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TRAVELING ELECTRICAL CONTACTOR

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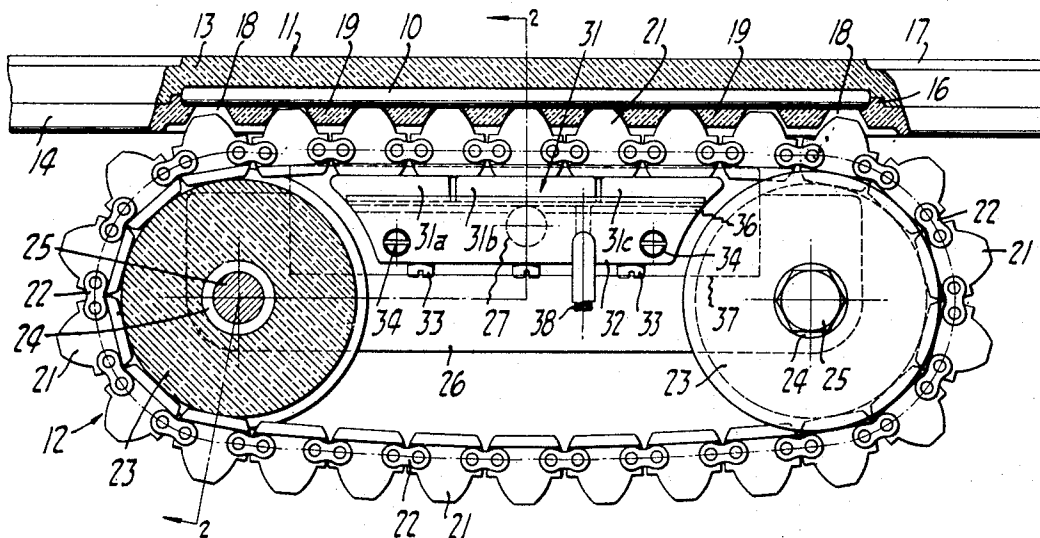


FIG. 1

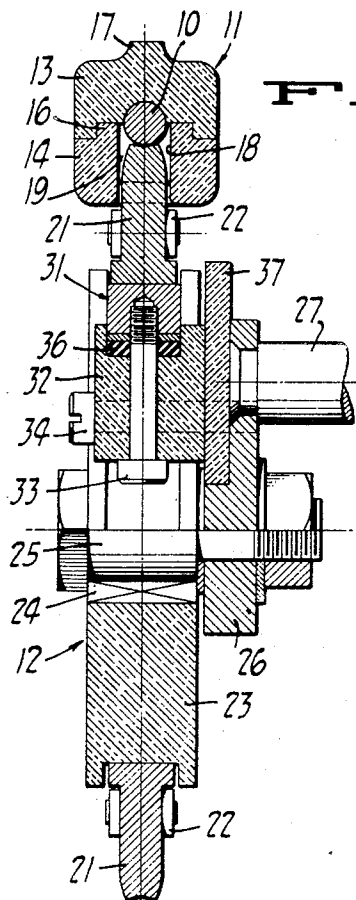


FIG. 2

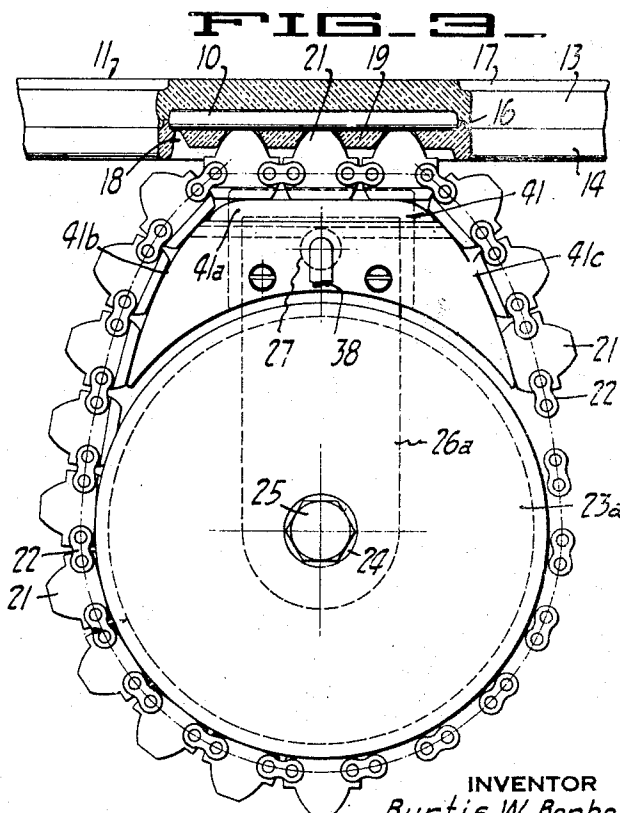


FIG. 3

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TRAVELING ELECTRICAL CONTACTOR

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12 Claims. (Cl. 191-22)

This invention relates generally to electrical equipment of the type making use of a traveling contacting device together with one or more extended electrical conductors. Such devices can be used advantageously where a trolley arrangement is desired to supply current to movable appliances like hoists, cranes, or small locomotives.

