Aug. 3, 1954 L. H. GARMAN ET AL 2,685,361

FLOOR TYPE CONVEYER CHAIN

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FIG. 1

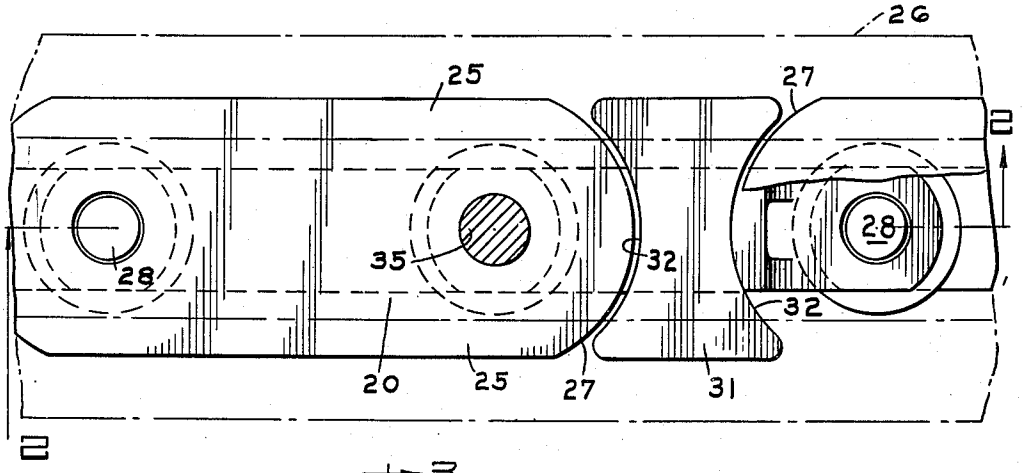


FIG. 2

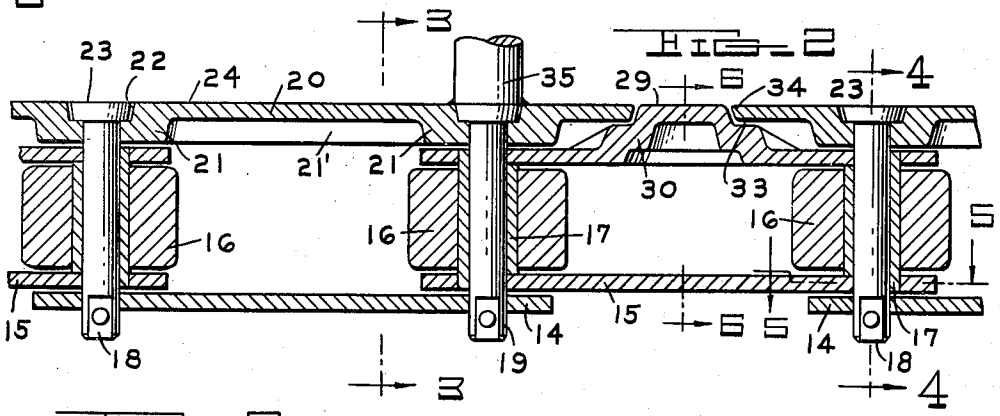
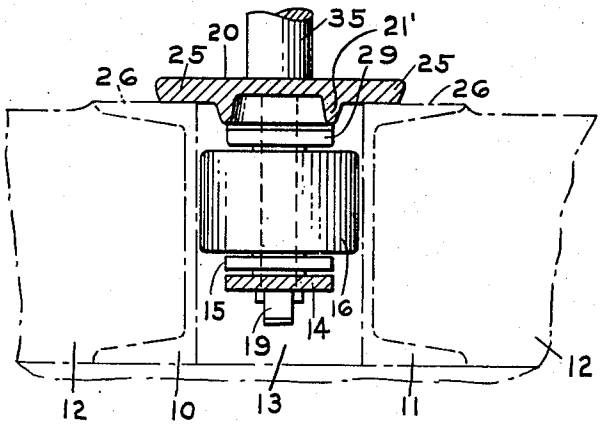


