Jan. 18, 1938. J. R. MADEIRA 2,105,889

BELT CONVEYER

Filed March 29, 1937

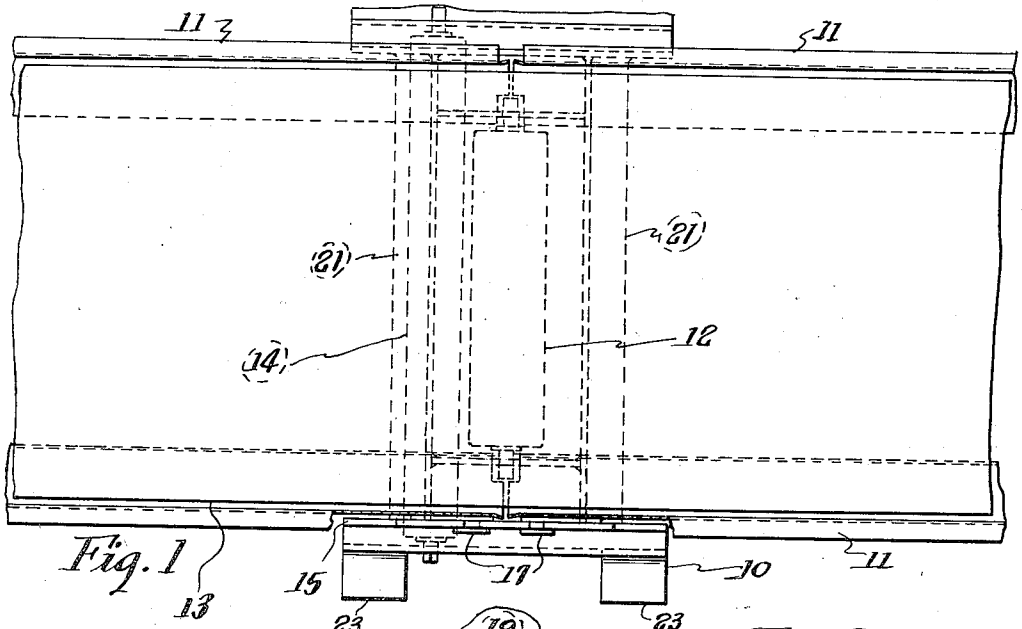

Fig. 1

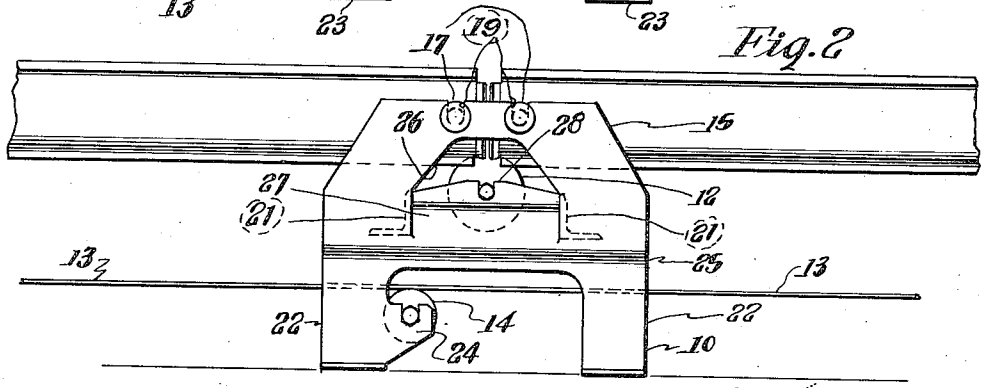

Fig. 2

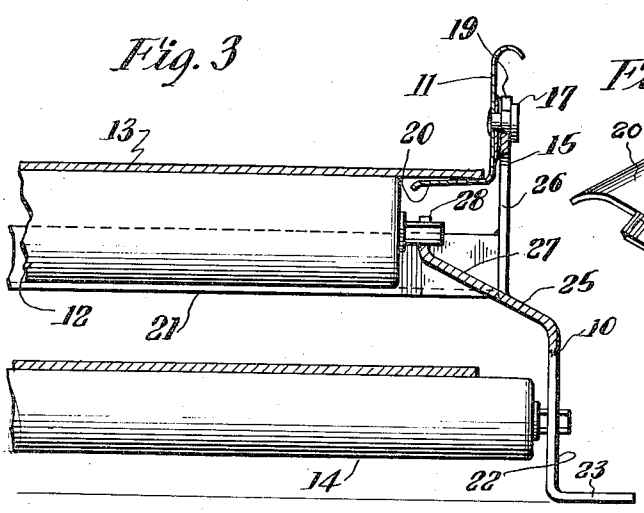

Fig. 3

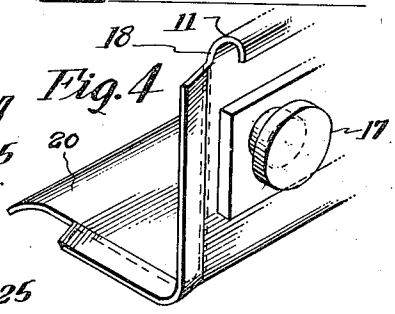

Fig. 4

Inventor
John R Madeira
Clarence F. Poole
Attorney

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BELT CONVEYER

John R. Madeira, Chicago, Ill., assignor to Goodman Manufacturing Company, Chicago, Ill., a corporation of Illinois

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13 Claims. (Cl. 198—204)

This invention relates to improvements in belt conveyers, and more particularly to improvements in a sectional belt conveyer of the flat belt type adapted for use in mines.

Flat belt conveyers of the sectional type adapted for use in mines underground have heretofore consisted of a plurality of supporting standards forming a support for the rollers for the upper and lower runs of the belt which are held in spaced relation with respect to each other by spacing members extending between these supporting standards. Said spacing members are usually so arranged that they may extend upwardly along the sides of the belt to form a means for retaining material on the belt and may have portions extending beneath the belt, commonly called spill plates, which support the edges of the belt to prevent spillage of material from the belt onto the lower run of the belt. A space is usually present between abutting ends of said spacing members, with the result that fine material spills through the joints between said members. Since the average conveyer of this type is 300 feet or more in length, and the length of the individual conveyer sections can seldom be more than 6 feet, and inasmuch as the supporting standards must be close enough together to properly support the belt, and the sections must be of such size that the conveyer can readily be extended in low coal, the number of joints for the entire length of the conveyer and the amount of material which collects on the lower run of the belt are considerable. Material spilling through these joints falls onto the lower run of the belt and clogs the idler rollers, which causes undue wear of the belt and increases the load on the conveyer.

