Sept. 12, 1933. C. S. JENNINGS ET AL 1,926,541

CARRIER TRANSFER MEANS

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Fig. 1

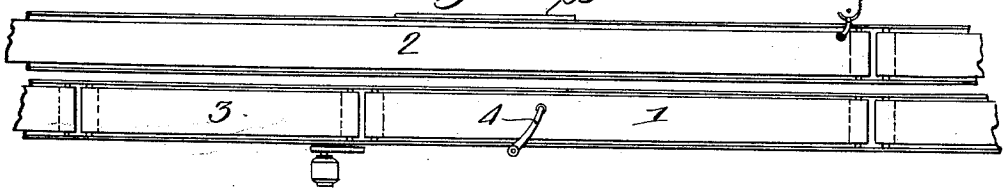


Fig. 2

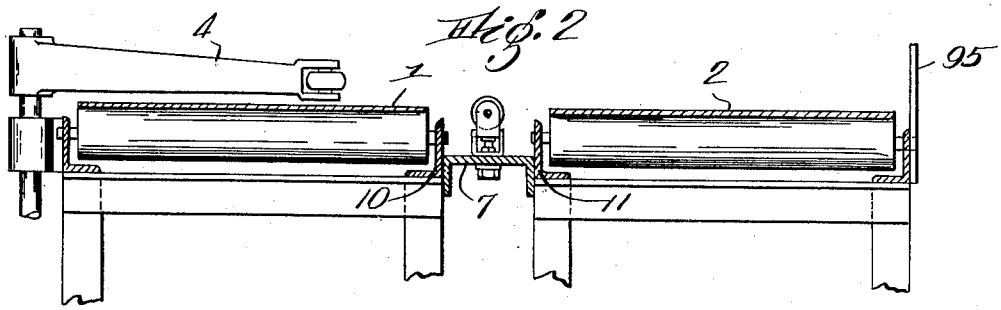


Fig. 3

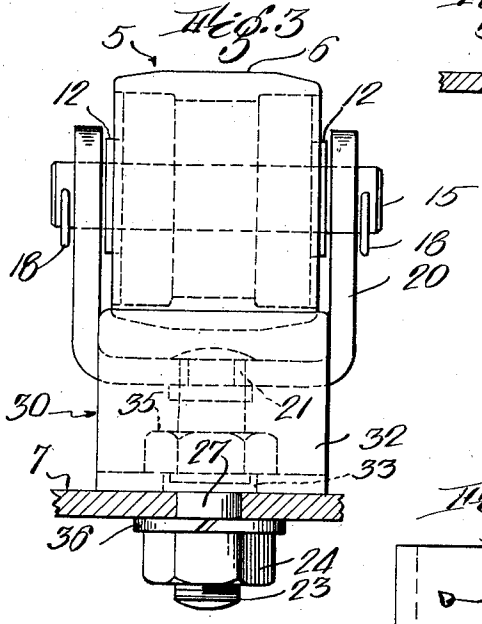


Fig. 6

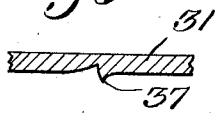
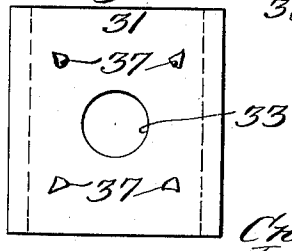


