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F. H. DALRYMPLE

2,515,079

CONVEYER CHAIN

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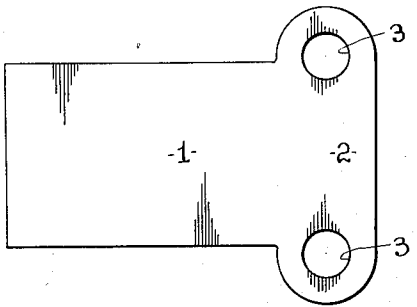


FIG. 1

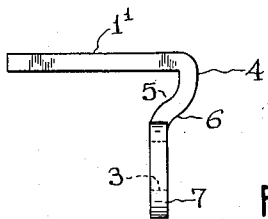


FIG. 2

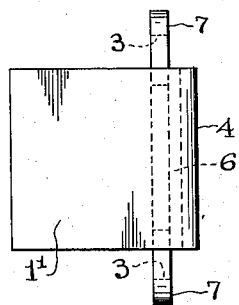


FIG. 3

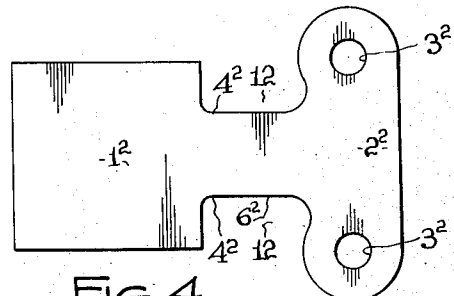


FIG. 4

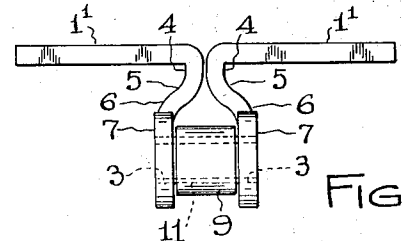


FIG. 5

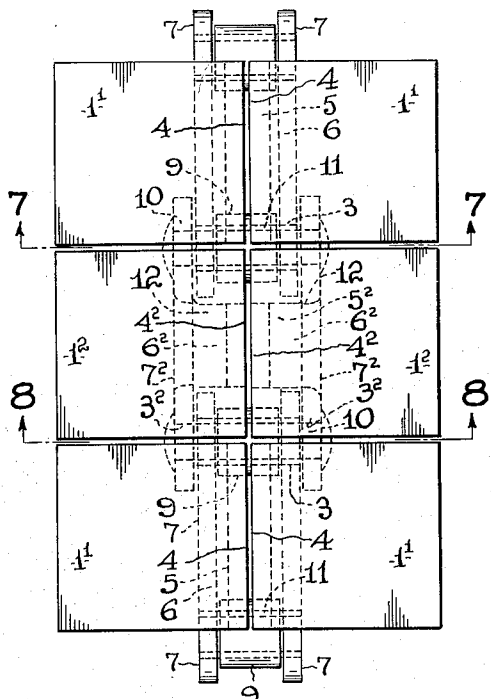


FIG. 6

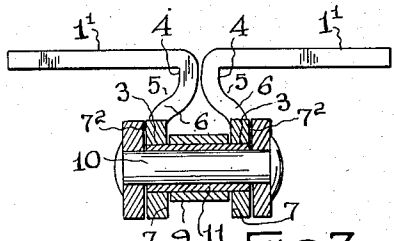


FIG. 7

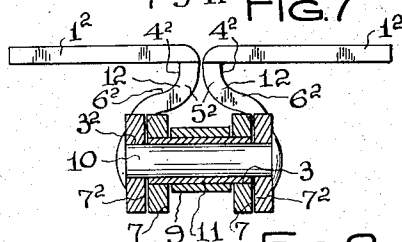


FIG. 8

INVENTOR.
FERDINAND H. DALRYMPLE

BY
George W. Sawyer
ATTORNEY

UNITED STATES PATENT OFFICE

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CONVEYER CHAIN

Ferdinand H. Dalrymple, Bedford, Ohio

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5 Claims. (Cl. 198—189)

1

The invention relates to conveyor chain and particularly to that type of such chain having a flat top plate or conveying platform.

As is well-known in the art, a fabricated flat top conveyor chain comprises two laterally opposed series of link side bars articulately connected together to form a plain chain upon which are mounted top plates forming platforms or supports for the articles to be conveyed.

The particular object of the instant invention is to provide a fabricated flat top conveyor chain, adaptable to different designs or types of chain, in which the side bars of the conveyor chain are of integral formation with the flat top portions thereof. The flat top portions may be integral with inside roller link side bars or with outside connecting link side bars.

The improved design of integrally formed flat top conveyor chain obviates considerable labor and incidental handling necessary in welding or riveting operations by means of which chain side bars are often secured to the top plates.

The instant invention is an improvement upon the type of conveyor chain shown in my Patent No. 2,402,376. Said patented structure also discloses integral formations of side bars and flat top plates, but the side bars of said patented structure serve the side of the chain opposite to that which is served by the flat tops with which the side bars are integrally formed.

