F. A. CARLTON.

BELT SHIFTER.

APPLICATION FILED OCT. 8, 1907.

927,222.

Patented July 6, 1909.

Fig. 1.

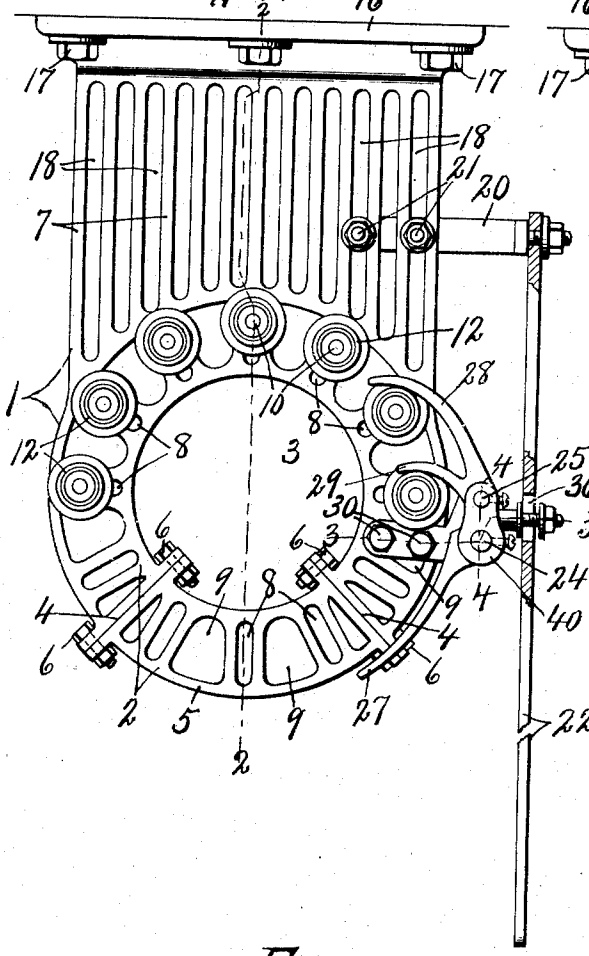


Fig. 2.

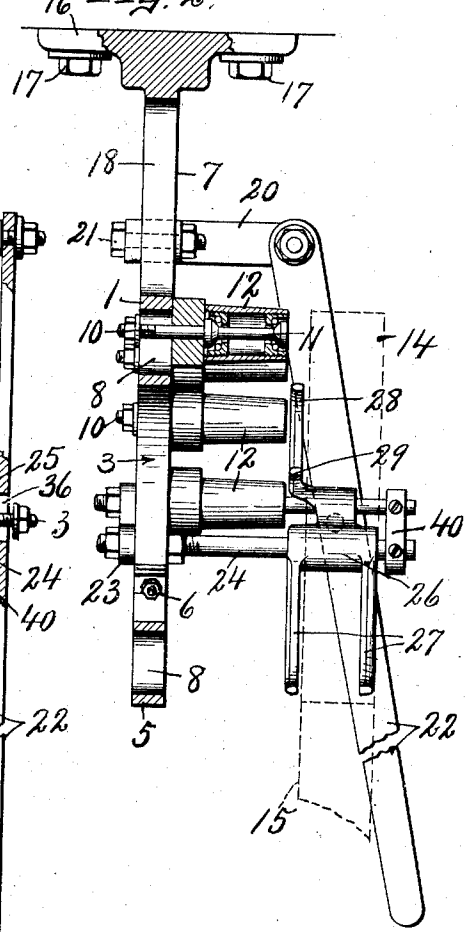


Fig. 3.

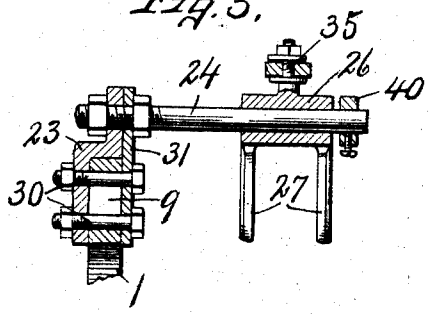
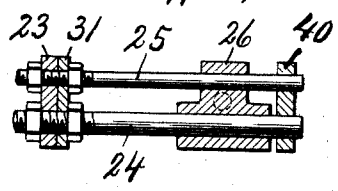


Fig. 4.



Witnesses.

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BELT-SHIFTER.

No. 927,222. Specification of Letters Patent. Patented July 6, 1909.

Application filed October 8, 1907. Serial No. 396,444.

To all whom it may concern:

Be it known that I, FRANK A. CARLTON, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Belt-Shifters, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in belt shifters, and refers more particularly to a fixed hanger carrying rotary idlers upon which a traveling belt may be shifted so that the belt may be at rest when not in actual use for the transmission of power.

My main object is to provide a one-piece fixed hanger with a segmental annulus having radial elongated slots for the reception and radial adjustment of a circular series of belt-sustaining rollers which are arranged concentrically around the axis of the pulley with which they are associated.

The object of the radial slots is to permit the rollers to be adjusted to conform to pulleys of different radii, and also to enable said rollers to be secured in different slots or adjusted about the axis of the slotted annulus to conform to the position or angle of the belt relatively to the hanger without disturbing the position of the hanger after it has once been secured to the underside of the floor or ceiling.

Another object is to provide the hanger with a vertically elongated portion having a series of parallel slots for the reception and adjustment of the fulcrum for the shifting lever, as used in connection with the shifting mechanism.

A further object is to utilize certain slots in the annulus for the reception and circumferential adjustment of the shifting mechanism-support so that the latter may be made to conform to the position of the rollers, or angle of the belt.

