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E. V. FRANCIS

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TROLLEY CONVEYER

Filed April 21, 1930

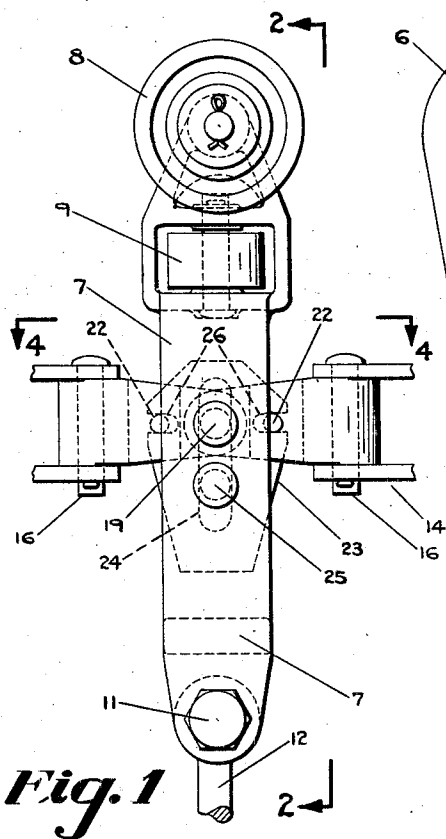


Fig. 1

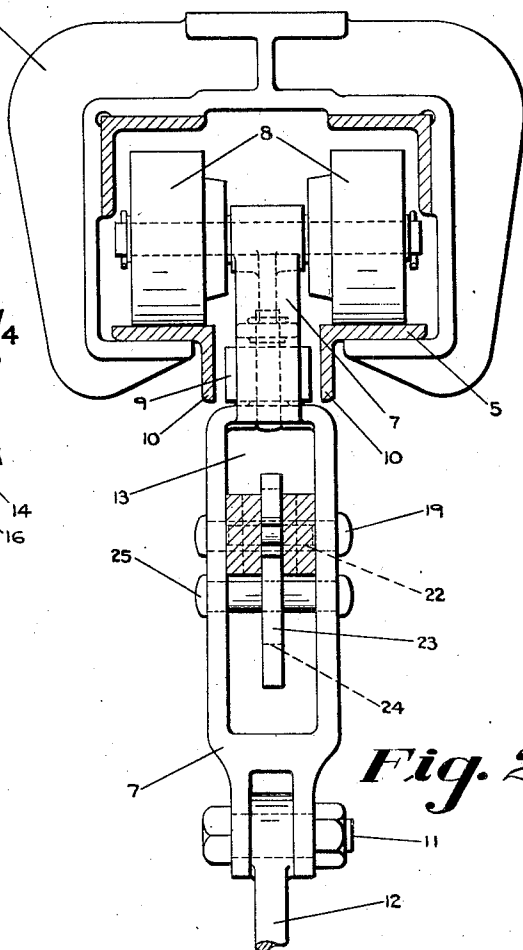


Fig. 2

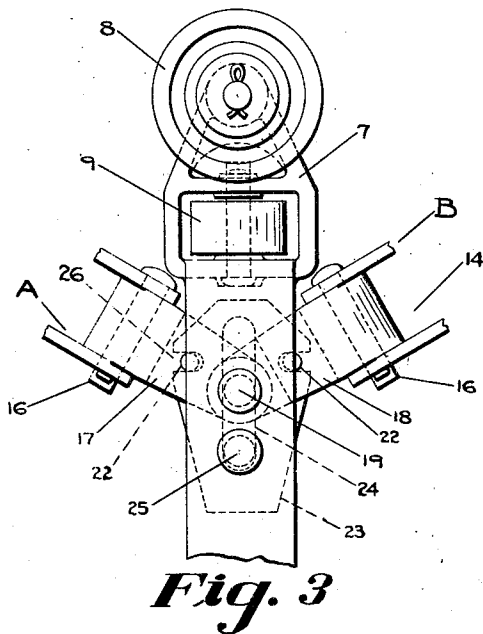


Fig. 3

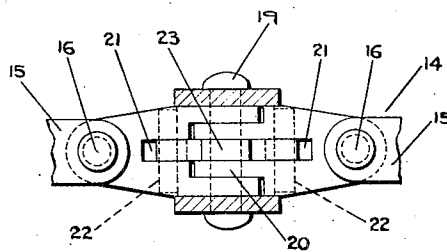


Fig. 4

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TROLLEY CONVEYER

Application filed April 21, 1930. Serial No. 446,069.

This invention relates to new and useful improvements in trolley conveyers of the type disclosed in my co-pending applications, Serial No. 275,212, filed May 4, 1928, and No. 416,187, filed December 23, 1929, in which a series of trolley hangers are connected with a draft device for propulsion along a runway or track.

