

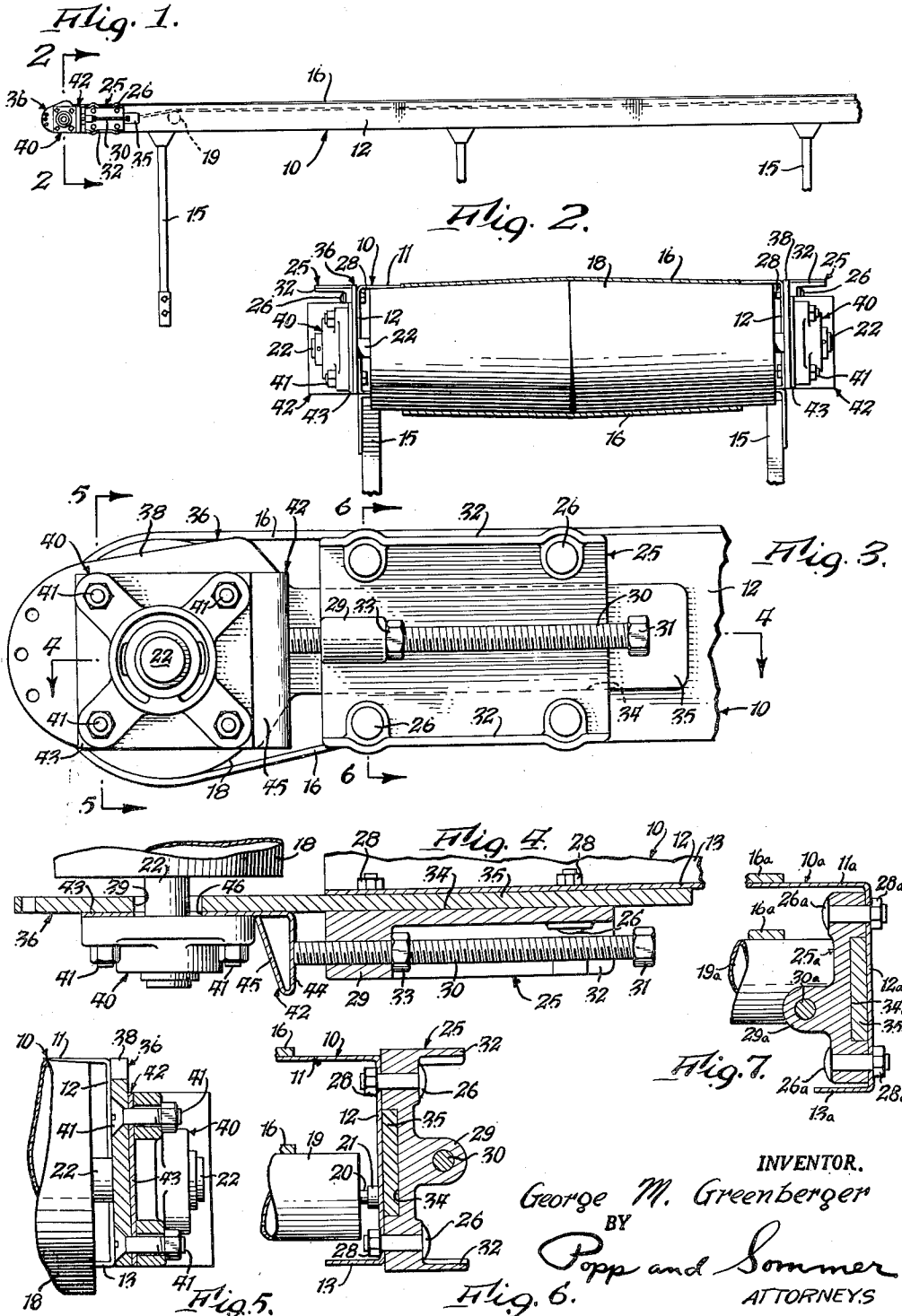
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TIGHTENER FOR CONVEYER BELTS

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TIGHTENER FOR CONVEYER BELTS
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This invention relates to a belt tightener and more particularly to tighteners for conveyer belts moved over the deck of a sheet metal box, wood or roller bed, or other support having vertical sides to which the body part or casting of the belt tightener is bolted or otherwise secured, the adjustable parts of the belt tightener supporting the end bearings of the end or return roller of the conveyer in such manner that this roller can be moved toward and from the end of the sheet metal box or body to adjust the tightness of the belt.