Fig. 5



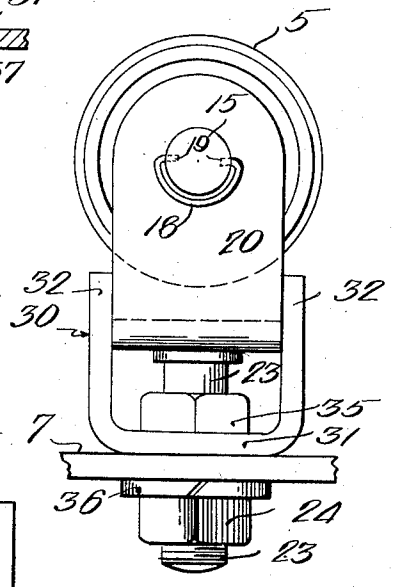


Fig. 4

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Fig. 7

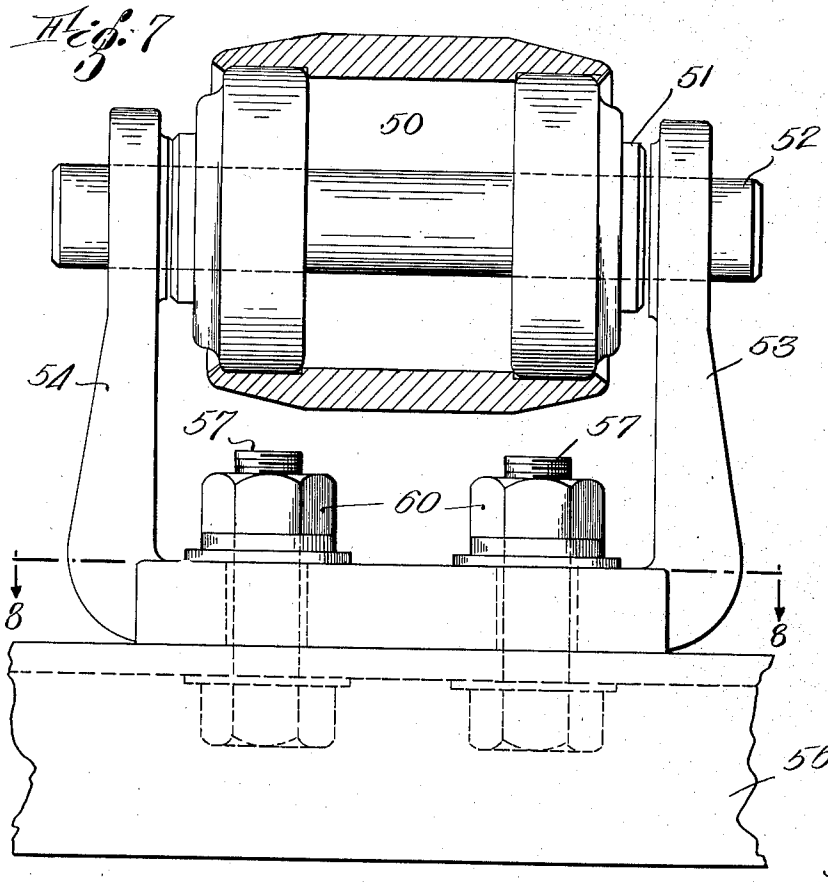
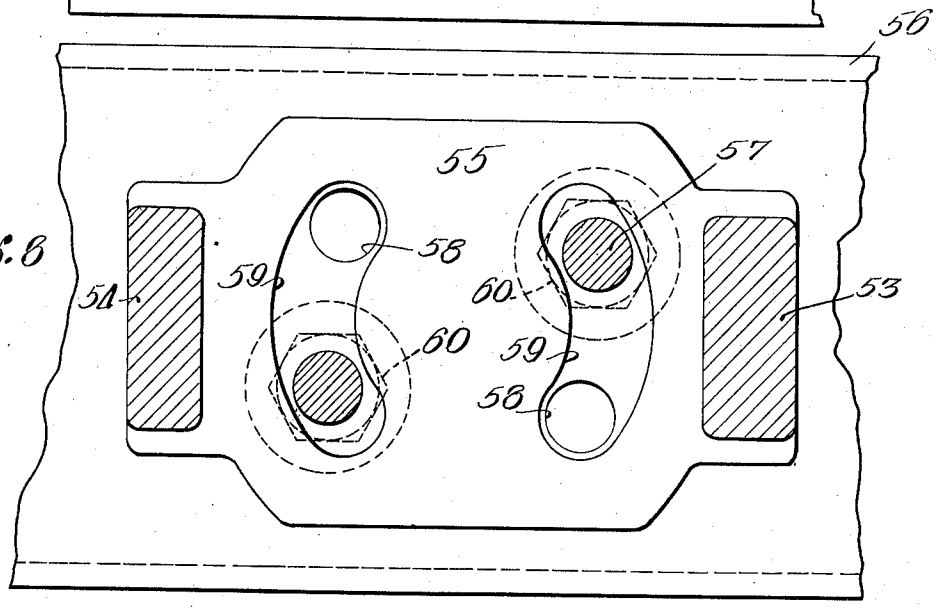


Fig. 8



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UNITED STATES PATENT OFFICE

1,926,541

CARRIER TRANSFER MEANS

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Application June 6, 1930. Serial No. 459,487

3 Claims. (Cl. 193—42)

This invention relates to improvements in conveyor systems, and more particularly to means arranged to expedite the movement of an article, such as a carrier box, from an elongate conveyor moving in one direction onto another conveyor.

