

July 29 1924.

1,502,976

C. K. BALDWIN ET AL

TROUGHING SUPPORT FOR CONVEYER BELTS

Filed Feb. 15, 1922

3 Sheets-Sheet 1

Fig. 1.

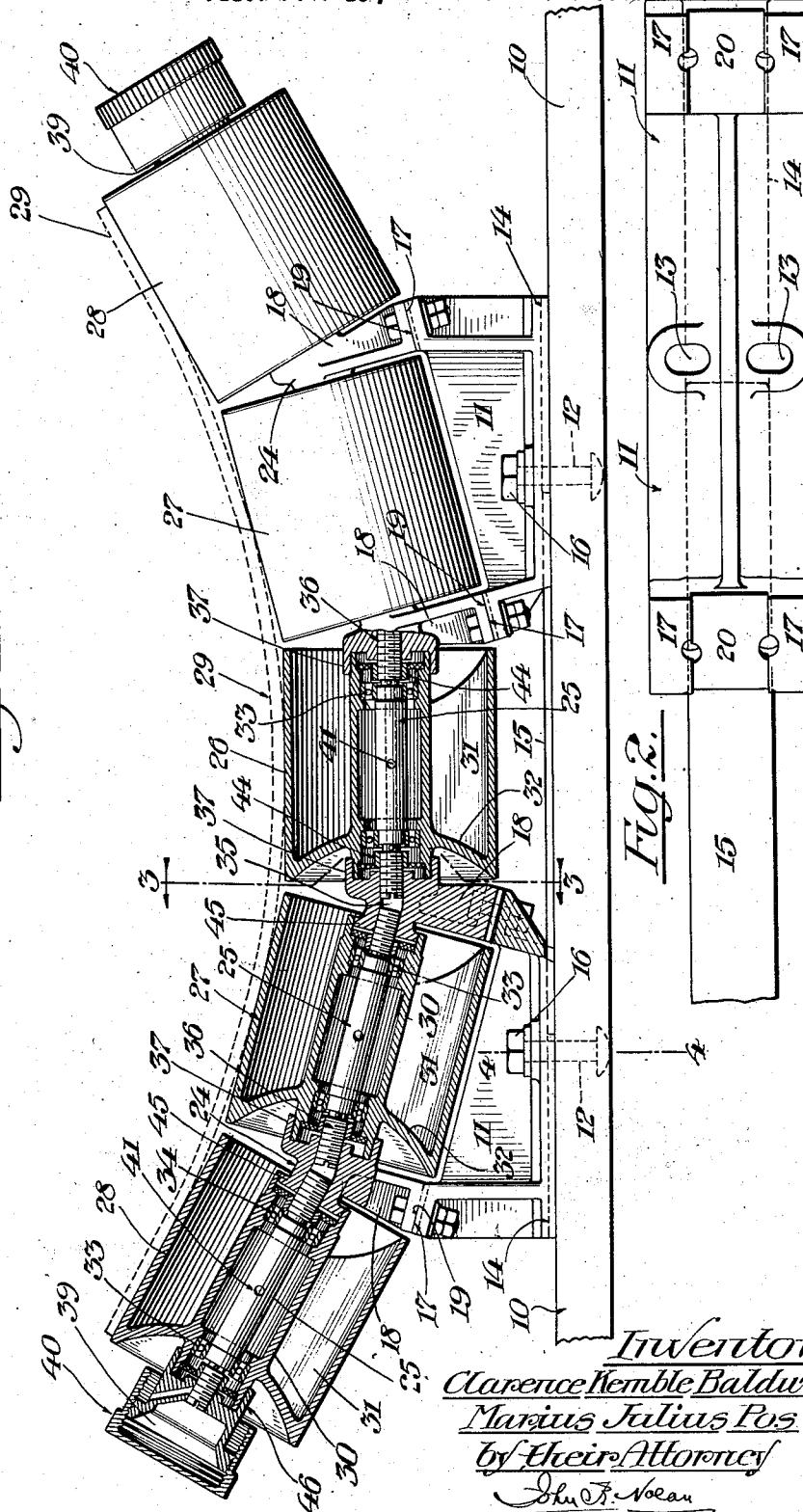
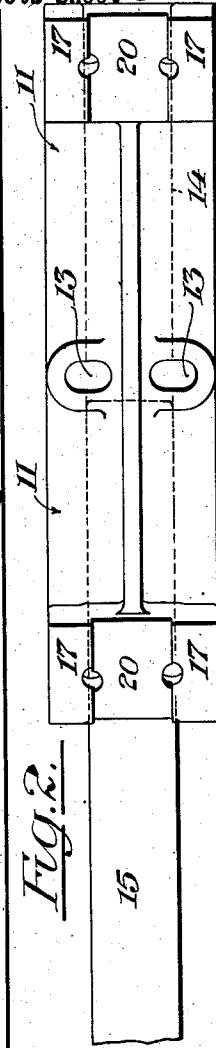


Fig. 2.