The principal object of the invention is to reduce the number of parts of the belt tightener to a minimum and still achieve a secure mounting for the head and tail pulleys complete with their roller bearings in all positions of adjustment; a powerful yet highly accurate screw adjustment; protection of the screw from accidental mutilation; compactness; and trim appearance.

Another object is to avoid the necessity for the provision of "lefts" and "rights" for parts at opposite sides of the conveyer, the parts being fully interchangeable and useable without modification on either side.

Another object is to provide such a belt tightener the parts of which require little machining and which at the same time is smooth and non-erratic in its adjusting movement.

Another aim is to provide a form of the invention in which the principal parts are arranged inside of the sheet metal box which forms the deck rather than the outside thereof.

Other objects and advantages of the invention will be apparent from the following description and drawings in which:

FIG. 1 is a side elevational view of a belt conveyer having takeups embodying the present invention.

FIG. 2 is a vertical section taken generally along line 2—2, FIG. 1, through the conveyer belt and showing the rest of the parts in elevation.

FIG. 3 is an enlarged fragmentary side elevational view similar to FIG. 1 and showing the end of the conveyer in greater detail.

FIG. 4 is a fragmentary generally horizontal section taken on line 4—4, FIG. 3.

FIG. 5 is a fragmentary vertical section taken generally on line 5—5, FIG. 3.

FIG. 6 is a fragmentary vertical section taken generally on line 6—6, FIG. 3.

FIG. 7 is a view similar to FIG. 6 illustrating a modified form of the invention.

While the invention is applicable for use as a takeup for the belt of any type of conveyer, it is particularly illustrated in conjunction with a horizontal conveyer having one or more sheet metal boxes indicated generally at 10. This box has an upper deck 11 from which vertical side flanges 12 project downwardly and these side flanges have their lower ends continued in the form of short inwardly projecting strengthening flanges 13. This box can be supported at any elevation or at any inclination, as by legs 15 connected to the bottom flanges 13 at suitable intervals.

The belt 16 travels along the upper surface of the deck 11 and is driven by a drive roller (not shown) at one end of this deck. At the opposite end of the deck this belt travels around the end return roller 18 and thence upwardly over one of a series of tracking rollers 19 arranged within the box 10. Each of these tracking rollers 19 is shown as having end stub shafts 20 journaled in bearings 21, suitably mounted on the opposing faces of

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the vertical side flanges 12 and the purpose of these tracking rollers is to support the inoperative or return stretch of the belt 16 inside the box 10 or to guide it in any other desired direction.

To hold the upper operative stretch of the belt 16 in centered relation to the deck 11, the end return roller 18 is preferably of enlarged diameter at its center and is provided with diminishing tapers toward its opposite ends from which stub shafts 22 project. The present invention is concerned with the provision of an adjustable bearing for each of these stub shafts whereby the return roller 18 can be adjusted lengthwise of and toward and from the end of the box 10 thereby to adjust the tightness of the belt 16.

The belt tighteners at opposite side of the return roller 18 are identical in construction, and in fact the parts are interchangeable without the necessity of providing "rights" and "lefts." Accordingly a description of the belt tightener at one side of the conveyer will be deemed to apply to the belt tightener at the opposite side of the conveyer.

Each belt tightener includes a body in the form of a metal casting indicated generally at 25. This casting is of generally rectangular form in elevation and is substantially equal in height to the height of the side flanges 12 of the box 10. Each of these castings is secured to the corresponding side flange 12 near the return roller 18 by a plurality of bolts 26, four corner bolts being shown as passing through the corners of the casting 25 and through the vertical side flanges 12 of the box 10. Preferably the nuts 28 for these bolts are tightened against the outside of the casting 25 so as to be readily accessible.

