

March 18, 1941.

J. B. MILLER

2,235,262

CABLE RELEASE

Filed Feb. 26, 1940

FIG. 1.

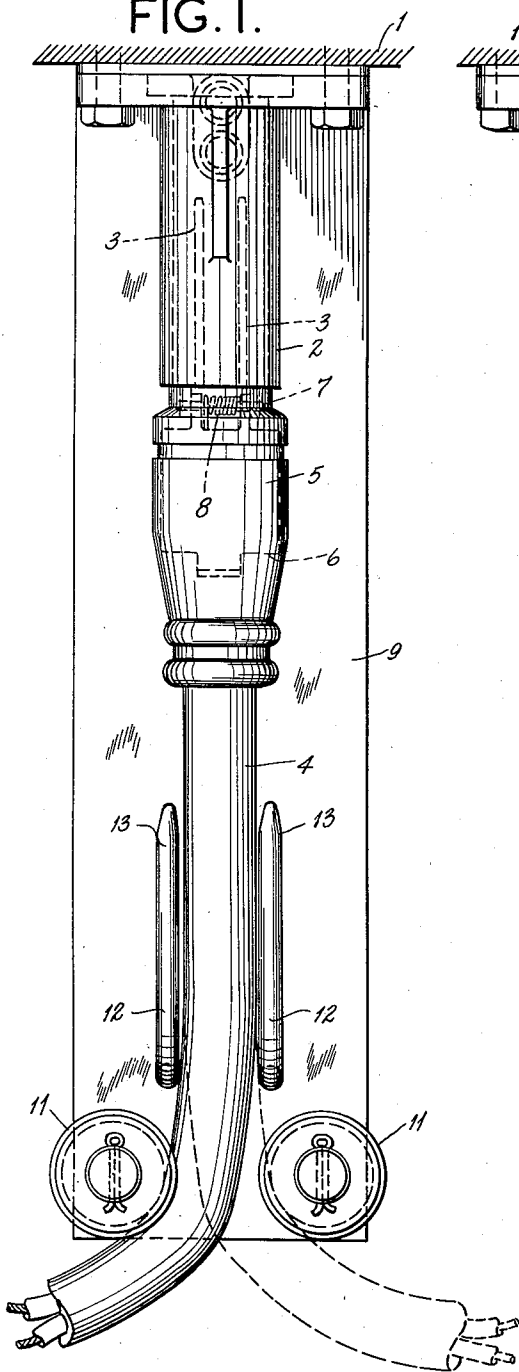
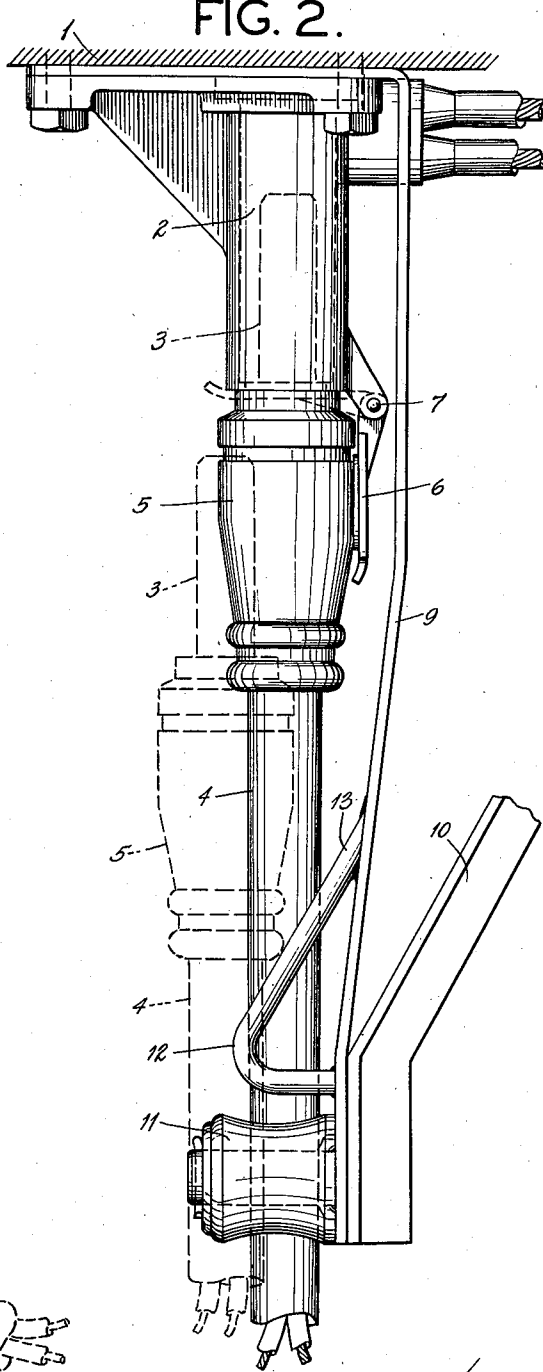


FIG. 2.



