

UNITED STATES PATENT OFFICE.

JOHN Z. MURPHY, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO FRANK W. HUDSON, OF SAME PLACE.

CABLE-REPLACER.

SPECIFICATION forming part of Letters Patent No. 519,586, dated May 8, 1894.

Application filed December 23, 1893. Serial No. 494,522. (No model.)

To all whom it may concern:

Be it known that I, JOHN Z. MURPHY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Cable-Replacers, of which the following is a specification.

In cable railway systems there is always a break in the line of the cable where it passes a power station, and as it is usual to provide the cable in separate lengths one driven from the other similar breaks occur along the line. For example in a double track system a continuous length of cable will extend from the power station upon sheaves between the rails of one track, partway along the line, to a large horizontally disposed wheel, around which the cable extends and by which it is guided to return upon sheaves between the rails of the other track. Driven by the horizontal wheel and extending therefrom to another wheel along the line is a second cable, and the second cable may drive a third, and so on. In running cars it is necessary wherever such a break in the line of the cable occurs, to "throw off" the grip, or disengage it from the cable when the car approaches the break, and put on "the grip," to take up the cable again, when the car has passed the break. At places where a break in the cable occurs, the cable slot is usually deflected for a short distance to a plane at one side of its normal line, causing the grip of a car, on nearing the break, to be forced to one side of its normal line of travel, to withdraw it laterally from the cable; the slot resuming its normal line, on the opposite side of the break, to force the grip again laterally into the position where it may take up the cable. As the car approaches a point where a break in the cable occurs, it is the duty of the "gripman" to let go the cable by opening the jaws of the grip, whereby when the latter is deflected, as described, it may free itself readily from the cable. The cable travels from the last guide, or sheave nearest the break, and which extends in the vertical plane, at an angle to the horizontal wheel, and it happens more or less frequently, owing to carelessness on the part of the gripman in not "letting go" the cable before reaching the last sheave, or owing to a fault

in the grip whereby it does not respond readily to the movement of the grip-lever, that the grip as it is forced to one side will hold onto the cable with sufficient tenacity to throw the latter off from the sheave onto the shaft upon which the sheave is mounted. Such an occurrence has made it necessary hitherto to stop the cable until with the use of suitable jacks it could be replaced upon the sheave; and in running across the shaft, before it could be stopped, the tendency of the cable has been to cut the shaft and injure the cable strands.

My object is to overcome the above difficulty in cable systems as hitherto constructed by providing the sheaves which are located adjacent to breaks in the line of the cable, with automatically operating cable replacers, whereby in the event of the cable becoming displaced as described it shall be supported to prevent injury and be automatically and speedily replaced.

In the drawings—Figure 1 is a view in elevation of a sheave provided with my improved cable replacer; and Fig. 2, a vertical section thereof.

A is a cable guide, or supporting-wheel, preferably in the form of a sheave which may be of the ordinary construction usually employed in this connection in cable railway systems, the sheave being mounted upon a shaft, A' , all in a common manner.

B is my improved cable support and replacer in the form of a hollow cone-frustum as shown. At its large end the replacer is, preferably, of a diameter slightly in excess of the diameter of the sheave, and is provided with an inward extending flange t at which it may be secured to the side of the sheave, as shown. On the small end of the replacer is a circumferential flange or stop s , and near the said end are an inner web r and a hub r' thereon fitting the shaft. Around the outer surface of the cone-frustum is a worm q which may be a spiral groove, commencing at the stop s and terminating at the sheave A. At the end of the spiral groove is a lip or guide projection q' . The replacer B is upon the side of the sheave at which the grip passes, and in practice the sheave and replacer are rotated continuously, by the ca-

ble, in the direction which causes the spiral groove or guide to travel, according to the optical illusion from the stop *s* to the sheave. The cable engaging jaws of a grip will clear and pass over the replacer between the ends of the conical surface; and should a grip in passing displace the cable, as described, the latter will drop upon the replacer against the retaining stop *s*. The cable in traveling across the conical surface will continue to rotate the replacer, and being engaged by the spiral groove will be guided thereby back to the sheave. The guide projection *q'* presents a cam surface to the cable, as the latter approaches the sheave and guides the cable into the sheave, thus overcoming any tendency of the cable to slip down the conical surface, as it nears the point of highest elevation. The replacer is, preferably, made as light as possible, consistent with the strength required, in order that it may rotate readily with the cable when the latter is displaced. If desired the replacer may be formed integral with the sheave, and the worm may be a spiral ridge on the conical surface, instead of a groove, and my improvement may be otherwise modified, in the matter of details of construction, without departing from the spirit of my invention as defined by the claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a traveling cable and rotary support therefor, of a rotary conical replacer at the side of said support, out of the normal path of the said cable and provided with a circumferential spirally extending engaging, raising and replacing guide for said cable, substantially as and for the purpose set forth.

2. The combination with a rotary cable-support, of a rotary cable-replacer at the side thereof, comprising a lateral conical extension of the support, out of the normal path of the cable, provided with a circumferential stop, and a cable engaging, raising and replacing guide between the said stop and support, substantially as and for the purpose set forth.

3. The combination with a traveling cable and rotary supporting sheave therefor, of a rotary replacer for said cable at the side of said sheave, comprising a cone-frustum-shaped extension of the sheave provided with a circumferential cable-engaging worm, substantially as and for the purpose set forth.

4. The combination with a rotary cable-supporting sheave, of a rotary cable replacer at the side thereof, comprising a hollow cone-frustum provided with a circumferential stop, a spiral cable engaging groove between the stop and sheave, and a guide projection *q'* at the end of the groove adjacent to the sheave, substantially as and for the purpose set forth.

JOHN Z. MURPHY.

In presence of—
M. J. FROST,
W. N. WILLIAMS.