FIG. 3



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FIG. 7

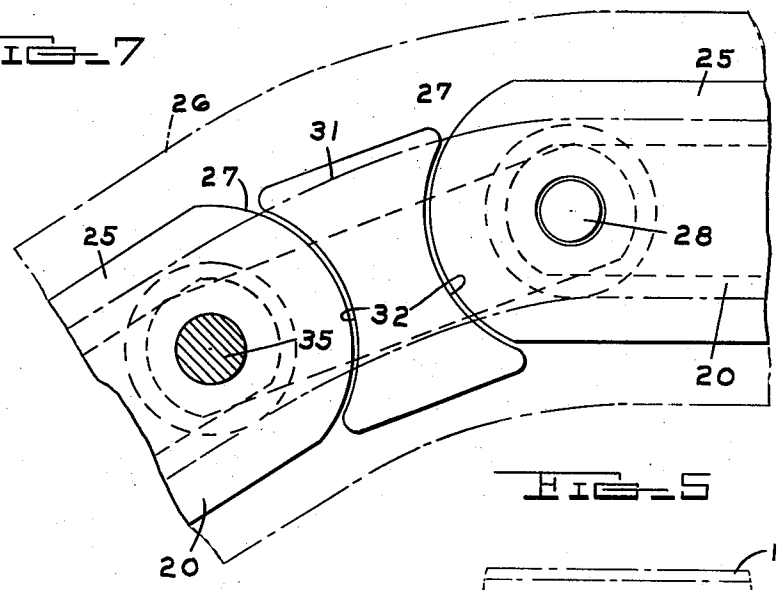


FIG. 5

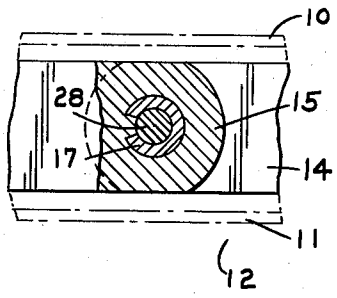


FIG. 6

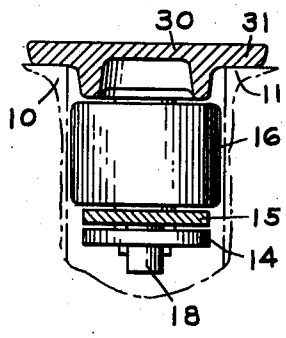
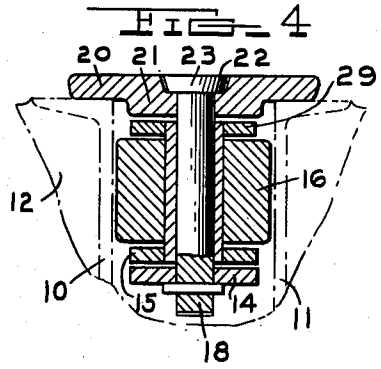


FIG. 4



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FLOOR TYPE CONVEYER CHAIN

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8 Claims. (Cl. 198—181)

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This invention relates to a floor type conveyor chain and has for its principal object to provide a chain construction wherein tension links are integrally formed both to ride along the upper surface of the chain track and to completely cover the opening in such chain track.

Foor conveyor chain drives have been employed in the past wherein a track is formed by a pair of spaced angle or channel members embedded in the floor, a power driven chain being adapted to run within the opening formed by the track members. Conventionally, slide plates are attached to the chain at intervals and are adapted to ride along the upper surface of the track thereby serving to support the chain. With this type of construction the track and chain are open to the accumulation of dirt causing rapid wear and increasing the frictional resistance of the chain to its movement in the track. Such open track also forms a convenient trap for small objects which may become wedged between the chain and the track or carried by the chain to the driving sprocket where they may jam the action frequently causing a breakdown stoppage of the conveyor line.

Furthermore, the conventional rider plates together with their attachment bolts constitute an irregular projection above the floor level forming a hazard to workmen around the track as well as to those stepping across the same.

The present invention contemplates the use of a roller type chain wherein spaced pairs of alternate inner and outer tension links are pivotally connected by pins which also serve as journals for intermediate rollers. The chain is adapted to travel with the axis of the pins in a vertical position, the rollers being dimensioned to contact either side of the chain track in order to reduce friction in traveling around curves in the track. Special links are employed for the top portion of the chain which are wide enough to project over the vertical opening and to ride along the top surface of the respective track members. The alternate inner and outer top links are also formed to provide a continuous coverage of opening in the track to seal the same against the introduction of dirt or foreign objects.

