Jan. 23, 1934. T. G. NYBORG 1,944,296

BELT DRIVE

Filed May 17, 1932

Fig. 1.

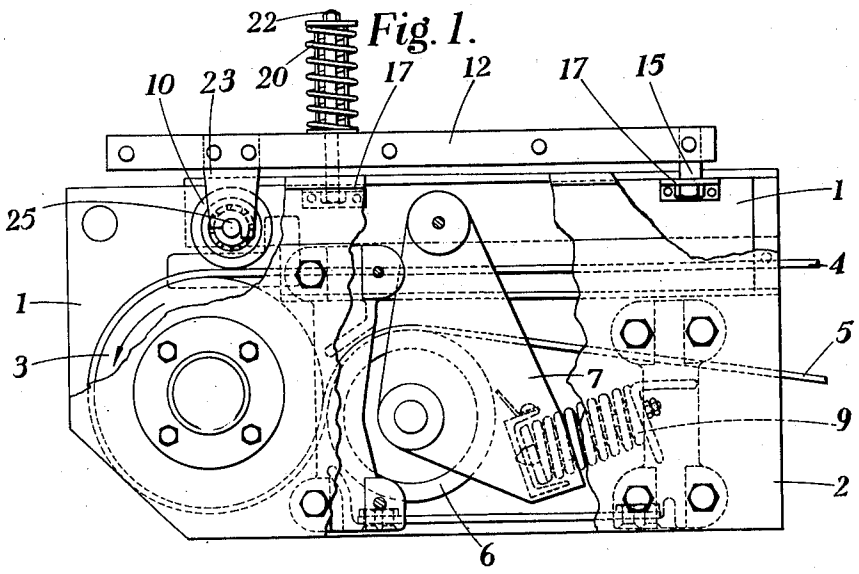


Fig. 2.

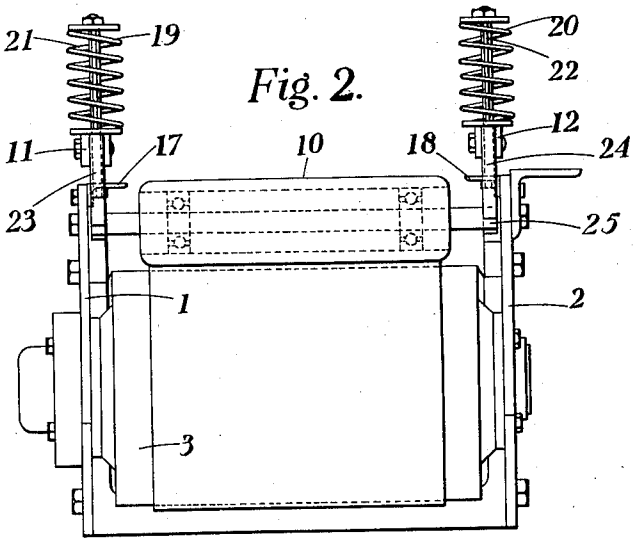
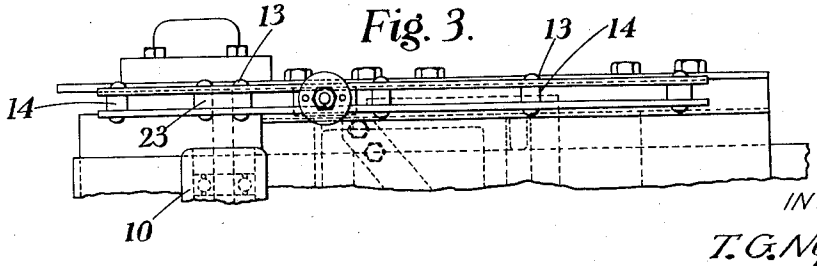


Fig. 3.



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BELT DRIVE

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4 Claims. (Cl. 198—203)

This invention relates to belt drives and more particularly, though not exclusively, to the driving heads of belt conveyors. In this connection it is observed that it is already well known to apply a jockey pulley to that length of belting which is normally the slack side of the belt to apply it to the driving drum so as to maintain a satisfactory arc of contact between the belt and the drum, the jockey pulley being resiliently urged against the belt by means of a spiral spring.

With such an arrangement difficulty is experienced when the direction of the belt is desired to be reversed, since what was formerly the tension side of the belt is now the slack side and is under no constraint but is able to lift, with a corresponding loss in the power that can be transmitted by the drum to the belt.

The present invention has for its object to provide an arrangement whereby a belt drive of the kind referred to is adapted to be used equally satisfactorily for forward and reverse directions.

According to the invention we provide a belt drive of the kind referred to with a mounting for applying a second jockey pulley against the belt on the opposite side of the driving drum to the usual jockey pulley for use when the direction of drive is reversed, said mounting receiving said second jockey pulley in a readily detachable manner.

When the invention is applied to the driving head of a belt conveyor it will be realized that in normal use the upper belt length moves towards the driving drum, and the material conveyed passes over the driving drum as it is delivered from the conveyor.

The already known jockey pulley is, therefore, located below the lower belt length and in known forms has been applied towards the driving drum by being mounted in a pivotal frame controlled by one or more compression springs. The second jockey pulley additionally provided by the present invention, therefore, normally rests on the top of the driving drum when in use, and the mounting, therefore, may comprise a pivotal frame or arms located above the driving head and having depending fingers provided with semi-circular slots or half bearings at their ends adapted to engage the shaft of the second jockey pulley to press it downwards on to the belt.

When the belt is running in its normal direction the second jockey pulley can be readily removed by slightly lifting the free ends of the pivoted arms by means of a crowbar or the like sufficiently to free the jockey pulley shaft from the slots or half bearings.

