

March 27, 1962

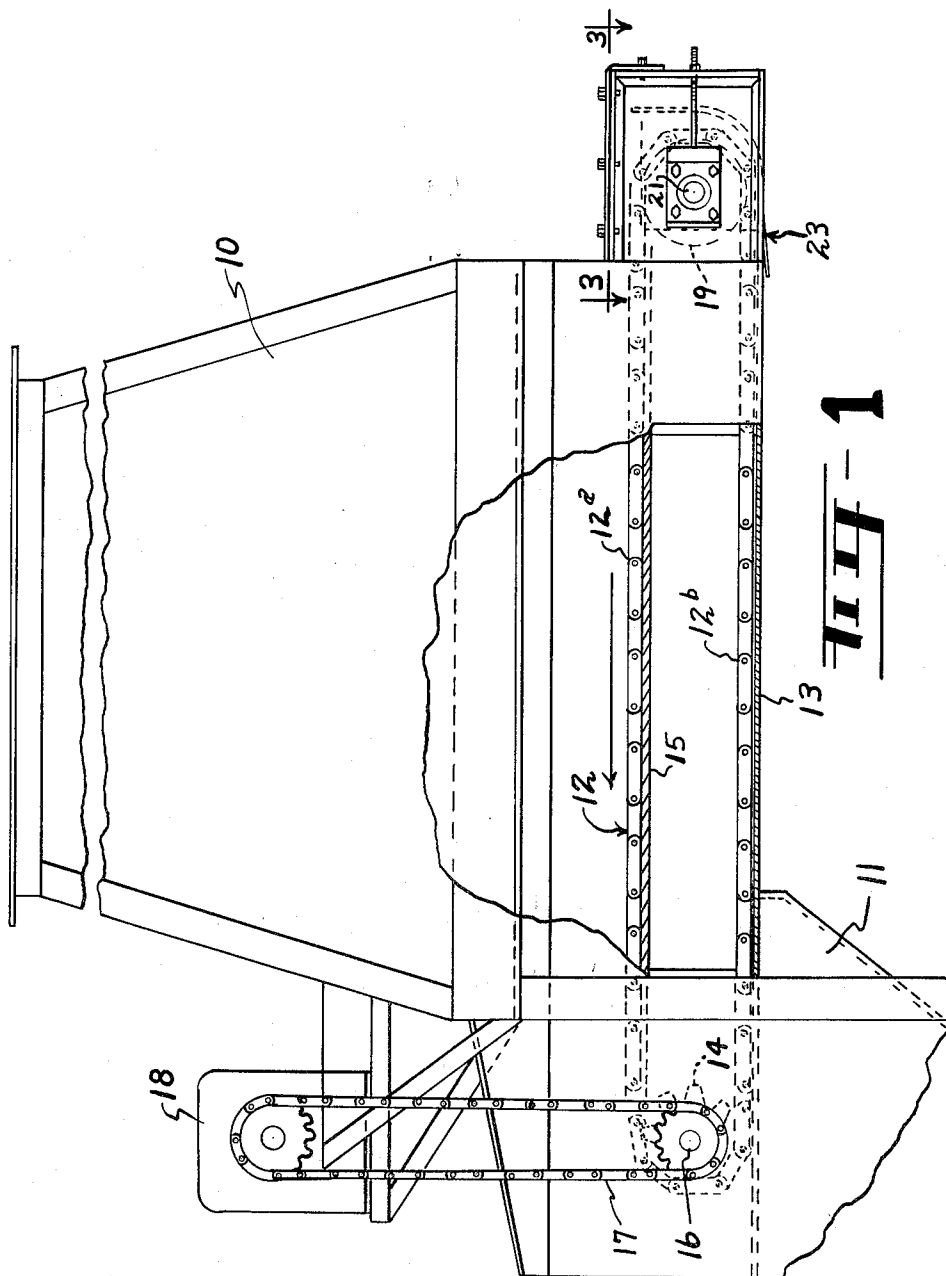
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APPARATUS FOR DISCHARGING WOOD REFUSE FROM A HOPPER

