

July 28, 1942.

W. R. MAGUIRE ET AL

2,290,981

CONVEYER

Filed Sept. 21, 1939

3 Sheets-Sheet 1

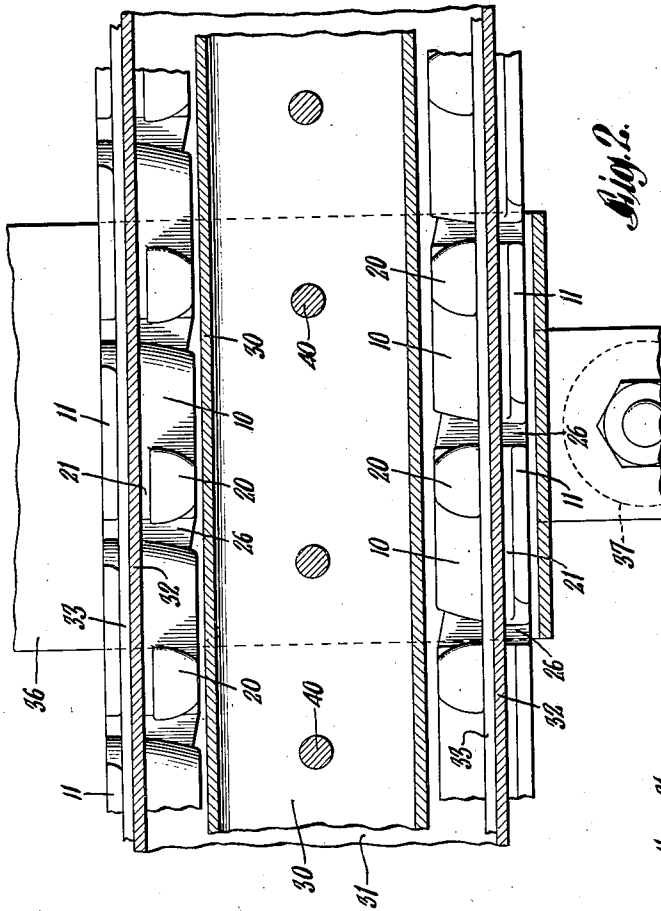


Fig. 2.

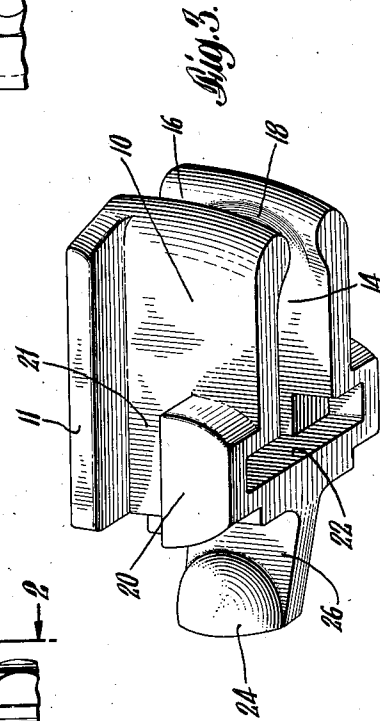


Fig. 3.

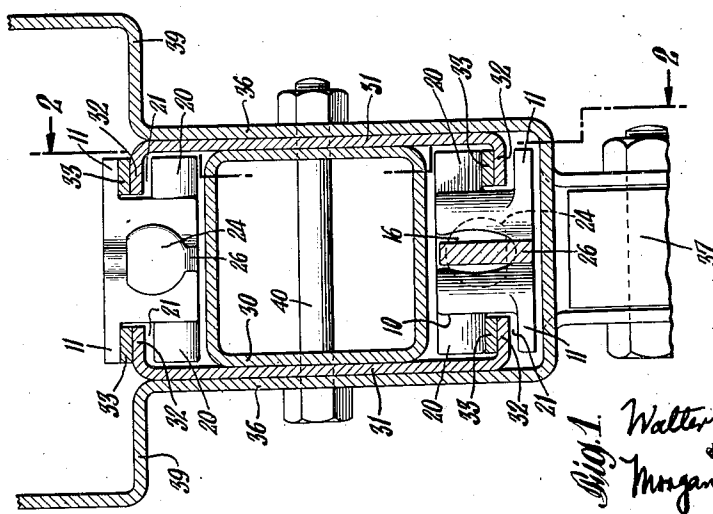


Fig. 1.