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3 Sheets-Sheet 2

Fig. 3.

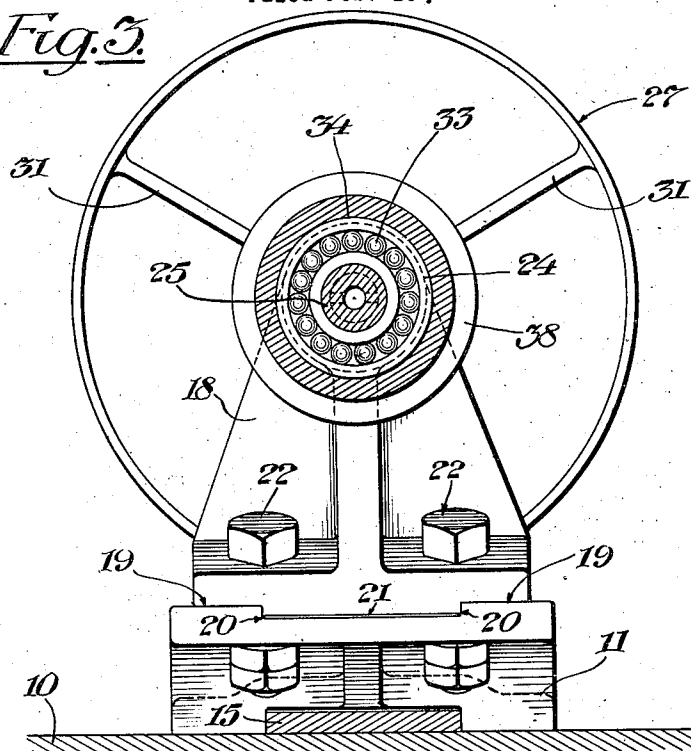
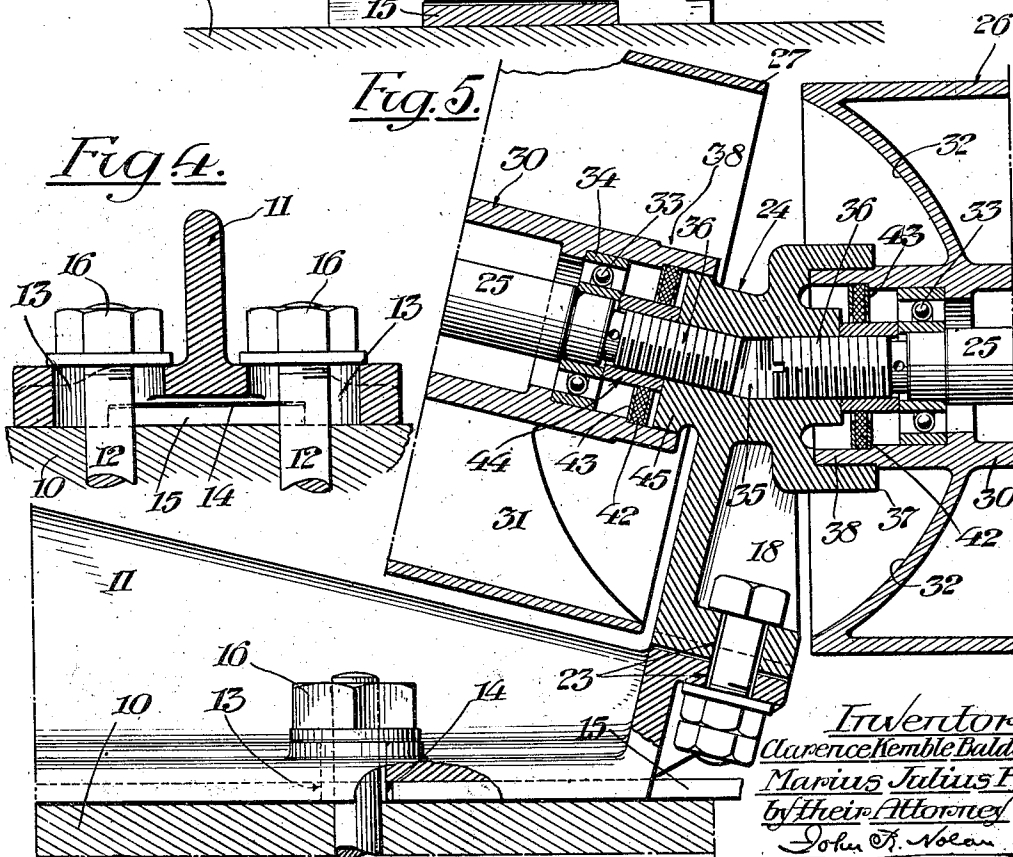


Fig. 5.



