

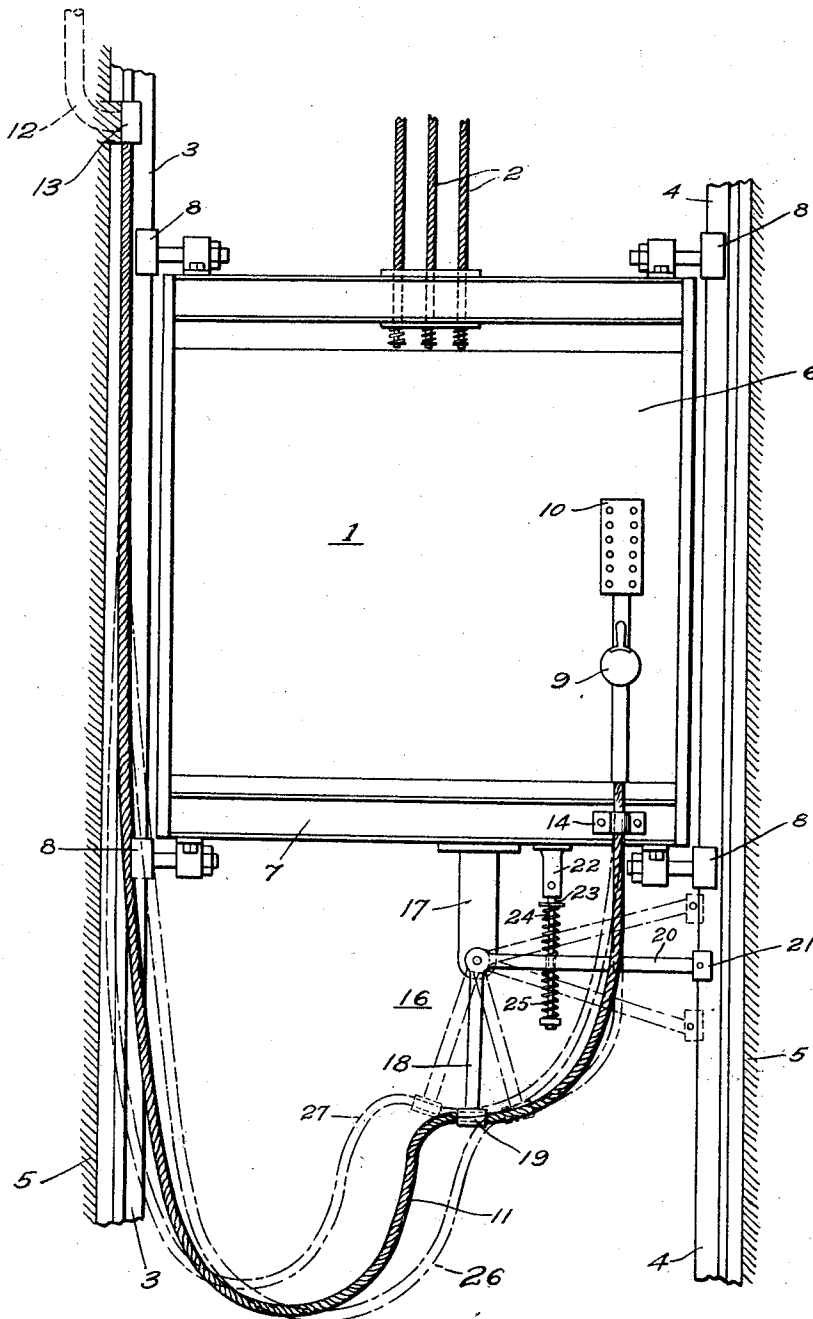
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CONTROL CABLE HANGER

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CONTROL CABLE HANGER

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My invention relates to control cable hangers and it has particular reference to devices for supporting the control cables that are suspended from elevator cars.

Usually the electrical conductors for connecting an elevator car with its control system and its signal system are grouped together for convenience in one cable which is known as a control cable. The control cable is suspended in the hatchway in the form of a loop, one end of which is fastened to the car and the other end of which is secured to the wall of the elevator shaft at a point approximately midway between the top and the bottom of the hatchway. The loop in the cable is made sufficiently long to permit free movement of the car throughout the entire length of the hatchway without placing a strain upon the cable when the car is at either of its terminal floors.