INVENTOR
Walter A. Maguire and E. J. Lockwood
BY Morgan Finnegan and Durham
ATTORNEYS

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3 Sheets-Sheet 2

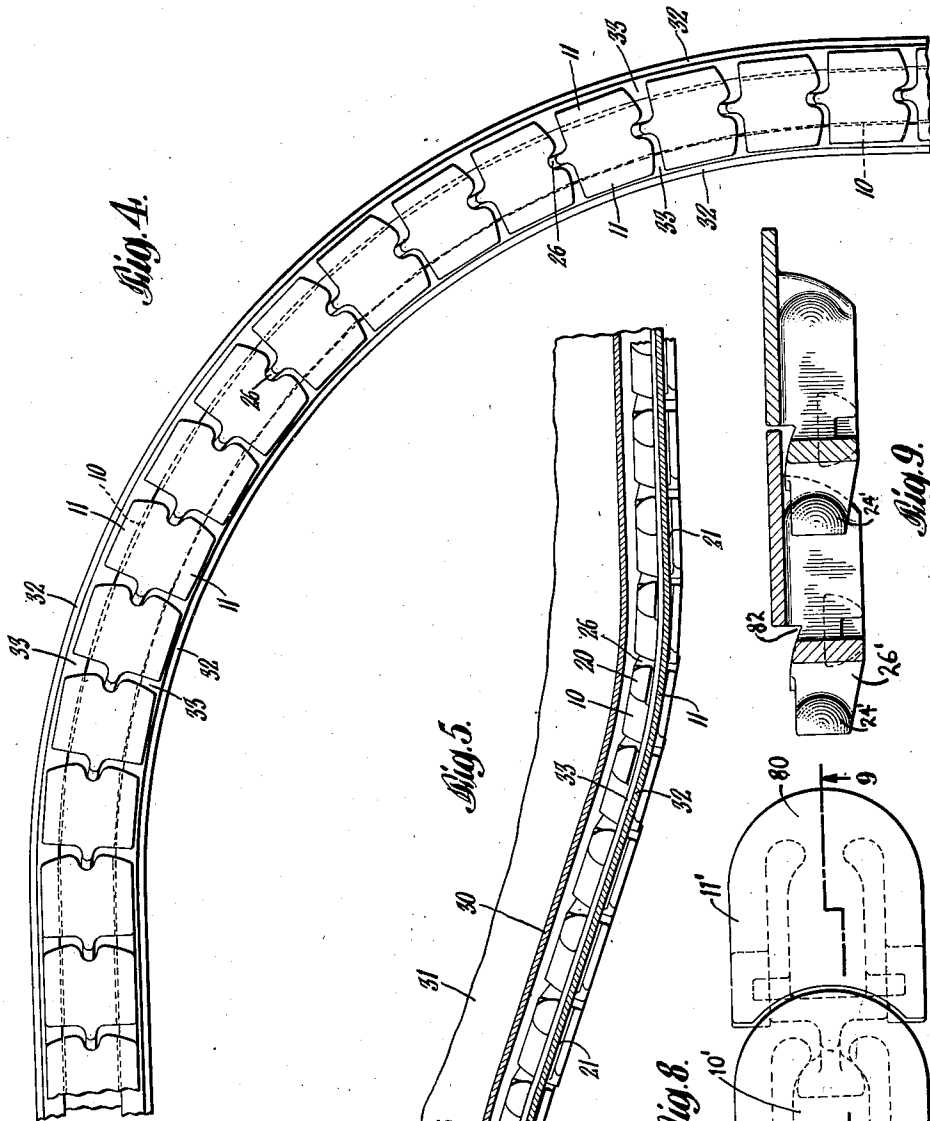


Fig. 4.

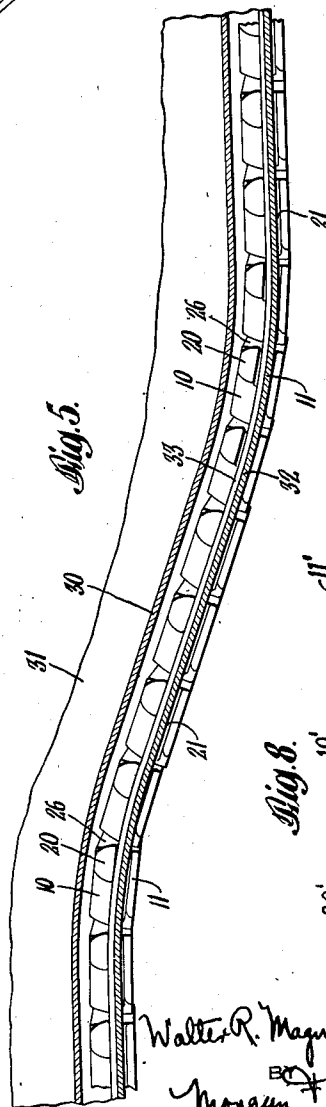


Fig. 5.

