

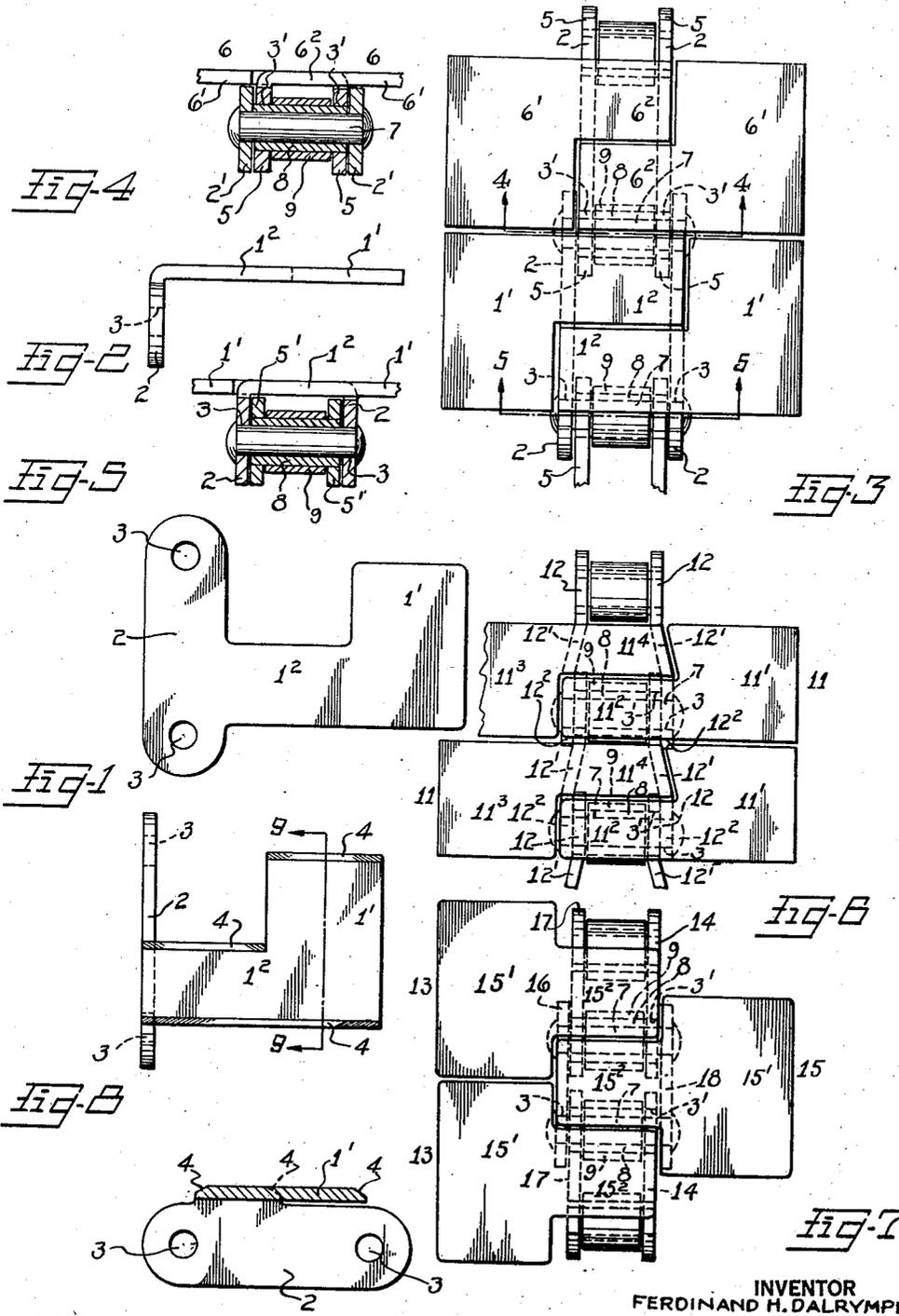
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CONVEYER CHAIN

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## CONVEYER CHAIN

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The invention relates to conveyer 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 conveyer 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 conveyer chain, adaptable to different designs or types of chain, in which the side bars of the conveyer chain are of integral formation with the flat top portions thereof. The flat top may be integral with roller link side bars or with connecting link side bars, or a combination of such integral structures may be utilized to constitute the improved flat top conveyer chain.

