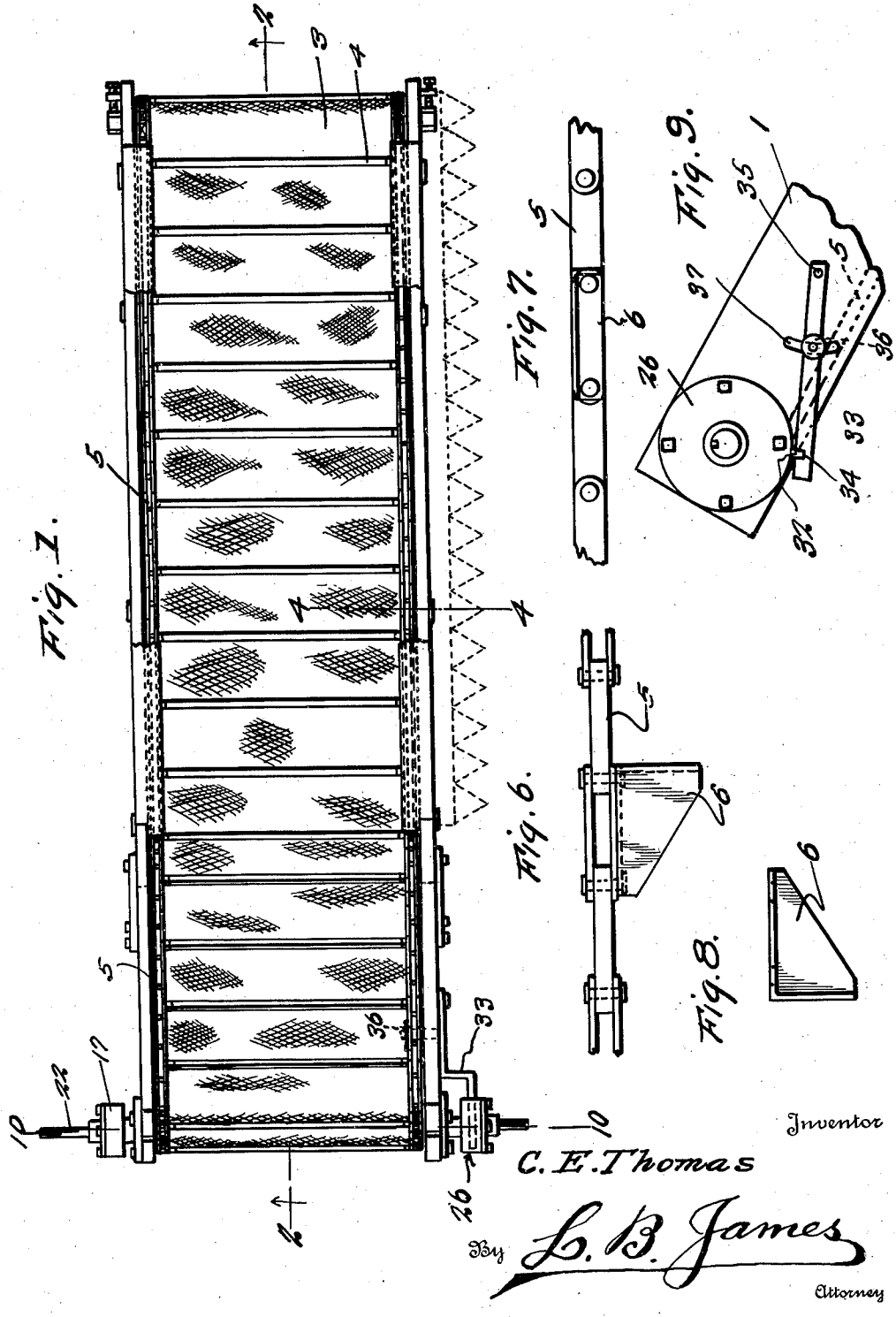
Aug. 12, 1941. C. E. THOMAS 2,252,336

GRAIN BINDER

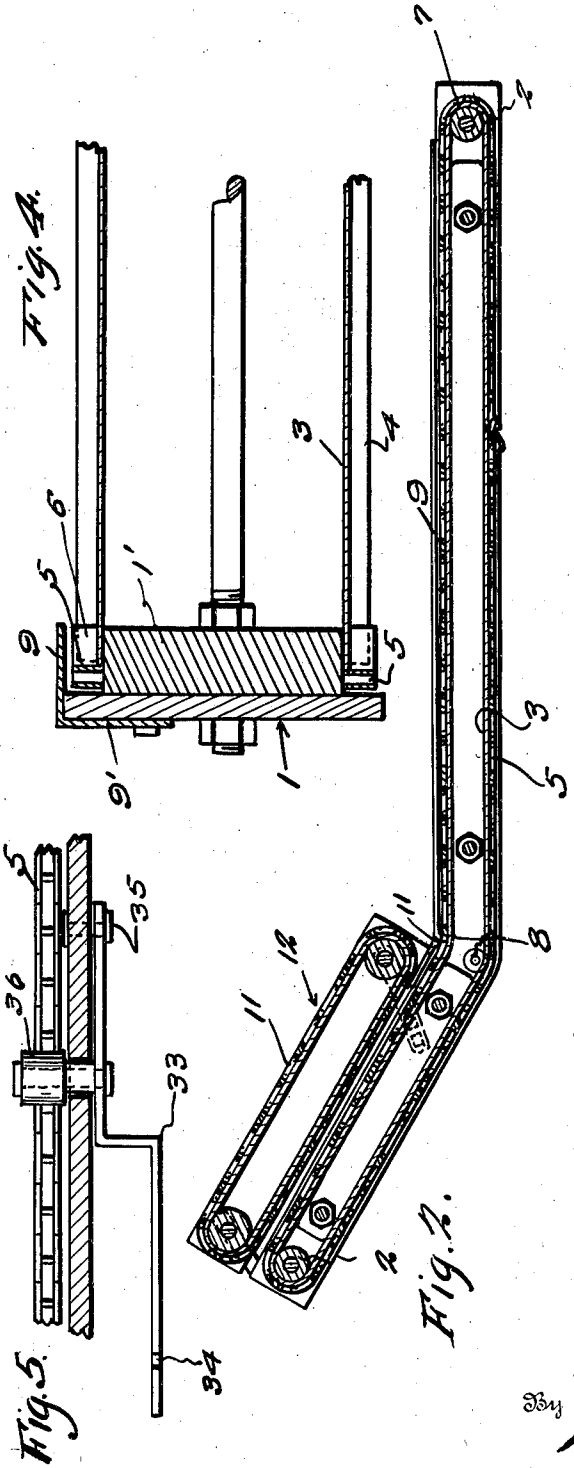
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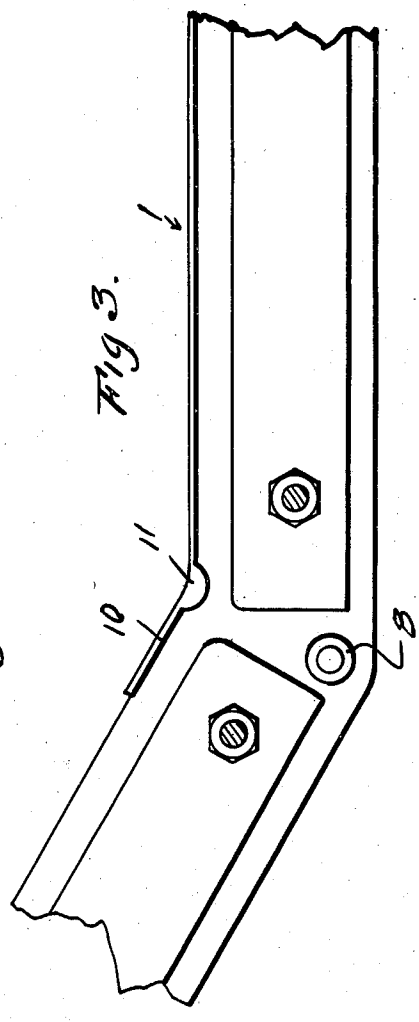


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GRAIN BINDER

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GRAIN BINDER

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Fig. 11.