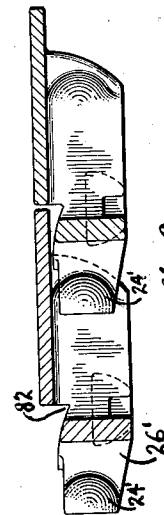


Fig. 9.

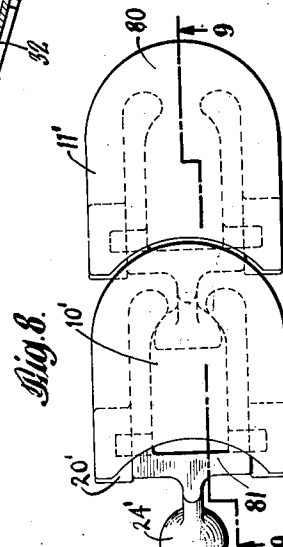


Fig. 8.

Walter R. Maguire and E. G. Lockwood
BY Morgan, Finnegan and Durham
ATTORNEYS

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3 Sheets-Sheet 3

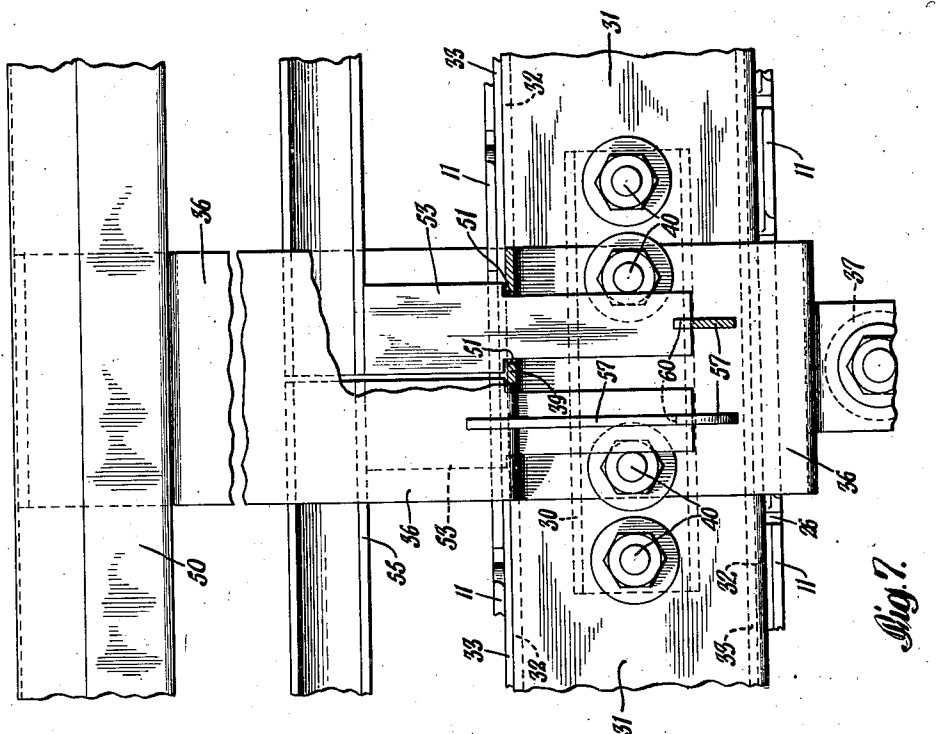


Fig. 7.