The invention is illustrated in the accompanying drawing in which

Figure 1 shows a side view, and

Figure 2 an end view,

Figure 3 being a plan of a detail of one form of embodiment.

Turning now to the form illustrated, the driving head comprises a pair of side plates 1, 2 between which is located the driving drum 3 driven from an electro-motor or from any other source of power not shown.

In Fig. 1 the driving drum 3 will normally rotate in an anti-clockwise direction so that the upper belt length 4 carrying the material moves towards the drum and the lower belt length 5 moves away from the drum. The jockey pulley 6 normally used to engage the slack side 5 of the belt against the driving drum 3 is mounted in a pair of pivoted arms 7 and urged towards the drum by one or more springs 9.

Now according to the present invention I provide a mounting for a second jockey pulley 10 adapted to be located above the driving drum 3 and resiliently pressed against said drum, the jockey pulley being readily detachable from its mounting so as not to impede the conveyance and delivery of material during the normal use of the conveyor as described above.

In the form illustrated the mounting comprises a pair of arms 11, 12 each of which comprises two opposed metal bars united by bolts or rivets such as 13, and separated by sleeves 14 carried by the bolts 13. The arms are each pivoted to pillars such as 15, 16 supported from angle pieces 17, 18 riveted to the side plates 1, 2. The arms are urged downwardly by means of spiral springs 19, 20 threaded on rods 21, 22 mounted on angle pieces secured to the side plates 1, 2 similarly to the angle pieces 17, 18. Adjacent their free ends the arms carry depending fingers 23, 24 which, in the form shown, terminate in semi-circular slots adapted to engage over the shaft 25 about which jockey pulley 10 is rotated by ball races or roller bearings.

It will be realized that when the conveyor is moved in its normal direction so that the drum 3 rotates anti-clockwise as indicated by the arrow in Fig. 1, the jockey pulley 10 is removed by lifting the free ends of the arms 11, 12 sufficiently to allow the shaft 25 to be withdrawn forwardly of the half round slots; the jockey pulley 6 then functions in known manner.

When, however, it is desired to reverse the direction of the conveyor the jockey pulley 10 is set up in the position illustrated in which case

it will function under the control of the springs 19, 20 in a manner similar to jockey pulley 6 in the alternative case. During the reverse movement it is not necessary to dismantle jockey pulley 6 as the belt length 5 now becomes the tension side of the belt and the spring 9 yields sufficiently to avoid any objectionable consequence.

The invention is not limited to the details of construction shown, for example, jockey pulley 10 may be controlled wholly or in part by gravity acting on the pulley and frame which may be specially loaded if desired. Instead of the half round slots carried by the fingers 23, 24, half bearings may be employed if the shaft 25 rotates with the pulley 10.

The arms 11, 12 may be connected by cross-braces if desired, but normally with strong springs this is not necessary. The walls of the half round slots carried by the fingers 23, 24 are extended downwardly behind the shaft 25 to form abutments to prevent accidental release of the shaft under the pull of the belt should a finger lift slightly.

It will be realized that in the construction shown the driving drum 3 is normally reversible in direction. being driven by a reversible motor or through reversing gear not shown. Further, the mounting for the second jockey pulley 10 is so arranged that the half round slots in the fingers 23 (which engage and locate the shaft of pulley 10) move in a path which when extended passes through the periphery of the drum 3 at the top, the belt contacting the drum through an angle in the form shown of substantially 270° between the topside line where it is pressed on the drum by pulley 10 and the underside line where it is pressed on the drum by pulley 6.

I claim:—

1. In a belt conveyor having an upper and a lower run of belting, a driving head comprising the combination with a driving drum normally drawing the upper run of belting toward the head, and a spring-urged pulley pressing the lower run of belting against the driving drum, of means for holding the upper run of belting against the top of the drum in case of reversal only, said means comprising pivoted mountings above the driving drum and beyond the edges of the belt, spring means urging the said mountings downwardly, and an auxiliary pulley held in said mountings during reversal, said pulley being readily removable from the mountings to clear the upper run of the belt for normal running.

2. In a belt conveyor having an upper and a lower run of belting, a driving head comprising the combination with a driving drum normally drawing the upper run of belting toward the head, and a spring-urged pulley pressing the lower run of belting against the driving drum, of means for holding the upper run of belting against the top of the drum in the event of belt reversal, said means comprising pivoted mountings above the driving drum and beyond the edges of the belt, spring means urging the said mountings downwardly, and an auxiliary pulley held in said mountings by said spring means during belt reversal, said auxiliary pulley being readily removable to clear the upper run of the belt for normal running.

3. In a belt conveyor having an upper and a lower run of belting, a driving head comprising the combination with a driving drum normally drawing the upper run of belting toward the head, and a spring-urged pulley pressing the lower run of belting against the driving drum, of downwardly spring-urged mountings above the driving drum and permanently clear of the said upper run of belting, and a pulley carried by and removably arranged in said mountings to press the upper run of belting against the top of the driving drum during belt reversal.

4. In a belt conveyor, a driving drum, a head in which the drum is mounted, a belt cooperating with the drum and normally operative by the drum to move the upper run of belting toward the head, means cooperating with the lower run of the belting to force the same in contact with the drum in the normal movement of the belting, and means cooperating with the upper run of belting to force the same against the drum in the event of belt reverse movement, said means including arms supported for pivotal movement and arranged longitudinally of and beyond the belt in both directions, resilient means for forcing the arms toward the plane of the belt, half bearings carried by and movable with the arms, and an auxiliary belt-engaging pulley removably seated in said half bearings, said pulley being held against separation from the half bearings when the auxiliary pulley is in contact with the belt.

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