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POSITIVE PRESSURE CURRENT COLLECTOR

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FIG. 1

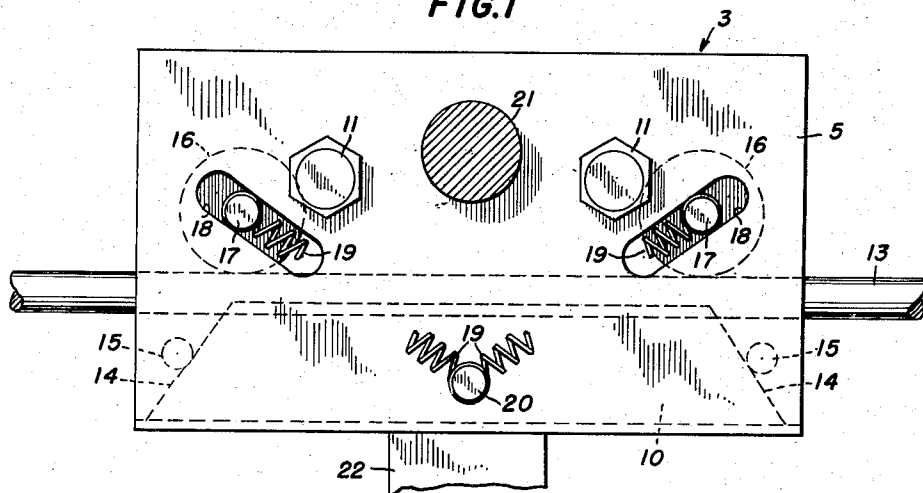
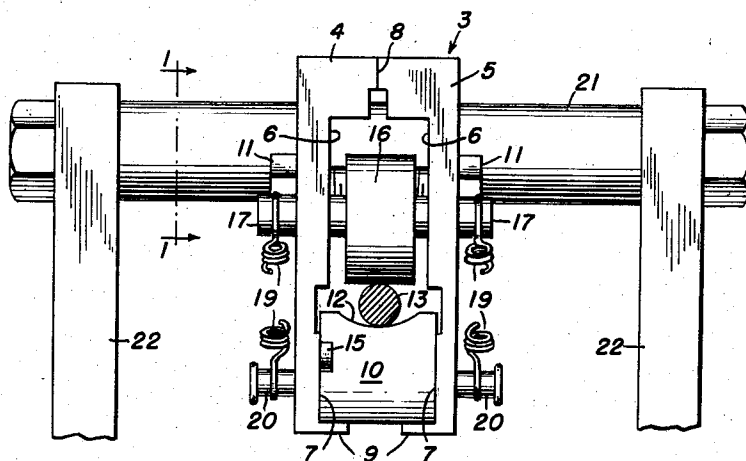


FIG. 2

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1

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POSITIVE PRESSURE CURRENT COLLECTOR

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2 Claims. (Cl. 191—59.1)

This invention consists in new and useful improvements in a current collecting device for use in connection with current conducting trolley wires or the like and has for its object to provide a current collector designed to insure the application of adequate contact pressure between the current collecting insert and the trolley wire, independently of external means.

Another object of the invention is to provide a current collector of this type having a readily replaceable insert of carbon or other current collecting material arranged for sliding engagement with a trolley wire and including means engageable with the opposite side of said wire for automatically maintaining a positive contact pressure between the insert and the wire. With many of the known current collecting devices, overheating and uneven and rapid wear, caused by insufficient contact pressure, has been a major disadvantage where the weight of the wire itself is inadequate to insure sufficient pressure.

A further object of the invention is to provide a positive pressure current collecting device including an elongated current collecting insert having a contact surface adapted to slidably embrace a trolley wire and provided with spring tension means engageable with the opposite side of said wire at longitudinally spaced points, for maintaining a constant contact pressure between the insert and the wire.

Still another object of the invention resides in the provision of an insert mounting assembly which may be dismantled and reassembled with a minimum of effort.

A still further object of the invention is to provide a current collector having an elongated current collecting insert carried by a housing member which is mounted for limited rotary movement about an axis transverse to the longitudinal axis of the insert to facilitate proper contact and alignment of the insert with a trolley wire.

With the above and other objects in view, which will appear as the description proceeds, the invention consists in the novel features herein set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

Referring to the drawings in which numerals of like character designate similar parts throughout both views,

Figure 1 is a view of the assembly in side elevation with the supporting shaft shown in section and the insert in dotted lines, and

Figure 2 is an end view of the assembly taken at right angles to Figure 1.