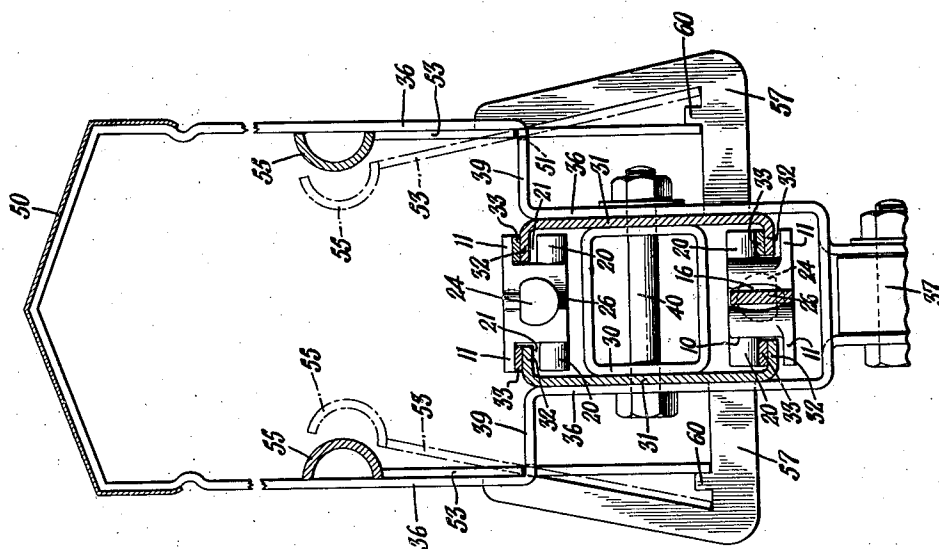


Fig. 6.

INVENTORS
Walter R. Maguire and E. J. Lockwood
BY
Morgan, Finnegan & D. W. Ashham
ATTORNEYS

UNITED STATES PATENT OFFICE

2,290,981

CONVEYER

Walter R. Maguire, Manhasset, and Edwin J. Lockwood, Peekskill, N. Y., assignors to Walter Maguire Company, Inc., New York, N. Y., a corporation of New York

Application September 21, 1939, Serial No. 295,898

3 Claims. (Cl. 198—189)

The invention relates to a conveyer chain and more particularly to a novel and improved chain for use in a drag conveyer.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate embodiments of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Figure 1 is a vertical section of an illustrative and preferred embodiment of the invention showing the upper and lower reaches of the chain and its supporting and guiding structure;

Figure 2 is a vertical section taken on the line 2—2 of Figure 1;

Figure 3 is a perspective view showing a single link, viewed from below;

Figure 4 is a plan showing a curved section of the conveyer chain and guide;

Figure 5 is a vertical section of an inclined section of the conveyer chain and guide;

Figure 6 is a cross-section of an illustrative embodiment of a conveyer guide rail as used with the present invention;

Figure 7 is a side elevation, certain parts being broken away, of the embodiment shown in Figure 6;

Figure 8 is a top plan view of a modified form of conveyer chain in accordance with the present invention; and

Figure 9 is a sectional view taken on the line 9—9 of Figure 8 and showing the portion of the conveyer chain shown in Figure 8.

The present invention has for its object the provision of a novel and improved conveyer chain and guiding structure which is adapted to remain clean in operation and avoids soiling of the bottles or packages which are moved along by it. A further object is the provision of a novel and improved conveyer chain and link which may be used either with a single or double sprocket drive. The invention also provides a conveyer chain which can be used on inclined or curved reaches without the links lifting from their guiding track.

Still another object of the invention is the provision of a novel and improved guide rail construction by which the conveyer may be adapted to different sizes of packages or cases.

5 As illustratively embodied, the conveyer chain is composed of a large number of duplicate links which are mutually engaged and interlocking so that no other connecting members are required, and each link comprises a body portion which 10 is provided with a wider top overhanging the sides of the body portion so as to provide article supporting wings on top, while the under sides of the wings serve as guide engaging members to support the chain on its guides. The body 15 portion of the chain link is hollow, and the cavity is open to the bottom and at one end, the sides converging towards the open end so as to provide a slotted concave or parti-spherical surface into which may be received the convex, or ball-shaped, end of another link, the slotted end and convex ends being at opposite ends of each link. Adjacent to the bottom of the body portion and extending from each side of the body is a lug which may engage with the teeth of a double 20 sprocket driving or idler wheel. The lugs are spaced from the wings and provide a channel at each side of the body portion into which may project the guiding strips or ribs of the guideway. The chain may also be driven by a single tooth 25 sprocket, and for this purpose the wall of the cavity nearest the ball-shaped end is closed and the lugs are provided with slots, open to the bottom of the link and extending transversely of the link so as to receive the tooth of a single 30 sprocket.

35 The guideway consists essentially of a pair of spaced-apart ribs or strips extending towards the link, each strip extending into the space between one wing and the adjacent lug, and these ribs or strips extend throughout the conveyer so that 40 the chain rides on the upper surface of the ribs. With the links in their normal position, the wings rest on the rib, while on the return reach, the lugs rest on the rib, at all times supporting the links so that neither the top nor the bottom surfaces touch any lubricated surface. Also, on inclined and curved reaches of the conveyer, the ribs or guides hold the chain links in position so that the conveyer chain remains in its guideway.