One of the objects of my invention is to provide a sectional conveyer of the flat belt type which is arranged to conform to an uneven bottom and is arranged to prevent spillage of material on the lower run of the belt by pivotally connecting the spacing members to the supporting standards and by providing collecting means at the joints between the spacing members to cover the lower run of the belt at these places and collect the material spilled and discharge it beyond the belt.

Another object of my invention is to so arrange these collecting means that they may form a part of the supporting standards.

Still another object of my invention is to so arrange these collecting means that they may form a support for rollers which support the upper run of the belt.

My invention may be more clearly understood with reference to the accompanying drawing wherein:

Figure 1 is a fragmentary plan view of a sectional conveyer constructed in accordance with my invention with certain parts broken away and shown in section;

Figure 2 is a side elevation of the device shown in Figure 1;

Figure 3 is a transverse sectional view taken substantially along line 3—3 of Figure 1; and

Figure 4 is an enlarged fragmentary perspective view of one of the ends of a spacing member showing certain details of construction thereof.

Referring now in particular to the embodiment of my invention illustrated in the drawing, a plurality of transverse supporting standards 10 is provided. Said standards are detachably held in spaced relation with respect to each other by means of parallel spaced longitudinally extending spacing members 11, 11.

Each of said supporting standards forms a support for a transversely disposed idler roller 12 for supporting the upper run of a conveyer belt 13 and for a transversely disposed idler roller 14 for supporting the lower run of said conveyer belt. The details of said standards will hereinafter be more fully described as this specification proceeds.

