Dec. 20, 1955 R. J. BELER 2,727,723

CABLE DRIVE

Filed April 26, 1952 2 Sheets-Sheet 1

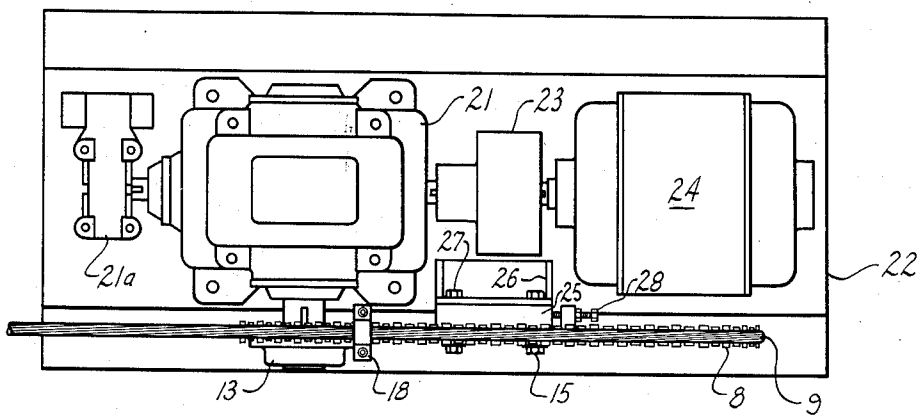


Fig. 1

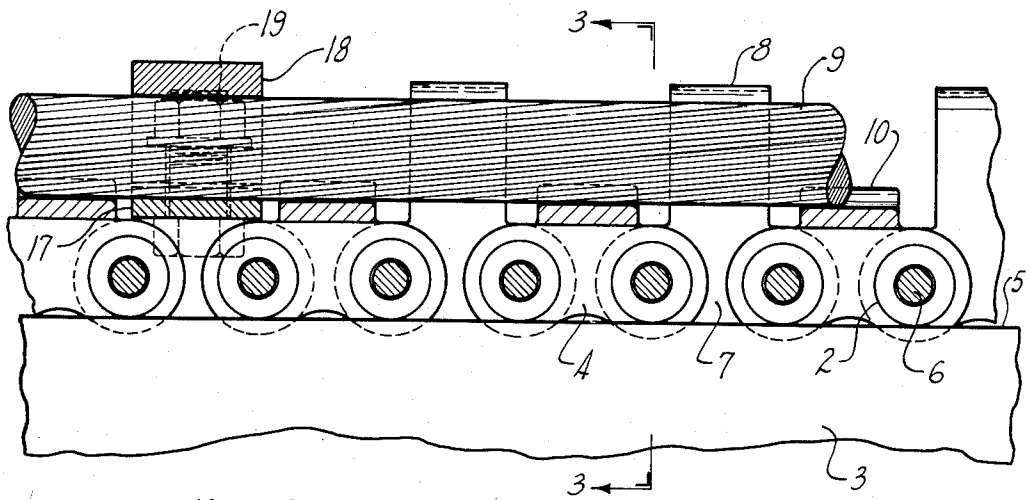


Fig. 2

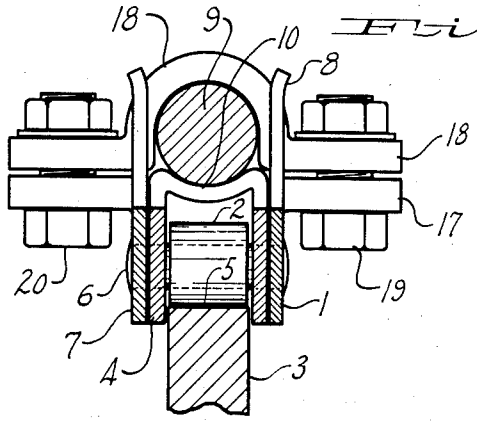


Fig. 3

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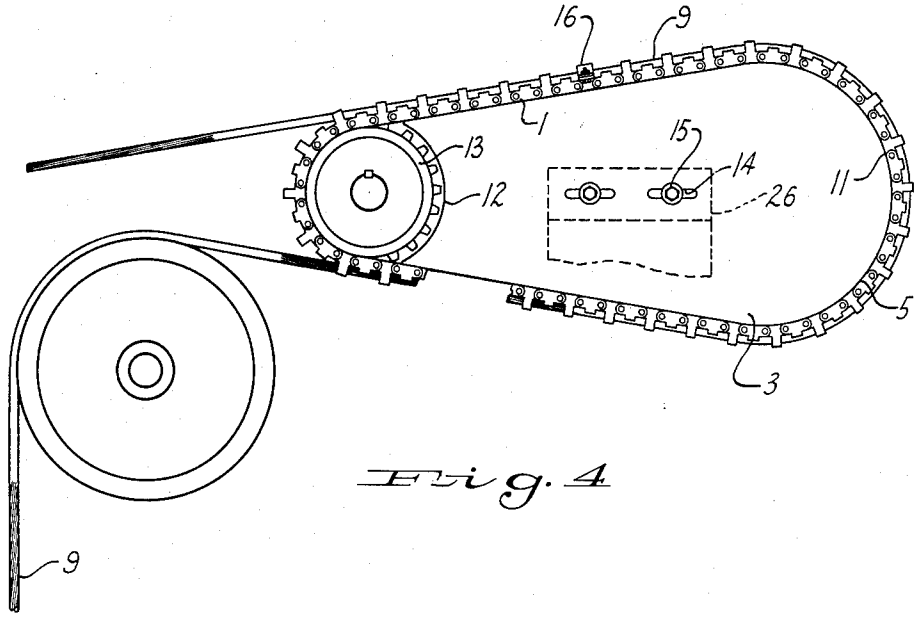