Filed Oct. 8, 1959

3 Sheets-Sheet 1



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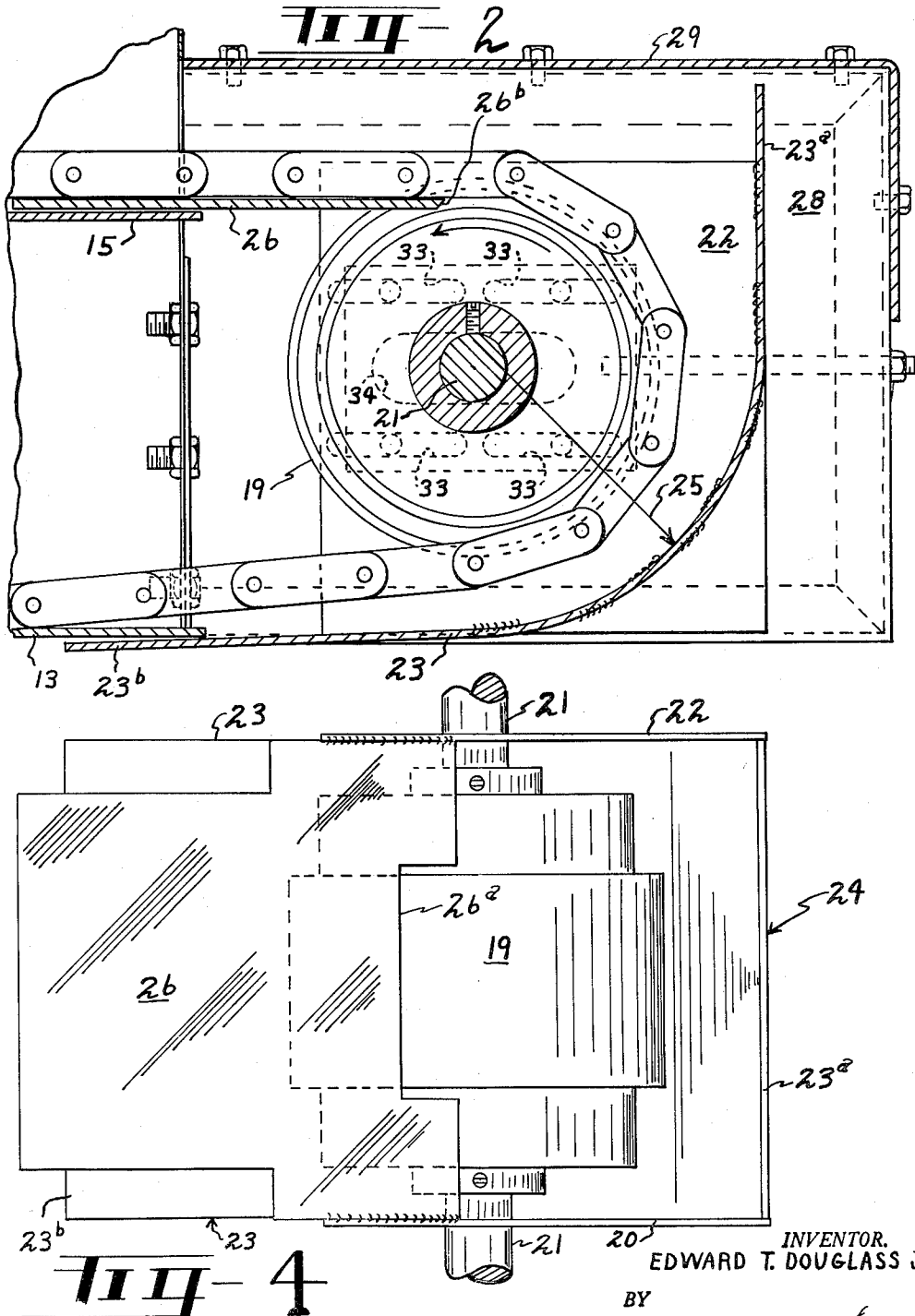
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