The spacing members 11, 11 are supported inwardly of a pair of parallel spaced upstanding side walls 15, 15 of the supporting standards 10 by means of studs 17, 17 which project from the sides of said spacing members adjacent opposite ends thereof. Each of said studs engages a notch 19 in an upstanding side wall 15 which notch opens towards the upper end of said side wall. Said notches are spaced apart in a longitudinal direction in each side wall 15 to space the ends of said spacing members so they may be pivotally adjusted with respect to each other to permit the conveyer to conform to an uneven bottom, and said studs are each provided with a head to prevent lateral displacement of said spacing members with respect to said standards.

Each spacing member is of a substantially L-shaped formation with an inwardly extending lower side or spill plate 20 which is turned downwardly at its inner end. The outer edges of the under side of the upper run of the conveyer belt 13 are adapted to ride on said spill plates, so said spill plates and the sides of said members may prevent spillage of material from the belt.

The ends of said spacing members and spill plates are flared outwardly and downwardly to

prevent damage to the under side and edges of the belt as said belt passes from one section to the other and to permit said members to be pivotally adjusted with respect to each other (see Figures 2 and 4).

It should herein be noted that a gap is provided between the ends of the spacing members 11, 11 in order to permit adjustment of the conveyer to an uneven bottom and that material tends to fall through this gap onto the lower run of the belt which causes wear of the belt and clogging of the idler pulley.

With reference now in particular to the details of the novel form of supporting standards 10 embodying my invention, each of said standards includes the parallel spaced upstanding sides 15, 15 which rest on the ground and are connected together in spaced relation with respect to each other by a pair of spaced apart transversely extending connecting members 21, 21. Each of said upstanding sides has a pair of spaced apart legs 22, 22 with horizontally extending portions 23, 23 extending away from the conveyer to form supporting feet adapted to rest on the ground. A bracket 24 extends from one of said legs, into the space between said legs, and said brackets on opposite upstanding sides 15, 15 form a support for the ends of the shaft for the roller 14. An intermediate portion 25 of each of said upstanding sides is beveled upwardly and inwardly toward the belt so the lower portion of said standards will be wider than the upper portion thereof to prevent rubbing of the edges of the lower run of the belt on said standards. An opening 26 is provided in the upright portion of each of said upstanding sides immediately above said beveled intermediate portion. As herein shown, said opening is formed by stamping out the upright upper portion of said side and bending the stamped portion inwardly. Said stamped portion extends inwardly of said side in an angularly upward direction and is preferably at the same angle as said inclined portion so it may form a collecting chute 27 which covers the lower run of the belt at the joint between said spacing members to collect material which spills through said joint and permit it to be discharged through said opening away from the belt. Said collecting chute has an upright upper end 28 which is notched so as to open toward the upper end thereof to receive an end of the shaft for the upper belt supporting roller 12.

It may thus be seen that a sectional conveyer of the flat belt type has been provided which may readily conform to an uneven bottom and which is so arranged as to prevent spillage of material onto the lower run of the belt, and that said conveyer includes a standard of a novel and simplified form of construction, so arranged as to cover the lower run of the belt at the point of junction of the spill plates so that material which may fall through the gap between said sections may be collected and discharged beyond said standard. It may also be seen that this collecting means comprises an inwardly extending chute on each side of each standard which is herein shown as being an integral portion of said standard and which also forms a means for supporting the roller for the upper run of the belt.

While I have herein shown and described one form in which my invention may be embodied, it will be understood that the construction thereof and the arrangement of the various parts may be altered without departing from the spirit and scope thereof. Furthermore, I do not wish to be construed as limiting myself to the specific embodiment illustrated, excepting as it may be limited in the appended claims.

I claim as my invention:

1. In a sectional conveyer, an endless flat conveyer belt, a plurality of supporting standards, and longitudinally extending spacing members connecting said supporting standards together, said spacing members forming sides extending along said belt and having portions extending beneath and supporting the edges of said belt to prevent the spillage of material onto the lower run of said belt, and means to prevent material spilling through the joints between adjacent spacing members from collecting on the lower run of the belt comprising a collecting chute on each side of each of said standards, said chutes being disposed beneath the joints between said spacing members and arranged to discharge material away from said standards.