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

The annexed drawing and the following description set forth in detail certain means illustrating the improvements in conveyer chains, such disclosed means constituting, however, only a few 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 blanked out part before it is bent into the final form suitable for nesting with other integrally formed parts to constitute a chain section having integral side bars and top plates;

Figure 2 is an edge view 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 a section of conveyer chain constituting two chain pitches formed of the improved integral top-plate-side-bar structures, the top pitch showing the top plates integral with roller link side bars, and the bottom pitch showing the top plates integral with connecting link side bars;

Figures 4 and 5 are fragmentary sections taken, respectively, in the planes indicated by the lines 4—4 and 5—5, Figure 3;

Figure 6 is a plan view illustrating a section of chain in which top plates integral with offset side bars are suitably nested to provide a complete practicable flat top structure;

Figure 7 is a plan view illustrating a different

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design of nested flat tops, the flat top parts on one side of the chain being integral with roller link side bars, and the flat top parts upon the opposite side of the chain being integral with connecting link side bars;

Figure 8 is a plan view of a chain element formed of an integral top plate and side bar, similar to the formation shown in the end view of Figure 2, but in Figure 8 the two ends of the top plate have been coined or beveled, for a purpose hereinafter fully explained; and

Figure 9 is a vertical longitudinal section, taken in the plane indicated by the line 9—9, Figure 8.

Referring to the annexed drawing, in which the same elements are indicated by the same respective numbers in the several views, the invention is illustrated by reference to several chain designs, some of which have inside roller link side bars and outside overlapping connecting link side bars, and one of which is comprised wholly of overlapping offset side bars, which bars, suitably articulated, form mechanism engageable by driving sprockets, which articulately connected side bars are integrally formed with platform plates forming a flat top by means of which bottles, jars, cans, etc., are conveyed from station to station through cleaning, filling, capping, or sealing, and inspection operations to the accumulating table or casing machine.

In the form of blank 1 shown in Figure 1, which, when formed in final shape, illustrated in Figure 2, is designed to be mated with a similar finally formed blank in reverse position, as shown in Figures 3 and 5, to constitute the flat top serving one chain pitch, there is a side section 1<sup>1</sup> designed for disposition exteriorly laterally of the links forming the length of chain proper on one side of the chain, such side section 1<sup>1</sup> being substantially equal in length to the chain pitch, together with a narrower intermediate section 1<sup>2</sup> merging at its outer side into an end section 2 which section 1<sup>2</sup> is designed for disposition between the links forming the two sides of the chain proper and which end section 2 has the length of a suitable side bar and the width of a suitable depth for a side bar. The sections 1<sup>1</sup> and 1<sup>2</sup>, when associated with corresponding sections of other similar chain elements, as hereinafter fully described, form a continuous plane conveying platform form. The element 1 is blanked out with the side section 2 having a pair of longitudinally aligned and spaced holes 3, the distance between whose centers is equal to the chain pitch.

The section 1<sup>1</sup> of the blank 1 is designed to be one of the top plates or platforms upon one side

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of the complete chain, and the section 1<sup>2</sup> of the blank 1 is designed to extend over and substantially between the opposed side bars of the complete chain. Thus, the side section 2 can, when bent into angular formation relative to the intermediate section 1<sup>2</sup>, form a side bar upon the side of the chain opposite to that which is served by the platform section 1<sup>1</sup>. When two of these blanks 1 are formed into the final shape shown in Figure 2, and also shown in Figure 8 is a coined or edge-beveled design, and the two forms are mated in reverse position, as shown for two such mated pairs in Figure 3, they will form a chain section in which the parts 1<sup>1</sup>—1<sup>2</sup> form the flat top and the parts 2 form an opposed pair of side bars which, by means of pins 7 passed through the laterally aligned holes 3, can be articulately secured to laterally adjacent and overlapping side bars. Insofar as the designs shown in Figures 3, 4, and 5 are concerned, if the "laterally adjacent side bars" are inside or roller link side bars, then the integral flat top side bar structure is one involving the connecting link side bars. If the "laterally adjacent side bars" are outside bars, then the integral flat top side bar structure involves the inside roller link side bars. Both assemblies are shown in Figure 3 in which, at the top, roller link side bars 5 are integral with the parts 6<sup>1</sup>—6<sup>2</sup> of the flat top 6, and in which, at the bottom, connecting link side bars 2 are integral with flat top portions 1<sup>1</sup>—1<sup>2</sup> formed of the blank 1.