As already mentioned, this continuous coverage of the track opening and suspension of the chain by tension links thereof forms the principal objects of the present invention.

Another object is to make the upper surface of the chain form a continuous flat plane free of projections other than those required for driving connections with the floor trucks or other loads.

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A further object is to employ alternate inner and outer links for the upper links which are constructed in a manner such that the inner links will have a raised portion flush with the upper surface of the outer links.

Another object is to provide mating arcuate surfaces between the ends of the outer links and the flush portion of the inner links whereby freedom of pivotal movement and the continuous flat upper surface of the chain may be preserved through the curved as well as straight portions of the track.

A further object is to provide an outer link construction for the upper links which incorporates depressions for accommodating headed pivot pins in a manner such that the head of the pivot pin will not project above the upper surface of the chain.

These and other objects will appear more clearly from the following more detailed description and from an examination of the drawings forming a part hereof wherein,

Fig. 1 is a plan view of a straight portion of the chain showing the track in phantom.

Fig. 2 is a sectional elevation taken along the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 2.

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 2.

Fig. 6 is a sectional view taken along the line 6—6 of Fig. 2.

Fig. 7 is a plan view of a portion of the chain as it appears on a curved section of the track.

Referring to Fig. 3, it may be seen that a conveyor chain track is formed by a pair of channel members 10, 11 embedded in the floor 12 providing an open 13 for accommodating a conveyor drive chain. The chain is of the roller type wherein pairs of alternate inner and outer links are connected by pivot pins which serve also to journal intermediate rollers. In the present case the lower outer links 14 and inner links 15 are of the conventional type and are substantially narrower than the diameter of the rollers 16 so as to provide ample clearance for the rollers to maintain contact with either of the vertical walls of the track members 10, 11, while the chain is rounding a curve as shown in Fig. 7. The rollers 16 are journaled on a sleeve 17 through the center of which pivot pins 18, 19 extend. The construction of the chain thus far described follows conventional practice, and it is in the construction of

the upper links of the chain that the principal novel features of the present invention reside. As best seen in Figure 2, the upper outer link 20 is constructed as a forging wherein downwardly depending bosses 21 are provided at the pivot points joined by strengthening webs 21' on either side of such bosses. Countersunk pin holes 22 are provided to accommodate the headed pivot pin 18 which is so dimensioned that the top surface 23 of the pin lies in the same plane as the upper surface 24 of the outer link 20.

As best seen in Fig. 3, the outer link 20 has a substantially greater width than the opening in the track so that the edges 25 of such link project over the upper surfaces 26 in the track members in a manner permitting the link to slide along such surfaces dependingly supporting the remainder of the chain within the opening 13. Referring to Fig. 1, it will be seen that the ends of the outer links 20 are formed with arcuate curves 27 having centers at the adjacent pivot points 28.

The inner link 29 is likewise constructed as a forging with an upwardly extending center section 30. While the width of the inner link 29 is generally equal to that of the lower links 14, 15, laterally projecting ears 31 are provided at the top central portion of the link which extend out to a width equal to that of the outer links 20. Concave surfaces 32 are provided in such upper portion matching the convex ends 27 of the outer links 20. The intermediate central portion of the inner link 29 is provided with a horizontal surface 33 underlying the extreme ends 34 of the outer links 20.

Pivot pins 19 with upwardly projecting driving lugs 35 are provided at spaced intervals as required for load engagement, and such lugs constitute the only projection above the upper surface of the chain links 20, 29.

With this construction a continuous cover for the opening 13 is provided by the upper tension links of the chain over both straight and curved portions of the track guarding the same against introduction of dirt or foreign objects which otherwise might impair its operation; such links also serve in lieu of separate slide plates to slidingly support the chain along the track; and the upper surfaces of the upper links and headed pivot pins provide a continuous level surface free from hazardous projections.

While a particular embodiment of the present invention has been described above in detail, it will be understood that numerous modifications are possible without departing from the scope of our invention as defined in the following claims.