In practice it is found that the direction of travel of the car and the speed of the car vary the position and diameter of the cable loop, in such manner that the cable rubs against the hatchway wall as the car descends and against the car as it ascends. The rubbing against the wall and the car wears away the electrical insulation on the cable prematurely which results in interruption of the elevator service and consequent replacement of the cable.

Therefore, it is an object of my invention to provide for varying the position and diameter of the control cable loop in such manner as to prevent it from unnecessarily rubbing against the car or the hatchway wall.

Another object of my invention is to provide a means automatically responsive to the travel of the car for carrying the loop portion of the cable in the position that will be most favorable to its long life.

Still further objects of my invention will become apparent to those skilled in the art by reference to the accompanying drawing, the sole figure of which represents an elevator of a conventional type embodying my improved control cable hanger.

Referring to the drawing in detail, I have shown an elevator car 1 as suspended by a

plurality of operating cables 2 between a pair of guide rails 3 and 4 that are mounted on the walls 5 of an elevator hatchway.

The car 1 comprises a cab 6 that is mounted in a frame 7. A plurality of guide shoes 8 are mounted on the frame 7 in position to engage the guide rails 3 and 4 to guide the car during its up and down travels in the hatchway.

As shown, the car is provided with a controlling switch 9 and a signal panel 10, which are electrically connected with the elevator control and signal apparatus, (not shown) by means of a control cable 11. The control cable is brought into the hatchway through a conduit 12 at a point midway between the top and the bottom of the elevator shaft, where it is firmly secured to the hatchway wall by a bracket 13. The free end of the cable is fastened to the car by a cleat 14 with sufficient slack to permit the free movement of the car throughout the entire length of the hatchway. The slack portion of the control cable depends in a loop below the car.

When a cable is suspended from the car in the usual manner, the downward movement of the car causes the loop to roll and push the cable over against the hatchway wall. On the other hand the up movement of the car affects the movement of the loop in such manner that the cable rubs against the side of the car. The unnecessary contact of the cable with the hatchway wall and the side of the car causes the cable to become unduly worn and chafed within a short time.

In order to prevent the wearing and chafing of the cable I provide a cable hanger that is automatically responsive to operation of the car for controlling the position of the cable loop in such manner that it will not rub unduly against the hatchway wall or the car.

The cable hanger comprises a bell crank lever 16 that is pivotally mounted in a bracket 17 which is bolted to the under side of the car frame 7. The lower arm 18 of the lever 16 extends downwardly and is provided with a pair of insulating clamps 19 by

means of which it may be firmly connected to the control cable so that the up or down movement of the car will cause a corresponding movement of the cable toward or away from the hatchway wall. Obviously the clamps 19 should be fastened to the cable at such a distance from the point where the cable is secured to the car by the cleats 14 as will permit free movement of the loop portion of the cable with reference to the car.

In order that the cable gripping arm 18 may be actuated to move the cable away from the hatchway wall or away from the side of the car in accordance with the direction of operation of the car, the operating arm 20 of the elevator 16 is extended transversely toward the right-hand guide rail 4 to which it is connected by means of a friction shoe 21. The shoe 21 should be so disposed on guide rail 4 that the friction between it and the rail will cause the arm 20 to move upwardly with reference to the car when the car travels downwardly and thereby operate the arm 18 to enlarge the diameter of the cable loop and pull it away from the hatchway wall. Conversely, if the shoe is properly disposed upon the guide rail, an upward movement of the car will cause the shoe to move the operating arm 20 downwardly with reference to the car and thereby operate the cable arm 18 to change the position of the loop, so that the cable will not touch the side of the car.

Pivottally mounted in a bracket 22 on the underside of the car frame 7 is a bolt 23 which extends through an aperture in the operating arm 20. A pair of springs 24 and 25 are mounted upon the bolt 23 in position to press upon the opposite sides of the operating arm for the purpose of balancing the hanger, so that it may operate equally well in either direction.

