Dec. 29, 1931. F. N. WOODMAN 1,839,071

LINK CONVEYER

Filed Nov. 15, 1930

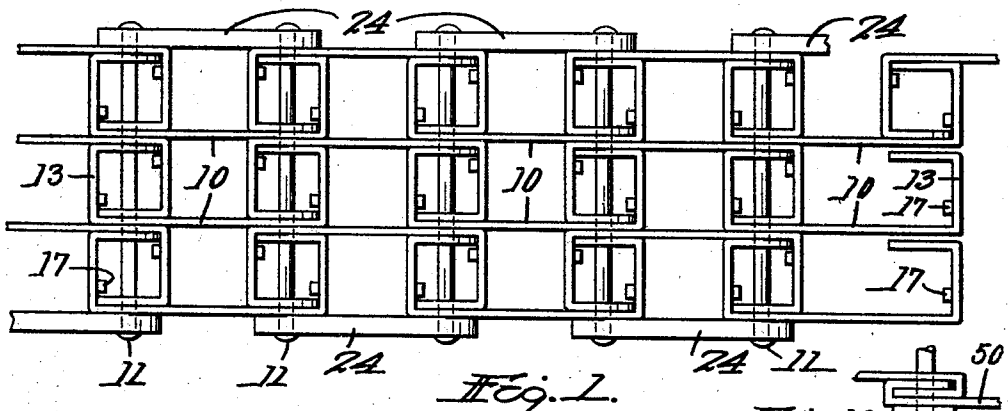


Fig. 1.

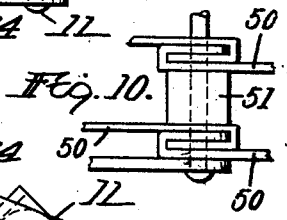


Fig. 10.

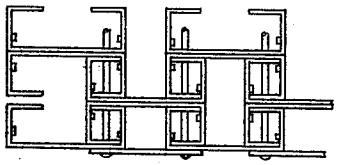


Fig. 9.

Fig. 2.

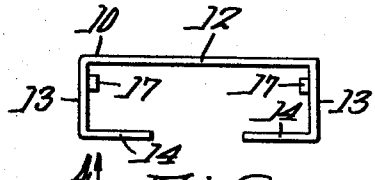


Fig. 3.

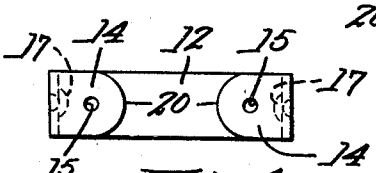


Fig. 4.

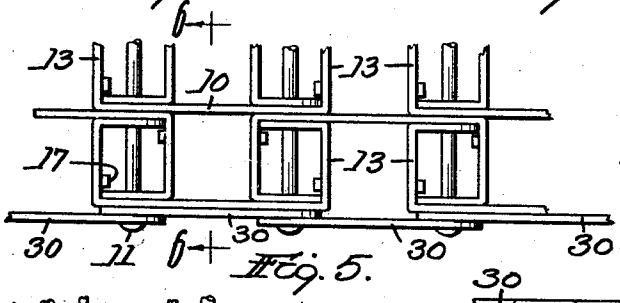


Fig. 5.

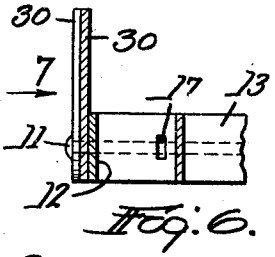


Fig. 6.

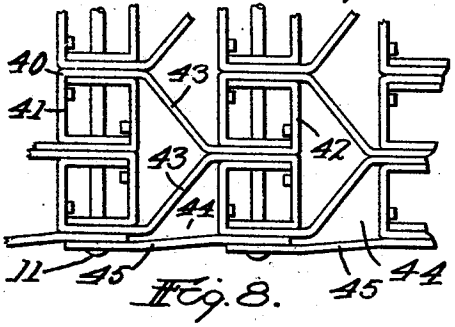


Fig. 8.

