

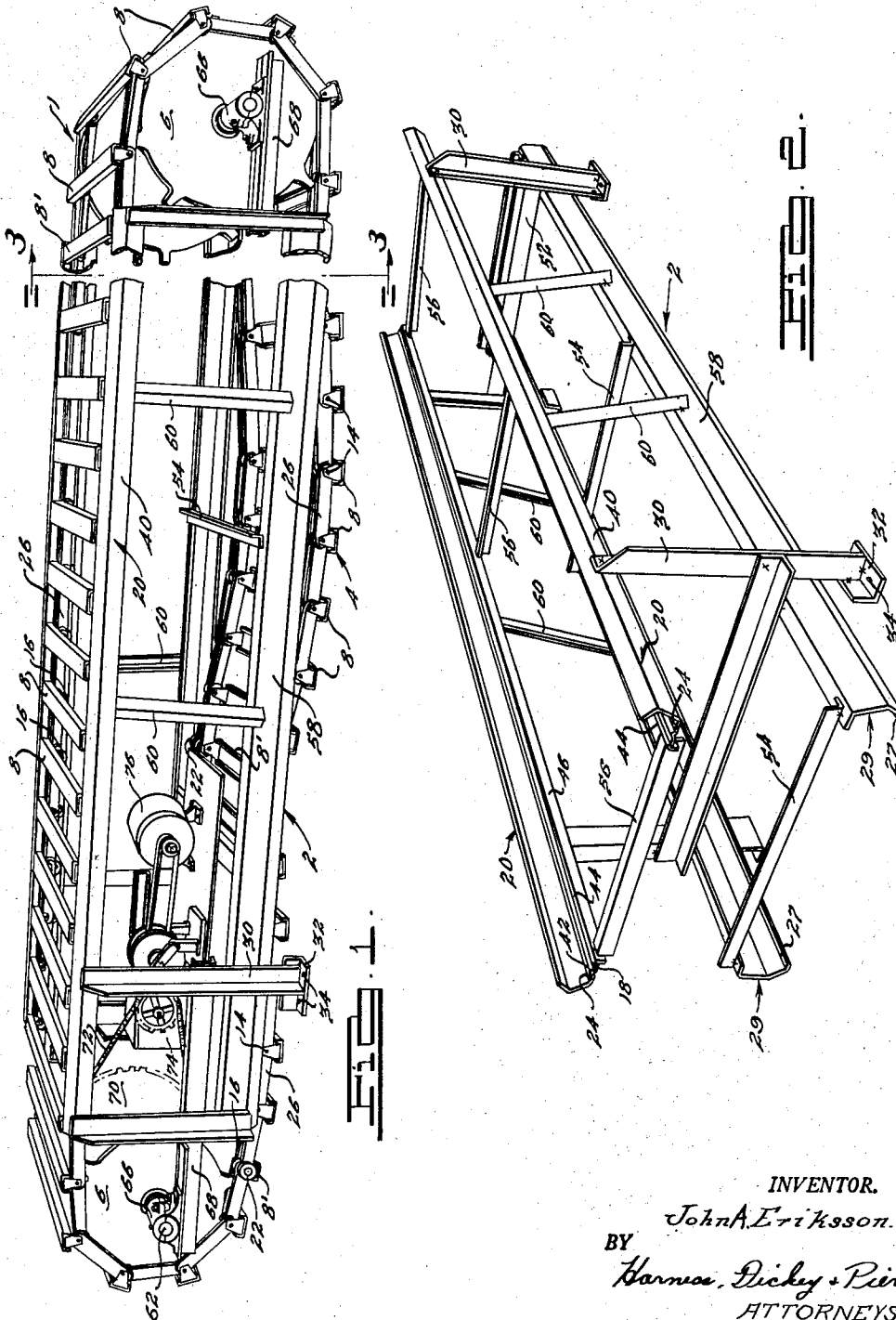
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CONVEYER MECHANISM

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2 Sheets-Sheet 1



INVENTOR.
John A. Eriksson.
BY
Harniss, Dickey & Pierce
ATTORNEYS.

