

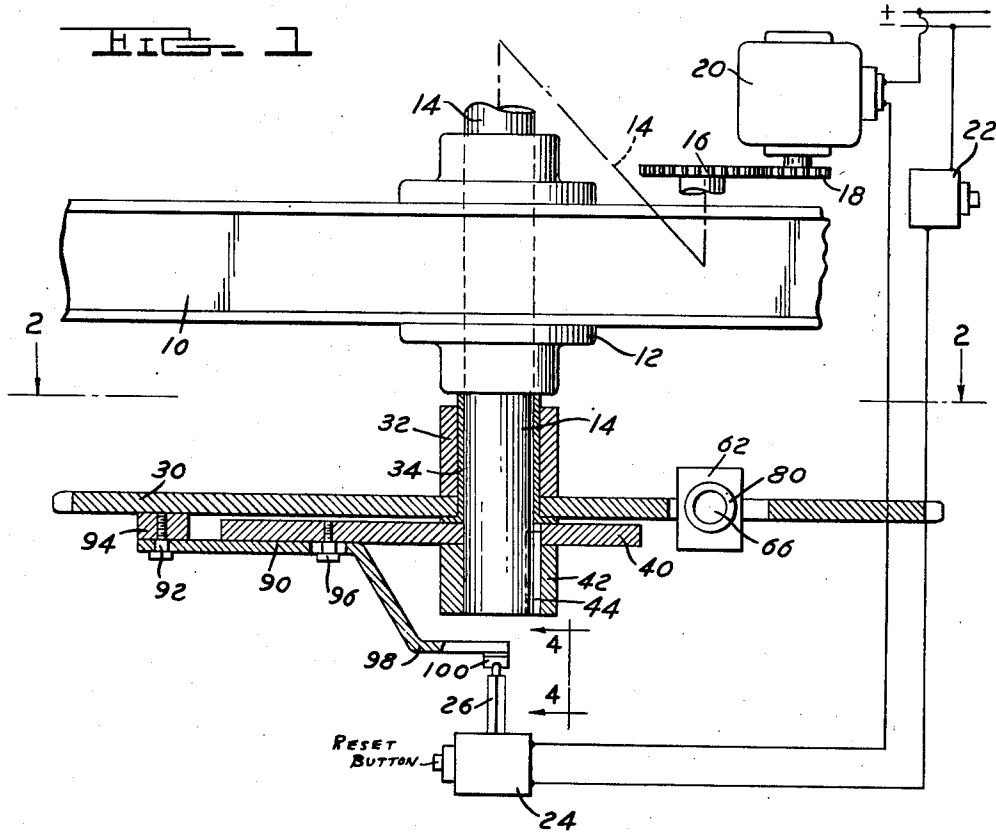
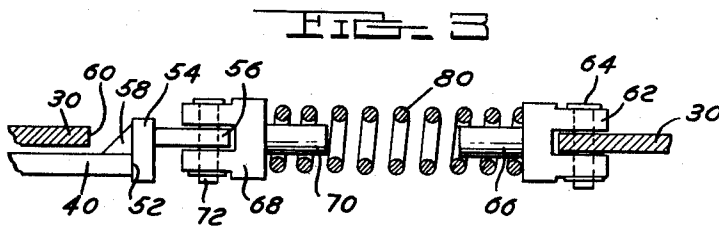
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J. B. SILVER ET AL
SPROCKET DRIVE WHEEL