It is a general object of my invention to provide an improved electrical contacting device to provide a maximum contacting surface between the trolley wire and the device with minimized wear both on the contacting surfaces and on the insulation material about such surfaces.

Another object of the invention is to provide a traveling contacting device of the character referred to which avoids the necessity for brushes, slip rings, and the like.

Other objects and advantages of the invention will be apparent from the following description of a preferred embodiment thereof as illustrated in the accompanying drawing, in which:

Figure 1 is a side elevational view partly in section of a traveling electrical contactor embodying my invention in cooperative relation with an extended electrical conductor.

Figure 2 is a sectional view of the apparatus shown in Figure 1, the view being taken in planes indicated by the line 2-2 in Figure 1.

Figure 3 is a side elevational view of a modified form of traveling electrical contactor, the view being partially in section.

The apparatus shown in Figures 1 and 2 comprises an extended electrical conductor or trolley wire 10 which is disposed within a sheath of insulating material 11. The trolley wire 10 is adapted to cooperate with a traveling electrical contacting device indicated generally at 12, which is described in detail hereinafter.

The sheath 11 is preferably made from a molded plastic which has sufficient strength to properly retain the conductor, for example "Bakelite" or the like phenolic condensate products. Usually the sheath 11 will be manufactured in two parts 13 and 14. The lower part 14 is provided with a pair of raised ribs 16 which seat in corresponding longitudinal grooves in the lower face of the upper part 13. The upper part 13 may also be provided with a longitudinal reinforcing rib 17.

The lower part 14 of the sheath is provided with a series of openings 18 to expose spaced apart portions of the wire 10 and between the openings is provided with a series of teeth 19

for cooperation with the traveling contacting device later described.

The traveling electrical contacting device 12 comprises a series of articulated conductor elements 21 which are preferably formed as teeth. The adjacent elements 21 are connected by suitable articulated links 22. The series of elements 21 are trained about a pair of pulley wheels 23 of insulating material such as "Bakelite" which have suitable bearings or bushings 24 journaled about respective shafts 25. The shafts 25 are suitably clamped to an adjacent frame plate 26 which is provided with a laterally extending bar or post 27 for support from the appliance on which it is carried.

The electrical contacting device is provided with a longitudinally extending bus bar 31 which may be provided in sections 31a, 31b, and 31c, which are secured on a bracket 32 of insulating material by suitable fastening studs 33. Bracket 32 is secured on plate 26 by suitable fastening studs 34. Preferably, a resilient mounting for the bus bar 31 on the bracket 32 is provided by means of a rubber cushion 36. In this way the bus bar sections are mounted for slight yielding movement. In a recessed side of the supporting plate 25 an insulating plate 37 may be mounted to prevent accidental contact of the conductor elements with the metal portions of the frame plate. The bus bar 31 may be electrically connected to the motor of the appliance as by means of an electrical conducting cable 38.

In order to minimize friction between the teeth comprising the conductor elements 21 and the teeth 19 of the sheath at the beginning and end of the travel of the teeth 21 over the bus bar 31, the bus bar 31 is raised slightly above the uppermost portions of pulleys 23. The teeth 21 when fully engaged with the teeth 19 operate at an effective diameter greater than their diameter when traveling about the pulleys 23. Also the teeth 21 are formed for operation at a pitch diameter smaller than their effective diameter when engaged with teeth 19, thereby increasing the clearance as the teeth 21 engage and leave the teeth 19. In this way as the conductor teeth 21 begin their travel in engagement with the trolley wire sheath, they do not have driving contact with the teeth 19 of the sheath. A similar action obtains as the teeth 21 leave their conducting position.

In operation, as the appliance moves along its track, the conductor elements or teeth 21 are driven by their engagement with the teeth 19 of the trolley wire sheath so that they slide along

over the bus bar as they engage the trolley wire through the openings 18. As seen in Figure 2, preferably the engaging face of the teeth are made slightly concave for maximum contact with the wire 10. Because of the resilient mounting for the bus bar, the teeth are maintained at all times in firm engagement with both the trolley wire and the bus bar to provide a good conducting surface between the wire and the bus bar.

The form of the invention shown in Figure 3 is particularly adapted for use in installations where sharp turns are required. In this modification, the sheath 11 and its trolley wire 10 are identical in construction to that shown in Figures 1 and 2. The traveling articulated series of conductor elements or teeth 21 are also similar in construction. The teeth are trained about a single pulley 23a which is similar to the pulleys 23 and similarly mounted in a bracket or plate 26a. Plate 26a carries a bus bar 41 of special construction having a central portion 41a between respective curved end portions 41b and 41c are provided for guiding the teeth from the single pulley wheel 23a up to the bus bar 41. The operation of the contacting device of Figure 3 is similar to that of Figure 1, and is more readily adaptable to turns because of the smaller number of teeth in operation at the same time.