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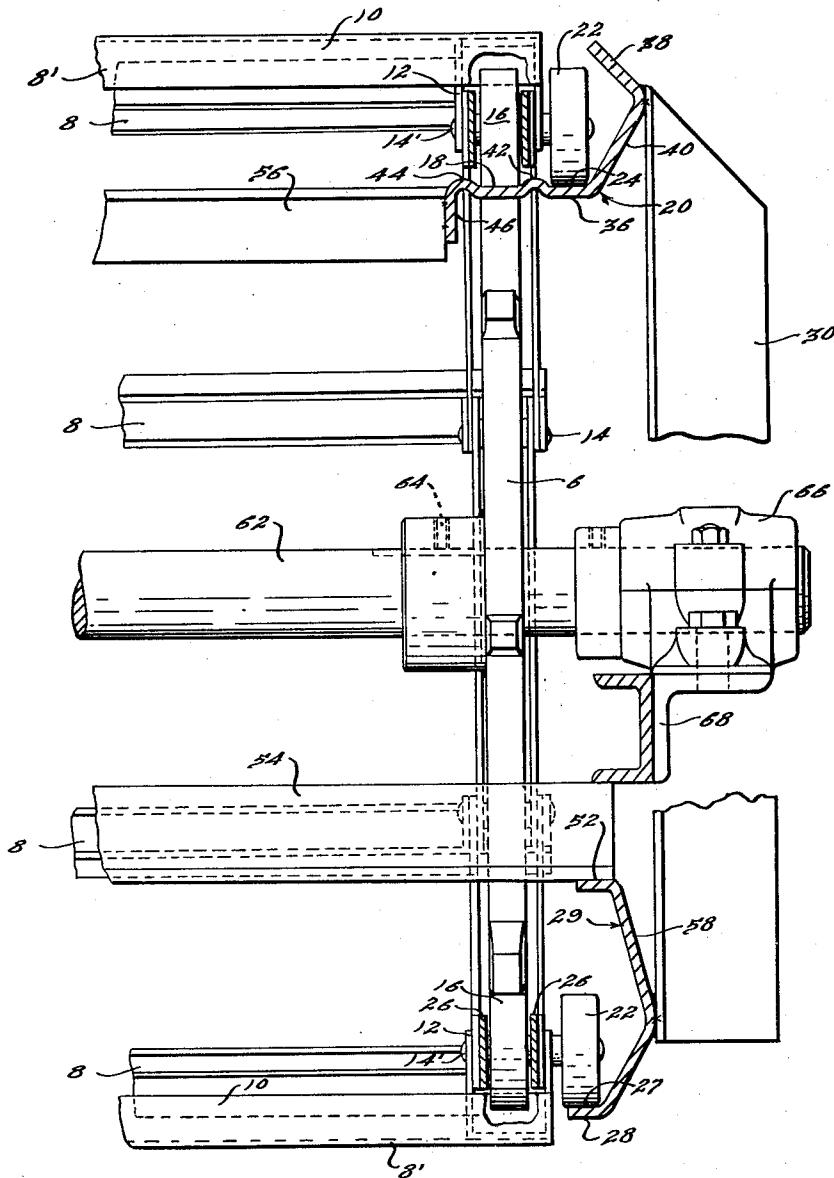


FIG. 3.

INVENTOR.
John A. Eriksson.
BY
Harniss, Dickey & Pierce.
ATTORNEYS.

UNITED STATES PATENT OFFICE

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CONVEYER MECHANISM

John A. Eriksson, Detroit, Mich.

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2 Claims. (Cl. 198—137)

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This invention relates to improvements in conveyor mechanisms and is especially directed toward means for controlling the slack in a conveyor chain.

Objects of this invention are to provide an improved conveyor of the character described; to provide means which will automatically maintain the desired tension of an endless carrier; to provide automatic means which will compensate for increase in length of the carrier relative to the distance between the sheaves due to wear or other causes; to provide means to support the returning portion of the endless carrier to relieve the load on the sprocket wheels; to provide, at spaced intervals along the endless carrier, conveyor wheels for supporting the carrier during the return portion of its movement and permitting intermediate portions of the carrier to sag whereby the tension for the carrier may be maintained; to provide in such an endless carrier a plurality of tracks whereby the load-transporting portion of the carrier is prevented from sideways movement; to provide a track for the supporting casters which holds the carrier in the desired position and against side movement; and generally to provide improved structures of the character described.

The invention has been shown in its presently most desired form; however, the drawings should be treated as illustrating rather than as limiting the invention. The scope of the invention is to be limited only by the scope of the appended claims, it being possible to make changes and modifications within the scope of the generic concept of the invention.