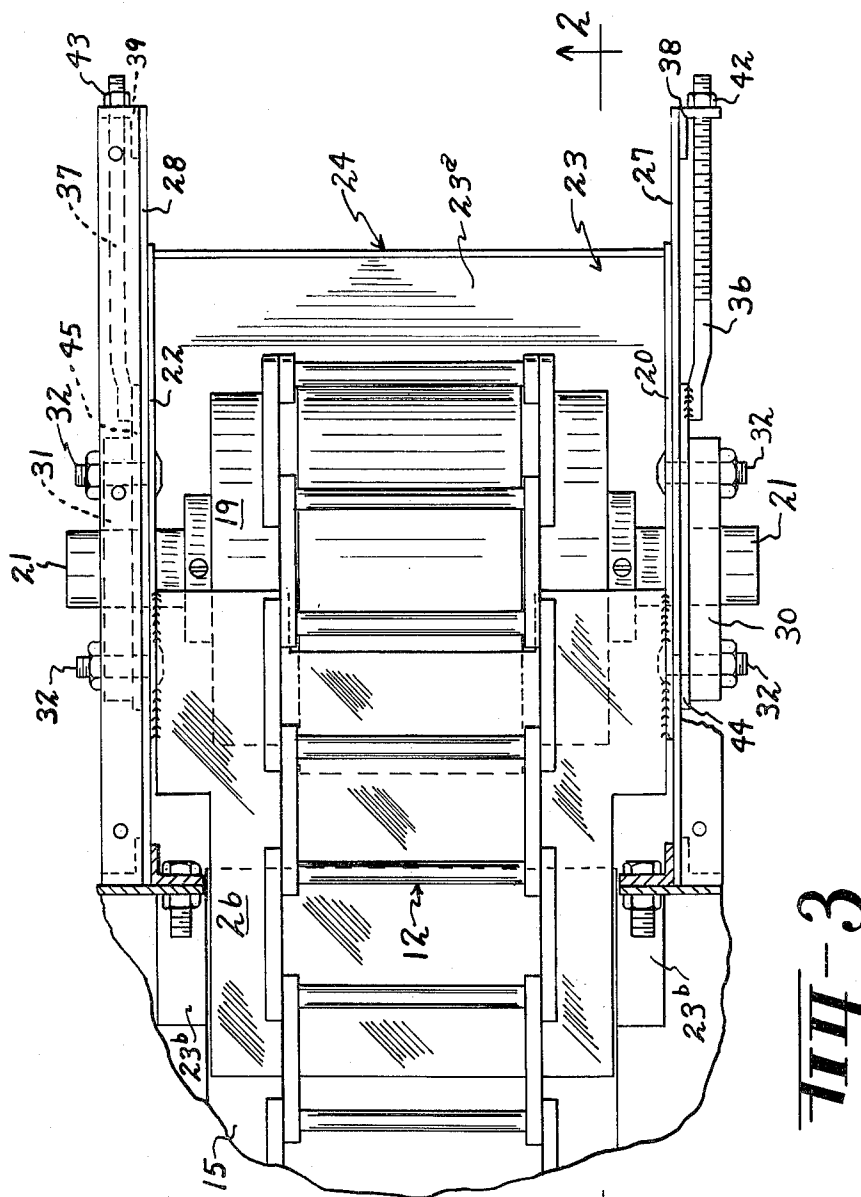
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APPARATUS FOR DISCHARGING WOOD REFUSE FROM A HOPPER