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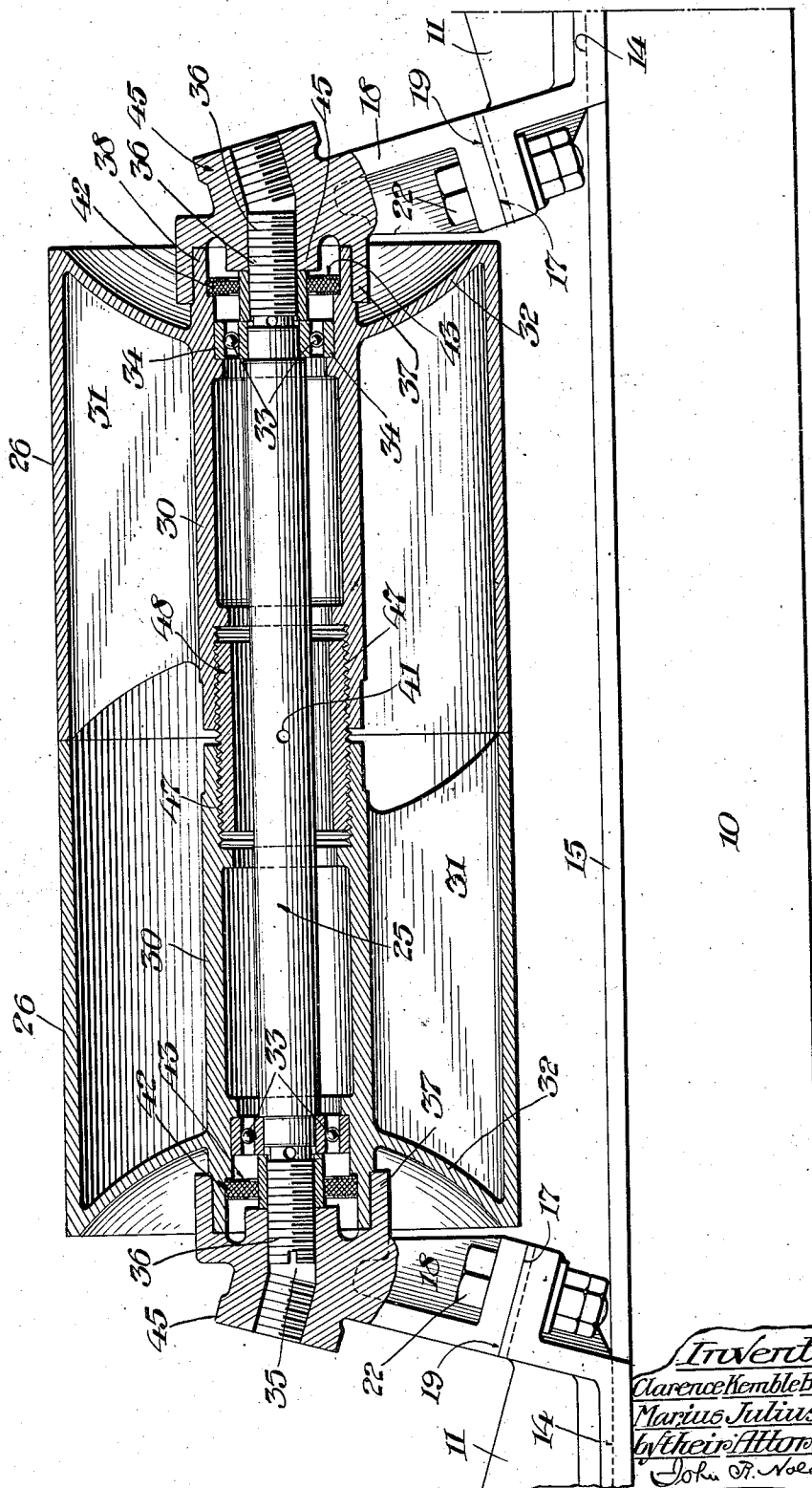
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3 Sheets-Sheet 3

Fig. 6.