Fig. 4

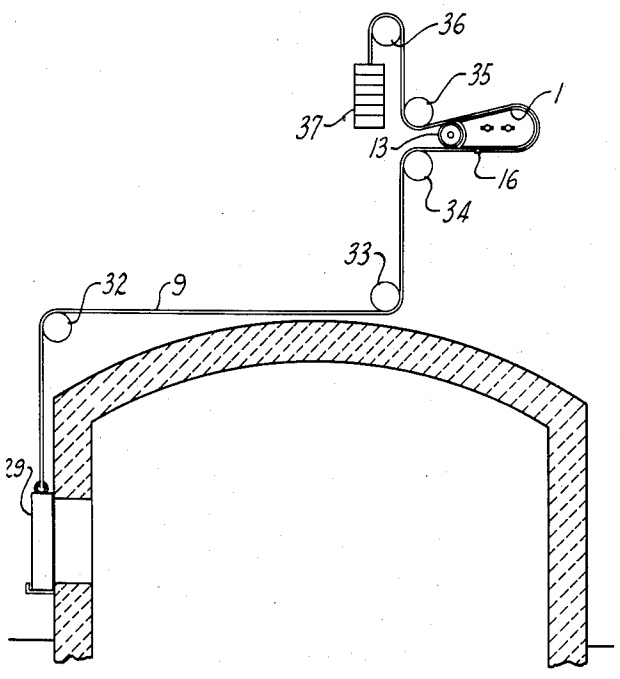


Fig. 5

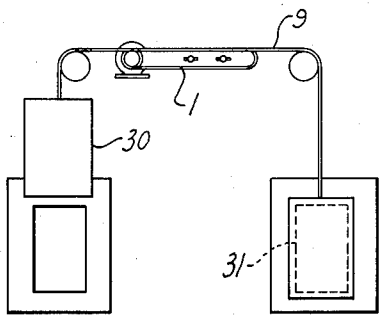


Fig. 6

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CABLE DRIVE

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Application April 26, 1952, Serial No. 284,669

3 Claims. (Cl. 254—135)

This invention relates to new and useful improvements in drives for cable hoists and the like, and it is among the objects thereof to provide means for driving cable to obtain desirable linear speeds with a minimum gear ratio reduction.

It is a further object of the invention to provide a cable drive which shall eliminate the cable drum and actuating cranks commonly employed in cable hoists, such as for lifting doors or other hoisting operations.

It is a further object of this invention to provide a cable mount which shall prevent friction to minimize cable wear.

The invention will become more apparent from a consideration of the accompanying drawings, constituting a part hereof, in which like reference characters designate like parts, and in which

Fig. 1 is a top plan view of a cable drive embodying the principles of my invention;

Fig. 2 is a vertical sectional view, partially in elevation, of a portion of a cable conveyor;

Fig. 3 is a vertical cross-sectional view of the conveyor and cable taken along the line 3—3, Fig. 2;

Fig. 4 is a front elevational view of the conveyor drive;

Fig. 5 is a vertical cross-sectional view of a portion of a furnace and a cable drive therefor; and

Fig. 6 is a front elevational view diagrammatically illustrating a pair of reversing valves embodying the cable drive.

With particular reference to Figure 4 of the drawings, the numeral 1 designates a roller chain in the form of an endless conveyor as shown in cross section in Figure 3, the rollers 2 operating on a fixed track 3, the chain being guided by links 4 that extend below the roller surface 5 of the track 3. The roller spindles 6 extend through outer links 7 which have upstanding prongs 8 that constitute guides for a cable 9. The links 4 are provided with a curved seat which may be termed a saddle 10 on which the cable 9 is supported.

As shown in Figure 4, the track 3 is of oblong shape shape having a relatively large radius 11 on one end and a concavity 12 at the other end, the latter providing clearance for a sprocket wheel 13 that drives the chain 1 as it rolls on the face 5 of the track 3. The track 3 is adjustable mounted by being slotted as shown at 14 by bolts 15 so that it may be adjusted laterally relative to the sprocket wheel 13 to maintain suitable tension on the roller chain 1.