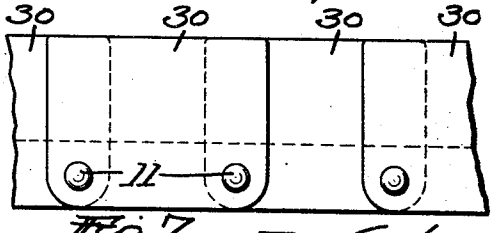


Fig. 7.

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UNITED STATES PATENT OFFICE

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LINK CONVEYER

Application filed November 15, 1930. Serial No. 495,939.

This invention relates to a belt particularly designed for the transportation of materials or machine parts in industrial or commercial operations.

It is the general object of my invention to provide a belt for such purposes which is composed of metal links so designed that the belt is effective to withstand heavy longitudinal tension and consequently is available to transport heavy loads of material.

A further object is to provide a belt capable of giving effective service during long continued use.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

Preferred forms of the invention are shown in the drawings, in which

Fig. 1 is a plan view of a portion of one form of my improved belt;

Fig. 2 is a side elevation thereof;

Fig. 3 is a plan view of one of the links;

Fig. 4 is a side elevation thereof, looking in the direction of the arrow 4 in Fig. 3;

Fig. 5 is a plan view of a portion of belt provided with side flanges;

Fig. 6 is a detail sectional view, taken along the line 6—6 in Fig. 5;

Fig. 7 is a side elevation, looking in the direction of the arrow 7 in Fig. 6;

Fig. 8 is a plan view of a portion of a modified belt construction, and

Figs. 9 and 10 are similar views of further modifications.

Referring particularly to Figs. 1 to 4, my improved belt comprises a plurality of sheet metal links 10 joined together by hinged-pins 11. Each link 10 comprises a longitudinally extending portion 12, transversely extending portions 13 and end portions 14.

In the form shown in Figs. 1 and 3, the link is substantially C-shaped in plan, with the end portions 14 projecting toward each other and each extending part way toward the longitudinal center of the link.

Holes 15 are provided for the hinge-pins 11, these holes being of such diameter that the pins 11 fit loosely in the holes 15. Lugs 17 are formed on the inner faces of the end portions 13 for a purpose to be described.

The extreme end surfaces 20 of the end portions 14 are formed convex and are preferably substantially semi-cylindrical. Each link constitutes a single piece of metal and may be made in the form of a casting or may be formed by bending a strip of sheet metal. In the latter case, the lugs 17 may be formed by inwardly offsetting portions of the sheet metal, as clearly shown in Fig. 4.

When the links are assembled, as shown in Fig. 1, the end surfaces 20 of one link have bearing engagement with the inner surfaces of the transverse portions 13 of the longitudinally adjacent links. The parts are so proportioned that when thus assembled the holes 15 in successive links are aligned with each other to loosely receive the hinge-pins 11.

The longitudinal tension of the belt is taken between the end surfaces 20 and the transverse link portions 13. This gives a bearing surface much increased over a construction in which the end tension is taken directly on the hinge-pin. Each link directly engages its longitudinally adjacent links, independently of the hinge-pins, and this engagement permits relative rocking movement of the links, as indicated in Fig. 2, without disengagement of the bearing surfaces. Such a conveyer belt has been found exceptionally well adapted for use under heavy load conditions.

The lugs 17 are provided to prevent lateral displacement of the end portions 14 under excessive load. These lugs hold the several parts of the link in such alignment that they are best adapted to resist longitudinal tension.

Each alternate link along each outer edge of the belt has an open outer side. These openings are preferably closed by special edge links 24, which are shown of double thickness so as to provide ample bearing surfaces for the hinge-pins.

It is sometimes desirable to provide side flanges on a link conveyer belt and in such cases I provide widened side links 30, as shown in Figs. 5 to 7. These links are of single thickness and are provided between

each two adjacent hinge-pins along the entire edge of the belt, so that a continuous flange may be formed.

A slightly different form of the invention is shown in Fig. 8, in which the links 40 are S-shaped in plan, with the transverse members 41 and 42 extending in opposite directions, and in which the longitudinal members are provided with diagonally disposed middle portions 43.