INVENTOR:
JAMES B. MILLER,

BY *Drummond & Sutherland*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,235,262

CABLE RELEASE

James B. Miller, Webster Groves, Mo., assignor to
Mines Equipment Company, St. Louis, Mo., a
corporation of Missouri

Application February 26, 1940, Serial No. 320,841

6 Claims. (Cl. 173—332)

This invention pertains to means for releasing an electric cable from its connection to a circuit by means of an attachment plug and socket. In many types of vehicles, particularly railway passenger cars, there are various devices and apparatus operated by electric power; for instance, the lighting of these cars by electricity and air-conditioning apparatus are usually electrically operated. During the travel of the car the power for these purposes is usually provided by a generator, or the like, operated from the axle of the car. When, however, the train is at a standstill, particularly when standing in a terminal station to take on passengers preparatory to a trip, these devices must be maintained in operation so that the cars may be lighted and rendered comfortable in inclement weather. As the axle generator is not in operation at that time, it is customary to provide an outside source of power at the station and to connect the same to the car circuits by means of attachment plugs. Such connections are usually made by a flexible cable connected at one end to a fixed service connection, or similar device, for supplying it with power from a local power station. The free end is usually equipped with a plug terminal adapted for insertion into a suitable socket on the car or vehicle, whereby connection is made to the car circuits and power may be supplied from the local power station to said circuits while the train is standing in the station.

It will be evident that this arrangement requires that an attendant release these connections by withdrawing the plugs from the sockets on the various cars. However, as such attendants are usually subject to human forgetfulness, it often happens that this operation is neglected and the train pulls away from the station without one or more of these connections having been withdrawn. In that case it usually happens that some portion of the equipment is wrecked. If the plug fails to pull out of the socket by the tension of the cable when the train has moved the full length of the cable, something must be ruptured when the train moves on. Usually the direction of the pull of the cable is not in the axis of insertion of the plug, and, accordingly, the plug is not pulled out of the socket. Either the socket fixture is wrecked or, as often happens, the cable is pulled out of its ground connection, often taking with it a part of the connecting fixture. As a result, the train moves away at increasing speed with this cable sometimes 50 to 100 feet in length whipping about behind it with consequent danger to yard hands

or others who may be near the track, and even to equipment such as switch posts.

One of the objects of this invention, therefore, is to provide means whereby such a power cable, which has been connected to a circuit on the vehicle, may be released automatically by a pull on the cable in any direction so that if the attendant should forget to release the cable before the vehicle starts away, such release may be accomplished automatically without danger to the equipment or to persons in the vicinity.

Another object is to provide means adapted to take the pull of the cable and redirect it to a direction substantially in line with the axis of insertion of the plug into the socket so that in whatever direction the pull may come, it will be redirected so as to withdraw the plug from the socket in the proper manner.

Another object is to provide such a device with means to insure that the plug or plug handle, or other portion on the cable which may be enlarged over the size of the cable itself, may not foul the apparatus or become jammed so as to prevent the proper functioning of the device.

Another object is to provide such cable-releasing means which will not only insure that the cable is released in the proper manner, but which will so guide the cable so as to prevent it from fouling any of the numerous devices and apparatus which are usually found mounted underneath a railway car or other vehicle.

Further objects will appear from the following description taken in connection with the accompanying drawing, in which:

Figure 1 is a side view of an apparatus embodying this invention; and

Figure 2 is a front view of the same.