UNITED STATES PATENT OFFICE.

CLARENCE KEMBLE BALDWIN, OF CHICAGO, ILLINOIS, AND MARIUS JULIUS POS, OF NEW YORK, N. Y., ASSIGNORS TO ROBINS CONVEYING BELT COMPANY, A CORPORATION OF NEW JERSEY.

TROUGHING SUPPORT FOR CONVEYER BELTS.

Application filed February 15, 1922. Serial No. 536,686.

To all whom it may concern:

Be it known that we, CLARENCE KEMBLE BALDWIN, a resident of Chicago, in the county of Cook and State of Illinois, and MARIUS JULIUS POS, a resident of the city of New York, borough of Manhattan, in the county and State of New York, both citizens of the United States, have invented certain new and useful Improvements in Troughing Supports for Conveyor Belts, of which the following is a specification.

This invention relates to troughing supports for conveyer belts, having reference especially to that class of supports wherein a plurality of idler pulleys are mounted in angular axial relation to each other to present a supporting surface which imparts a transverse or trough-like curvature to the upper run of the traveling belt.

The object of our invention is to provide a troughing support of such character that the pulleys thereof can be readily assembled and accurately adjusted and held in angular axial relation to each other; that the assembled pulleys turn with minimum friction; and that the bearings for the said pulleys are effectually protected from the ingress of moisture, dust, &c.

With these and other objects in view our invention comprises various novel features of construction and combinations of parts; all of which will be hereinafter described and claimed.

In the drawings—

Figure 1 is a sectional elevation of a troughing-support embodying the principle of our invention.

Fig. 2 is a plan of one of the base brackets showing a portion of the alinement bar.

Fig. 3 is a transverse section through the horizontal pulley and adjuncts, on the line 3—3 of Fig. 1.

Fig. 4 is a similar section through one of the base brackets and the base, on the line 4—4 of Fig. 1.

Fig. 5 is a longitudinal section, partly in elevation, of one end of a base bracket, and its inclined standard, showing the adjacent ends of the pulleys and of their shafts and associated bearings.

Fig. 6 is a section of a modification com-

prising two pulleys coupled end to end to turn as a unit.

Referring to the drawings, 10 designates a suitable base, and 11 designates a pair of elongated brackets supported in spaced relation to each other and upon the base, and adjustably secured to the base by through bolts 12 which extend through elongated holes 13 in the basal portions of the brackets. In the present instance the brackets are longitudinally grooved in their under sides, as at 14, and are slidably fitted upon a longitudinally-extending bar 15 imposed on the base 10; the bar terminating at or short of the holes 13 of the respective brackets. Hence by loosening the bolt nuts 16 the brackets, together with the bar, can be laterally adjusted within limits, and then by tightening the nuts, the brackets and bar can be secured in any predetermined position of adjustment. The provision of the bar connection for the two brackets insures their alinement with each other irrespective of the lateral adjustment of the brackets, or either of them. The holes 13 are slightly wider than the diameters of the shanks of the bolts extending therethrough in order that limited longitudinal adjustment of the base brackets can be had. Each bracket is provided adjacent its respective ends with correspondingly inclined supporting faces 17, located preferably at different heights, the lower face being at the inner end of the bracket, as shown.

18 designates standards having inclined basal faces 19 which correspond with and rest upon the inclined faces of the respective brackets 11. The latter faces are preferably longitudinally grooved, as at 20, to receive ribs 21 on the opposing faces of the respective standards, so as to permit of limited adjustment of the latter, independently or together, yet maintaining their alinement. Preferably each of the standards 18 is adjustably secured in place by means of bolts 22 passing through slightly larger holes 23 in the opposing parts of the respective brackets and standards. By the construction just described limited parallel adjustment of the standards 18 longitudinally of the base bracket can be readily effected. These standards 18 are provided at their

upper ends with appropriate heads 24 for the rigid support of the ends of a series of fixed hollow shafts 25, hereinafter described, constituting the axes of the idler pulleys, of which pulleys there are, in the present instance, five in number, viz: a central horizontal pulley 26, and two inclined pulleys 27, 28 at and beyond each end of the horizontal pulley, said inclined pulleys being in angular relation to each other as shown in Fig. 1, in order to "trough" the upper run of the conveyer belt 29 in its travel upon the pulleys.

