

June 19, 1934.

S. D. ROBINS

1,963,099

TRAINING IDLER FOR CONVEYER BELTS

Filed Jan. 11, 1933

Fig. 1.

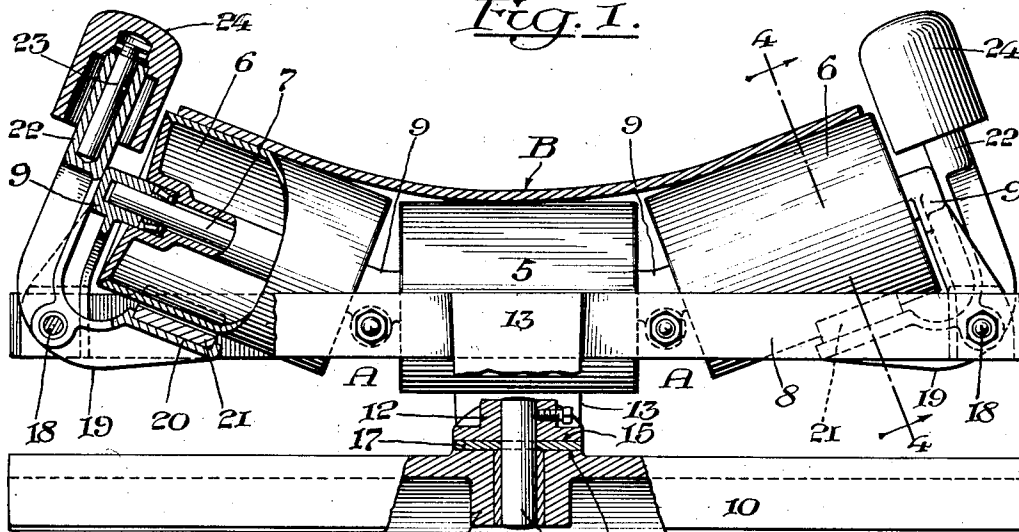


Fig. 2.

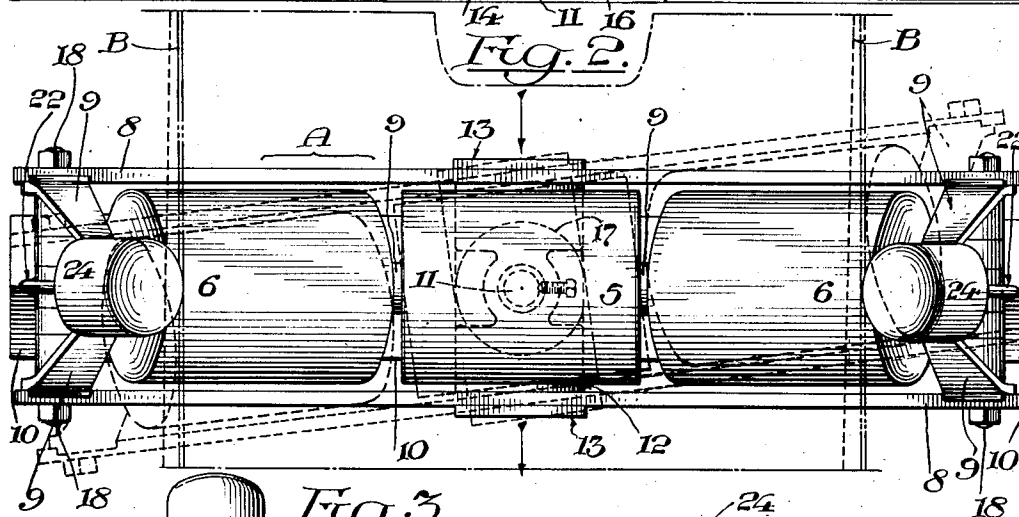


Fig. 3.

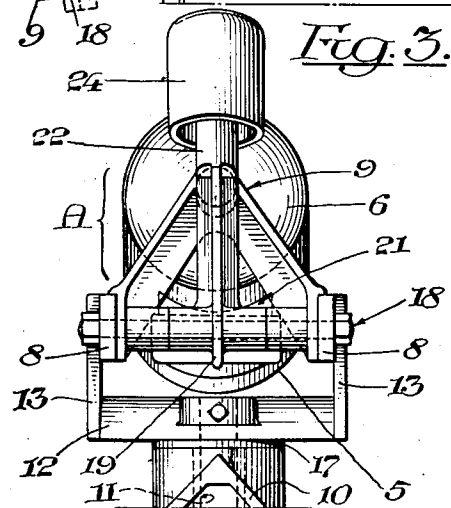
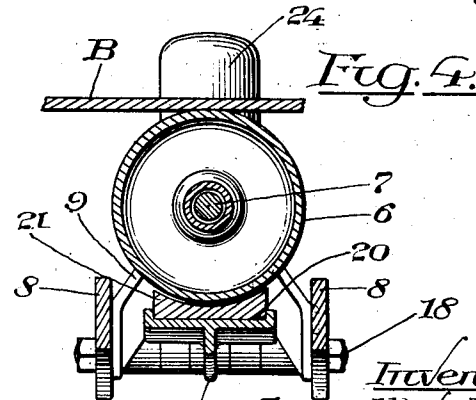


Fig. 4.