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1 Claim. (Cl. 198—57)

This invention relates to discharge means for wood refuse hoppers and contemplates an improved means of preventing fouling of the drag chain used to convey the material from the hopper.

Heretofore, the idling or tail section of the drag chain in wood refuse hoppers has been susceptible of clogging adjacent the rear pulley or sprocket. Such clogging has been occasioned by the presence of pieces of wood carried on the upper surface of the lower flight and which are forced through the chain and then bind between the chain and the surrounding end wall of the housing or trough structure. The configuration of the trough bottom and end wall adjacent the rear sprocket heretofore has been such as to encourage the wedging or packing action of such refuse, causing excessive wear on the chain and a waste of power.

The prime object of my invention is to provide drag chain discharge apparatus for removing wood refuse from the bottom of hoppers in which the end wall of the housing or casing around the idle or tail sprocket or roller is so made as to provide an ever increasing clearance on the upgoing side of the sprocket or roller, whereby material forced through the chain enters such space and rides upwardly without packing or binding between the chain and the adjacent housing.

Another object is to provide apparatus of the character designated in which means is provided for tightening the chain without disturbing the spaced relationship between the idling sprocket and the adjacent end wall of the housing.

Apparatus illustrating features of my invention is shown in the accompanying drawing forming a part of this application in which:

FIG. 1 is a side elevational view of a hopper for wood refuse having my improved discharge apparatus located in the bottom thereof;

FIG. 2 is an enlarged fragmental sectional view taken generally along line 2—2 of FIG. 3 and showing the ever increasing space afforded between the upgoing side of the tail pulley and the end wall of the housing;

FIG. 3 is an enlarged detail view taken generally along line 3—3 of FIG. 1; and,

FIG. 4 is a top plan view of the tail end roller and the movable trough thereat for tightening the chain.

Referring now to the drawing for a better understanding of my invention I show in FIG. 1 a hopper 10 which may be filled with wood refuse such as shavings, bark, splinters of wood, and the like. While I refer herein to "wood refuse," my improved apparatus appears useful in handling various other materials. There is provided means to convey the material from the hopper 10 and to discharge it down an inclined discharge chute 11. As is customary, such means comprises a drag chain 12 in the bottom of hopper 10 which has an upper flight 12^a and a lower flight 12^b. The lower flight may ride on a bottom plate 13 and the chain may pass over a sprocket 14 mounted on a shaft 16 in turn driven through a chain 17 from a motor 18. Upper flight 12^a of the chain rides on a plate 15. The tail section of the chain may pass over a roller 19 mounted on a shaft 21.

Roller 19 is housed between vertical walls 20 and 22 of a short adjustable trough section indicated generally by the numeral 24. Adjustable trough section 24 has a bottom wall indicated generally by numeral 23 compris-

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ing a curved rear section or end plate 23^a struck on a radius indicated by the line 25 from a point offset from the center of the shaft 21 and positioned slightly below the upper outer surface of shaft 21 as indicated in FIG. 2, and a forward section 23^b which extends under bottom plate 13 and is adapted to slide relative to plate 13. Forward section 23^b extends forwardly of walls 20 and 22 and thus, walls 20 and 22 do not interfere with the overlapping of section 23^b and bottom plate 13. Shaft 21 passes through suitable openings in the respective side walls 20 and 22 of trough member 24. Trough member 24, as shown in FIG. 4, has an upper plate member 26 welded to the vertical walls 20 and 22. The rear end 26^a of the plate is cut out to lie very close to the periphery of the rear sprocket or roller 19, thus to prevent material on the upper surface of the chain from dropping onto the lower flight at this point. If desired the rear end 26^a may be beveled for a closer fit as shown at 26^b in FIG. 2. A fixed outer housing comprising vertical side walls 27 and 28 (see FIG. 3) and an upper plate member 29 is positioned around trough 24 and trough 24 is slidably mounted between walls 27 and 28 for relative movement as will be explained further.

Shaft 21 is journaled in bearings 30 and 31 which are slidably secured to the respective walls 27 and 28 by means of studs 32 or the like. Walls 27 and 28 are provided with slots 33 as shown in dotted lines in FIG. 2 for slidably receiving the studs. Elongated slots 34 for passing the shaft 21 are also provided in walls 27 and 28 so that shaft 21 may slide relative to walls 27 and 28.