In order to cause a carrier box, or the like, moving upon one conveyor to pass, for example, onto a parallel conveyor moving in the opposite direction, we preferably provide deflector arms swingable to a position where they extend across the path of articles upon the first conveyor to turn the same through an arc of substantially 180° as they pass onto the other conveyor. These deflector arms may be selectively operated in any suitable manner, for example automatically in response to the positioning of pins or contacts upon the carrier boxes themselves, which are adapted to operate suitable deflector control mechanism to cause the box to be returned upon the conveyor moving in the opposite direction when it arrives at the desired deflector. Such deflector control mechanism is shown for example in Patent No. 1,535,075 to T. S. Knap.

In order to permit the turning of the box in a comparatively small space, we preferably provide pivot or balancing rolls between the two conveyors; these rolls preferably are positioned so that their planes of rotation may conform to the direction of movement of articles between the conveyors. Preferably these rolls are provided with more or less convex peripheral portions so that they provide a limited region of contact for engagement wth the bottom of the carrier box which swings upon the same, thus in effect comprising more or less spherical pivotal supports to permit the ready swinging of a carrier box which substantially rests upon these rolls as it passes from one conveyor to another.

The impact of the carrier boxes upon the balancing rolls as well as the torsional strains set up by the swinging of the boxes upon the rolls tend to cause the rolls to rotate as units out of the desired positions. This movement impairs the operation of the system and impedes the travel of the boxes so that the balancing rolls must be reset from time to time.

The objects of this invention are to provide balancing rolls having convex peripheral portions which act as substantially spherical supports, and which guide the leading corners of the boxes onto the rolls avoiding any direct impact of the box corners and consequent stoppage of their travel, and also to provide means by which the rolls as a unit are locked in a definite position and can not while in use twist to change the plane of rotation, such means being easily adjustable and locked in place.

The present application is a continuation in part of our copending application Serial No. 348,262, filed March 19, 1929, corresponding thereto with respect to the formation of the balancing rolls and being an improvement thereon with respect to the locking means here shown.

In the accompanying drawings

Fig. 1 is a diagrammatic plan view of two conveyors with means associated therewith to facilitate the movement of a carrier from one conveyor to the other;

Fig. 2 is a transverse sectional view of the two conveyors at a point adjoining the region of carrier deflection;

Fig. 3 is an elevation view of one form of balancing or pivot roll which preferably may be associated with the conveyors;

Fig. 4 is a side elevation view of such a roll;

Fig. 5 is a bottom plan view of one form of a locking element that may be employed;

Fig. 6 is an enlarged cross-sectional detail illustrating the type of locking prong here employed;

Fig. 7 is an elevation of another form of balancing or pivoting roll that may be used; and

Fig. 8 is a plan view of the base thereof taken along the line 8—8 of Fig. 7.

Referring to the accompanying drawings, and first more particularly to Fig. 1 thereof, it may be seen that the conveyor 1 (for convenience termed the primary conveyor) is arranged to move in one direction, and that the conveyor 2 (hereinafter termed the secondary or receiving) disposed beside the same may be arranged to move in the opposite direction. While we have illustrated herewith but a single deflector, a corresponding independently controllable belt section 3, and a deflector 4 associated with conveyor 1, it is to be understood that ordinarily a plurality of deflectors 4 may be provided at suitable intervals so that carriers may pass along the conveyor 1 for different distances, thereupon engaging a selected deflector 4, and being swung outwardly onto balancing rolls 5, and thence onto the receiving conveyor 2 which may return them to the point of origin. While the deflectors 4 may be actuated in any suitable manner, preferably they may be operated by suitable control means which is responsive to a predetermined positioning of actuating pins or tabs upon the carrier boxes. Thus, when the pin upon a box is properly positioned, it will cause the desired deflector 4 to be actuated so that it extends sub-

stantially across the conveyor 1, engaging the front of the oncoming carrier, and turning the same substantially at an angle to its former position. In the meantime the bottom of the carrier is engaged with the surfaces of one or more balancing rolls 5 which, during the mid-portion of the movement of the carrier from one conveyor to the other, substantially support the carrier so that its ends merely lightly engage the oppositely moving conveyor belts, thus the turning of a carrier in a limited space is facilitated. A rail 95 extends along beside conveyor 2 opposite deflector 4 to prevent undesirable lateral movement of transferred carriers.