In this case it is desirable to provide edge links along the entire length of the belt, as a V-shaped opening 44 occurs for every outside link 40. The edge links 45 used with this construction are preferably offset between their end portions, as indicated in Fig. 8. Otherwise the construction and operation of this form of belt is the same as that shown in Fig. 1.

In Fig. 9, I have shown a variation in the arrangement of the link of the belt shown in Fig. 1. In Fig. 9 the links are reversely disposed in pairs with their longitudinal members adjacent and back to back. The product is very similar to that shown in Fig. 1, but the openings in the belt are of different sizes and differently disposed.

In Fig. 10 I have shown a construction in which the side portions of each pair of longitudinally adjacent links 50 are in closely adjacent relation, and in which spacing collars 51 may be used to transversely separate different pairs of links. The tension between the links in this form is more directly applied and the construction is desirable for heavy duty under heat.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:—

1. A link conveyer belt comprising a plurality of links and a series of hinge-pins by which said links are assembled, each link having a longitudinal portion joined at its ends to transverse portions, and each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having its extreme end surface having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link.

2. A link conveyer belt comprising a plurality of links and a series of hinge-pins by which said links are assembled, each link having a longitudinal portion joined at its ends to transverse portions, and each transverse portion having an end portion extending toward the longitudinal center of the link and engaging an inner end surface of a longitudinally adjacent link, said transverse portions being provided with inwardly extending lugs preventing lateral displacement of said end portions.

3. A link conveyer belt comprising a plurality of links and a series of hinge-pins by which said links are assembled, each link being formed of a single piece of metal and having a longitudinal portion joined at its ends to transverse portions, and each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having an end surface having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link.

4. A link conveyer belt comprising a plurality of links and a series of hinge-pins by which said links are assembled, each link being formed of a single strip of sheet metal bent to provide a longitudinal portion joined at its ends to transverse portions, and each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having an end surface having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link.

5. A link conveyer belt comprising a plurality of links and a series of hinge-pins by which said links are assembled, each link having a longitudinal portion joined at its ends to transverse portions, and each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having its extreme end surface convexly shaped and having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link.

6. A link conveyer belt comprising a plurality of links and a series of hinge-pins by which said links are assembled, each link having a longitudinal portion joined at its ends to transverse portions, and each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having its extreme end surface formed substantially semi-cylindrical and having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link.

7. A link conveyer belt comprising a plurality of links and a series of hinge-pins by which said links are assembled, each link being substantially C-shaped in plan and comprising a longitudinal portion joined at its ends to transverse portions, and each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having a convex end surface having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link.

8. A link conveyer belt comprising a plurality of links and a series of hinge-pins by which said links are assembled, each link being substantially S-shaped in plan and

comprising a longitudinal portion joined at its ends to transverse portions, and each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having a convex end surface having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link.

9. As an article of manufacture, a metal link for a conveyer belt comprising a single piece of metal having a longitudinal portion joined at its ends to transverse portions, and each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having a convex end surface having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link.

10. As an article of manufacture, a metal link for a conveyer belt comprising a single substantially C-shaped piece of metal having a longitudinal portion joined at its ends to transverse portions, each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having a convex end surface having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link, and each transverse portion having an inward projection adapted to restrain lateral displacement of an end portion of said adjacent link.

11. As an article of manufacture, a metal link for a conveyer belt comprising a single substantially S-shaped piece of metal having a longitudinal portion joined at its ends to transverse portions, each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having a convex end surface having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link, and each transverse portion having an inward projection adapted to restrain lateral displacement of an end portion of said adjacent link.

12. As an article of manufacture, a metal link for a conveyer belt comprising a single strip of sheet metal bent to provide a longitudinal portion joined at its ends to transverse portions, each transverse portion having an end portion extending part way toward the longitudinal center of the link, and each end portion having a substantially semi-cylindrical end surface having bearing engagement with an inner surface of one of the transverse portions of a longitudinally adjacent link.

13. The combination in a link conveyer belt as set forth in Claim 1, in which all side portions of a longitudinally adjacent pair of links are closely adjacent to each other, and in which spacing collars are provided on said hinge pins between transversely adjacent pairs of links.

In testimony whereof, I have hereunto affixed my signature.

FRANCIS N. WOODMAN.