable valve in the syrup tank adjustable toward or from the feed pipe, and means for discharging grain on to the uppermost disk.

5. In a feed mixer, a receptacle for the feed, a drum mounted in the top of said receptacle and having a cylindrical casing thereon, a vertical shaft disposed within the drum, means for driving the shaft at a high speed, a pair of disks slightly spaced from each other and mounted upon the shaft for rotation therewith, the upper disk being annular, the lower disk being provided with propeller blades at its margin and with a central conical distributing member, a syrup tank disposed above said casing, a feed pipe extending therefrom and discharging on to the conical member, the sleeve extending upward from the annular disk and loosely surrounding the feed pipe, and means for discharging feed into said casing whereby the feed may fall upon the lower disk.

6. A feed mixer comprising a hopper, a drum forming the top of the hopper and open at its lower end into the hopper and having a casing forming an upward extension of the drum, a syrup tank mounted above the casing and having a downwardly extending feed pipe entering the casing, a vertical shaft disposed within the drum, means for driving the shaft at a high speed, a pair of spaced disks mounted upon the drum, the upper disk being annular, the feed pipe alining with the central opening in the disk, the lower disk having propeller blades at its rim and having a central conical distributing member in alinement with the feed pipe, means for controlling the discharge of molasses from the feed pipe on to said disks, a vertically movable elevator in the hopper constituting a mixing device, a conveyor into which the elevator discharges at its upper end, means for discharging feed from said conveyor either into said casing or exterior to the hopper, a feed grinder, a dust separator into which the hopper discharges, and a spout leading from the dust separator into said casing.

7. A feed mixer and molassizer comprising a hopper, horizontally disposed rotatable disks disposed in the upper portion of said hopper, the uppermost disk being annular, means for discharging syrup through the central opening of the annular disk on to the lower disk whereby the syrup will be discharged outward by centrifugal force in the form of a spray, and means in said hopper

for lifting the grain to a point above the hopper and again discharging said grain into the hopper above said rotating disks whereby the grain in passing down into the hopper will again pass through the spray of syrup.

In testimony whereof I hereunto affix my signature.

DAVID E. SKIRVIN.