It will be understood that the only marked difference between having the flat top integral with the outer connecting side bar 2 and having it integral with the inner roller link side bar 5 is that the flat top made integral with the outer connecting bar 2 would be somewhat longer and, also, if the flat top is made integral with the roller link side bar, the holes 3<sup>1</sup> of the roller link side bars 5 for accommodation of the articulating pins 7 are blanked out large enough also to accommodate a bushing 8.

In Figure 4 is clearly shown the assembly when the flat tops 6 are integral with the roller link side bars 5. In this case the oppositely opposed pair of roller link side bars 5 are connected together by a pin 7 passed therethrough, which pin also articulately connects the roller link side bars 5 with an opposed pair of outer overlapping plain connecting link side bars 2<sup>1</sup>. In Figure 5 is clearly shown the assembly when the flat tops 1<sup>1</sup>—1<sup>2</sup> are integral with the outer connecting side bars 2. In this case, the outer connecting side bars 2 are connected together by a pin 7 which also articulately connects the bars 2 with the inner overlapping plain roller link side bars 5<sup>1</sup>.

Between the inside roller link side bars, whether the latter are plain links 5<sup>1</sup> or whether they are integrally formed with top plates 6, is mounted the roller 9 upon a bushing 8 surrounding the pin 7 and having its ends seated in the opposed link bars 5 or 5<sup>1</sup>.

Referring particularly to Figure 6, in which the flat tops are formed integrally with a type of side bar which is offset, it will be noted that every link is of the same design, comprising overlapping side bars in which the narrow ends 12 of side bars enclosing a roller assembly, in the form of design shown, are articulately mounted with and between the opposed rectilinear end portions 12<sup>2</sup> of the bar parts 12<sup>1</sup> of offset formation. Two designs of flat top plates are integrally formed with the side bars to form a link 11, one design 11<sup>1</sup>

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having a tapered side portion and having its smaller intermediate flat top portion 11<sup>2</sup> formed integrally with the bar 12—12<sup>1</sup>—12<sup>2</sup> for the opposite chain side and merging into the wide rectilinear terminal portion 12<sup>2</sup> of the bar, and the other flat top 11<sup>3</sup> having its smaller intermediate part 11<sup>4</sup> correspondingly tapered and formed integrally with the bar 12—12<sup>1</sup>—12<sup>2</sup> for the other chain side and merging into the tapered portion 12<sup>1</sup> of the bar, so that in each case the bent sides of the flat tops 11<sup>1</sup> and 11<sup>3</sup> extend in planes parallel with the corresponding parts of the offset bar portions 12<sup>1</sup> to which they are laterally adjacent. Thus, the integrally formed members, of which the flat tops 11<sup>1</sup> and 11<sup>3</sup> form respective parts, can be nested, as shown in Figure 6, and each nested pair forms a link 11 of a flat top conveyer chain substantially equal in length to the chain pitch. In this structure each integrally formed side bar serves two links 11, serving as a roller link side bar at its narrow rectilinear end 12 and serving as a connecting link side bar at its wide rectilinear end 12<sup>2</sup>.

Referring to that adaptation of the invention which is shown in Figure 7, an integrally formed structure 15 has a side flat top portion 15<sup>1</sup>, and an intermediate flat top portion 15<sup>2</sup> which is substantially one-half the length of the flat top portion 15<sup>1</sup> and is also of a length substantially equal to the chain pitch. The integrally formed structure 15 which serves one side of the chain also includes a connecting link side bar 16. The integrally formed structure for the opposite side of the chain, which is designated "13", includes a roller link side bar 14 and the same flat top structure 15<sup>1</sup>—15<sup>2</sup>. Interiorly of the connecting link side bar 16, in the chain formation, are longitudinally aligned plain roller link side bars 17, and overlapping and outside the longitudinally aligned roller link side bars 14 is an overlapping plain connecting link side bar 18. The flat top portion 15<sup>2</sup> is symmetrically arranged with reference to the transverse edges of the flat top portion 15<sup>1</sup>, which latter, as stated, is twice the length of the flat top portion 15<sup>2</sup>, so that the integral formations 13 and 15 can be alternately reversed in position, as shown in Figure 7, to form a complete chain section which, as stated, is one in which the flat tops on one side are integral with the roller link bars 14 and the flat tops on the other side are integral with the connecting link bars 15, plain connecting link bars 18 and plain roller link bars 17 being respectively utilized on the opposite sides. As is clearly apparent, this formation effects an arrangement of the chain elements in which the breaks between the contiguous ends of adjacent side portions of the flat tops upon one side of the chain are staggered relatively to the breaks between the contiguous ends of adjacent flat top side portions upon the opposite side of the chain.