It is to be noted that by arranging the inclined supporting faces 17 of each of the base brackets at different heights, the outer standard, which is subjected to the maximum strain and vibration, can be made relatively short, similarly to the inner standard, and thus afford a rigid and substantial bearing support. Moreover, the standards can be counterparts, thus economizing cost of manufacture.

In the preferred form of our invention herein shown each of the pulleys is a hollow structure having a hub 30 and radial ribs 31, the former being co-extensive, or substantially so, with the length of the pulley and being connected adjacent one end with the rim of the pulley by a concave head 32. The ends of the hub are mounted to rotate in close relation to the heads 24 of the adjacent standards 18 between which the pulley is interposed, as hereinafter described, and upon anti-friction bearings including balls 33 fitted in suitably-disposed races 34. The outer annulus of each race is fast to the interior wall of the hub 30 and the inner annulus is fast on the adjacent hollow shaft 25. The ends of the shaft are entered and held within axial apertures 35 extending through the heads 24 of the respective adjacent standards 18, such ends being preferably threaded, as at 36, and the apertures 35 being tapped to receive the same; thereby facilitating the accurate mounting of the shafts and their appurtenances on the standards. The inner portions of the standard heads adjacent the horizontal pulley 26 are cup-shaped, as at 37, to receive and encase the ends 38 of the hub 30, and thus serve as protective covers to prevent the entrance of water to the bearings.

The hollow shafts 25 for the respective pulleys communicate with each other through the apertures 35 of the heads of the standards 18, and the outer ends of the shafts 25 for the outside pulleys 28 carry grease cups 39 having screw caps 40 by the manipulation of which lubricant can be forced through the shafts and delivered thence through suitably-disposed lateral apertures 41 in the shafts to the chambers surrounding the shafts and adjacent the ball

bearings. Felt washers 42, flanked by steel washers 43, are preferably fitted in each end of the hub and upon a sleeve 44 on the adjacent threaded end of the shaft, so as to seal the entrance to the chambers at or near the bearings.

Each of the inclined pulleys 27, 28 is so positioned that the concave head 32 of the pulley is at its higher end, which head thus serves as an efficient guard and deflector to prevent water, dirt, &c., from entering and accumulating within the pulley. The inner portions 37 of the standard heads at the upper ends of the hubs of the inclined pulleys 27, 28 are similar in construction to those hereinbefore described for the hub of the horizontal pulley, but the inner portions for the lower ends of the hubs of the said pulleys 27, 28, instead of being cup-shaped, comprise cylindrical bosses 45 which are telescopically received by the lower ends of the respective hubs. By this reverse telescopic relation of the hubs and the head members at the lower ends of the inclined pulleys, the encircling hubs serve to deflect moisture, dust, &c., over the adjacent head portions of the standards and thus effectually preclude the entrance of foreign matter to the bearing surfaces.

The cup-shaped guards for the outer ends of the hubs of the pulleys 28 are constituted by the basal portions 46 of the grease cups, which portions are supported on the outer ends of the adjacent shafts 25 and are appropriately shaped to receive the ends of the hubs, the lower ends of the latter encasing the bosses 45 of the adjacent standards 18, as previously described.

By the above-described construction it will be seen that the central pulley 26, together with its shaft and ball bearings, all properly assembled, can be readily and accurately mounted in and between the heads of the two inner standards 18, such standards not only being adjustable in spaced relation to each other through the relative setting of the brackets 11 on the base, but being also independently adjustable on the said brackets to effect and insure the true axial mounting of the pulley; that then the two inclined pulleys 27, together with their associated shafts and ball bearings, can be independently mounted in and between the heads of the respective pairs of inner and outer standards, and the outer brackets nicely adjusted independently of each other to effect and insure the uniform axial mounting of the latter pulleys; that, then, the outside pulleys 28, together with their shafts and ball bearings, can be accurately positioned on the heads of the respective outer standards, and that, finally, the base brackets 11 can be laterally adjusted on the inclined base to ensure the true positioning of the pulleys in respect to the path of travel of

the belt. Hence the series of pulleys can be readily mounted and assembled in proper alinement and angular relation to each other to effect and maintain the uniform troughing and guidance of the conveyer belt.

It will also be seen that the described construction and arrangement of ball bearings for the respective pulleys permit the pulleys to turn with minimum friction, and that such bearings are effectually protected from the ingress of moisture, dust and other foreign matter.