Like the previous applications, the important object of the present invention is to provide a trolley conveyer capable of traversing horizontal and vertical curves in a trackway without causing undue friction or imposing breaking stresses upon the parts constituting the conveyer and is accomplished by providing a construction which will cause the center lines of the trolley hangers to be disposed in the lines of reaction normal to the trackway in passing about the curves, so that the hangers are maintained radial to the curve of the trackway.

Another object of the invention is to provide a conveyer of this type in which the draft device does not necessarily depend upon the trolley hangers to form the draft element into a unitary device, just as in my co-pending application, Serial No. 416,187.

Another important object of the invention is to provide a sliding element cooperating with the trolley hanger and the pair of links of the draft device which extend from opposite sides thereof, to compel this pair of links to be disposed symmetrically and at equal angles relative to the hanger in traversing vertical curves in the trackway.

Other objects and advantages of the invention will become apparent in the following description:

In the accompanying drawings, forming a part of the description and wherein like numerals are employed to designate like parts throughout the several views,

Figure 1 is a side elevation of a portion of the trolley conveyer showing the position of the draft device with respect to a trolley hanger when traversing a straight portion of the trackway;

Figure 2 is a vertical section on an enlarged scale taken on the line 2—2 of Figure 1 illus-

trating the trolley hanger supported by the trackway;

Figure 3 is a side elevation of the trolley hanger showing the position of the draft device when passing around a vertical curve; and

Figure 4 is a transverse section taken on the line 4—4 of Figure 1 looking in the direction of the arrows.

As explained in my co-pending applications, it is essential where the draft device takes the form of a chain, to possess both horizontal and vertical pivots to enable the chain to flex horizontally and vertically in passing around curves in the trackway of the conveyer. The simplest and most efficient construction for this purpose is a draft chain having its links joined on vertical axes which permits the chain to flex properly when passing around horizontal curves. With such a chain, however, difficulties before the advent of my applications, were encountered in such a chain passing around vertical curves, due to the arrangements heretofore provided failing to remove the breaking stress imposed upon the side links and pintles of the draft chain when flexed about vertical curves. My foregoing applications have completely eliminated this objectionable phase of prior trolley conveyers by constructions compelling the links or portions of the draft device extending from opposite sides of each trolley hanger to be disposed symmetrically and at equal angles with respect to the trolley hangers when passing about vertical curves. This arrangement also compels the longitudinal center lines of the trolley hangers, when passing about vertical curves, to be disposed in the line of reaction normal to the trackway, thereby causing the trolley hangers to be disposed radial with respect to the vertical curves in the trackway when passing about the same, so as to relieve the parts of the conveyer from the breaking stress heretofore referred to.

In the present modification of the construction devised for this purpose, the trackway is supported upon suitable hangers 6 or other supporting means as in my preceding appli-

cations. The upper end of the body of each trolley hanger 7 is equipped with rollers 8 adapted to rest upon and travel along the trackway 5. Below these rollers, a guide roller 9 is mounted in the hanger body on vertical axis for engagement with the depending portions 10 of the trackway for properly guiding the conveyer in its course and for restricting lateral movements of the hangers with respect to the trackway. Pivotally connected by bolts 11 or other suitable means to the lower bifurcated end of each trolley body 7, is a load supporting element 12 which may assume various different forms, usually in the form of a suspension hook.

The portion of each trolley hanger below the guide roller 9 is pierced with an opening 13 of considerable size extending transversely through the body as shown for the connection of a draft device 14.

The draft device 14 in the present illustration assumes the form of a chain composed of a plurality of links 15 pivotally connected together on vertical axes by means of pintles 16 prevented from accidental dislocation by cotter pins or other suitable means. At intervals throughout the length of the draft chain, where trolley hangers 7 are to be associated therewith, the chain includes a pair of links 17 and 18 pivotally connected at their outer ends to the chain links 15 by means of the vertical chain link pintles 16. These connecting links 17 and 18 are of a size to pass through the opening 13 in the trolley hangers and are connected thereto on its longitudinal center line by means of a horizontally disposed pivot pin 19 extending through apertures in the hanger and also through apertures in the inner ends of the connecting links whereby these links are not only pivotally connected to the hanger on a horizontal axis but are also pivotally connected together. This arrangement causes the link 17, connected with a portion A of the draft chain, to extend from one side of the hanger and the other connecting link 18, connected to another portion B of the draft chain, to extend from the opposite side of the hanger as illustrated. It will be noted that this arrangement provides only one horizontal pivot pin, whereas my previous applications employ two horizontal pivot pins, one for each link or clevis.