2. In a sectional conveyer, an endless flat conveyer belt, a plurality of supporting standards, and longitudinally extending spacing members detachably connecting said supporting standards together, said spacing members forming sides for retaining material on said belt and having portions extending beneath the edges of said belt to prevent the spillage of material onto the lower run of said belt, and means to prevent material spilling through the joints between adjacent spacing members from falling on the lower run of the belt comprising a collecting chute mounted on each side of each of said standards, said chutes being disposed beneath the joints between said spacing members and arranged to discharge material away from said standards.

3. In a sectional conveyer, an endless flat conveyer belt, a plurality of supporting standards, and longitudinally extending spacing members connecting said supporting standards together, said spacing members forming sides for retaining material on said belt and having portions extending beneath the edges of said belt to prevent the spillage of material onto the lower run of the belt, and means to prevent material spilling through the joints between adjacent spacing members from falling onto the lower run of the belt comprising an opening in each side of each of said standards and collecting chutes arranged beneath the joints between said spacing members to collect and discharge material through said openings.

4. In a sectional conveyer, an endless flat conveyer belt, a plurality of supporting standards, and longitudinally extending spacing members connecting said supporting standards together, said spacing members forming sides for retaining material on said belt and having portions extending beneath the edges of said belt to prevent the spillage of material onto the lower run of the belt, means to prevent material spilling through the joints between adjacent spacing members from collecting on the lower run of the belt comprising an opening in each side of each of said standards and collecting chutes extending inwardly of said openings and arranged beneath the joints between said spacing members to collect and discharge material through said openings, and a transversely disposed roller adapted to support the upper run of the belt, said roller being supported between the upper ends of said chutes.

5. In a sectional conveyer and in combination with an endless conveyer belt, a plurality of belt supporting standards, a plurality of longitudinally

extending spacing members pivotally connected adjacent their ends to said standards to permit the conveyer to conform to an uneven bottom, said spacing members being adapted to retain material on said belt and having spill plates extending beneath the outer edges of said belt to prevent the spillage of material onto the lower runs of said belt, a gap being provided between the ends of said spacing members to permit pivotal adjustment of said sections with respect to each other, and means to prevent material spilling through said gaps from collecting on the lower run of the belt comprising a collecting chute disposed beneath each of said gaps and arranged to discharge material beyond said associated standards.

6. In a sectional conveyer and in combination with an endless conveyer belt, a plurality of belt supporting standards, means detachably connecting said standards together in spaced relation with respect to each other comprising a plurality of parallel spaced spacing members adjustably supported at their ends on said standards to enable the conveyer to conform to an uneven bottom, said spacing members having sides extending upwardly along said belt to retain material thereon and inwardly extending spill plates on which the outer margins of said belt ride, and means to prevent material spilling through the joints between said spacing members from collecting on the lower run of the belt comprising a collecting chute extending inwardly from each side of each of said standards and covering the belt at said joints and arranged to discharge said spilled material beyond said standards.

7. In a sectional conveyer and in combination with an endless conveyer belt, a plurality of belt supporting standards, means detachably connecting said standards together in spaced relation with respect to each other comprising a plurality of parallel spaced spacing members adjustably supported at their ends on said standards to enable the conveyer to conform to an uneven mine bottom, said spacing members having sides extending upwardly along said belt to retain material thereon and inwardly extending spill plates on which the outer margins of said belt ride, and means to prevent material spilling through the joints between said spacing members from collecting on the lower run of the belt comprising an opening in each side of each of said standards adjacent the joint between said spacing members and a collecting chute leading inwardly from each of said openings and arranged to collect material spilled at the joint between said members and discharge it through said opening.

8. In a sectional conveyer and in combination with an endless flat conveyer belt, a plurality of belt supporting standards, an upper and lower transversely disposed roller mounted in each of said standards for supporting the upper and lower runs of said belt, means detachably connecting said standards together in spaced relation with respect to each other comprising a plurality of parallel spaced spacing members adjustably supported at their ends on said standards to enable the conveyer to conform to an uneven mine bottom, said spacing members having sides extending upwardly along said belt to retain material thereon and inwardly extending spill plates on which the outer margins of said belt ride, means to prevent material spilling through the joints between said spacing members from collecting on the lower run of the belt comprising an opening in each side of each of said standards adjacent the joint between said spacing members and an integrally formed collecting chute extending upwardly and inwardly from each of said openings and arranged to collect material spilled at the joint between said members and discharge it through said opening beyond said standard, and the inner ends of said chutes forming a supporting means for said upper roller.