At one end each casting is formed to provide an integral horizontally outwardly and laterally projecting boss which forms a nut 29 for an adjusting screw 30. This adjusting screw is arranged lengthwise of the casting 25 centrally along its outer face and is provided with an out-of-round head 31 at its end remote from the return roller 18 and by means of which the screw is turned to adjust the tightness of the belt.

A feature of the invention resides in the protection of each adjusting screw 30 against accidental injury and to this end the casting 25 is provided with upper and lower horizontally outwardly projecting edge flanges 32. These flanges preferably project outwardly beyond at least the threaded shank of this adjusting belt so as to embrace the same and protect the threads thereof from accidental mutilation. A conventional lock nut 33 tightened against the nut or boss 29 is provided for holding the screw 30 in its adjusted position.

A feature of the invention resides in the provision of a longitudinal groove or recess 34 cast in the face of the casting 25 opposing the side flange 12 of the box 10 and extending from one end thereof to the other. This groove or recess is of substantial height and is preferably of rectangular form in cross section to provide in conjunction with the side flange 12 to which the casting is attached a guideway enclosed on all four sides and open at its opposite ends. This guideway snugly receives and guides the straight tongue 35 of a bearing holder indicated generally at 36. This bearing holder is in the form of a flat plate and to support the bearing the outboard end of the tongue 35 is in the form of an enlargement 38. This enlarged outboard portion of the bearing holder is provided centrally with a large opening 39 through which the adjacent stub shaft 22 extends as best shown in FIG. 4.

The end of each stub shaft 22 is journaled in a bearing 40 secured to the outside face of the enlargement 38 in any suitable manner as by the four corner bolts 41 shown. The invention is not concerned with the details of the bearings 40 and any suitable form of bearings can be employed.

A feature of the invention, however, resides in the abut-

ment plate indicated generally at 42 against which each screw 30 bears in providing the desired tightness of the belt. This abutment plate is preferably in the form of a single piece of sheet metal having a rectangular base or body portion 43 conforming to the base portion of the bearing 40 and interposed between each bearing and enlarged portion 38 of the corresponding bearing holder 36 and secured by the same bolts 41 which pass therethrough. The base portion 43 of the abutment plate 42 projects beyond the end of each bearing 40 on the side of the screw 30 and is formed to provide an outwardly projecting flange 44 which is preferably perpendicular to the base portion 43 and is preferably reinforced by a diagonal extending return bend 45 at its outboard end, this return bend bearing against the base portion 43. This base portion 43 is, of course, provided with a hole 46 in register with the hole 39 and through which the corresponding stub shaft 22 extends.

In the adjustment of the form of the invention shown in FIGS. 1-6, when it is desired to, say, tighten the belt 16, the lock nuts 33 at opposite sides of the conveyer are backed off and the adjusting screws 30 turned, by means of their heads 31, to effect the desired tightening of the belt. Thus, as each screw 30 is moved in the direction to tighten the belt it forces against and moves the flange 44 of the corresponding abutment plate 42 thereby to extend the bearing holder 36 and the return roller 18 journalled therein. In this movement the tongue 35 of this bearing holder 36 slides along the slideway jointly provided by the U-shaped groove 34 along the inner face of the casting 25 and the opposing outer face of the adjacent side flange 12 of the box 10. After the desired adjustment of the belt tightener at each side of the conveyer has been achieved, the lock nuts 33 are tightened to hold this adjustment.

It will particularly be noted that the onepiece or integral casting 25 serves a number of functions. Thus, it serves as a mounting for the integral nut 29 which carries the adjusting screw 30. In addition, its flanges 32 project beyond the shank and protect the threads of this adjusting screw. In addition, this onepiece casting provides the greater part of the guideway for the tongue 35 of the bearing holder, the remaining part of this guideway being provided by side flange 12 of the box 10 to which this casting is secured. It will also be noted that the abutment 42 against which each screw 30 works is in the form of a very simple sheet metal plate having, in effect, two simple bends and which at the same time provides a sturdy and reliable seat for the end of the adjusting screw 30.