The inner end of link 17, as shown in Figure 4, is bifurcated to receive a projection 20 of the link 18 and both of the links are additionally bifurcated or slotted as at 21. A pin 22 forming a shoulder is extended transversely through each link 17 and 18 across the slot 21 and is prevented from accidental dislocation by the side wall of slot 13. These pins 22 are provided for cooperation with means, which will now be described, for causing the links 17 and 18 to swing on their axes 19 and be disposed symmetrically and at

equal angles with respect to the hanger as the chain passes around vertical curves to overcome breaking stress being imposed upon the links of the chain 14 in the portions of the chain which trail behind the hangers.

The means provided for this purpose here comprises a plate or element 23 slidably mounted in the slots 21 of the links 17 and 18 for movement vertically and longitudinally of the hanger. This plate 23 is provided with an elongated slot 24 in which the horizontal pivot pin 19 operates when the draft chain flexes on the horizontal pivot 19 in passing around vertical curves. The plate 23 is guided in a rectilinear path longitudinally of the hanger by reason of a pin 25 extending transversely through the hanger body and through the slot 24 of the sliding plate. This pin 25 is mounted in circular openings immediately below the pivot pin 19 and on the longitudinal center line of the hanger as shown. The two side edges of the plate 23 are notched as at 26 to receive therein the pins 22 of the two connecting links 17 and 18. Consequently, it will be evident that when either link 17 or 18 is swung at an angle with respect to the trolley hanger on the pin 19 in passing about a vertical curve, pins 22 will cause the plate 23 to move longitudinally of the hanger to swing the other link 17 or 18 on its axis 19 a distance corresponding to the movement of the first mentioned link. This causes equal angular movement of the links 17 and 18 about their horizontal axis 19 thereby causing them to be disposed symmetrically and at equal angles with respect to the trolley hangers, therefore relieving the links and pintles of the trailing portion of the chain from breaking stress and at the same time causing the trolley hangers to be disposed radially with respect to the vertical curve they are traversing.

Having thus fully described the construction and operation of the invention, it will be understood that various changes in the construction and arrangement of parts may be resorted to without departing from the scope of the appended claims.

I claim:

1. The combination with a trolley hanger; of a draft device having portions connected with said hanger extending from opposite sides thereof to swing vertically, and a sliding element mounted in said hanger and having movement longitudinally of said hangers and connected with said portions of the draft device for causing equal angular movement thereof.

2. The combination with a trolley hanger; of a draft device having portions pivotally connected with said hanger on a horizontal axis and extending from opposite sides thereof, and a rectilinearly slidable element having connection with said portions for causing equal angular movement thereof.

3. The combination with a trolley hanger; of a draft device having portions pivotally connected with said hanger on a horizontal axis and extending from opposite sides thereof, and a rectilinearly slidable element having connection with said portions for causing equal angular movement thereof, said horizontal axis forming guide means for said element.
4. The combination with a trolley hanger; of a draft device having portions pivotally connected with said hanger on a horizontal axis and extending from opposite sides thereof, a rectilinearly slidable element having connection with said portions for causing equal angular movement thereof, and means cooperating with said horizontal axis to form a guide for said slidable element.
5. The combination with a trolley hanger; of a pair of links pivotally connected thereto on a horizontal axis and extending from opposite sides thereof, shoulders carried by said links, and a slidable element having notches receiving said shoulders to cause equal angular movement of said links.
6. The combination with a trolley hanger; of a pair of links pivotally connected thereto by a horizontal pin and extending from opposite sides thereof, shoulders carried by said links, and a slidable element slotted for sliding engagement with said horizontal pin and having notches cooperating with said shoulders to cause equal angular movement of said links.
7. The combination with a trolley hanger; of a pair of links, a horizontal pin pivotally connecting corresponding ends of said links to said hanger, a second horizontal pin extending through said hanger in the same vertical plane with said first named pin, said links extending from opposite sides of said hanger, pins carried by said links, and a sliding element slotted for sliding engagement with the hanger pins and having notches in its side edges receiving the link pins for causing equal angular movement of said links.
8. The combination with a trolley hanger; of a pair of bifurcated links pivotally connected thereto on a horizontal axis and extending from opposite sides thereof, shoulders carried by said links, and a connecting element slidably associated with said hanger and operating in the bifurcation of said links for engagement with said shoulders to cause equal angular movement of said links.
9. The combination with a trolley hanger; of a pair of bifurcated links, a horizontal pin pivotally connecting the bifurcated ends of said links to said hanger, said links extending from opposite sides of said hanger, pins carried by said links and extending across said bifurcated ends thereof, and a connecting element slidably associated with said hanger and disposed in the bifurcations of said links and having notches in its side edges for engagement with the link pins for causing equal angular movement of said links.
10. The combination with a trolley hanger; of a pair of links extending from opposite sides thereof, a single horizontal pivot pin pivotally connecting said links together and to said hanger, and means for causing said links to assume substantially corresponding angular relation at opposite sides of the hanger.

In testimony whereof I have hereunto set my hand.

EARLE V. FRANCIS.

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