A still further object is to support the sliding shifter upon parallel bearings placed some distance apart to better resist the strains to which this shifter is subjected.

A still further object is to make one of the segments of the annulus easily removable so that the hanger may be readily placed around a shaft which is already installed, the segment being re-secured in place to complete and reinforce the annulus.

Other objects and uses relating to the specific parts of my invention will be brought out in the following description.

In the drawings, Figure 1 is a side elevation, partly in section, of a belt shifter embodying the various features of my invention. Figs. 2, 3 and 4 are sectional views taken respectively on lines 2—2, 3—3, and 4—4, Fig. 1.

This belt shifter consists essentially of a one-piece hanger —1— having a segmental annulus —2— having a central shaft opening —3—, said annulus being divided in radial lines —4— forming a removable segment —5— which is clamped to the remaining portion of the annulus by clamping bolts —6—. This segment —5— forms one side of the shaft opening —3— diametrically opposite to the main upright portion, as —7—, and is usually of greater circumferential length than the diameter of any shaft with which the belt shifter may be used, so that when removed the hanger may be readily placed in operative position on the shaft and in proper relation to the pulley, after which the segment —5— may be re-secured in place to complete the annulus.

The greater portion of the annulus —2— is integral with the upright portion —7—, and together with the segment 5—, is provided with a series of radial slots —8— and intervening openings —9—, said radial slots being usually spaced circumferentially equidistant apart to receive and support a number of clamping bolts —10— having journals —11— upon which are mounted suitable tapering rollers —12—. These rollers are associated with and have their small ends arranged in close proximity to one side of a pulley 14— carrying a belt 15— shown by dotted lines in Fig. 2, said rollers being adjusted in the slots —8— to bring their belt-bearing portions in alinement with the surface of the pulley with which they are associated so that the belt 15— may be readily transferred by a suitable shifting mechanism hereinafter described, from the pulley to the rollers, and vice versa.

The object in making the rollers tapering toward the adjacent side of the pulley is to facilitate the sliding action of the belt to and from said rollers and pulley and to tighten the belt more or less when shifted to the rollers. The number of rollers employed depends somewhat upon the lap of the belt; that is, whether the belt connects the pulley

14— to a larger or smaller pulley. When the segment —5— of the annulus is in place the series of radial slots extend entirely around the axis of the pulley with which the rollers are associated, and theretore, these rollers may be adjusted circumferentially in position around said axis according to the angle with which the belt approaches the hanger.

The upright portion of the hanger terminates in a suitable flange or foot 16— adapted to be secured by any suitable fastening, as bolts 17—, to the underside of the floor or ceiling of the building, not shown, and the intermediate portion of said upright portion between the foot 16— and annulus, is provided with a series of parallel slots 18— in which a support —20— is adjustably secured by suitable clamping bolts —21—, said support constituting a fulcrum for a shifting lever —22—.

The shifting mechanism which is associated with the rollers 12— consists essentially of a bracket or support —33— having a pair of laterally projecting guide-rods —24— and —25— spaced apart one above the other, for receiving and supporting a slidable shifting head —26— having a pair of lower shifting arms —27— between which the belt passes, and an additional pair of shifting arms —28— and —29— located one above the other at the opposite side of the guide-rods —24— and 25.

The bracket —23— is secured to the annulus —2— by clamping bolts —30— which are passed through the apertures —9— and engage an additional clamping plate —31— forming a part of the bracket —23—. This bracket may be adjusted circumferentially around the annulus —2— to conform to the position of the rollers 12— with which it coacts. The guide-rods —24— and —25— are arranged parallel with the axis of the pulley at the outside of the periphery of the pulley and the annulus —2— and of greater length than the combined face width of the pulley and axial length of the rollers so that the shifter head —26— may have ample movement for shifting the belt from the pulley to the roller, and vice versa. This sliding head —26— is provided with a radially projecting stud —35— which rides in an elongated slot —36 in the lever —22— some distance from the fulcrum —20—, which distance, however, may be varied, by adjusting the fulcrum supporting bracket —20— along the slots 18— in the hanger —7— so as to vary the leverage, according to the work required, or rather, according to the size or length of the belt.

The free end or handle of the lever may extend downwardly into the room within easy reaching distance from the floor where it may be readily operated for shifting the sliding head —26— and belt actuated thereby back and forth from the rollers to the pulley, and vice versa. The arms —28— and —29— are located in substantially the same vertical plane at one side of and preferably between the belt and hanger, and their free ends are disposed in proximity to the peripheries of the adjacent rollers so as to facilitate shifting of the belt to and from the rollers by means of the shifting arms —27—. These rollers are preferably mounted upon ball bearings, as best seen in Fig. 2, to reduce friction and noise incidental to the operation of the rollers. The outer extremities of the guide-rods —24— and —25— are connected by a yoke —40—, which, together with the bracket —23—, at the opposite end of the rods, operates to hold said rods a fixed distance apart and to prevent springing during the operation of the sliding head —26— in shifting the belt. The invention, however, lies more particularly in the construction of the hanger and manner of mounting the shifting mechanism.

What I claim is:

In a belt shifter, a one-piece hanger comprising an upright portion having parallel upright slots, and a circular portion having a removable segment and radial slots, in combination with rollers adjustably secured in some of the radial slots, a lever support adjustable vertically on said upright portion, means entering some of the upright slots for securing the support in its adjusted position to the upright portion, a lever fulcrumed on said support, a bracket adjustably secured to the circular portion of the hanger, guide rods on the bracket, a belt-shifting yoke guided on said rods, and connections between the lever and yoke for shifting the latter as the lever is operated.

In witness whereof I have hereunto set my hand this 3d day of October, 1907.

FRANK A. CARLTON.

Witnesses:
H. E. CHASE,
C. M. MCCORMACK.