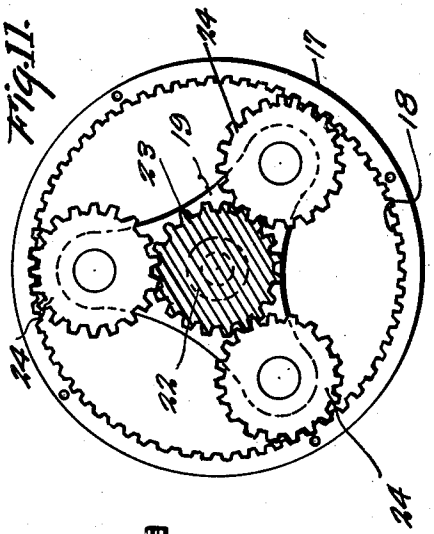


Fig. 10.

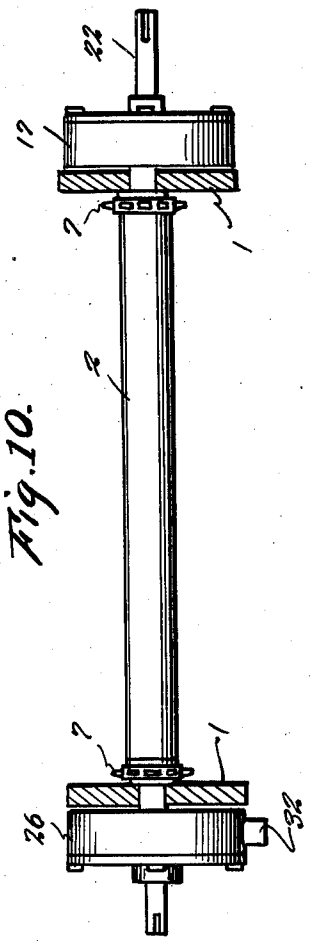
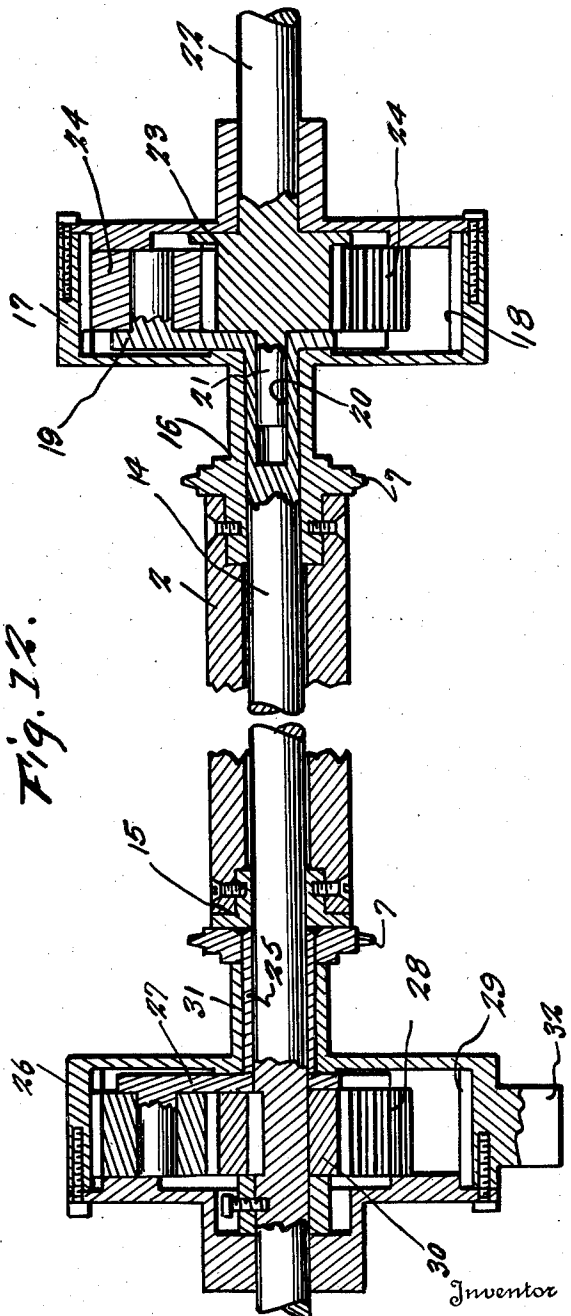


Fig. 12.