The operation of the device may be described as follows:

Assuming that the car is at its upper terminal and is conditioned to travel downwardly, then as it moves downwardly the friction between the shoe 21 and the guide rail 4 causes the operating arm 20 to move upwardly with reference to the car. The upward movement of the arm 20 moves the cable arm 18 to the right and thereby increases the diameter of the cable loop and pulls the cable away from the side wall of the hatchway, as shown by the dotted lines 26. Hence as the car proceeds downwardly the cable loop is maintained out of contact with the hatchway wall even though the downward roll of the loop tends to push the cable toward the wheel. Consequently the cable will not rub against the wall while the car is traveling downwardly.

Assuming now that the car is at the lower terminal and is conditioned to travel up-

wardly, then as the car moves upwardly the friction between the shoe 21 and the guide rail 4 moves the operating arm 20 downwardly with reference to the car. The downward movement of the operating arm moves the cable gripping arm 18 to the left and thereby moves the vertical portion of the cable that is attached to the hatchway wall away from the side of the car as illustrated by the dotted lines 27, even though the upward roll of the cable loop tends to pull it toward the car. Hence as the car proceeds upwardly the cable will be maintained out of contact with the side of the car and will not rub against it.

It should also be noted that, by reason of the friction of the shoe 21 on the guide rail 4, and the effect of the balancing springs 24 and 25 that the speed of the car controls the movement of the cable gripping arm in such manner that the faster the car moves the greater will be the movement of the operating arm and consequently the greater the displacement of the control cable with reference to the hatchway wall or the side of the car as the case may be.

Therefore, it will be readily seen that I have provided a device that can be easily installed upon an elevator car and which will at all times be responsive to the movements and speed of the car for preventing rubbing of the control cable against either the hatchway wall or the car.

Although I have shown and described only one specific embodiment of my invention, I do not desire to be limited thereto as various modifications of the same may be made without departing from the spirit and scope of the invention.

I claim as my invention:

1. In combination, an elevator car operable in a hatchway, a control cable depending therefrom, means carried by said car and operably responsive to travel thereof for varying the position of a portion of said control cable.

2. The combination with a control cable for an elevator car operable in a hatchway, of means carried by the car and operably responsive to the direction of travel of said car for varying the position of a portion of said control cable.

3. The combination, with a control cable for an elevator car operable in a hatchway, of means for supporting said cable in a loop below said car and means for varying the diameter of said loop during movements of said car.

4. The combination, with a control cable for an elevator car operable in a hatchway, of means for supporting said cable in a looped position below said car, and means carried by said car and operably responsive to travel thereof for varying the diameter of the looped portion of said control cable.

5. The combination with a control cable for an elevator car operable in a hatchway, of means carried by said car and operably responsive to the speed of said car for varying the position of a portion of said control cable.

6. The combination with a control cable for an elevator car operable in a hatchway, of means carried by said car and operably responsive to travel thereof for varying the position of a portion of said control cable with respect to said hatchway.

7. The combination with a control cable for an elevator car operable in a hatchway, of means carried by said car and operably responsive to travel thereof for varying the position of a portion of said control cable with respect to said car.

8. A hanger for the control cable of an elevator car operable in a hatchway comprising a cable gripping member carried by said car and operably responsive to movement thereof for varying the position of said cable.

9. A hanger for the control cable of an elevator car operable in a hatchway comprising a cable gripping member carried by said car and operably responsive to movement thereof for transversely varying the position of said cable.

10. A hanger for the control cable of an elevator car operable along a guide rail in a hatchway comprising a cable gripping member carried by said car and operatively associated with said guide rail during travel of said car for varying the position of a portion of said cable with respect to said car and said hatchway.

11. A hanger for the control cable of an elevator car operable in a hatchway, comprising a cable-gripping member carried by said car and means operable, responsive to movement of said car for operating said member to transversely vary the position of the control cable.

12. A hanger for the control cable of an elevator car operable along a guide rail in a hatchway, comprising a lever pivotally supported by the car, gripping means for connecting one arm of said lever to said cable, and means for frictionally connecting the other arm of said lever to said guide rail to cause said lever to transversely move said cable in one direction as the car ascends and in another direction as the car descends.

In testimony whereof, I have hereunto subscribed my name this twelfth day of May, 1930.

LUTHER J. KINNARD.