In the structure shown herein, the side bar integral with a flat top plate serves the same side of the chain as is served by the flat top plate with which it is integrally formed. In other words, inasmuch as the flat top plate extends inwardly substantially to the median longitudinal axis of the conveyor, the side bar integral therewith in the present invention is bent outwardly of and angularly to the inner longitudinal edge of its flat top plate so that the latter extends upon both sides of the angularly bent side bar and there is thus formed between the adjacent faces of opposed side bars sufficient space to accommodate a roller mounted between the opposed side bars. These rollers are engaged by sprocket teeth to effect the chain movement.

The annexed drawing and the following description set forth in detail certain means illustrating the improvements in conveyor chain, such disclosed means constituting, however, only two of the many forms in which the principle of the invention may be embodied.

In said annexed drawing:

Figure 1 is a plan view of a punched out blank before it is bent into form suitable for coopera-

2

tion with an other like form to constitute a chain link having integral side bar and top plate formations;

Figure 2 is an elevation looking at an end of the structure shown in Figure 1 after the structure of Figure 1 has been formed into final shape;

Figure 3 is a plan view of the integral formation shown in Figure 2;

Figure 4 is a plan view of a punched out blank, similar to Figure 1, the difference between the two views being that the blank of Figure 1 is suitable for forming an integral formation in which the flat top plate portion is integral with an inside roller link side bar, whereas, the blank of Figure 4 is suitable for forming an integral formation in which the flat top plate portion is integral with an outside connecting link side bar; and, also, the punched out blank of Figure 4 omits certain of the material on the two ends of the blank for purposes hereinafter fully described, which apply both to roller link side bars and connecting link side bars.

Figure 5 is an elevation of opposed integral formations in final form connected together by a bushing seated at its ends in the opposed roller link side bars of the two formations and upon which a roller is mounted, the whole forming one link of the improved conveyor chain;

Figure 6 is a plan view of a section of the improved conveyor chain, the same comprising three chain links and two complete joints, the top joint between the upper and intermediate link being formed by an articulating pin which connects the upper chain link having its flat top portions integrally formed with roller link side bars with the intermediate link having its flat top portions formed integrally with connecting link side bars; whereas, the articulating pin of the lower joint connects the intermediate link with its flat top portions integrally formed with connecting link side bars with the lower link with its flat top portions integrally formed with roller link side bars;

Figure 7 is a transverse section, taken in the plane indicated by the line 7—7, Figure 6, showing the upper joint of Figure 6 in which the integral formations consist of flat top portions and inside roller link side bars; and

Figure 8 is a transverse section, taken in the plane indicated by the line 8—8, Figure 6, showing the lower joint of Figure 6 in which the integral formations consist of flat top portions and outside connecting link side bars.

Whenever a chain "element" is mentioned herein, it should be understood that a single integral formation is thus referred to, consisting

3

of a flat top plate and a side bar forming one side of a chain link, it being understood that by a "link" is meant two transversely-opposed similar elements or integral formations forming that part of the complete conveyor chain between adjacent articulating joints.

Referring to the annexed drawing in which the same parts are indicated by the same respective numbers in the several views, the blank of Figure 1 has a main portion 1 and a longitudinally extended or lengthened end side portion 2, which extension is in both longitudinal directions and is formed with circular holes 3 whose respective centers are slightly outside the planes of the two ends of the main portion 1. The blank of Figure 1 is thus referred to as having a transverse width of greater dimension than its longitudinal length inasmuch as "width" and "length" are conveyor chain terms and the width of a complete conveyor is that of the transverse dimension of the conveyor, and the length of a complete conveyor is the sum total of the lengths of all of the pitches of the conveyor.

The blank 1 is bent in a lengthwise direction so as to produce a formation such as shown in Figure 2, in which the lengthened side portion 2 of the blank extends in a longitudinal direction and forms a side bar 7, intermediate the planes defining the sides of an unbent flat portion 1¹ serving as a conveying surface, an intermediate portion 5 of the blank being bent outwardly and forming a connecting member between the conveying portion 1¹ and the side bar 7. The intermediate portion 5 is formed into an upper end portion 4 extending substantially parallel to the side bar 7 and a lower curved end portion 6 which connects the portion 4 and the side bar 7. The width of the conveying surface portion 1¹ determines the transverse dimension or width of a flat top portion; i. e., substantially the distance from the median longitudinal line of the contemplated complete chain conveyor to an outside edge of the conveyor, which is substantially one-half the transverse dimension of the carrying surface of a complete conveyor link. The extent to which the side bar 7 is carried in under the conveying surface 1¹ is determined by about one-half the space that is required to accommodate a roller 9 between the side bar 7 and the side bar 7 of an opposed like integral formation the inner edge of whose opposed conveying surface 1¹ substantially abuts the inner edge of the conveying surface 1¹, as shown in Figure 5, two such integral formations thus assembled forming a complete link of the conveyor chain and the two conveying surfaces 1¹ forming the complete conveying platform between adjacent chain joints. The roller 9 is mounted on a bushing 11 secured at its respective ends in the opposed side bars 7.

