April 14, 1942. A. DE L. SINDEN 2,279,862

CONVEYER

Filed Feb. 23, 1940

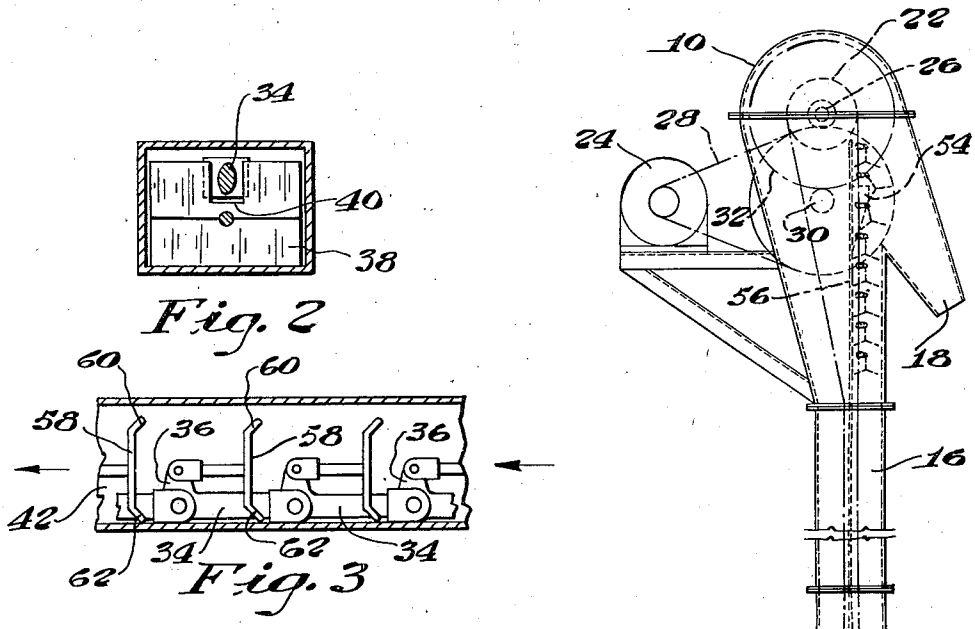
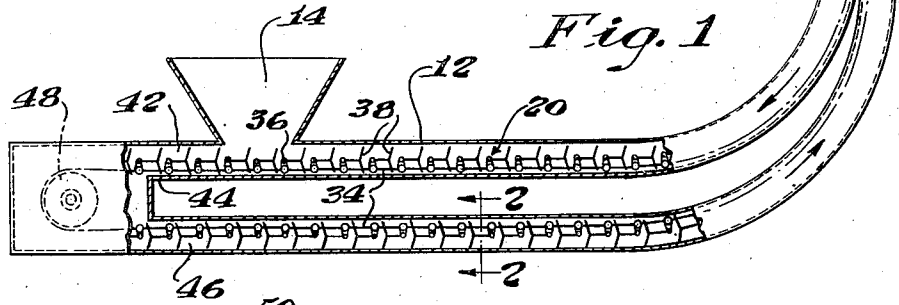


Fig. 1

Fig. 2

Fig. 3



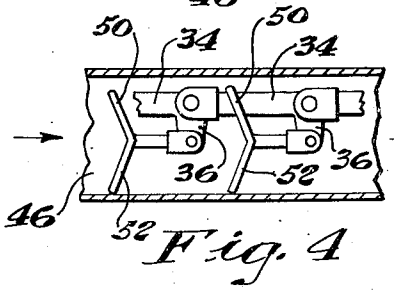


Fig. 4

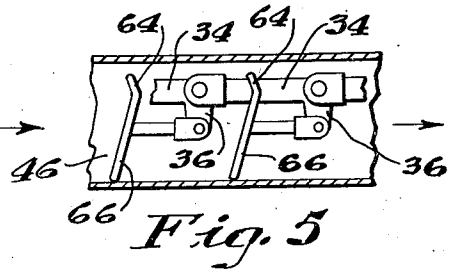


Fig. 5

INVENTOR.
Alfred deLos Sinden

BY J. Stanley Churchill

ATTORNEY.

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CONVEYER

Alfred De Los Sinden, Aurora, Ill., assignor, by mesne assignments, to Link-Belt Company, Chicago, Ill., a corporation of Illinois

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13 Claims. (Cl. 198—172)

This invention relates to a conveyer for conveying flowable solid material.