9. In a sectional conveyer and in combination with an endless flat conveyer belt, a plurality of belt supporting standards, a plurality of longitudinally extending spacing members pivotally connected to said standards to permit the conveyer to conform to an uneven bottom, said spacing members being adapted to retain material on said belt and having spill plates extending beneath the outer edges of said belt to prevent material from spilling onto the lower run of said belt, a gap being provided between the ends of said spacing members to permit pivotal adjustment of said sections with respect to each other, and means to prevent material spilling through said gaps from collecting on the lower run of the belt comprising collecting chutes disposed beneath said gaps, one of said chutes being on each side of each of said standards and being arranged to collect and discharge material beyond the sides of said standards.

10. In a sectional conveyer and in combination with an endless flat conveyer belt, a plurality of belt supporting standards, and a plurality of longitudinally extending spacing members detachably and pivotally connected to said standards to hold said standards in spaced relation with respect to each other and permit the conveyer to conform to an uneven bottom, said spacing members being adapted to retain material on said belt and having spill plates extending beneath the outer edges of said belt to prevent material from spilling onto the lower run of said belt, a gap being provided between the ends of said spacing members to permit pivotal adjustment of said sections with respect to each other, and means to prevent material spilling through said gaps from collecting on the lower run of the belt comprising collecting chutes extending inwardly from opposite sides of each of said standards and covering the lower run of said belt at said gaps and being adapted to guide and discharge material through openings in the sides of said standards.

11. In a sectional conveyer and in combination with an endless conveyer belt, a plurality of belt supporting standards, and a plurality of longitudinally extending spacing members pivotally connected to said standards to hold said standards in spaced relation with respect to each other and permit the conveyer to conform to an uneven bottom, said spacing members being adapted to retain material on said belt and having spill plates on which the outer edges of said belt ride to prevent the spillage of material onto the lower run of said belt, a gap being provided between the ends of said spacing members to permit pivotal adjustment of said sections with respect to said standards, and means to prevent material spilling through said gaps from collecting on the lower run of the belt comprising openings in the sides of said standards beneath said gaps, and integrally formed collecting chutes extending angularly inwardly and upwardly from said openings and covering the lower run of said belt at said gaps, and being adapted to discharge material through said openings.

12. In a sectional conveyer and in combination with an endless flat conveyer belt, a plurality of

belt supporting standards, and a plurality of spacing members pivotally connected to said standards to hold said standards in spaced relation with respect to each other and permit the conveyer to conform to an uneven bottom, said spacing members being adapted to retain material on said belt and having spill plates extending beneath the outer edges of said belt to prevent the spillage of material onto the lower runs of said belt, a gap being provided between the ends of said spacing members to permit pivotal adjustment of said members with respect to each other, and means to prevent material spilling through said gaps from collecting on the lower run of the belt comprising openings in the sides of said standards adjacent said gaps, and collecting chutes extending inwardly of said openings and covering the lower run of said belt at said gaps and being adapted to discharge material through said openings, said chutes being formed integral with said standards and forming a support for a roller for supporting the upper run of the belt.

13. In a sectional conveyer and in combination with an endless conveyer belt, a plurality of belt supporting standards, an upper and lower transversely disposed roller mounted in each of said standards for supporting the upper and lower runs of said belt, and a plurality of longitudinally extending spacing members detachably and pivotally connected to said standards adjacent their ends to permit the conveyer to conform to an uneven bottom, said spacing members having sides extending upwardly along said belt to retain material on said belt and having spill plates extending beneath the outer edges of said belt to prevent the spillage of material onto the lower runs of said belt, a gap being provided between the ends of said spacing members to permit pivotal adjustment of said sections with respect to said standards, means to prevent material spilling through said gaps from collecting on the lower run of the belt comprising collecting chutes extending inwardly from opposite sides of each of said standards covering the lower run of said belt at said gaps, and being adapted to guide and discharge material through openings in the sides of said standards, said chutes having inner upright upper ends having said upper roller supported therebetween.

JOHN R. MADEIRA.