45 It will be understood that the foregoing general description and the following detailed description as well, are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the illustrative embodiment of the present invention as shown by 55

the accompanying drawings, Figure 3 of the drawings shows an individual conveyer chain link, and as many of these as desired may be linked together to form the conveyer chain. This link comprises a body portion 10 which may be longer than it is wide, and is provided on its upper surface with integral wings 11 which project beyond the sides of the body portion and extend for substantially the full length of the body portion, being surfaced to provide a flat upper surface on which the conveyed articles may rest. The body portion is preferably hollow to provide a cavity 14 which extends to one end of the body portion and at that end the sides turn inwardly to narrow the cavity so as to provide a slit 16 which is spherically concave on its inner surface, as at 18.

Adjacent the lower edge of the body portion 10 are two lugs 20, one on each side of the body portion and extending laterally therefrom, which lugs may engage with the teeth of a double sprocket wheel so that the chain may be driven by engagement therewith. These lugs are spaced from the wings 11 and provide a narrow longitudinally extending channel 21 which is adapted to receive the projecting rib or guide strip 32 of the guideway, as shown in detail in Figures 1 and 2.

The lugs 20 are internally recessed to provide the tooth receiving sockets 22 which extend transversely of the body portion 10 and are open to the bottom of the link, and these sockets are each adapted to receive a tooth of a single sprocket so that the chain may be driven by either the single or double sprocket.

The chain links are linked together by means of the ball-shaped end 24 which is connected to the body portion by means of the narrow vertically extending web 26 which is adapted to pass through the slot 16 at the other end of a duplicate link, while the ball-shaped end 24 is seated within the cavity 14 and against the concave seat 18, thus allowing universal movement of each link with respect to the duplicate link on either end, while at the same time securely fastening the links together so that the chain as a whole may be driven by driving any one or more of the separate links.

Preferably, all of the parts of the link are integral with each other and may be formed as a single casting, and usually the only finishing operation which is at all necessary is the surface grinding of the upper surface.

Figures 1 and 2 show the upper and lower reaches of the conveyer chain in a typical form of guideway, it being understood that the details of this guideway will be determined by the character of the packages or articles to be carried on the conveyer. As illustrated, the conveyer is particularly adapted for use with milk bottles and comprises a hollow, square tube 30 extending longitudinally of the conveyer and provided on its side faces with a plate 31 having in-turned upper and lower edges 32 on the upper surface of each of which are narrow wear strips 33. The edges 32 and the wear strips 33 project in to the channels 21 of the chain links and support the links thereon at the same time preventing lifting of the chain or its links from the guideway as the chain is driven up or down inclines or round relatively sharp corners. Outside of the plates 31 are provided the supporting pieces 36 by which the guideway is supported on the legs 37, and the upper end of the pieces 36 may be shaped and bent as at 39 to allow for the passage

of the conveyed article. The supporting tube 30, the plates 31, and the side pieces 36 are held together in assembled relation by means of bolts 40 provided at suitable intervals along the length of the conveyer.

The conveyer chain is supported on its upper reach by the wings 11 resting on the wear strips 33, while on its lower reach the links are supported by the lugs 20 resting on the wear strips 33. The in-turned edges 32 are preferably spaced from each other and from the wear tube 30 a sufficient distance so that neither the top nor the bottom of the conveyer links ever comes in contact with any of the stationary surfaces, and thus adequate lubrication may be provided between the wear strips 33 and the wings 11 and lugs 20. In this way, there is no soiling of the conveyed packages or articles by the lubricant, as both the top and bottom surfaces of the chain links are always kept clean.

Figure 4 of the drawings shows the conveyer chain as it is driven around a right angle turn, and in such a condition the ribs or edges 32 support the conveyer chain on the inside of the turn, and on the outside of the turn they hold it against lifting out of the guideway as it might otherwise tend to do.

Figure 5 of the drawings shows a section of the conveyer chain as it changes from a horizontal to an inclined path and clearly shows the manner in which the edges or ribs 32 and wear plates 33 keep the chain from being lifted out of the guideway at the bottom of the incline.

Any suitable driving means may be provided, as the individual conveyer chain links will operate equally well with either a single or double tooth sprocket, and the driving means may be provided at suitable points as is customary, and at other points the chain may run over idlers if desired.