The invention has for an object to provide a novel and improved conveyer of the character specified having a casing and a conveying element of novel and improved construction which is adapted to be drawn therethrough to effect the conveyance of the material in a smooth, efficient and noiseless manner.

With this general object in view and such others as may hereinafter appear, the invention consists in the conveyer and in the various structures, arrangements and combinations of parts hereinafter described and particularly defined in the claims at the end of this specification.

In the drawing illustrating the preferred embodiments of the invention; Fig. 1 is a side elevation partly in section embodying the present invention; Fig. 2 is an enlarged detail view in cross-section taken on the line 2—2 of Fig. 1; Fig. 3 is a detail in side elevation showing one form of the conveying element embodied in the present conveyer; and Figs. 4 and 5 are similar views showing modified forms thereof.

The present invention is preferably embodied in a conveyer of the type particularly adapted for use in conveying material of a free flowing nature and comprises a casing or conduit having a conveying element adapted to be drawn through the casing to effect the conveyance of the material therethrough. The conveying element may preferably comprise a plurality of connected links and is provided with a plurality of substantially solid transverse flight members pivotally attached thereto at spaced intervals. In conveyers of this type as heretofore constructed, the solid transversely extended flight members were arranged at right angles with respect to the casing through which they were drawn and this construction caused the contacting portions of the flights to jump or vibrate intermittently in a manner analogous to the vibration set up by rubbing a finger across a window pane, with the production of excessive noise and wear of the flights themselves and of the walls of the casing or conduit through which they were drawn, particularly when the flight passed through the horizontally extended portions of the conveyer.

In accordance with the present invention, these objectional features are eliminated by so constructing the pivotally mounted flight members that the contacting portions of the flights are disposed rearwardly with respect to the travel of the conveying element instead of at right angles thereto so that the flights may be drawn smoothly through the conduit without the production of vibration, noise and the resulting wear above referred to.

Referring now to the drawing, as shown in Fig. 1, the numeral 10 represents a casing or conduit of general L shape, having a horizontally extended leg 12, provided with an inlet 14, and a vertically extended leg 16 having a discharge outlet 18. A conveying element, indicated generally at 20, is arranged to be drawn through the conduit 10 over a head sprocket 22, which latter may be driven through any usual or preferred mechanism, herein shown as comprising an electric motor 24 connected to the drive shaft 26 through a belt 28 and through gearing 30, 32. The conveying element 20 preferably comprises a plurality of connected links 34, each being provided with an extended portion 36 to which a substantially solid flight member 38 is pivotally or otherwise connected to suspend it in a position transversely of the casing 10. Each flight member 38 is preferably of a size such as to nearly fill the cross-sectional area of the casing, and as shown in Fig. 2, each flight may be provided with a slotted portion 40 to provide clearance for the links 34.

In operation, material is supplied through the inlet 14 to the upper or return run 42 of the horizontally extended leg 12, and is carried over the partition 44 to fall by gravity into the lower or working run 46 of the conveyer to be carried up through the vertical leg 16 and discharged through the outlet 18. In passing from the upper run to the lower run the conveying element passes over an idler sprocket 48 disposed at the end of the horizontal leg 12 and, in practice, provision is preferably made for adjusting the sprocket to adjust the tension on the conveying element 20.

In accordance with the present invention, the pivotally mounted flight members 38 are rearwardly inclined with respect to the direction of travel of the conveying element instead of being disposed at right angles thereto so that the contacting portions will drag upon the casing and permit the flights to slide easily through the casing and thus reduce to a minimum the tendency of the flights to vibrate, particularly when they pass through the horizontally extended leg 12. As illustrated in detail in Fig. 4, one form which the transverse flight may take comprises a V shaped flight having two wing portions 50, 52, inclined rearwardly from an intermediate portion of the flight so that when passing through either the upper run 42 or the lower run 46 the portions

engaging the bottom of the runs will be rearwardly inclined with respect to the direction of travel.

As will be observed from an inspection of Fig. 1, such construction also facilitates the discharge of the material from the flights when they reach the discharge opening 18 since the material may flow off the wings 50, 52 by gravity and through the discharge chute thus precluding the possibility of carrying the material on the flights over the head sprocket and into the return run. Provision may also be made for tilting the flights adjacent the outlet if desired to provide additional assurance of having the flights entirely free of material when they pass the outlet. Such means may comprise a stationary wedge shaped member 54 fixed to the inner wall 56 of the conveyor and which is arranged to engage one edge of the flights as they pass by.