The curvature 11 of track 3 is determined by the diameter of the cable 9, good practice requiring that the minimum diameter of the track is no less than twenty times the cable diameter to prevent stresses in the cable due to bending.

As shown in Figures 1 to 4, inclusive, one or more cable clamps 16 may be employed to hold the cable 9 on the chain 1. The cable clamps are more clearly shown in Figure 3 and consist of a base member 17 having a saddle shaped portion, like the surface 10 of link 4, and

which in fact may be a portion of the link 7 integrally formed with the chain. An upper clamp member 18 is curved to the shape of the cable and effects clamping engagement of the cable 9 by means of bolts 19 and 20. The clamps may be just a plurality of cross straps shaped to engage the cable 9 and can be attached to the roller chain 1. Such straps, when clamped to the cable, will be disposed between two of the upstanding lugs 8 and of the links 7 so that the cable will be positively driven by the chain.

As shown in Figure 1, the sprocket wheel 13 is actuated through a gear reduction mechanism 21 mounted on a base plate 22 which is connected by a coupling 23 to a motor 24 or other prime mover. The track plate 3 is shown mounted on a block 25 secured to a bracket 26 by bolts 27 that are disposed in the slots 14 of the track plate 3 as shown in Figure 4. An adjusting screw 28 subjects the block 25 to movement relative to the position of the sprocket wheel 13 to adjust the tension on the roller chain as previously explained.

With reference to Figure 5, the drive is shown as applied as a door operating mechanism for raising and lowering door 29. In the view of Figure 5, the door 29 is connected by the cable 9 passing over pulleys 32, 33 and 34 to the drive chain 1, thence around guide wheels 35 and 36 to a counterweight 37. When the drive unit of Figure 1 is energized in one direction, the door 29 is raised while the counterweight 37 lowers, and in the opposite direction of rotation the door is lowered while the counterweight 37 is raised. This makes for a smooth operation without the need of cable drums or door operating cranks.

As shown in Figure 1, a magnetic brake 21*a* may be employed to stop the cable drive at the proper raised and lowered positions determined by limit switches not shown.

In the view shown in Figure 6, the cable drive is employed to operate reversing valves 30 and 31. The track plate in that view is shown as of elongated shape instead of enlarged at one end, and the cable 9 does not travel around a bend like the curved face 11, Figure 1 of the drawing, but is engaged only by the upper strand of the roller chain 1. In such case the cable clamps 16 are employed to interact with the roller chain in the same manner as illustrated and described in connection with Figure 1 of the drawing.

The cable track 3, while shown in a more or less horizontal position, may be disposed vertically or inclined in relation to the drive sprocket 13.

It is evident from the foregoing description of this invention that cable hoists made in accordance therewith have a distinct advantage over other types of cable drives, such as the drum drive with geared motors, and that while for demonstrating purposes the drive is illustrated with door and valve operating mechanism, it will be evident to those skilled in the art that it may be used for other purposes for raising and lowering devices having restricted vertical movements.

I claim:

1. A cable hoist drive comprising a fixed roller track for engaging the rollers of an endless chain, a sprocket wheel at one end of the track and mounted independently of the track to be relatively adjustable to said track to the desired tension of a chain, a roller chain mounted to be engaged by the teeth of the sprocket wheel having rollers engaging the surface of the track and having depending link portions for guiding the roller chain on said track whereby the desired linear speed of the chain is obtained by the chain passing over the surface of the track, said roller chain having upstanding lugs spaced to receive a cable therebetween and having a saddle portion for supporting the under surface of the cable, and means

connected to said cable for engagement with the roller chain to render the cable movable with the chain.

2. A roller chain drive comprising a sprocket wheel and a fixed track having a circular end portion for extending one end of an endless chain mounted on the sprocket wheel, a chain interacting with the teeth of the sprocket wheel and having rollers for engaging the fixed track with depending portions for maintaining alignment of the rollers with said track whereby the desired linear speed of the chain is obtained by the chain passing over the surface of the track, one strand of the chain being provided with means on its outer faces for engaging an element to be driven thereby.

3. A cable hoist drive comprising a fixed roller track having an elongated shape with a large radius at one end and a concave portion at the other end for engaging the rollers of an endless chain, a sprocket wheel mounted concentric with the concave portion of the track with its periphery in alignment with the track surface to be relatively adjustable to the large radius at the opposite end of the track to the desired tension of a chain, a roller chain mounted to be engaged by the teeth of the sprocket wheel having rollers engaging the surface of the elongated shape track and having depending link portions for guiding the roller chain on said track whereby the desired linear speed of the chain is obtained by the chain passing over the shaped track surface, said roller chain having upstanding lugs to receive a cable therebetween and having a saddle portion for supporting the under surface of the cable, and means connected to said cable for engagement with the roller chain to render the cable movable with the chain.

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