Figures 6 and 7 show a modified form of conveyer in which variably positionable guide rails are provided to accommodate the conveyer to different sizes of cases or packages and in which the position of the guide rails may be easily and quickly changed.

As embodied, the side pieces 36 are bent outwardly and upwardly, as at 39 and continue upwardly for a sufficient distance to clear the top of the package to be conveyed, and are bent in at the top to form a support for the continuous roof-like sheet 50 extending along to the top of the conveyer. Near their outer edge the side pieces are slotted longitudinally of the conveyer, as at 51, to receive the downwardly projecting shouldered supports 53 which are fastened to and support the half-round side rails 55, the apertures 51 being slightly larger than the lower portion of the supports 53 so as to permit some lateral movement of the supports. Fastened to the intermediate portion of the side pieces 36 and extending outwardly and upwardly therefrom are the angled pieces 57 which are also fastened to the side pieces 39 at the upper ends of the pieces 57, one angle piece 57 being provided for each end of each side rail 55. The horizontal portion of each angled piece 57 is provided with a stop or projection 60 extending upwardly therefrom and of a sufficient length to be engageable by the lower end of the supports 53, while the upwardly extending portion of the angled piece 57 is set so as to join the side piece 39 at the slots 51. Thus, the supports 53 may lay against the inner side of the angled pieces 57 to hold the guide rails 55 in their closed position, as

shown by the dot-dash lines of Figure 6, or the supports 53 and their guide rails 55 may be bodily lifted and moved outwardly to the full-line position so as to increase the space between the guide rails and thereby accommodate a wider package or case. The guide rails are held in this wider position by the inner face of the side pieces 39 and by the projections 60.

Figures 8 and 9 of the drawings illustrate a modified embodiment of conveyer chain in which the links are interconnected as in Figures 1 to 5 but are specially adapted to the conveying of boxes and other objects having straight edges. As shown, the links 10' are provided with the guiding wings 11' and lugs 20' and are also formed with the internal socket portion 18' and the rearwardly extending ball portion 24'. The top, plate-like surface of the links is, however, formed with a circular overhanging plate portion 80 projecting beyond the body of the link and concentric with the ball portion 24' of the next connected link. Overhanging portion 80 projects into a correspondingly circular cut-away portion 81 in the adjacent link so that the adjacent links may have relative angular movement in the plane of the plate portion 80. To provide for changes in grade, as in Figure 5, the connecting web 26' is cut away to provide a notch 82 so as to receive the end of portion 80 as the adjacent links move relatively about a ball 24 in a vertical plane.

Thus, the interconnected links provide a substantially continuous surface with no gaps between adjacent links which can catch or mar the straight edges of a carton while the carton is being conveyed.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What we claim is:

1. A conveyer chain composed of substantially identical, one-piece links, each link comprising a double walled body defining a socket near one end of the link, between the walls thereof, the body being provided with a rounded head mem-

ber at the other end thereof, for cooperation with a like socket in the next link, each of said walls being provided with a pair of laterally and outwardly projecting wings for supporting articles being carried on the conveyer, and with a pair of laterally and outwardly projecting lugs, an adjacent wing and lug defining between them a guide channel for cooperating with a suitable guideway, the body of the link being also provided in the lower central part thereof, with a downwardly opening recess located between the said rounded head member and said socket, for receiving a tooth of a driving wheel sprocket.

2. A conveyer chain composed of substantially identical, one-piece links, each link comprising a double walled body defining a socket near one end of the link, between the walls thereof, the body being provided with a rounded head member at the other end thereof, for cooperation with a like socket in the next link, each of said walls being provided with a pair of laterally and outwardly projecting wings for supporting articles being carried on the conveyer, and with a pair of laterally and outwardly projecting lugs, an adjacent wing and lug defining between them a guide channel for cooperating with a suitable guideway, each lug being substantially narrower lengthwise of the link than the wall from which it projects, whereby the teeth of sprocket wheels may pass alongside each wall and into engagement with said lugs, the body of the link being also provided in the lower central part thereof, with a downwardly opening recess located between the said rounded head member and said socket, for receiving a tooth of a driving wheel sprocket.

3. A conveyer chain composed of links, each comprising a body having a rounded head member projecting forwardly therefrom, said body further comprising two rearwardly extending, substantially parallel, spaced walls, defining between them a socket for receiving a head member of the next link, the rear edges of said walls being curved toward each other to form a slot, and article supporting wings carried by the upper edges of said walls.

WALTER R. MAGUIRE.
EDWIN J. LOCKWOOD.