Referring now to the drawing:

1 designates the bottom or other supporting portion of the railway car or other vehicle, such, for instance, as a passenger bus. Mounted in any suitable manner upon the support 1 is a socket fixture 2. This may be of any suitable type and provided with a contact socket adapted for receiving a complementary plug contact 3 on the end of a conductor cable 4. The plug on the cable may be provided with a handle portion 5. In the usual practice such plugs are provided with handle portions of this kind which are usually larger in diameter than the plug 3 and also larger than the cable 4. The socket of the fixture 2 is preferably provided with a lid or cover 6, which may be hinged as at 7, so that it may be opened to receive the plug in the

position shown in full lines in Figure 2. This cover is preferably provided with spring means, indicated at 8, whereby the cover is closed to the position indicated in dotted lines in Figure 2 when the plug is withdrawn. This arrangement assists in preventing dirt and dust from entering the socket when not in use.

Also mounted on the support 1, or in any other suitable manner, is a bracket 9. This may be braced against the support 1, or other suitable part, by means of one or more side braces 10. Mounted at the lower end of the bracket 9 is a pair of rollers 11 spaced apart sufficiently to permit the cable 4 to be inserted therebetween, as shown in Figure 1. These rollers may be hollowed to a greater or less extent, as indicated in Figure 2, so as to cause the cable to remain on the roller as the latter turns. The rollers 11 are located so that the cable 4 when inserted therebetween will be guided thereby to extend from the socket 2 in a direction substantially in line with the axis of insertion of the plug 3 into the socket. It will be seen that a pull on the free portion of the cable below the rollers 11 either to the right or left, as seen in Figure 1, will be redirected by one or the other of said rollers so as to pull substantially in line with the axis of insertion of the plug, and, therefore, such a pull will act to withdraw the plug from the socket in the normal manner and without danger of injury to any of the parts.

The bracket 9, of course, should be secured and braced so as to be rigid enough to take the pull of the cable even when suddenly applied as the car moves out to the limit of the cable length.

Since the handle 5 is often considerably larger than the cable 4, the spacing between the rollers 11 can ordinarily not be made great enough to permit this handle to pass between the rollers. Furthermore, if such spacing were permitted, the tendency of the side pull of the cable is to cock the plug to one side as it passes around a roller so that it would usually jam against the other roller under any circumstances. In order, therefore, to prevent the handle 5 from fouling the rollers, means are provided for releasing the cable from said rollers before the plug handle arrives at this point. One arrangement of such means is shown by the ejector bars 12. In the arrangement illustrated these bars are secured to the bracket 9, as by welding, but spaced apart just sufficient to permit the cable 4 to pass therebetween, as shown in Figure 1. The upper portions of these bars, indicated at 13, are arranged at an inclination to the vertical so that when the plug has been pulled out of the socket 2 and the handle 5 has moved downward to a position, such as indicated in dotted lines in Figure 2, an enlarged portion of the handle will engage the inclined parts 13 of the ejector bars. When this occurs the bars will act with a cam action to force the handle 5 outwardly from the bracket 9, and this at the same time causes the cable 4 to be disengaged from between the rollers 11. The distance that the crests of the bars 13 extends outwardly from the bracket 9 is made sufficient to carry the plug handle entirely clear of the rollers 11. This at the same time disengages the cable entirely from the guide rollers 11, after which it is entirely free to fall to the ground.

It will be seen, therefore, that this invention is adapted to protect equipment of the type involved by insuring the withdrawal of the contact plug from the socket so as to release the cable from the vehicle and, at the same time, to clear

the cable and the plug completely from the apparatus so as to obviate any danger of fouling. In the use of the device the operator in making the contact inserts the plug 3 into the socket in the usual manner, and then simply engages the cable 4 between the rollers 11 and the ejector bars 12. He may even swing the free portion of the cable below the rollers 11 to that side, right or left, as shown in Figure 1, toward which it would be dragged if the vehicle should move off without the plug having been withdrawn. In the usual installation the device is so mounted that the side shown in Figure 1 faces outwardly toward one side of the vehicle. Accordingly, the view of Figure 2 will then be a view from the front of the vehicle. The length of the bracket 9 is made sufficient to bring the rollers 11 to a level somewhat below any of the other apparatus mounted on the bottom of the car, so that the free portion of the cable may be kept below such apparatus and any tendency to become tangled therewith is thereby obviated.

