Aug. 25, 1953 R. B. NAWMAN 2,649,954

FLIGHT MEMBER AND MOUNTING THEREFOR

Filed Aug. 31, 1949 2 Sheets-Sheet 1

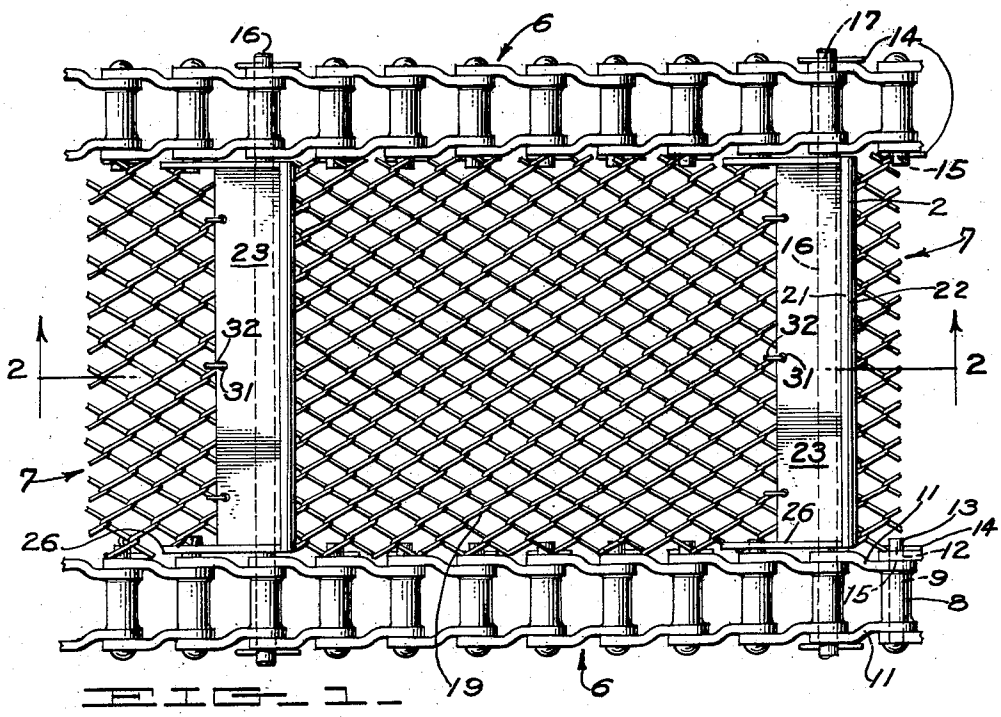


FIG. 1

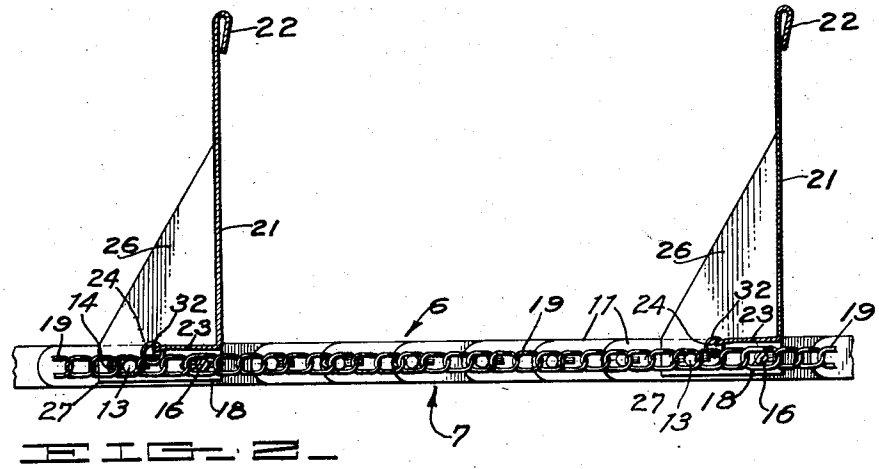


FIG. 2

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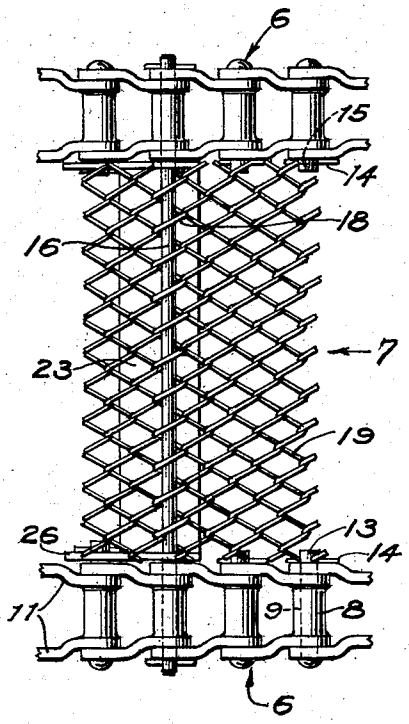