We claim:

1. In combination with a submerged floor chain track having opposed walls defining an opening for accommodating a conveyor chain and horizontal surfaces on either side of said opening, a conveyor chain of the type having rotatable rollers journaled on pivot pins between tension links which are pivotally connected to said pins, said chain having lower links of a width less than said track opening being adapted to travel within said track opening with the roller axes positioned vertically between said walls, and each of the upper tension links of said chain having a width greater than said track opening to substantially continuously cover said opening and to slide along said horizontal surfaces dependingly supporting the remaining portions of said chain within said opening.

2. In combination with a submerged floor chain track having an opening for accommodating a conveyor chain, a conveyor chain extending into said opening having all of its upper longitudinally stressed tension links per se formed wider than said opening and to substantially continuously cover said opening.

3. In combination with a submerged floor chain track having an opening for accommodating a conveyor chain, a conveyor chain having upper and lower tension links, said upper tension links being all constructed wider than said opening and adapted to slidingly engage said track, dependingly support remaining portions of said chain within said opening, and continuously cover said opening, the upper surfaces of all upper connecting tension links being formed to lie in a single plane.

4. In combination with a submerged floor chain track having an opening for accommodating a conveyor chain, a conveyor chain of the type having alternate inner and outer tension links pivotally joined by connecting pins, said chain having upper tension links all constructed wider than said opening and adapted to slidingly engage said track, dependingly support remaining portions of said chain within said opening, and substantially continuously cover said opening, the upper surfaces of all connecting upper tension links being formed to lie in a single plane with adjacent end surfaces arcuately formed to provide for articulation about the connecting pins.

5. A floor conveyor chain having alternate inner and outer tension links pivotally joined with connecting pins, one face of said chain being adapted for exposure by a construction wherein a portion of the inner link extends outwardly into the plane of the outer surface of adjacent outer links, said face being also adapted for engagement with spaced track members through the provision of links wide enough to span said opening and dependingly support the remaining portions of the chain within said opening.

6. In combination with a submerged floor chain track having vertical walls defining an opening for accommodating a conveyor chain and horizontal surfaces on either side of said opening, a conveyor chain having exposed tension links all constructed with sufficient width to span and completely cover said opening and to slide on said horizontal surfaces dependingly supporting the remainder of said chain within said opening, and headed pivot pins for connecting said tension links in overlapping relationship, said tension links being constructed with offset portions and with recesses for said pivot pins in a manner whereby exposed surfaces of said links and pins will lie substantially in a single plane, and contiguous exposed portions of adjacent links being provided with mating convex and concave arcuate ends having centers substantially coincident with the axes of said pivot pins.

7. A conveyor chain adapted for use in a fixed track system having appropriately spaced track members, said chain being of the type wherein laterally spaced tension links are overlappingly connected by pivot pins which serve to journal rollers intermediate said spaced links characterized by tension links on one side of said rollers having a smaller width than the diameter of said rollers, tension links on the other side of said rollers all having a width greater than the diameter of said rollers, said latter tension links being adapted to slide upon and substantially continuously cover the opening between said

spaced track members while said rollers and narrower links ride within such opening.

8. A conveyor chain adapted for use in a fixed track system having appropriately spaced track members, said chain being of the type wherein laterally spaced tension links are overlappingly connected by pivot pins which serve to journal rollers intermediate said spaced links characterized by tension links on one side of said rollers having a smaller width than the diameter of said rollers, tension links on the other side of said rollers having a width greater than the diameter of said rollers, said latter tension links being adapted to slide upon and continuously cover the opening between said spaced track members while said rollers and narrower links ride within such opening, continuous track contact by all of said wider links and a single substantially continuous solid exposed chain surface being provided by an offset link construction wherein exposed surfaces of the inner links extend to the level of the outer links and over the edges of the spaced track members.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
387,913	Pendleton	Aug. 14, 1888
874,330	Groom	Dec. 17, 1907
892,965	Sevcik	July 7, 1908
1,000,107	Morris	Aug. 18, 1911
1,792,533	Francis	Feb. 17, 1931
2,157,283	Dyson	May 9, 1939
2,317,675	De Burgh	Apr. 27, 1943

FOREIGN PATENTS

Number	Country	Date
11,827	Great Britain	May 21, 1913