A modified form of flight structure, as shown in Fig. 3, may comprise a dish shaped flight having a wall 58 disposed at right angles to the casing and having angular edges 60, 62 inclined rearwardly with respect to the direction of travel. As illustrated in Fig. 5, another modification may comprise a flight having two angularly disposed portions 64, 66 of unequal length. The longer portion 66 is preferably disposed to engage the bottom of the lower run, so that when the flight is advanced and arrives adjacent the outlet 18, the longer portion will be inclined in a direction to spill the material thereon directly into the discharge chute.

From the above description it will be observed that the present construction of conveying element is capable of operation in a substantially noiseless and vibrationless manner.

While the preferred embodiment of the invention has been herein illustrated and described, it will be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:

1. In a conveyor, or the like, for transporting flowable solid materials, the combination with a flexible drive member, of a plurality of substantially solid, rectangular flights spaced along said drive member, and means extending forwardly of each flight and connected thereto at a point intermediate its front and rear edges, in reference to the flexible drive member, for pivotally attaching the flight to the flexible drive member, each of said flights comprising a plurality of angularly arranged portions extending in opposite directions with respect to the aforesaid pivot means and inclined rearwardly with respect to the direction of force applied to the flight by said means, whereby the flights may be drawn over a horizontally arranged supporting surface without jumping or vibrating and said inclined portions will discharge material by gravity when the flights are unconfined while traveling a vertical path.

2. In a conveyer, or the like, for transporting flowable solid materials, the combination with a chain conveyer formed of articulated links, of a substantially solid, rectangular flight for each link, and means extending forwardly of each flight and connected thereto at a point intermediate its front and rear edges, in reference to the chain conveyer, for pivotally attaching the flight to its respective link of the chain with the flight projecting substantially from only one side of the chain, each of said flights comprising a plurality of angularly arranged portions extending in opposite directions with respect to the aforesaid pivot means and inclined rearwardly with respect to the direction of force applied to the flight by said means, whereby the flights may be drawn over a horizontally arranged supporting surface without jumping or vibrating and said inclined portions will discharge material by gravity when the flights are unconfined while traveling a vertical path.

3. In a conveyer, or the like, for transporting flowable solid materials, the combination with a chain conveyer formed of articulated links, of a substantially solid, rectangular flight for each link, and means extending forwardly of each flight and connected thereto at a point intermediate its front and rear edges, in reference to the chain conveyer, for pivotally attaching the flight to its respective link of the chain with the flight projecting substantially from only one side of the chain, each of said flights comprising a plurality of portions extending to the front and rear edges of the flight which are inclined rearwardly with respect to the direction of travel of the flight and in opposite directions with respect to the point of connection of the aforesaid pivot means, whereby the flights may be drawn over a horizontally arranged supporting surface without jumping or vibrating and said inclined portions will discharge material by gravity when the flights are unconfined while traveling a vertical path.

4. In a conveyer, or the like, for transporting flowable solid materials, the combination with a flexible drive member, of a plurality of substantially solid, rectangular flights spaced along said drive member, and means extending forwardly of each flight and connected thereto at a point intermediate its front and rear edges, in reference to the flexible drive member, for pivotally attaching the flight to the flexible drive member, each of said flights comprising an intermediate portion, to which the aforesaid pivot means is attached, normally disposed at right angles to the axis of the flexible drive member, and an edge portion inclined rearwardly with respect to the plane of the said intermediate portion, whereby the flights may be smoothly drawn over a horizontally arranged supporting surface with said edge portions contacting the same.

5. In a conveyer, or the like, for transporting flowable solid materials, the combination with a flexible drive member, of a plurality of substantially solid, rectangular flights spaced along said drive member, and means extending forwardly of each flight and connected thereto at a point intermediate its front and rear edges, in reference to the flexible drive member, for pivotally attaching the flight to the flexible drive member, each of said flights comprising an intermediate portion, to which the aforesaid pivot means is attached, normally disposed at right angles to the axis of the flexible drive member, and opposite edge portions inclined rearwardly with respect to the plane of the intermediate portion, whereby each flight of the conveyer may be smoothly drawn over a horizontally arranged supporting surface with either of its said edge portions contacting the same.

6. In a conveyer, or the like, for transporting flowable solid materials, the combination with a flexible drive member, of a plurality of substantially solid, rectangular flights spaced along and

attached to said drive member, each of said flights comprising an intermediate portion disposed at right angles to the axis of the flexible drive member, and an edge portion inclined rearwardly with respect to the plane of the said intermediate portion, whereby the flights may be smoothly drawn over a horizontally arranged supporting surface with said edge portions contacting the same.