I claim:

1. A traveling contactor for a trolley wire comprising a bus bar mounted for movement parallel to and in spaced relation to the trolley wire, and an endless series of articulated conductor elements mounted for movement between said bus bar and said wire to provide a conducting path therebetween.

2. A traveling contactor for a trolley wire comprising a bus bar mounted for movement parallel to and in spaced relation to the trolley wire, resilient means supporting said bus bar, and an endless series of articulated conductor elements mounted for movement between said bus bar and said wire to provide a conducting path therebetween.

3. A traveling contactor for a trolley wire comprising a bus bar mounted for movement parallel to and in spaced relation to the trolley wire, a pulley wheel of insulating material at either end of said bus bar, and an endless series of articulated conductor elements trained about said pulley wheels for travel over said bus bar in contact therewith and in contact with said trolley wire.

4. A traveling contactor for a trolley wire comprising a bus bar mounted for movement parallel to and in spaced relation to the trolley wire, a pulley wheel of insulating material at either end of said bus bar, said bus bar being elevated above said pulleys, and an endless series of articulated conductor elements trained about said pulley wheels for travel over said bus bar in contact therewith and in contact with said trolley wire.

5. A traveling contactor for a trolley wire comprising a bus bar mounted for movement parallel to and in spaced relation to the trolley wire, a pulley wheel of insulating material at either end of said bus bar, and an endless series of articulated conductor elements trained about said pulley wheels for travel over said bus bar in contact therewith and in contact with said trolley wire, said elements being formed as teeth for engagement with corresponding teeth of the trolley wire construction.

6. A traveling contactor for a trolley wire comprising a bus bar mounted for movement parallel

to and in spaced relation to the trolley wire, said bus bar being of sectional construction, a pulley wheel of insulating material at either end of said bus bar, and an endless series of articulated conductor elements trained about said pulley wheels for travel over said bus bar in contact therewith and in contact with said trolley wire, said elements being formed as teeth for engagement with corresponding teeth of the trolley wire construction.

7. A traveling contactor for a trolley wire comprising a bus bar mounted for movement parallel to and in spaced relation to the trolley wire, a pulley wheel of insulating material at either end of said bus bar, and an endless series of articulated conductor elements trained about said pulley wheels for travel over said bus bar in contact therewith and in contact with said trolley wire, said elements being formed as teeth for engagement with corresponding teeth of the trolley wire construction, said teeth being formed about a pitch diameter smaller than the pitch diameter of their travel with respect to said trolley teeth.

8. A traveling contactor for a trolley wire comprising a bus bar mounted for movement parallel to and in spaced relation to the trolley wire, a pulley wheel of insulating material at either end of said bus bar, said bus bar being elevated above said pulley wheels, and an endless series of articulated conductor elements trained about said pulley wheels for travel over said bus bar in contact therewith and in contact with said trolley wire, said elements being formed as teeth for engagement with the corresponding teeth of the trolley wire construction, said teeth being formed about a pitch diameter smaller than the pitch diameter of their travel with respect to said trolley teeth.

9. A traveling contactor construction comprising an extended conductor having a sheath of insulating material and an extended trolley wire supported therein, said sheath including teeth providing spaced openings therebetween exposing portions of said wire, a traveling contactor including a bus bar for movement parallel to and spaced from said wire, an endless series of articulated teeth for engaging the teeth of said sheath and for contacting said wire while also engaged with said bus bar, and means for supporting said teeth for movement as the contacting device travels along the trolley wire.

10. A traveling contactor construction comprising an extended conductor having a sheath of insulating material and an extended trolley wire supported therein, said sheath including teeth providing spaced openings therebetween exposing portions of said wire, a traveling contactor including an endless series of articulated teeth for engaging the teeth of said sheath and for contacting said wire while also engaged with said bus bar, and means for supporting said teeth for movement as the contacting device travels along the trolley wire.

11. A traveling contactor construction comprising an extended conductor having a sheath of insulating material and an extended trolley wire supported therein, said sheath including teeth providing spaced openings therebetween exposing portions of said wire, a traveling contactor including a bus bar for movement parallel to and spaced from said wire, an endless series of articulated teeth for engaging the teeth of said sheath and for contacting said wire while also engaged with said bus bar, and means for supporting said teeth for movement as the contact-

ing device travels along the trolley wire, said mounting means including a single pulley disposed beneath said bus bar.

12. A traveling contactor construction comprising an extended conductor having a sheath of insulating material and an extended trolley wire supported therein, said sheath including teeth providing spaced openings therebetween exposing portions of said wire, a traveling contactor including a bus bar for movement parallel to and spaced from said wire, an endless series

of articulated teeth for engaging the teeth of said sheath and for contacting said wire while also engaged with said bus bar, and means for supporting said teeth for movement as the contacting device travels along the trolley wire, said mounting means including a single pulley disposed beneath said bus bar, and means for guiding said teeth into engagement with and out of engagement with said bus bar.

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