FIG. 3

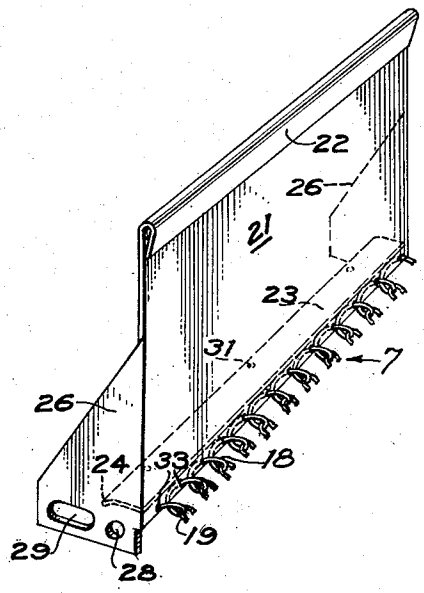


FIG. 5

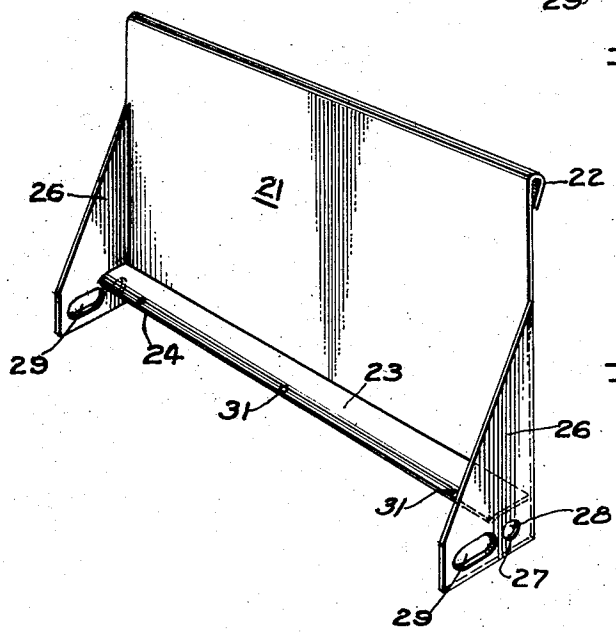


FIG. 4

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FLIGHT MEMBER AND MOUNTING THEREFOR

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9 Claims. (Cl. 198—198)

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This invention relates to flexible belt type conveyors and particularly to the mounting thereon of salient cleats or similar flight elements employed to retain positional arrangement or to prevent shifting of objects borne by the conveyors.

An object of the invention is to provide in a conveyor utilizing standard link chain or similar articulated elements as the drive imparting means, flight elements which are capable of ready attachment to any link or element without requiring any special form in the latter to effect the attachment.

Another object of the invention is to provide, in an attachment device of the character described, connector means associated with the device capable of intermeshing engagement with linkage elements of the drive chains or other articulated support means which serve to positional perpendicularity or angularity of the flight member with the object supporting surface of the conveyor belt.

A further object of the invention is to provide in connection with a conveyor of the type referred to a flight member in which the load bearing and attachment effecting portions thereof are capable of being economically formed from a unitary section of originally flat construction material.

Still another object of the invention is to provide, in connection with conveyors of the open mesh wire belt type, a flight member arranged to lend support to inter-marginal portions of the belt so as to resist objectionable sagging thereof.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawing accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawing and description may be adopted within the scope of the invention as as set forth in the claims.

Referring to the drawing:

Figure 1 is a top plan view of a section of belt conveyor equipped with the improved flight member of my invention.

Figure 2 is a vertical sectional view taken in the plane indicated by the line 2—2 of Figure 1.

Figure 3 is a portional bottom plan view of the structure of Figure 1.

Figure 4 is a perspective view of the attachment flight member.

Figure 5 is a perspective view of the flight member showing a modification in the manner of attachment of the conveyor web thereto.