7. In a conveyer, or the like, for transporting flowable solid materials, the combination with a flexible drive member, of a plurality of substantially solid, rectangular flights spaced along and attached to said drive member, each of said flights comprising an intermediate portion disposed at right angles to the axis of the flexible drive member, and opposite edge portions inclined rearwardly with respect to the plane of the intermediate portion, whereby the flights may be smoothly drawn over a horizontally arranged supporting surface with either of said edge portions contacting the same.

8. In a conveyer, or the like, for transporting flowable solid materials, the combination with a flexible drive member, of a plurality of substantially solid. rectangular flights spaced along said drive member, and means extending forwardly of each flight and connected thereto at a point intermediate its front and rear edges in reference to the flexible drive member, for pivotally attaching the flight to the flexible drive member, each of said flights comprising two flat, rearwardly inclined portions which are angularly arranged with respect to each other and with their line of connection passing through the point at which the aforesaid pivot means is connected to the flight, whereby the flights may be drawn over a horizontally arranged supporting surface without jumping or vibrating and said inclined portions will discharge material by gravity when the flights are unconfined while traveling a vertical path.

9. In a conveyer, or the like, for transporting flowable solid materials, the combination with a flexible drive member, of a plurality of substantially solid, rectangular flights spaced along said drive member, and means extending forwardly of each flight and connected thereto at a point intermediate its front and rear edges, in reference to the flexible drive member, for pivotally attaching the flight to the flexible drive member, each of said flights comprising two flat, rearwardly inclined portions which are angularly arranged with respect to each other and with their line of connection lying to one side of the point at which the aforesaid pivot means is connected to the flight, whereby the flights may be drawn over a horizontally arranged supporting surface without jumping or vibrating and said inclined portions will discharge material by gravity when the flights are unconfined while traveling a vertical path.

10. In a conveyer, or the like, for transporting flowable solid materials, the combination with a flexible drive member adapted to travel in opposite directions relative to superimposed horizontally arranged supporting surfaces, of a plurality of substantially solid, rectangular flights spaced along said drive member, and means extending forwardly of each flight and rigidly connected thereto at a point intermediate its several edges for pivotally attaching the flight to the flexible drive member so that the flight will bear against said horizontal supporting surfaces during the aforesaid travel of the drive member, each of said flights having those portions which will engage said supporting surfaces inclined rearwardly with respect to the direction of travel thereof, whereby the flights may be drawn over said surfaces without jumping or vibrating.

11. In a conveyer, or the like, for transporting flowable solid materials, the combination with a flexible drive member adapted to travel relative to a horizontally arranged supporting surface, of a plurality of substantially solid, rectangular flights spaced along said drive member, and means extending forwardly of each flight and rigidly connected thereto at a point intermediate its several edges for pivotally attaching the flight to the flexible drive member so that the flight will bear against said horizontal supporting surface during the aforesaid travel of the drive member, each of said flights having that portion which will engage said supporting surface inclined rearwardly with respect to the direction of travel thereof, whereby the flights may be drawn over said surface without jumping or vibrating.

12. In a conveyer, or the like, for transporting flowable solid materials, the combination with a chain conveyer adapted to be drawn over a horizontally arranged supporting surface and formed of articulated links with each link having an extension formed on its leading end and projecting away from said supporting surface, of a substantially solid, rectangular flight for each link, each of said flights having a slot formed in one edge portion to accommodate its link, and means extending forwardly of each flight and connected thereto for pivotally attaching the flight to the extension of its respective link, each of said flights having its edge portion which is provided with said slot inclined rearwardly with respect to the direction of force applied to the flight by said means, whereby the flights may be drawn over the said horizontally arranged supporting surface, while unencumbered with the weight of the chain conveyer, without jumping or vibrating.

13. In a conveyer, or the like, for transporting flowable solid materials, the combination with a flexible drive member arranged adjacent one margin of the path through which the material is moved by the conveyer, of a plurality of solid, rectangular flights substantially filling the cross sectional area of the said material path, and means extending forwardly of each flight and connected thereto for pivotally attaching the flight to the flexible drive member with the major portion of the flight projecting substantially from only one side of said member, each of said flights having its said major portion inclined rearwardly with respect to the direction of travel thereof, whereby the flights may be drawn over a horizontally arranged supporting surface, with the outer edges of their said major portions engaging said surface, without jumping or vibrating and said inclined major portions may discharge material by gravity when the flights are unconfined while traveling a vertical path.

ALFRED DE LOS SINDEN.