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GRAIN BINDER

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Application December 19, 1939, Serial No. 310,076

3 Claims. (Cl. 198—203)

This invention relates to conveyor means for binders or combines, an object of the invention being to make the horizontal and inclined parts of the conveyor means of a single endless belt, with supporting means, thus saving grain and reducing wear on the belt.

Another object of the invention is to provide chains having lugs for engaging cross pieces of the conveyor means, for driving such means.

Another object of the invention is to provide drive means which will stop the movements of the parts if a chain should break.

The invention also consists in certain other features of construction, 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:

Fig. 1 is a top plan view of the conveyor means.

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

Fig. 3 is a fragmentary sectional view through the conveyor frame.

Fig. 4 is a section on line 4—4 of Fig. 1.

Fig. 5 is a view showing the stop arm for stopping the movement of the parts if a chain should break.

Fig. 6 is a top plan view of part of a chain.

Fig. 7 is an edge view thereof.

Fig. 8 is a bottom view of one of the lugs.

Fig. 9 is an elevation showing how the stop arm engages the projection on a housing of the drive means.

Fig. 10 is a section on line 10—10 of Fig. 1.

Fig. 11 is a view looking into one of the housings.

Fig. 12 is a longitudinal sectional view through the drive means.

In these drawings, the numeral 1 indicates the frame of the main conveyor, said frame being provided with the horizontal part which has one edge connected with the cutter assembly of the binder, as shown in Fig. 1, and with the upwardly and outwardly sloping part. Any suitable number of rollers 2 are supported in the frame, for the endless belt 3, which is provided with the usual cross slats 4. As shown, this belt extends through both the horizontal part of the frame and the sloping part, so that one belt is used instead of two belts, as is the practice now used on binders. Strips 1' are fastened to the inner faces of the members of frame 1 and the edges of the belt engage the edges of these strips, as shown in Fig. 4. Endless chains 5 also engage the edges of the strips adjacent the edges of the belt and the chains carry the lugs 6, which are of the form shown in Figs. 6, 7 and 8. These lugs engage the ends of the slats 4 so that movement of the chains is communicated to the belt. The chains pass over sprockets 7 carried by the shafts of the rollers and the lower reaches of the belt and chains pass under the guide roller 8 at the bottom portion of the junction of the horizontal part of the frame with the sloping part, as shown in Fig. 3. Flanges 9 extend over the chains and belt edges and the top parts of the frame and these flanges are attached to the frame by the depending parts 9', as shown in Fig. 4. Parts of these flanges extend part way up the sloping parts of the frame as shown at 10 and projections 11 are formed at the junction of the straight parts of the flanges with the sloping parts, these projections causing the belt and chains to pass smoothly from the horizontal part of the frame to the sloping part thereof.

By having the single belt for both the horizontal and sloping parts of the conveyor there is no loss of grain at the junction of the two belts used in apparatus of this kind and it also avoids damage to the belt as occurs when two belts are used, due to the fact that it is necessary to stretch these belts very tight to make them convey the grain to the proper place.

The usual upper short conveyor 12 operates over the sloping part of the main conveyor and this conveyor belt is also actuated by chains 13 provided with lugs similar to the lugs 6. This top conveyor operates in the usual manner.