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The most common types of transport conveyors comprise parallel articulate chains made up of series-joined sprocket links, a large number of which are equipped with lug elements to which are attached the usually wooden slats combining to form the load supporting surface of the conveyors or to which may be connected the vertically rising cleats or plate flight members with which the conveyors are equipped to insure against uncontrolled slippage of objects along the conveyors, particularly where the latter are vertically inclined. The more modern conveyors utilize woven wire screening to provide the load bearing surface and require specially lugged chain links so that the latter may be secured to the inner fabric. In many instances it is required, particularly where the conveyor is inclined in ascending or descending, that the latter be provided with upwardly extending cleats or higher plate elements generally termed flight members in the art, which act as pushers or arresters preventing uncontrolled slippage along the conveyor of objects borne thereby during the aforesaid inclinations of the conveyor. In the wooden slat type of conveyor the application of such cleats or flight members is comparatively simple since the slat elements provide convenient base parts to which the flight members may be readily nailed or otherwise attached. Attachment of cleats or flight members to the wire fabric type of conveyor presents some difficulties, however, and often necessitates the use of chain links specially lugged to receive the fabric in addition to the flight member mounting elements.

I have provided an improved construction whereby flight members may be readily connected to standard link chains at a small fraction of the cost required to provide similar structures with presently available structural devices with the additional advantage of providing desirable lateral stiffening of the conveyor wire fabric so as to lessen transverse sagging therein to a minimum degree. Shown in Figure 1 for illustrative purposes is a sectional length of conveyor comprising relatively spaced and parallel runs of chain, generally indicated by the reference numeral 6 between which is provided the load-bearing web of the conveyor generally indicated by the numeral 7. The chains 6 here shown are of the conventional type generally employed for conveyor drives, each link unit of which comprises a cylindrical stud portion 8, having a bore 9 extending axially therethrough, and provided

with a pair of relatively-spaced, radially-extending side links 11 transversely spaced to receive therebetween the stud portion 8 of an adjacent link unit and provided at their distal ends with bores 12 for receiving a pintle pin 13 which also passes through the bore 9 of the adjacent link unit so as to hingedly join successive units in a continuous chain. Cotter pins 14, secured in receiving apertures 15 drilled transaxially in end portions of the pintle pins, are provided for securing the latter in the link units. The relative spacing between adjacent stud portions 8 and pintle pins 13 of the link units is of course in correspondence with the circular pitch of the various sprockets to be used in the conveyor system and at spaced points longitudinally of the chains, where flight members are to be provided, axially opposing pintle pins 13 are replaced by elongated pintle rods 16 which extend transversely across the conveyor and are provided in their extreme end portions with transaxially drilled apertures 17 for receiving cotter pins 14 disposed on the outer sides of the chain runs so as to limit lateral spreading of the latter. Each and all of the chain link units employed are of the common type entirely devoid of lugs or other special mounting means by which attachment elements such as cleats or flight members could be secured to the chains in the usually practiced manner.

The elongated pintle rods 16 are spaced along the runs of the chain preferably in locations at which it is desired to apply the pusher or flight members and conveniently form attachment supports for the load-bearing member of the conveyor. As here shown, and as will be best seen in Figure 3, each pintle rod 16 is provided with a surrounding sheath of spirally coiled wire 18 which may be formed of a unit length of wire or of duplicate interwoven lengths extending preferably along the pintle rods between the inner sides of the chain runs. Interlaced with the wire sheaths 18 of each pintle rod, and with each other, are spiral web wires 19 which cooperate to form intercostal increments of the load-bearing bed of the conveyor.

The flight members each comprise, preferably, a unit piece of sheet metal having a central facial portion 21 of horizontal length sufficient to extend substantially between the inner sides of the chain runs and of any desired vertical width. The upper edge of the facial portion 21 is provided with a preferably integral retrorsely-bent reinforcing rim 22 while the lower parallel edge of the portion 21 has a marginal flange portion 23 bent substantially normally to the vertical facial plane of the flight member and provided at its distal edge with a down turned lip 24 which approaches and substantially rests against the upper face plane of the load-bearing web of the conveyor. The flange 23 and its lip portion 24 provide longitudinal rigidity along the lower edge of the flight member equivalent to the similar rigidity afforded by the rim 22 in the upper portion of the member. Extending from the opposite vertical edges of the facial portion 21 are wings 26 bent correspondingly to lie at substantially right angles to the facial portion 21 and along the relatively confronting sides of the chain runs. The lower end portion 27 of the wings 26, which extend below the plane of the upwardly and angularly bent flange 23 and lip 24, are each provided with spaced apertures 28 and 29 respectively, the former of which is adapted

to receive a pintle rod 16 and the latter of which is horizontally enlongated to receive and embrace the inner end of the adjacent pintle pin 13 and the cotter pin 14 associated therewith. The arrangement of the parts is such that the flight member is positively connected to the chain runs by virtue of the pintle rod 16 extending through the apertures 28 while vertical stability of the flight members with respect to the pitch line of the chain runs is provided in the engagement of the adjacent pintle pins 13 in the elongated apertures 29.