One advantageous form of balancing roll is illustrated more particularly in Figs. 3 and 4. This roll may be supported upon a bracket or channel 7 bridging the space between the side rails 10 and 11 of conveyors 1 and 2 respectively. Each roller preferably is provided with a more or less convexly curved peripheral portion 6, for example, having its peripheral face oppositely beveled or curved as shown. The roller has a hub portion 12 rotatable upon an axle 15 which is held against longitudinal movement in relation to a U-shaped supporting bracket 20, by double ended retaining pins 18 engageable in diametrically opposed recesses 19 at the axle ends. A bolt 23 extends through the opening 21 in bracket 20 and through one of a series of corresponding openings 27 in the channel 7, being retained in place by a nut 24.

The rolls 5 must rotate in the proper planes relative to the conveyors, so that the carrier boxes are transferred from one conveyor to the other without any undue strain or travel. In our copending application reliance was placed upon tightening the nuts 24. Experience has demonstrated however that the rolls will work loose and swivel about the bolts 23 due to the impacts of the boxes and the torsional strains set up thereby. Accordingly a locking element 30 is provided for each roll. Such element is preferably U-shaped in cross-section (see Fig. 4) comprising a base 31 and uprights 32. The base 31 has a central opening 33 through which the bolt 23 is passed. The bolt 23 is provided with a nut 35 which may be tightened against the base and coact with the nut 24 to clamp the base against the channel 7. A lock washer 36 may be inserted between the nut 24 and channel to increase the clamping action. It has been found advisable to form integral prongs 37 in the base 31 (see Figs. 5 and 6) which, when the nuts 24 and 35 are tightened, will be embedded in the face of the channel and thus insure the locking element against unwanted shifting.

The uprights 32 extend at either side of the bracket 20 and hence when the locking element is clamped against the channel 7 the bracket is held against turning. Such uprights as shown in the drawings do not interfere in any way with the rotation of the roll 5 which takes place freely under the contact of the boxes with the peripheral portion 6.

The form of balancing roll shown in Figs. 7 and 8 is particularly intended for use in transferring heavy boxes and other articles. Such roll, designated as 50, includes a hub 51 through which an axle 52 extends. The axle is carried upon the arms 53 of a U-shaped bracket 54 and permits free rotation of the roll 50. The base 55 of the bracket is secured to a channel 56 by bolts 57 two of which are here shown. The bolts pass through holes 58 in the channel 56 and through arcuate slots 59 in the base 55. The holes 58 are preferably arranged in pairs and only one hole of each pair is used so that as shown in Fig. 8 the bracket 54 may be swung around the bolts and locked to the channel by tightening the nuts 60. By using the other holes the travel of the bracket is increased so that the roll 50 may be set to rotate in any desired plane. In this embodiment as well as in the embodiment previously described the peripheral face of the roll is oppositely beveled or curved.

From the above description it is evident that we have provided means whereby the movement or deflection of a carrier box from a conveyor moving in one direction to an adjoining conveyor moving in an opposite direction, such means including a balancing roll, the peripheral portion of such roll on which the carrier boxes are supported in transit, having an oppositely beveled or curved peripheral face and locking mechanism by which the roll may be adjusted readily into any desired plane of rotation and rigidly held therein. While for purpose of clarity of illustration we have elected to show the balancing rolls associated with oppositely moving conveyors, it will be understood that the invention is not limited thereto and that the rolls may be employed with conveyors of any desired type or may be used in any desired relation without departing from the spirit and scope thereof as set forth in the following claims.

We claim:

1. A load supporting unit comprising a roll, a bracket in which said roll is supported for free rotation upon its axis, a member upon which the bracket is supported and relative to which the bracket is adapted to swing and thereby determine the plane of rotation of the roll, and a U-shaped element for locking the bracket in any desired position, said element including a base interposed between the bracket and the member, and uprights extending at opposite sides of the bracket.

2. A load supporting unit comprising a roll, a bracket in which said roll is supported for free rotation upon its axis, a member upon which the bracket is supported and relative to which the bracket is adapted to swing and thereby determine the plane of rotation of the roll, a bolt fixed to the bracket and member, an element through which the bolt passes, and means for clamping said element upon said member, said element including uprights which extend at opposite sides of the bracket and lock it in any desired position.

3. A load supporting unit comprising a roll, a bracket in which said roll is supported for free rotation upon its axis, a member upon which the bracket is supported and relative to which the bracket is adapted to swing and thereby determine the plane of rotation of the roll, a bolt fixed to the bracket and member, a U-shaped element comprising a base having a hole through which the bolt passes, and uprights which extend at opposite sides of the bracket and prevent swinging thereof relative to the element, said base resting upon said member and having prongs projecting therefrom, and means for clamping the base upon the member and embedding the prongs therein, thereby locking the bracket against swinging relative to the member.

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