In Fig. 6 we have shown a modification of the invention for use in connection with an extra wide conveyer belt. In this construction each of the brackets 11 is extended to support standards 18 sufficiently distant from each other to receive two pulleys placed end to end, and the opposite inner standards are similarly spaced from each other for the same purpose. In each instance, a single hollow shaft 25 of ample length to receive two pulleys is provided, and the ends 38 of the hubs at the open ends of the pulleys are internally threaded, as at 47, to receive a coupling sleeve 48 by means of which the open ends of the two pulley sections are united in close relation to each other. The two pulley sections, when associated with the shaft and bearings and supported between the standards, thus turn as a unit.

It is to be understood that our invention is not limited to the specific construction herein disclosed, as the structure may be modified in various respects without departing from the principle of the invention and the scope of the appended claims.

We claim—

1. In a support for a conveyer belt, a base, a longitudinal alinement bar, a pair of spaced-apart brackets mounted on the base and slidably fitted to the bar, means whereby the brackets are secured to the base to permit of their lateral adjustment, standards on said brackets, and idler pulleys mounted to rotate between the standards.

2. In a support for a conveyer belt, a base, a longitudinal alinement bar, a pair of spaced-apart brackets mounted on the base and slidably fitted to the bar, said brackets having inclined upper faces, means whereby the brackets are secured to the base to permit of their lateral adjustment, standards having inclined bearing faces, means for securing the standards to the brackets with the inclined faces of the standards in contact with those of the brackets, and idler pulleys mounted to rotate between the standards.

3. In a support for a conveyer belt, a base, brackets thereon each having inclined upper faces, standards having inclined bearing faces imposed on the inclined faces of the brackets, means for securing the

standards to the inclined faces of the brackets, and idler pulleys mounted to rotate between the standards.

4. In a support for a conveyer belt, a base, brackets thereon each having inclined upper faces located at different heights, standards having inclined bearing faces imposed on the inclined faces of the brackets, means for securing the standards to the inclined faces of the brackets, and idler pulleys mounted to rotate between the standards.

5. In a support for a conveyer belt, a base, brackets thereon each having inclined upper faces located at different heights, means for adjustably securing said brackets to the base, standards having inclined bearing faces imposed on the inclined faces of the brackets, means for securing the standards to the inclined faces of the brackets, and idler pulleys mounted to rotate between the standards.

6. In a support for a conveyer belt, a base, a longitudinal alinement bar thereon, brackets each having a basal groove slidably fitted to said bar, and having also inclined upper faces, means whereby the brackets are secured to the base to permit of their lateral adjustment, standards having inclined bearing faces imposed on the inclined faces of the brackets, the opposing faces of the standards and brackets having registering guide-ribs and grooves, means for securing the standards to the inclined faces of the brackets, and idler pulleys mounted to rotate between the standards.

7. In a conveyer-belt support having standards provided with apertured and threaded head portions, a shaft having threaded ends for engagement with said end portions, a pulley on said shaft, and ball-bearings between the shaft and the pulley, said shaft, with the pulley and bearings assembled thereon, being adapted to be mounted in and between the standards.

8. In a conveyer-belt support having standards provided with head portions, shafts arranged in angular relation to each other and supported by and between the said head portions, pulleys having hubs mounted on said shafts, the said heads at the higher ends of the inclined pulleys comprising cup-shaped members to encase the adjacent ends of the hubs, and the heads at the lower ends of the inclined pulleys comprising bosses encased by the adjacent ends of the hubs.

9. In a conveyer-belt support having standards provided with head-portions, a shaft, a pulley having an axial hub mounted on said shaft, and ball bearings between the shaft and the hub, said shaft, with the pulley and bearings assembled thereon, being adapted to be supported in and between the head portions of the standards, and said

head portions and the adjacent ends of the pulley hub being formed to telescope one with the other and thus prevent the ingress of foreign matter to the bearings.

- 5 10. In a conveyer-belt support having standards provided with apertured head-
portions, hollow shafts arranged in angular
relation to each other and supported by and
between the said head portions so as to
10 communicate with each other, the outermost
shafts being supported at their lower ends
by the heads of the outermost standards,
grease cups mounted on the outer ends of
the latter shafts and having cup-shaped
15 basal portions, pulleys having axial hubs

mounted on said standards, and ball bearings interposed between the shafts and the respective hubs, the said basal portions of the grease cups encasing the hub ends of the outermost pulleys.

- 20 11. In a conveyer-belt support, two hollow idler pulleys each having an end head and a central hub portion, such portion at the open end of each pulley being internally threaded, in combination with a
25 threaded coupling sleeve engaging the threads of the respective hub portions and uniting them in close relation to each other.

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