In instances where unusually wide load-bearing webs comprise the conveyor belt and where the webs are either not connected with the pintle rods 16 or where the latter are dispensed with and mounting of the wings 26 is effected by slightly extending pairs of the pintle pins 13, it is desirable that medial portions of the conveyor belt be suitably supported against sagging. In the structure of my invention this may be effected by providing along the distal edge of the lip 24, a series of relatively spaced apertures 31 in which may be engaged loops 32 of wire which are intermeshed with subjacent convolutions of the web wires 19. As many as desired of the wire loops 32 may be provided depending upon the width of the conveyor and the load that it is expected to carry.

In Figure 5 is shown a modified form of the invention in which the conveyor web is attached directly to the flight member rather than by means of an intermediate element such as the pintle rod 16. As here shown, the flight member construction is modified to the extent that the lower margin of the facial portion 21 is extended downwardly across the plane of the conveyor web 7 and is provided with spaced apertures 33 through which may be threaded the convolutions of the spiral sheath 18, thus attaching the latter securely to the flight member. The portions of the conveyor web extending oppositely from the flight member may be entwined with the spiral wire sheath 18 as previously explained. The above structure is employed where the conveyor web is made up of adjacently aligned separate sections of wire fabric, each section being attached to relatively adjacent flight members so as to form a continuously coupled conveyor unit. In cases where the conveyor web already exists as a unitary continuous member in an installation and it is desired to apply flight members to the conveyor, the type of flight member shown in Figure 5 is employed, medial portions of the web being then connected to the flight member by means of attachment loops 32 as already explained. It is also within the scope of the invention to use, instead of the cylindrical pintle rod 16, a flat bar to the opposite longitudinal edges of which the conveyor web sections may be secured in the manner illustrated in Figure 3, the ends of the said flat bar being of cylindrical form to extend through the opposite chain runs and to form the pintle pins between adjacent link members thereof.

From the foregoing description of my invention it will be seen that I have provided flight members and mountings therefor which may be readily attached to conventional removable pintle link chain without requiring the utilization of comparatively expensive, specially lugged links which may be so attached without substantially dismantling the chain runs and whose design permits a selective placement of the

members in any desired degree of relative spacing along the runs.

I claim:

1. In a conveyor including a drive chain comprising a plurality of link elements relatively interconnected pivotally by pintle members and a load bearing web member extending along and operative with said drive chain, a flight member overlying said web member and rising therefrom, said flight member comprising a facial section of sheet material substantially perpendicular to said web member and having an angularly related wing member extending adjacent a longitudinal portion of said drive chain, and means including at least a pintle member carried by said drive chain and extending through said wing member for connecting the flight member with and to be supported by said drive chain.

2. In a conveyor including a drive chain comprising a plurality of link elements relatively interconnected pivotally by pintle members and a load bearing web member extending along and operative with said drive chain, a flight member overlying said web member and rising therefrom, said flight member comprising a facial section of sheet material substantially perpendicular to said web member and having at least one horizontal portion thereof provided with stiffening means and further provided in a vertical side portion thereof with an integral wing member having at least an aperture therein, a pintle rod carried by and interconnecting adjacent link elements of said drive chain and extending through said wing member aperture, and said wing member having means thereon for receiving and connecting thereto a pintle member.

3. In a conveyor including a drive chain comprising a plurality of link elements relatively interconnected pivotally by pintle members and a load bearing web member extending along and operative with said drive chain, a flight member overlying said web member and rising therefrom, said flight member comprising a facial section of sheet material disposed generally perpendicular to said web member and having a horizontal portion thereof bent to offset relation with respect to the facial section thereof, said flight member further having a wing member lying angularly with respect to the facial section and disposed adjacent a portion of said drive chain, said wing member having an aperture therein, a pintle rod extending through said wing member aperture and engaged with and to interconnect link elements of the drive chain, and means on said wing member engageable with a pintle member and cooperative with said pintle rod to secure the flight member to said drive chain.