In the drawings, in which the same reference characters are used to designate like parts in the various figures,

Fig. 1 is a perspective view of a conveyor mechanism embodying the invention;

Fig. 2 is a perspective view of an intermediate frame unit of the conveyor mechanism; and

Fig. 3 is a section view taken substantially along the line 3—3 of Fig. 1.

Referring to the drawings, the conveyor is designated generally by the character 1 and comprises a frame structure 2, an endless carrier 4 passing around sprocket wheels 6 arranged in pairs at opposite ends of the structure 2. The frame structure 2, as shown in Fig. 1, may comprise one or more separate units with one or more intermediate units whereby the frame 2 is built up to the desired length. The carrier 4 comprises a plurality of transversely arranged slats or bars 8 and 8' which may be of any desired contour but are preferably channel-shaped, as shown, and arranged with their flanges 10 down-turned during their load run and upturned during their return run. A U-shaped bracket 12 is suitably secured, as by welding, to the channel bars 8 and 8', one at each end portion thereof,

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with their legs extending downwardly of the bars 8 and 8' in the direction of the flanges 10. The outwardly extending legs of the bracket 12 associated with the slats 8 carry stub shafts or axles 14 upon which are journaled casters or rollers 16 which ride during the load run of the slats 8 on tracks 18 of the top channel rails 20 of the frame structure 2. The axles 14' of the slats 8' are carried by the legs of the bracket 12 associated with the slats 8' and extend outwardly beyond the end surface of these slats. Rollers 16 are carried by the axles 14' intermediate the legs of these brackets 12 and additional rollers or casters 22 are journaled on the extending portions of the axles 14'. During the load run of the slats 8' the rollers 22 ride along tracks 24 of the rails 20 while the rollers 16 ride on the tracks 18.

Parallel spaced pairs of links 26 having apertures adjacent each end portion for receiving the shafts 14 and 14' and arranged one on either side of the rollers 16 connect and space apart successive slats 8 and 8' to form the endless conveyor 4. There are a number of slats 8 between successive slats 8'. On the return run the rollers 22 ride on tracks 27 formed on the upper surface of the lower flanges 28 of the lower rails 29 of the frame structure 2. The inwardly facing edges of the tracks 27 are spaced apart a greater distance than the length of the slats 8 and 8' so that the conveyor in its return run is supported only at spaced intervals by the spaced slats 8' with the intermediate slats 8 hanging or sagging downwardly in generally catenary form. The tracks 27 may have entering ramps on which the rollers 22 may ride to the tracks 27 should the ends of the tracks 27 be spaced at such a distance from the sprocket wheels 6 that the rollers 22 tend to enter the tracks 27 below the surface level thereof.

The frame structure 2 is built up as by welding in generally rectangular form supported on posts or uprights 30 having pads 32 welded to their lower end portions. The pads 32 may have apertures 34 therethrough for receiving lag screws whereby the frame may be secured to a supporting surface. Four posts 30 are shown but the number thereof may vary in accordance with the length of the structure 2 and the weight of the articles which are to be carried by the conveyor 1.

The rails 20 are generally channel-shaped and have lower and upper flanges 36 and 38 and a central connecting web 40. The webs 40 are welded at an acute angle to the upper end portions of the posts 30, with the lower flange 36 extending substantially horizontally inwardly of the structure 2 to provide the tracks 18 and 24. An upwardly extending formed ridge 42 in the flange 36 runs lengthwise of the rails 20 and is spaced from the shoulder formed by the intersection of the flange 36 with the web 40 a dis-

tance substantially equal to but slightly greater than the width of the rollers 22 to provide the track 24. A second upwardly extending formed ridge 44 of the flange 36 runs lengthwise of the rails 20 and is spaced from the ridge 42 away from the web 40 a distance substantially equal to but slightly greater than the width of the rollers 16 to provide the track 18. A down-turned lip 46 is provided on the flange 36 adjacent the ridge 44 to provide additional support for the tracks 18 and 24. The upper flange 38 projects upwardly and inwardly of the structure 2 and partially over the rollers 22 to prevent foreign matter from becoming entangled with the rollers 22, the rollers 16 being protected by the slats 8 and 8'.

The generally channel-shaped rails 29 are welded adjacent the lower end portions of the posts 30 and have inwardly extending lower and upper flanges 28 and 52. The lower flange 28 provides the return track 27 for the rollers 22 and is of a width slightly less than that of these rollers 22, so that the slats 8 may hang down or sag therebetween. The upper flanges 52 of the parallel rails 29 are interconnected by tie bars 54 so that these rails are fixedly spaced from each other. Similar tie bars 56 interconnect the down-turned lips 46 of the rails 20 for a like purpose.