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 2

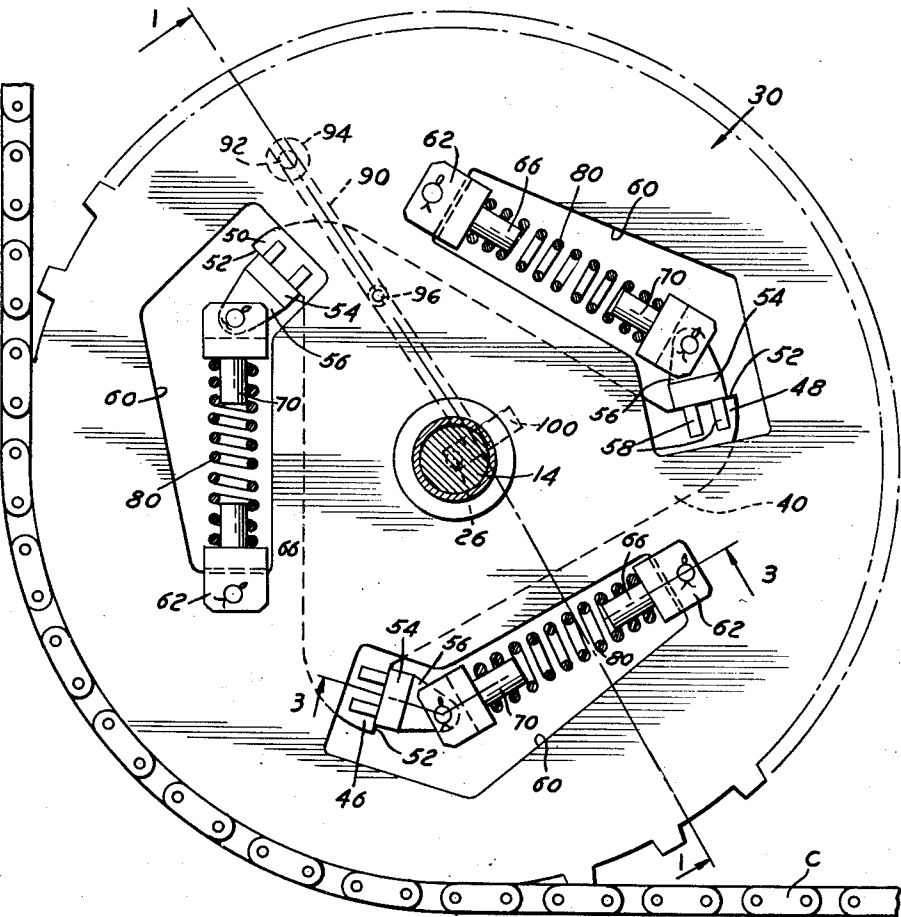
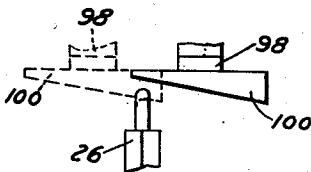


FIG. 4



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SPROCKET DRIVE WHEEL

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5 Claims. (Cl. 200—61.46)

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This invention relates to a sprocket drive wheel.

In connection with continuous conveyors, particularly of the chain drive type, it is usual to have a power wheel provided with sprockets at its periphery to engage the drive chain and to provide the power motivation for the conveyor.

With any type of conveyor the possibility of overloading or of jamming sometimes arises and it is necessary to have some type of device for relieving the strain on the conveyor when this situation arises. A clutch operation has been used and also a shear pin type of connection between the drive shaft and the sprocket. However, with this type of control the power motor continues to operate and there is a loss of power as well as the wear on the clutch. Also, replacement of the shear pin is a time consuming operation.

In other devices it has been the practice to mount the drive sprocket in a floating frame and associate therewith a limit switch which would be actuated if an overload on the chain caused a shifting of the floating frame.

The present invention contemplates a compound sprocket drive wheel in which the power unit is associated with the sprocket in a resilient manner and in which an overload on the chain being driven by the sprocket will be transferred as relative rotative movement between the sprocket wheel and the power unit. This relative movement will actuate a switch to cut out the power motivation until the overload condition is corrected.

Briefly, the invention consists of two co-axial plates, one of which is associated with the motor and the other of which is associated with the chain. These plates are resiliently connected for mutual rotation and relative rotation. A load on the conveyor chain will cause this relative rotation, and a switch actuating member mounted on both plates will be shifted by this relative rotation to actuate a limit switch.

There are additional advantages to the construction apart from the limit switch operation. In many conveyors the installations cover a considerable distance, and it is necessary to have more than one power drive sprocket. When there are a plurality of drive sprockets, the power units are synchronized so that they will operate simultaneously.

The resilient connection in the drive member will smooth out variations in the electrical signal synchronization and will also absorb the initial shock of starting when the conveyor is long or loaded at the time of the starting.

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Other objects and features of the invention, including details of construction and operation, will be apparent in the following description and claims.

Drawings accompany the specification, and the various views thereof may be briefly described as:

Figure 1, a sectional view of the sprocket drive wheel taken on line 1—1 of Figure 2.

Figure 2, a plan view of the drive wheel taken on line 2—2 of Figure 1.

Figure 3, a sectional view of the resilient connection between the co-axial plates taken on line 3—3 of Figure 2.

Figure 4, a side elevation on line 4—4 of Figure 1 showing the switch actuating member.

In the drawings, a mounting beam 10 has a bearing member 12 in which is journaled a drive shaft 14. This drive shaft is connected to a gear 16 driven by a gear 18 from motor 20. Motor 20 is electrically driven and normally operated by a switch 22. In the circuit of switch 22 is a limit switch 24 actuated by a plunger 26 to open the circuit of the motor 20 upon actuation as will be later described. The switch 24 is the type which requires a re-set before it will again close the circuit.

A drive sprocket plate 30 has a hub 32 which is mounted for free rotation on a bushing 34 surrounding shaft 14. At the bottom of shaft 14 and co-axial with plate 30 is an actuator or drive plate 40 having a hub 42 which is keyed to the shaft by key 44.

Plate 40 has a plurality of projections 46, 48 and 50 at corners of the triangularly shaped plate. Each of these projections 46, 48 and 50 has a surface 52 on a plane which passes through the axis of the assembly and a radius of the sprocket plate.