4. In a conveyor including a drive chain comprising a plurality of link elements relatively interconnected pivotally by pintle members and a load bearing web member extending along and operative with said drive chain, a flight member overlying said web member and rising therefrom, said flight member comprising a facial section of sheet material extending upwardly from the general plane of said web member and having a horizontal portion thereof bent to offset relation with respect to the facial section thereof, means interposed between a portion of said flight member and said load-bearing web member for supporting the latter on said flight member, said flight member further having a wing member lying angularly with respect to the facial section and disposed adjacent a portion of said drive chain, said wing member having an aperture therein, a pintle rod extending through said wing member aperture and engaged with and to interconnect link elements of the drive chain, and means on said wing member engageable with a pintle member and cooperative with said pintle rod to secure the flight member to said drive chain.

5. In a conveyor including a drive chain comprising a plurality of link elements relatively interconnected pivotally by pintle members and a load bearing web member extending along and operating with said drive chain, a flight member overlying said web member and rising therefrom, said flight member comprising a facial section of sheet material disposed generally perpendicular to said web member and having a horizontal portion thereof bent to offset relation with respect to the facial section thereof, said horizontal bent portion having therein a marginal aperture, link means connected in said marginal aperture and in said load-bearing web for securing the latter to said flight member, said flight member further having a wing member lying angularly with respect to the facial section and extending along a portion of said drive chain, said wing member having relatively spaced apertures therein, a pintle rod extending through one of the wing member apertures and engaged with and to interconnect link elements of the drive chain, and the other aperture of said wing member being in engagement with a pintle member adjacent to said pintle rod whereby said flight member is connected with said drive chain and retained in angular relation with the plane of said load-bearing web member.

6. In a conveyor including a drive chain comprising a plurality of link elements relatively interconnected pivotally by pintle members and a load bearing web member extending along and operative with said drive chain, coiled elements interposed between and interconnecting incremental sections of said load-bearing web member, a flight member overlying said web member and rising therefrom, said flight member comprising a facial section of sheet material extending upwardly from the general plane of said web member and having spaced horizontal portions thereof bent to offset relation with respect to the facial section thereof, said flight member further having a wing member lying angularly with respect to said facial section and extending along a portion of said drive chain, said wing member having therein separate apertures relatively spaced longitudinally of said drive chain, a pintle rod carried by and interconnecting adjacent link elements of said drive chain, said pintle rod extending through one of said wing member apertures and through said coiled elements for securing the flight member and the load-bearing web member respectively to said drive chain, and the other of said wing member apertures being engaged with a pintle pin adjacent to said pintle rod for retaining the angular position of said flight member relative to the plane of said load-bearing web member.

7. In a conveyor including a drive chain comprising a plurality of identical link elements relatively interconnected pivotally by pintle members and a load bearing web member extending along and operative with said drive chain, a unitary sheet metal flight member overlying said web member and rising therefrom, said flight member having a facial section disposed substantially perpendicular to said web member and of a horizontal width substantially corresponding with the width of the load bearing web member, a wing

member extending from a side of said facial section and bent angularly with respect to the latter to lie substantially parallel with the drive chain and extending for at least a full link element thereof, said wing member having relatively spaced apertures therein, a pintle rod carried by and interconnecting adjacent link elements of said drive chain and extending through one of said wing member apertures, the other of said wing member apertures being engaged with a pintle pin adjacent to said pintle rod for connecting said flight member, in cooperation with the pintle rod, to said drive chain, and a marginal flange on the facial section of said flight member, said flange having along it distal edge a lip turned downwardly to approach and substantially engage the adjacent plane of said load-bearing web member.

8. In a conveyor including a drive chain comprising a plurality of link elements relatively interconnected pivotally by pintle members and a load bearing web member extending along and operative with said drive chain, a flight member comprising a generally planar portion overlying said web member and angularly rising therefrom, end portions of said flight member angularly related to said planar portion and to said web member and engaged with longitudinally spaced pintle members of said drive chain for connecting the latter to said flight member, and elements

interconnecting medial portions of said flight member with medial portions of said load member.

9. In a conveyor including a drive chain comprising a plurality of link elements relatively interconnected pivotally by pintle members and a load bearing web member extending along and operative with said drive chain, a flight member comprising a generally planar portion overlying said web member and rising therefrom, end portions of said flight member being disposed substantially normal to said planar portion and extending upwardly from said web member and having lower portions thereof engaged with longitudinally spaced pintle members of said drive chain for connecting the latter to said flight member, and portions of said load bearing web member being in entwined interengagement with portions of said flight member.

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