A portion of the connecting web 58 of the rails 29 extends at an acute angle to the posts 30. Tie members 60 are welded at one end to this web portion 58 and at their other end to the under surface of the flange 36. These members 60 are located at spaced intervals along the rails 20 and 29.

The sprocket wheels 6 are arranged in pairs at each end of the frame structure 2 in alignment with the tracks 18 and are carried on axles 62. Preferably the sprocket wheels 6 are held in fixed position relative to the axles 62 as by set screws 64 or other equivalent means. The ends of the axles 62 are journaled in bearings 66 carried on brackets 68 of the frame structure 2. Each of the sprocket wheels 6 has teeth which engage the carrier 4 intermediate the rollers 16 and extend between the parallel connecting links 26. One of the axles 62 carries, intermediate the sprocket wheels 6, an axle driving sprocket wheel 70 driven by means of a sprocket chain 72 from a gear reduction unit 74. The unit 74 is in turn driven by suitable means such as an electric motor 76. The gear unit 74 and motor 76 are preferably carried by the structure 2 adjacent the one of the axles 62 which carries the wheel 70 and between the upper and lower rails 20 and 29.

With the aforesaid construction the tension of the endless carrier 4 is automatically maintained due to the sagging returning portion thereof between the spaced return rollers 22. The distance between the sets of return rollers 22 are determinative of the tension applied to the carrier 4, and such tension remains substantially constant irrespective of wear in the carrier 4, thereby obviating the necessity for making adjustments in the center distance between the axles 62.

In operation the motor 76 drives one of the axles 62 through the gear unit 74, chain 72 and wheel 70. The sprocket wheels 6 are thereby driven in a direction to pull the carrier 4 across the top rails 20. Such movement causes the other set of sprocket wheels 6 to rotate and draw the carrier across the bottom rails 29, the sagging portion of the carrier 4 acting to maintain the

carrier 4 under tension. The carrier 4 is prevented from undesired sideways movement during the load run, which might be due to various causes such as the sliding articles onto and off of the conveyer, by the longitudinally extending ridges 42 and 44 between which the rollers 16 operate on the track 18. The flange 38 acts as a guard to protect the rollers 22 and is placed at such an angle that it also acts as a ramp to guide articles which may be slid onto the carrier 4 from locations beside the conveyer 1 so that they will slide onto the upper surface of the carrier 4 and not be damaged due to striking the moving end surface of the slats 8 and 8' or the rollers 22.

What is claimed and is desired to be secured by United States Letters Patent is as follows:

1. A conveyer comprising an endless carrier, a pair of substantially parallel generally channel-shaped upper rails having inner and outer sets of tracks along one flange thereof, a pair of substantially parallel lower rails having a set of tracks, a first set of rollers on said carrier at spaced intervals therealong and operable to engage said inner set of tracks of said upper rails, a second set of rollers on said carrier spaced outwardly of said carrier from said first set and operable to engage said outer set of tracks of said upper rails and to engage said set of tracks of said lower rails, the rollers of said second set being spaced at less frequent intervals about said carrier than the rollers of said first set, means for moving said carrier along said pairs of rails, and a longitudinally extending raised portion on said one flange of each of said upper rails separating the said inner and said outer sets of tracks.

2. A conveyer comprising an endless carrier, a pair of substantially parallel generally channel-shaped upper rails having inner and outer sets of tracks along one flange thereof, a pair of substantially parallel lower rails having a set of tracks, a first set of rollers on said carrier at spaced intervals therealong and operable to engage said inner set of tracks of said upper rails, a second set of rollers on said carrier spaced outwardly of said carrier from said first set and operable to engage said outer set of tracks of said upper rails and to engage said set of tracks of said lower rails, the rollers of said second set being spaced at less frequent intervals about said carrier than the rollers of said first set, means for moving said carrier along said pairs of rails, and a pair of longitudinally extending raised portions on said one flange of each of said upper rails, one of said raised portions being adjacent the outer edge of said one flange of each of said upper rails and the other of said portions being spaced therefrom toward the connecting portion of said upper rails to define the width of said inner set of tracks, said outer set of tracks being defined by said rail connecting portions and the other of said pair of raised portions.

JOHN A. ERIKSSON.

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