The shaft 14 for the rear roller of the main belt is associated with differential means, as shown in Figs. 10, 11 and 12. This rear roller 2 is connected with the bushings 15 and 16 at its ends and the shaft passes freely through these bushings. The bushing 16 is extended beyond the roller and joins a housing 17 having a ring gear 18 on its interior circumference and one of the chain sprockets is rigidly connected to the bushing 16, as shown in Fig. 12. The adjacent end of the shaft passes into the housing where it is connected to a spider 19 and this end of the shaft is formed with a socket 20. The reduced end 21 of a drive shaft 22 rotatably fits in the socket and this shaft 22 carries the gear 23 which meshes with the gears 24 rotatably carried by the spider and these gears 24 mesh with the ring gear 18. The opposite end of shaft 14 passes through a sleeve 25 to which the opposite

sprocket 7 is attached and the sleeve extends into a gear housing 26 where it joins a spider 27 carrying the gears 28 which mesh with the ring gear 29 of housing 26 and with the gear 30 fastened to that part of shaft 14 which passes through housing 26 and said housing is formed with a hub 31 which rotates on the sleeve 25. The shaft 14 projects from the housing 26 and said projecting end is connected with the usual butter board. Housing 26 is formed with a projection 32 and a lever 33 has a notch 34 therein for receiving the projection 32. This lever is pivoted to the sloping part of frame 1, as at 35 and carries a roller 36, the spindle of which passes through a slot 37 in said part of the frame. The roller is engaged by the lower reach of the adjacent chain, as shown in Fig. 5. Thus the chain holds the lever in raised position with its notch engaging the projection 32 but if the chain should break the lever will drop by gravity so that the projection will be free of the notch and thus the housing 26 is free to turn, which causes the differential means to release the belt from the drive means and hence prevents damage to the belt and to the machine parts. If the other chain breaks the sprocket carrying it will be free to revolve and, the load being carried by the sprocket supporting the unbroken chain, will rapidly revolve while the conveyor will stop.

It is 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, combination and arrangement of the several parts, provided such changes fall within the scope of the appended claims.

What I claim and desire to protect by Letters Patent is:

1. A conveyor comprising a frame having side bars, an endless conveyor belt in said frame, rollers in said frame for movably supporting the conveyor belt, one roller constituting a drive roller, a driven shaft extending through said drive roller with its end portions projecting from end of the roller, sprockets at opposite ends of the roller, sprocket chains for moving the conveyor belt trained about the sprockets, gear housings outside the frame having necks passing through the side bars thereof about portions of the driven shaft, differential gearings in the housing, the neck of one housing having the adjacent sprocket carried thereby and the inner end of the neck being fixed to the drive roller, the other housing having its neck free from the adjacent sprocket, the last mentioned sprocket being fixed to a portion of the differential gearing in the last mentioned housing, a lug projecting from the last mentioned housing, a lever pivoted to the adjacent side bar of said frame, and a roller carried by said lever for resting upon the adjacent sprocket chain and supporting the lever in position to engage the lug and hold the last mentioned gear housing stationary and causing turning of the drive roller until breaking of the chain allows movement of the lever out of operative engagement with the lug.

2. A conveyor comprising a frame having side bars, an endless conveyor belt in said frame, rollers in said frame for movably supporting the conveyor belt, one roller constituting a drive roller, sprockets at ends of the drive roller, sprocket chains for moving the conveyor belt trained about the sprockets, drive means for the sprockets including differentials each having a housing disposed outwardly of a side bar of the frame, a lug extending from the housing of one differential, a latch lever pivoted to the adjacent side bar of said frame and formed with a recess to receive the lug and hold the housing stationary, a stem carried by said lever and passing through a slot in the adjacent side bar of the frame, and a roller carried by said stem and resting upon the lower flight of the adjacent sprocket chain to support the lever in its operative position until the chain breaks and allows movement of the lever to an inoperative position.

3. In combination, a driving shaft, a driving gear thereon, idler gears meshing with said driving gear, a spider supporting said idlers and carrying a shaft alined with said driving shaft, an internal gear wherewith said idlers mesh and having a hub surrounding a portion of the second shaft, a sprocket on said hub, a gear fixed on said second shaft, a second series of idlers meshing with the last mentioned gear, a spider supporting said second series of idlers and having a hub surrounding a second portion of said second shaft, a sprocket carried by the last mentioned hub, a second ring gear wherewith said second series of idlers meshes, and means for releasably holding the second ring gear against rotation.

CHARLES E. THOMAS.