Now, if the car moves off without the plug having been withdrawn, it first stretches out the free portion of the cable which extends from the rollers 11 to its point of attachment on the ground. When all the slack has been taken up, a pull or jerk is given to the cable. This pull is taken by the roller 11 against which the cable bears, and the bracket 9 must be sufficiently braced to withstand that pull. The roller 11 redirects the pull of the cable to a vertical direction in line with the axis of insertion of the plug, and the tension on the cable then operates to withdraw the plug along that axis in the proper manner. When the plug has been released from the socket, the handle portion strikes the ejector bars 13 and the plug and the adjacent portion of the cable are kicked outwardly from the bracket or to the left, as shown in Figure 2, until they clear the rollers 11 and they are then free of the apparatus entirely and may fall to the ground. The device, therefore, functions to positively release the cable from the vehicle in a proper manner and without injury to any of the fittings or apparatus.

It is obvious that various changes may be made in the details of construction within the scope of the appended claims without departing from the spirit of this invention, and it is understood, therefore, that the invention is not limited to the specific details shown and described.

The invention having thus been described, what is claimed is:

1. In combination with a vehicle having an electric power circuit, a contact-receptacle connected with said circuit and mounted on the vehicle with its contact-receiving axis transverse to the normal direction of travel of the vehicle, a cable-guide formed and positioned to receive a cable having a contact-plug thereon inserted in said receptacle, said guide having cable-receiving means positioned substantially in said axis and so as to hold the cable clear of obstruction thereto on the vehicle, and means for mounting said guide rigidly on the vehicle so as to enable said guide to sustain a pull on the free portion of the cable and redirect that pull to a direction substantially in line with said axis so as to pull the plug out of said receptacle along said axis.

2. In combination with a vehicle having an electric power circuit, a contact-receptacle connected with said circuit and mounted on the vehicle with its contact-receiving axis transverse to the normal direction of travel of the vehicle,

a cable-guide formed and positioned to receive a cable having a contact-plug thereon inserted in said receptacle, said guide having cable-receiving means positioned substantially in said axis and so as to hold the cable clear of obstruction thereto on the vehicle, means for mounting said guide rigidly on the vehicle so as to enable said guide to sustain a pull on the free portion of the cable and redirect that pull to a direction substantially in line with said axis so as to pull the plug out of said receptacle along said axis, and means engageable with a part on the cable and operable thereby after the plug has been withdrawn from said receptacle to disengage the cable from said guide.

3. In combination with a vehicle having an electric power circuit, a contact-receptacle connected with said circuit and mounted on the vehicle with its contact-receiving axis transverse to the normal direction of travel of the vehicle, a cable-guide formed and positioned to receive a cable having a contact-plug thereon inserted in said receptacle, said guide having cable-receiving means positioned substantially in said axis and so as to hold the cable clear of obstructions thereto on the vehicle, means for mounting said guide rigidly on the vehicle so as to enable said guide to sustain a pull on the free portion of the cable and redirect that pull to a direction substantially in line with said axis so as to pull the plug out of said receptacle along said axis, and means associated with said guide for retaining the cable in engagement therewith while the plug is in said receptacle adapted to free the cable when the plug has been withdrawn from the receptacle.

4. In combination with a vehicle having an electric power circuit, a contact-receptacle con-

nected with said circuit and mounted on the vehicle with its contact-receiving axis transverse to the normal direction of travel of the vehicle, and a cable-guide formed and positioned to receive a cable having a contact-plug thereon inserted in said receptacle, said guide having means to redirect a pull on the free portion of the cable to a direction along said axis so as to draw the plug out of said receptacle.

5. In combination with a vehicle having an electric power circuit, a contact-receptacle connected with said circuit and mounted on the vehicle with its contact-receiving axis transverse to the normal direction of travel of the vehicle, a cable-guide formed and positioned to receive a cable having a contact-plug thereon inserted in said receptacle, said guide having means to redirect a pull on the free portion of the cable to a direction along said axis so as to draw the plug out of said receptacle, and means engageable by the plug on the cable operating upon such engagement to cause the plug to clear said guide.

6. In combination with a vehicle having an electric power circuit, a contact-receptacle connected with said circuit and mounted on the vehicle with its contact-receiving axis transverse to the normal direction of travel of the vehicle, a cable-guide engageable by a cable having a contact plug thereon inserted in said receptacle, said guide having means about which the cable may flex to change its direction from one along said contact-receiving axis to one laterally thereof, said guide being rigidly supported on the vehicle so as to be able to sustain a pull on the flexed portion sufficient to pull the plug out of said receptacle.

JAMES B. MILLER.