The resultant structure, in a complete articulated chain, effected by two of the aforesaid integral formations disposed in opposed relation with the inner edges of the platform portions 1¹ substantially abutting is also shown in Figure 7, an articulating pin 10 being secured in outer connecting side bars 7².

When the flat top conveying portions are formed integrally with the outside connecting chain links, such as portions 1², Figures 4 and 8, the following modifications are necessary. The portion of the blank which forms the parts 4²—6²—7² must be somewhat longer, as can be clearly seen in Figure 8, and the articulating

4

pin holes 3² are smaller inasmuch as the bushings 11 do not intersect the outer connecting side bars 7². A suitable form of blank to effect these objectives is shown in Figure 4 in which it will be noted that the part 4²—6² of the blank is somewhat longer than the part 4—6 of the blank shown in Figure 2, and that the holes 3² are smaller than the holes 3 of the blank shown in Figure 1.

In either of the forms of blanks, blank 1 of Figure 1, and blank 1² of Figure 4, production may be expedited by relieving the ends of the intermediate portion of the blank between the side surface conveying portion and the side bar portion, as is indicated, for purposes of illustration, by the recesses 12, Figure 4. The advantages of the cut-away type blank shown in Figure 4 are that it is easier to form; and also permits lower platform or conveying surface height in relation to the horizontal chain pin centerline, and, as stated, is a type which may be used for forming roller link side bars or connecting link side bars.

Whenever the conveying surface portion of a chain element is formed integrally with the outside connecting link side bar, and the curved portion 6² of the element is not bent upwardly sufficiently to allow clearance for the inside roller link side bars 7, then the portion of the blank between the side conveying surface and the link side bar is necessarily relieved at its ends to an extent sufficient to provide the necessary clearance. This condition is illustrated in Figures 6 and 8. This clearance may not be to the same extent as indicated by the recesses 12, Figure 4, but is to such an extent as will provide the required clearance for the roller link side bar 7.

The invention lends itself to present standard chain assembly, as also, to present standard procedures of coupling, uncoupling, and field repairs. Furthermore, the two integral formations comprising an outside connecting link of the invention can be used as a coupling link for other flat top chains that have the same pitch and point dimensions, provided the conveying surface height of the integral formations above the side bar centerline is made to conform to the conveying surface height of the other flat top chain to which it is applied.

Although the gap between the adjacent inner edges between the conveying surfaces 1¹ or 1² of a chain link is shown as quite narrow, and thus the adjacent edges of the surfaces substantially abutting, this is merely illustrative, inasmuch as the bottles, cans, other containers, and packages carried by this type of flat top chain have a substantial bottom size or diameter so that they straddle any gap of a width which is not unreasonably great for the circumstances. Any width of gap within reason will not materially affect the smoothness of conveying and transfer operations, i. e., the conveyed articles will retain their balance and stability. These articles that are thus transported by the flat top chain are usually conveyed and transferred in single file and are guided to the approximate center of the chain conveyor by means of guide rails.

What I claim is:

1. A link element for chain conveyors which have articulated longitudinally-opposed links with transverse opposed and connected side bars, comprising a member formed from a one-piece blank bent to provide, on the same side of the

5

conveyor, a conveying surface and a substantially relatively right-angular side bar, the blank also being bent downwardly and outwardly to form a connecting member between the conveying surface and the side bar to provide a space laterally interiorly of the side bar for the accommodation of a sprocket-engaging member between the side bars of two of the link elements reversely-arranged in opposed relation.

2. A link for chain conveyors which have articulated longitudinally-opposed links with transverse opposed and connected side bars, comprising two opposed connected reversely-arranged link elements each characterized as in claim 1, in which the inner edges of the conveying surface portions of the two link elements substantially abut to form a substantially continuous conveying platform.

3. A link for chain conveyors which have articulated longitudinally-opposed links with transverse opposed and connected side bars, comprising two opposed connected reversely-arranged link elements each characterized as in claim 1, in which the two link elements are identical and form between them an enclosed space for a sprocket-engaged roller, a pin for articulate connection with an adjacent link having side bars overlapping the side bars of the elements, the pin being secured at its ends in the opposed side bars of the adjacent link, and a bushing mounted on the pin and in the side bars of the link elements, upon which bushing a roller is mounted.

4. A link element for chain conveyors which have articulated longitudinally-opposed links with transverse opposed and connected side bars, char-

6

acterized as in claim 1, in which the connecting formation is relieved at its transverse edges to form clearance recesses.

5. A conveyor chain comprising longitudinally-opposed links each of which consists of two transversely-opposed relatively reversely-arranged elements each formed from a one-piece blank bent to provide, on the same side of the conveyor, a conveying surface and a substantially relatively right-angular side bar, each blank being also bent downwardly and outwardly to form a connecting member between the conveying surface and the side bar, the conveying surfaces of the two elements being transversely aligned to form a conveying platform, side bars of longitudinally-adjacent links overlapping, alternately inside and outside, articulating pins connecting transversely-opposed pairs of overlapping side bars and secured at their ends in the outer bars, bushings connecting the inner bars and seated at their ends therein, and rollers mounted on the bushings between the opposed inner bars.

FERDINAND H. DALRYMPLE.

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