Secured to the rear of the bearings 30 and 31 are rearwardly extending take-up bolts 36 and 37, provided with threaded ends which pass through brackets 38 and 39 secured to walls 27 and 28, respectively. Bolts 36 and 37 are secured to plates 44 and 45, respectively, which have suitable openings to receive studs 32 and bove therewith relative to walls 27 and 28. Nuts 42 and 43 serve to pull the bearings 30 and 31 and hence the shaft 21 and roller 19 rearwardly, thus to tighten the chain. Furthermore, it will be noted that the entire inner trough 24 comprising walls 20, 22, 23 and 26 also moves forwardly and rearwardly with the adjustment of the nuts 42 and 43 maintaining a fixed distance between the periphery of the upgoing side of the chain over roller 19 and the inner surface of the curved rear section 23. Thus, the inner trough 24 is fixed in permanent position relative to the center line of shaft 21 so that there is always a constantly increasing clearance in the direction of travel of chain 12 in the area of the curved rear section 23^a with respect to the adjacent upgoing segment of chain 12.

From the foregoing, the method of constructing and using my improved apparatus will be readily apparent. With the tail roller or sprocket 19 in position and with the chain passing thereover, the tension of the chain may be adjusted by means of the nuts 42 and 43. This is accomplished by first loosening the nuts or studs 32 as is customary, then running in or out on the nuts 42 and 43 to move the entire assembly of the shaft 21, bearings 28 and 29, inner trough member 24 and roller 19 forwardly or rearwardly, that is, to the left or right as viewed in the drawings. It will be understood that the wall 13 extends as close as possible to the periphery of the drive sprocket 14 whereby most of the material spills over the forward end of the chain into the chute 11. However, due to difference between the root diameter and the outside diameter of the drive sprocket 14, if a sprocket is used, some material falls through the upper flight of the chain onto the top of the lower flight 12^b. It is this material that heretofore has caused difficulty at the rear sprocket.

With my improved apparatus, pieces of material which are forced through the links of the chain upon being

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squeezed between the chain and the surface of the idling roller or pulley 19 fill the space between the chain and the curved rear section 23^a. Since this space is defined by the ever increasing radius due to the offset relationship of the point where the radius of the wall 24 is struck 5 relative to the center line of shaft 21, such material remains quite loose and does not bind as heretofore has been the case. In practice I note that the material seems to build up about to the level of a horizontal plane passing through the center of shaft 21 and pieces thereof are 10 carried over by the upper flight 12^a of the chain, thus eventually to be discharged into the chute 11. The close running fit of the end 26^a of plate 26 against the rear sprocket or roller 19 assures that this material follows 15 the chain back through the hopper for delivery to the chute 11.

From the foregoing it will be apparent that I have devised an improved conveyor especially adapted for conveying wood waste. The trough section 24 which is fixed 20 relative to the tail pulley or roller and shaft and yet is movable when the chain is tightened or loosened assures that the curved rear section 23^a and roller 19 remain in the same relative position at all times. While I have shown but a single chain 12 it will be apparent that the roller 19 may be made longer and the trough 24 made 25 wider thus to accommodate a plurality of chains if that is desired.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not 30 so limited but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations be placed thereupon as are specifically set forth in the appended claim.

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What is claimed is:

In a chain type conveyor having head and tail sprockets over which an endless horizontally extending chain passes, an outer housing adjacent the tail sprocket comprising a pair of vertical outer side walls having mounted thereon a pair of bearings, a shaft in said bearings on which the tail sprocket is mounted, a trough slidably mounted between the outer side walls comprising vertical inner side walls adjacent the outer side walls through which the shaft passes 5 and a bottom wall extending between and secured to said inner side walls, a bottom plate extending under the lower flight of the conveyor and terminating adjacent the inner side walls of said trough, said bottom wall extending beyond said inner side walls and under said bottom plate 10 whereby said bottom plate overlaps said bottom wall of the trough, said bottom wall having a curved rear section struck on a radius to provide an ever increasing space between the rear section of the trough and the tail sprocket, means on the outer housing to move the shaft, tail 20 sprocket, and the trough relative to the outer side walls in a direction to adjust the tension of the chain, and means to maintain said fixed ever increasing spaced relationship between the curved rear section of the trough and the tail sprocket in all adjusted positions of the tail 25 sprocket.

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