Oftentimes, flat top conveyer chains are provided with coined or beveled ends to permit the chain to slide under cans in the event the production line is stopped while the chain continues in operation. Figures 8 and 9 illustrate an adaptation of the instant invention for this purpose, the integrally formed flat top and side bar structure shown in Figure 8 being similar to that shown in Figure 2, but having beveled ends 4 for the purpose stated.

In addition to the tools required to manufacture standard or plain chain that has no flat top or other attachments, the improved integrally formed flat top conveying chain requires one set

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of additional tools if the flat tops are integral either with the roller link side bars alone, or the connecting link side bars alone, and two sets of additional tools if part of the integral structures include roller link side bars and the balance of the integral structures include connecting link side bars.

What I claim is:

1. An element for chain conveyer which has transversely opposed side bars, comprising a one-piece member having angularly-related portions, one of which portions is a chain side bar formed for articulate connection with longitudinally adjacent side bars, and the other of which portions affords a plane conveying surface, which surface is of materially greater transverse dimension than the distance between opposed conveyer side bars, and, laterally exteriorly of the other conveyer side bar, is of a length at least substantially equal to that of the chain pitch.

2. An element for a chain conveyer which has transversely opposed side bars, comprising a one-piece formation having a side flat top portion for disposition exteriorly laterally of a conveyer side bar and of a longitudinal length at least substantially equal to that of the chain pitch, a flat top portion for disposition between opposed conveyer side bars, and an angularly-related opposite side portion forming a side bar and having longitudinally spaced holes the distance between whose centers establishes the chain pitch.

3. A conveyer chain having articulated opposed side bars, each side bar and an angular integral lateral extension formed therewith being a one-piece member, said extension forming a conveying surface bridging the side bars and projected laterally beyond the opposed side bar to form a continuous platform of longitudinal length at least substantially equal to that of the chain pitch.

4. An element for a chain conveyer which has transversely opposed side bars, comprising an integral formation having a side flat top portion for disposition exteriorly laterally of a side bar, a flat top portion of smaller longitudinal dimension than the side flat top portion for disposition between opposed side bars, and an angularly-related opposite side portion forming a side bar.

5. A strand for a chain conveyer which has transversely opposed side bars formed of elements each having angularly-related integral side portions one of which is a chain side bar formed for articulate connection with longitudinally adjacent side bars and the other of which affords a

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plane conveying surface, the conveying surfaces respectively integral with opposed side bars mating to form a complete continuous conveying platform.

6. A chain strand formed of elements characterized as in claim 4 and in which the conveying surfaces respectively integral with opposed chain side bars are similar and are mated to form a complete continuous conveying platform.

7. A chain strand formed of elements characterized as in claim 4 and in which the conveying surfaces respectively integral with opposed chain side bars are similar and are mated, in reverse position, to form a complete continuous conveying platform.

8. A chain strand formed of elements characterized as in claim 4 and in which the conveying surfaces respectively integral with opposed chain side bars are mated to form a complete continuous conveying platform.

9. A conveyer chain having articulated opposed side bars, each side bar having an angular integral lateral extension forming a conveying surface bridging the side bars and projected laterally beyond the opposed side bar to form a continuous platform, the conveying surfaces of opposed side bars being mated.

10. A plane surface conveyer having opposed articulated chain side bars, the plane conveying surface being broken at the chain pitches and each portion thereof between pitches consisting of two parts, each of said parts being integral with a single side bar and angularly related thereto.

11. A plane surface conveyer characterized as in claim 10 in which each pair of said parts are mated.

12. An element characterized as in claim 4 in which the flat top portion for disposition between opposed side bars is inwardly extended from the side flat top portion symmetrically relative to the transverse edges of the latter.

13. A chain formed of elements characterized as in claim 4 in which the longitudinally adjacent side bars are articulately connected and in which the breaks between longitudinally adjacent side flat top portions on one side of the chain are staggered with the breaks between the side flat top portions on the opposite chain side.

14. An element characterized as in claim 4 in which the chain side bars are of offset formation.

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