It will also be particularly noted that the casting 25; bearing holders 36; abutment plates 42; and all other parts, such as the bearings 40 are directly interchangeable at opposite sides of the conveyer so that it is unnecessary to provide these in "rights" and "lefts." This is due to the fact that the casting 25 is symmetrical in a vertical direction so that in, say, changing it from one side of the conveyer to the other all that is required is to turn it upside down. Also, while the bearing support 36 is not vertically symmetrical, it is in the form of a simple flat plate so that in, say, transferring it to the opposite side of the conveyer no inversion is necessary.

The form of the invention shown in FIG. 7 is essentially designed to place the belt tightener inside the box 10 instead of outside as shown in FIGS. 1-6. The construction of the parts is the same as with the preferred construction except that since the adjusting screw is adequately protected there is no necessity for the provision of edge flanges 32 as with the form of the invention shown in FIGS. 1-6. Since in other respects the form of belt tightener shown in FIG. 7 is substantially identical with the form shown in FIGS. 1-6, the same reference numerals have been applied and distinguished by the suffix "a" and the description of the manipulation of the belt tightener will not be repeated.

From the foregoing it will be seen that the present invention provides a belt tightener of simplified construction which is low in cost and at the same time of sturdy reliable and compact construction and accomplishes the various objects set forth.

I claim:

1. A belt tightener for a belt travelling over the deck of a sheet metal box having upright side flanges at the opposite edges of said deck and the end of the belt passing around a roller arranged beyond one end of the box with its axis generally parallel with said deck and journalled in bearings at its opposite ends, comprising a single metal body member fixed to a vertical side face of each of said vertical flanges at said one end of said box and having a external groove in its face opposing and enclosed by the vertical flange and opening at its end toward said roller whereby said groove in said body and vertical side face of said flange jointly provide a laterally enclosed slideway, a bearing holder having an outboard end fixed to a corresponding one of said bearings and having a tongue slidably fitted in said slideway, a nut fixed to the face of said body opposite that containing said external groove on an axis directed toward the adjacent one of said bearings, a screw in said nut, and an abutment member interposed between the end of each screw and the corresponding bearing.

2. A belt tightener as set forth in claim 1 wherein said body with its groove and said nut are in the form of a onepiece integral casting.

3. A belt tightener as set forth in claim 2 wherein said body is provided with laterally projecting integral flanges and arranged generally parallel with and embracing said screw.

4. A belt tightener as set forth in claim 2 wherein the longitudinal axis of said nut and groove are centrally disposed with reference to said body so that said body can be used interchangeably on either side of the box.

5. A belt tightener as set forth in claim 2 wherein said groove is of substantially rectangular form in cross section.

6. A belt tightener as set forth in claim 5 wherein said bearing holder is in the form of a flat plate with its tongue of cross sectional form to snugly fit said groove and with its outboard end enlarged.

7. A belt tightener as set forth in claim 6 wherein said abutment member is in the form of a plate interposer between each bearing and the enlarged outboard end of each bearing holder and having a transverse flange arranged perpendicular to and opposing the end of said screw.

8. A belt tightener for a belt travelling over the deck of a sheet metal box having upright side flanges at the opposite edges of said deck and the end of the belt passing around a roller arranged beyond one end of the box with its axis generally parallel with said deck and journalled in bearings at its opposite ends, comprising a metal body member fixed to one vertical side face of each of said vertical flanges at said one end of said box, a nut fixed to the outer face of said body on an axis directed toward the adjacent one of said bearings, a screw in said nut, a bearing holder slidably supported on said body for movement lengthwise of said screw, means securing each bearing against one face of the outboard end of each bearing holder, a sheet metal plate clamped between each bearing and said one face of each bearing holder, and an integral laterally projecting flange on each sheet metal plate arranged perpendicularly to and opposing the end of said screw.

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