COLLECTOR CONTACT FOR ELECTRICAL DISTRIBUTION SYSTEM

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This application relates to the art of electrical distribution systems and more particularly to that class of such systems comprising runs of duct or wire that feed to trolley type collectors.

Systems of this character generally comprise a duct run having closely adjacent copper bus bars therein upon which roll the roller contacts of trolley type collectors, the contact pressure of the roller contacts on the bus bars in most cases being of substantial amount because these contacts are often spring pressed. Trolley collectors of this character are generally reciprocated in the duct, and it has been found in the use of systems of this character that in installations where the reciprocation of trolley collector contacts under contact pressure is extremely rapid and frequent, that electrical disturbances in the nature of short circuits very often occur, with consequent damage to the duct and to the trolley collectors.

An intensive study of the problem of preventing such short circuits revealed the following hitherto unknown facts: It was first discovered that the rapid and frequent reciprocation of such trolley collectors in ducts, with the consequent rapid and frequent oscillatory rolling of the roller contacts under considerable contact pressure on the copper bus bars caused crystallization of the engaged surfaces of these bus bars, similar to that which occurs when copper is rolled through hardening rollers.

It was further discovered that such crystallization caused the engaged surfaces of the bus bars to flake off; that the flakes gathered in the ducts and provided creepage paths between the bus bars of opposite polarities; and that the presence of such creepage paths was responsible for the short circuits that occurred.

The problem at first appeared insolvable but after a considerable study it was discovered that the presence of a suitably thin film of lubricating oil prevented such crystallization and that if care was taken that the oil used were of high electrical conductivity, no difficulties would be encountered insofar as maintaining electrical contact between the roller contacts and the bus bars was concerned.

Various means were designed and a preferred means is here disclosed to insure the maintenance of a film of oil between the roller contacts and the bus bars. This means comprises roller contacts composed of a material of such a nature as to be electrically conducting, mechanically satisfactory for withstanding the wear that occurs due to rapid and frequent rolling under pressure on copper bus bars, and yet that was porous so that it could be saturated with a supply of oil and could be considered as carrying its own oil supply. Investigation revealed the existence of such a material and that it was substituted for the steel or copper commonly used in roller contacts.

The present invention comprises therefore, means for preventing electrical disturbances such as short circuits or the like in electrical distribution systems of the trolley and duct type created by the crystallization of engaged bus bar surfaces due to rapid and frequent reciprocation of roller contacts on these bus bar surfaces, which means maintains a film of electrically conducting oil between the roller contacts and the engaged surfaces of the bus bars; the means is embodied in a contact roll of an electrically conducting material porous enough to retain in saturation a quantity of electrically conducting oil sufficient to maintain a film of oil between the roller contact and the engaged surface of a bus bar, and thus eliminate crystallization of the bus bar as the contact rolls along the same.

For an understanding of the invention reference should be had to the specification and drawing forming part of this application. In the drawing,

The figure shows an electrical distribution system of the duct and trolley collector type wherein the trolley collector roller contacts are of an electrically conducting material of sufficient porosity to retain in saturation a quantity of oil.

A system of the character under consideration generally comprises a duct run 10 having insulatedly mounted therein copper bus bars 11, upon which roll the roller contacts 12 of trolley type collectors 14, having stirrups 15 mounting the contacts. The roller contacts 12 are generally spring-pressed towards the bus bars so that adequate contact pressure is maintained between the roller contacts and the bus bars.

The roller contacts are of electrically conducting material of sufficient porosity to retain in saturation a suitable quantity of oil. One such material is marketed under the trade name "Oiltite", and this material, as known at present, may aptly be termed porous carbon retaining in saturation a considerable quantity of oil.

I claim:

1. For use with electrical distribution systems of the duct and trolley collector type wherein copper roller contacts reciprocate rapidly and frequently and under adequate contact pressure upon engaged surfaces of copper bus bars dis-
posed in closely adjacent relation, roller contacts whose contact rolls are of copper of sufficient porosity to maintain in saturation a quantity of oil sufficient to provide a film of electrically conducting lubricating oil between the contact roll engaging surfaces and the surfaces of the bus bars engaged thereby of sufficient thinness to avoid disturbance of electrical contact between the contacts and the bus bars.

2, For use with electrical distribution systems of the duct and trolley collector type wherein metal roller contacts of good electrical conductivity reciprocate rapidly and frequently and under adequate contact pressure upon engaged surfaces of metal bus bars of good electrical conductivity disposed in closely adjacent relation, roller contacts whose contact rolls are of electrically conducting metal of sufficient porosity to maintain in saturation a quantity of oil sufficient to provide a film of electrically conducting lubricating oil between the contact roll engaging surfaces and the surfaces of the bus bars engaged thereby of sufficient thinness to avoid disturbance of electrical contact between the contacts and the bus bars.

3. A construction of the character described in claim 2 wherein copper is a principal constituent of the metal used for the rollers.

4. A construction of the character described in claim 2 wherein copper is a principal constituent of the metal used for the rollers and the bus bars.

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