Inventor
19 Samuel Davis Robins
by his Attorney John R. Nolan

UNITED STATES PATENT OFFICE

1,963,099

TRAINING IDLER FOR CONVEYER BELTS

Samuel Davis Robins, Hewlett, N. Y., assignor to
Robins Conveying Belt Company, Passaic, N. J.,
a corporation of New Jersey

Application January 11, 1933, Serial No. 651,067

4 Claims. (Cl. 198—202)

This invention relates to training troughing idler units for belt conveyers wherein the frame on which the supporting idlers or rolls for the belt are mounted is pivoted about a vertical axis and is provided with supplementary devices of various types which are arranged in proximity to the respective edges of the belt and are operative, by the contact therewith of one or the other of such edges when the belt deviates from its normal path, to produce a frictional moment which effects the partial turning of the frame about its vertical axis, thus shifting the series of idlers in the direction of travel of the belt in a manner to return the belt to its normal path.

In belt training devices heretofore described of the kind mentioned the supplementary devices with which the transversely shifted or displaced belt co-act, are of such character that the edges of the belt are subjected to destructive rubbing pressure.

The object of my invention is to provide a training idler unit of simple and efficient construction whereby the objection above noted is overcome, and whereby under any and all conditions of lateral displacement of the travelling belt a frictional moment effective quickly to swing the frame and its idlers to training position is attained.

With this and other objects in view my invention comprises novel features of construction and combinations of parts which, in a preferred form, will be hereinafter described, the scope of the invention being expressed in the appended claims.

In the drawing—

Figure 1 is a front elevation, partly in section, of a training troughing idler unit embodying my invention, the conveyer belt being shown in transverse section.

Fig. 2 is a plan of the improved idler unit.

Fig. 3 is a side elevation of the same.

Fig. 4 is a transverse vertical section through one of the outer idlers, the belt, and the brake for said idler, as on the line 4—4 of Fig. 1.

Referring to the drawing, A designates a troughing idler unit, and B a conveyer belt supported thereon. This unit comprises a series of idlers, in the present instance three, viz.; a horizontal idler 5 and two upwardly and outwardly extending idlers 6 arranged to impart a trough formation to the travelling belt in the usual manner. The idlers are loosely mounted for independent rotation on shafts 7 which are supported on a suitable frame comprising a base 8 and bearing brackets 9. The base is pivoted about a vertical axis on an underlying supporting structure 10, the pivot being located midway between the

ends of the base and in the vertical axial plane of the idlers, whereby the frame and its appurtenances are bodily moved about the axis of the base by the drag of the belt on one or the other of the outer idlers to which a braking action may be applied when the belt deviates from its normal path, as hereinafter described.

In the present instance the pivot for the base comprises a vertical pin 11 which is affixed to the cross-member 12 of a bracket 13 depending from the base, and which pin is rotatably seated in a vertical bearing 14 in the supporting structure 10. The cross-member 12 and the supporting structure 10 have opposed bearing surfaces 15 and 16, respectively, between which is preferably interposed a washer 17, of leather or other suitable material, effective to apply frictional resistance to the movement of the idler base about its axis.

Pivoted, as at 18, on the respective end brackets 9 carried by the base are brake actuating devices comprising bell cranks, whereof the lower arm 19 of each extends beneath the adjacent outer idler 6 and has a recessed portion, 20, for a brake shoe, 21, formed of wood or other suitable material with a concave active surface which normally lies in close relation to, but out of contact with, the under surface of the adjacent idler. The arm 22 of each bell crank terminates in a spindle 23 upon which is rotatably mounted a roll, 24, that is located at and extends above the outer end of the adjacent idler 6, so that in the event of the lateral swerving of the travelling belt from its normal path—to the right or left—the higher edge of the belt makes rolling contact with the opposing roll 24 and thereby immediately swings the roll and the bell crank about the fulcrum of the latter in a manner to apply the brake shoe directly to the under surface of the adjacent idler.