On thus surface is mounted an L-shaped lug having one leg 54 projecting normal to the plate 40 and another leg 56 projecting parallel to the plate 40 and in the same plane as the plate 30. The leg 52 is reinforced to the plate 40 by triangular pieces 58.

The plate 30 has three dog leg shaped openings 60 lying above the projections 46, 48 and 50 of the actuator plate 40. The L-shaped lugs 54—56 mounted on the actuating plate 40 extend into one end of these openings 60. At the other end of these openings is pivoted a clevis 62 on a pin 64, the clevis having a stud projection 66.

A similar clevis 68 having a stud projection 70 is pivoted on the lug leg 56 by a pin 72. Bolts 66 and 70 on the respective clevises 62 and 68 serve as positioners for a relatively heavy spring 90. Due

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to the L shape of the lugs 54—56 the bolts 66 and 70 are in alignment within the dog leg opening 60 of plate 30.

It will thus be seen that there is a resilient connection between the plates 30 and 40 wherein power applied to shaft 14 will be transmitted to the plate 30 through the springs 80.

As shown best in Figure 1 a lever 90 is disposed radially of the plates and pivoted at its outer end by a pin 92 to a block 94 fastened to plate 30 outside the plate 40. Spaced radially from the pin 92 is a second pin 96 which pivotally connects the lever 90 to plate 40. A free end 98 on the lever 90 extends down below the shaft 14 to a point centrally thereof and mounted on the free end 98 is a cam 100. Normally this cam 100 is positioned relative to plunger 26 on limit switch 24 as shown in the full lines of Figure 4. However, a relative rotating movement between plates 30 and 40 will cause the lever 90 to shift to the dotted line position of Figure 4, thus depressing the plunger 26 and actuating the limit switch to stop the motor 20. The limit switch is supported independently of the sprocket assembly by a means not shown.

In the operation of the device the starting of motor 20 will actuate a chain C engaging sprockets of plate 30. The springs 80 will absorb the initial starting shock and the chain with whatever load it may be carrying will be actuated. If however, there is an overloading on the chain for any reason, the springs 80 will compress under the load, causing relative rotating movement between plates 30 and 40 and a shifting of the lever 90 and the cam 100 to depress the plunger of the limit switch, thus stopping the system until switch 24 is re-set and enabling the operator to determine the cause of the overload.

What we claim is:

1. In a drive mechanism of the type having two adjacent co-axial drive plates resiliently linked together for relative and mutual rotative movement and a control means for the plates, the combination of a means for actuating the control means comprising a lever pivotally mounted on each of said plates at radially spaced points and through pivots having axes substantially parallel to the axis of said plates, said lever having a free end extending centerward in spaced relation to said plates in a position to operably associate with the control means, the free end of said lever being shiftable in a plane substantially parallel to the plane of said plates upon relative motion between said drive plates to actuate said control means.

2. In a drive mechanism of the type comprising two adjacent co-axial drive plates resiliently linked together for relative and mutual rotative movement, a control means for said plates positioned concentric therewith and spaced from

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said plates, the combination of an actuation for said control means comprising an elongate bar pivotally mounted on and adapted to revolve with the plates, said bar having a free end extending to the center of said plates, means on the free end of said bar to actuate said control means when shifted away from center, the free end of said bar being shiftable away from center upon relative rotation of said plates while the plates are revolving.

3. A drive wheel mechanism comprising a wheel plate having a peripheral formation to engage a continuous chain or belt, means mounting said plate for free rotation, a drive shaft, a drive plate mounted on said shaft concentric with said wheel plate in a plane parallel to but spaced from said wheel plate, resilient means connecting said plates at a plurality of spaced points whereby power rotation of said drive plate will be transmitted to said wheel plate through said resilient means, a limit switch and actuator mounted adjacent and co-axially with but independent of said plates, and a lever pivotally mounted on both said wheel plate and said drive plate to rotate with said plates and having a free end extending centerward over said shaft and limit switch actuator, and a cam formation on said free end away from said shaft positioned to shift off-center to contact said actuator upon relative rotary motion between said disc and plate.

4. A drive mechanism comprising co-axial plates resiliently connected to transmit torque from one to the other and adapted to have relative rotative movement upon the application of a predetermined torque load, a radially extending bar pivotally connected to said plates at radially spaced points and arranged to revolve with said plates, said bar being shifted from its radial position across the center of said plates upon relative rotation of said plates, and control means at the center of said plates independent of said plates responsive to said shifting to affect the motion of said plates.

5. A device as defined in claim 4 in which the bar has a free end extending to the center of said plates and spaced therefrom, a cam on said end transversely located, and the control means comprises a limit switch mounted independently of said plates to be actuated by said cam upon relative rotative movement between plates.

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