The weight of the belt on this idler when the brake is applied produces sufficient frictional contact to insure rotation of the idler at all times, the action of the brake resulting not in slowing down such idler but in ensuring sufficient drag of the belt thereon to cause a turning of the idler frame about the pivot 11 effective to swing the series of idlers into training position, with the result that the edge of the belt breaks contact with the brake actuating roll, and thereby releases the brake, the instant that the training effect starts to move the belt back towards its proper central position. At this point the pivotal idler structure remains at rest in a training position and does not return through any belt action

to any particular previous position. However in some cases the described braking action may switch the idler structure into too extreme training position with the result that the belt may pass beyond its central position and into light rolling contact with the opposite brake actuating roll. This will have the effect of lightly applying the opposite brake to the adjacent idler with a consequently small swing of the idler structure counter to the first swing. The result of this slight counter movement will break contact between the edge of the belt and the opposing brake actuating roll.

It is to be noted that in the cases indicated such successive opposite swing of the idler structure will be less than the preceding movement until the idler structure comes to rest, and in this condition it will remain at the proper training angle so long as those effects which singly or cumulatively disturb the central running of the belt remain at the constant value. Should a change in these disturbances take place, the idler will again be adjusted to a new stable position of central belt operation. The washer 16 brings friction into play as a damping force which eliminates see-sawing or "hunting" of the idler structure about the vertical axis.

Since by the foregoing described construction embodying my invention, either edge of the travelling belt, according to the direction of lateral displacement of the belt, makes free rolling contact with the periphery of an adjacent roll on a freely turning bearing and utilizes the displacement of the roll itself and the spindle on which it is mounted as a means to move the brake shoe into prompt breaking action against the adjacent inclined idler, the undue wearing of the edge or edges of the belt resulting from the contact of the belt with the actuating devices heretofore employed in belt training constructions for troughing idlers, is obviated.

Since, also, the frictional resistance of the pivot of the idler base 8 is augmented, as hereinbefore described, the turning moment about the pivot to effect the training of the laterally displaced belt is solely produced by the drag of the belt on the idler 6 to which the braking action is applied.

It is to be noted that, since in the foregoing described construction embodying my invention the pivot pin of the idler base is in the plane of the axes of the idlers, the idler unit is symmetrical in all respects, and therefore is suitable for use in connection with reversible belts as well as with those that run in one direction only. Furthermore, that since the brake shoes 21 are located beneath the respective idlers 6, and under the upper run of the conveyer belt, such shoes are

effectually shielded from materials that may be spilled from the belt.

It is to be understood that my invention is not limited to the precise construction herein disclosed, as the structural features may be modified in various respects within the principle of the invention and the scope of the appended claims.

I claim—

1. In a training idler unit for conveyer belts, a series of troughing idlers, a frame on which said idlers are mounted for independent rotation, said frame pivotally mounted to turn about a vertical axis in the plane of the axes of the idlers, and brake mechanisms for acting on the respective outer idlers, each of said mechanisms including a freely-rotatable belt-actuated roll independent of the adjacent idler and located at one end thereof in the path of the adjacent edge of a laterally shifted belt supported on the idler unit.

2. In a training idler unit for conveyer belts, a series of troughing idlers, a pivoted frame on which said idlers are mounted for independent rotation, and brake mechanisms for acting on the respective outer idlers, each of said mechanisms including a lever fulcrumed adjacent the outer idler, a brake member on one arm of the lever in co-operative relation to the said outer idler and a freely rotatable roll mounted on the other arm of the lever at the outer end of the said idler and in the path of the adjacent edge of a laterally shifted belt supported on the idler unit.

3. In a training idler unit for conveyer belts, a series of troughing idlers, a pivoted frame on which said idlers are mounted for independent rotation, and brake mechanisms for acting on the respective outer idlers, each of said mechanisms including a bell crank fulcrumed adjacent the outer idler, the shorter arm of the bell crank extending beneath the said idler, and the longer arm of the bell crank extending upwardly adjacent the outer end of said idler, a brake member on the shorter arm arranged in close spaced relation to the under surface of the said idler, and a freely rotatable roll mounted on the upper end of the longer arm of the bell crank in the path of the adjacent edge of a laterally shifted belt supported on the idler unit.

4. The combination with a series of idlers, and a pivoted frame on which said idlers are mounted for rotation independently of each other, of belt-actuated training means comprising a lever fulcrumed on the frame, a brake member on one arm of the lever, and a freely rotatable roll on the other arm of the lever, the brake member located adjacent the surface of one of the outer idlers, and the roll located in proximity to the outer end of the said idler and in the path of a laterally shifted belt supported on the idlers.

SAMUEL DAVIS ROBINS.