In the drawings the housing for the assembly is generally indicated by the numeral 3 and consists of a pair of opposed side plates 4 and 5, preferably but not necessarily, rectangular in shape. The inner faces of the side plates 4 and 5 are recessed as at 6 and 7 to provide adjoining chambers for housing the contact pressure rollers and current collecting insert, respectively, as will be later explained.

The opposed side faces of the plates 4 and 5 abut as at 8 along the upper longitudinal extent of the assembly while the lower ends of said plates form inwardly di-

2

rected, longitudinally extending flanges 9, the opposed extremities of which are spaced as shown in Fig. 2. The lower recess 7 which is bounded at its lower extremity by the inturned flanges 9, receives the current collecting insert 10 which may be formed of carbon or other suitable current collecting material and the spacing of the flanges 9 facilitates the firm engagement of the side faces of the insert 10 by the respective inner walls of the recess 7 formed in the side plates 4 and 5, when the side plates are assembled. A pair of bolts 11 transversely penetrate the side plates 4 and 5 at longitudinally spaced points, and serve as the sole means for connecting the assembly.

The current collecting insert 10 is preferably elongated and its upper face is provided with a longitudinally extending contact groove 12 for slidably receiving a trolley wire 13 which extends longitudinally through the housing 3 adjacent the junction of the recesses 6 and 7. As will be seen from Fig. 1, the opposite extremities of the insert 10 are inclined at converging angles as at 14 where they abut retaining studs 15 which project inwardly from the side walls of the chamber 7. Preferably, one stud 15 is provided at alternate opposite ends of the plates 4 and 5 so that when the insert 10 is resting upon the flanges 9, one stud 15 abuts each inclined end 14 to thereby prevent both longitudinal and vertical displacement of the insert.

Within the upper recess 6, there are provided two longitudinally spaced contact rollers 16 which are rotatably mounted on transverse shafts 17 extending through the opposed plates 4 and 5. The shafts 17 are slidably disposed in downwardly converging slots 18 in the side plates and their opposite ends project through and extend beyond the respective side plates to receive coil springs or the like 19. A pair of springs 19 is arranged on each side of the assembled housing 3, with one end of each pair secured to the respective shafts 17 and the opposite ends of the springs of each pair secured to a common retaining pin 20.

It will be apparent that with the trolley wire 13 riding in the contact groove 12 of the insert 10, and interposed between the insert and the spaced rollers 16, the constant converging tension of the two pairs of springs 19 on the roller shafts 17, causes a uniform contact pressure to be maintained between the trolley wire and the insert, throughout the length of the latter.

In explanation of the application and operation of this device it may be noted that the trolley wire 13 is loosely supported intermediate its ends on a series of spaced, horizontally disposed insulator spools carried by any convenient supporting means. The housing 3 of the collector assembly is carried by a current conducting support as will hereinafter appear and it is sufficiently elevated with respect to the plane of the insulator spools, to lift the wire 13 as it approaches these intermediate supports. Thus, as each insulator spool is encountered, the wire 13 is lifted so that the collector assembly can pass the support without interference and after passing, the wire 13 drops back on the supporting spools.

In the form of the invention shown in the drawings for purposes of illustration, the housing 3 is mounted upon a transverse shaft 21 supported at the upper ends of a pair of crane frames 22 and in many installations, the crane frame is adapted to act as a conductor leading from the current collector assembly to the crane motor. However, in some installations it may be desirable to employ a collector support of insulating material with auxiliary means for conducting the current. Thus, in the appended claims, the term "current collecting support" is intended to embrace either or both of these arrangements.

As will be seen from Fig. 1, the supporting shaft 21 penetrates the side plates 4 and 5 at substantially the

3

center of the longitudinal extent of the housing 3 and located above the longitudinal axis thereof. The shaft 21 rotatably engages the side plates 4 and 5 and due to the vertically eccentric mounting thereof, the housing tends to be self adjusting to insure proper alignment of the collector insert 10 as it travels along the trolley wire.

It will thus be seen that with the present invention there is provided an extended contact surface for the collection of current from the trolley wire and adequate contact pressure is maintained throughout the length of this surface. The proper alignment and insurance of positive pressure are extremely important factors particularly when heavy currents are involved, as inadequate pressure on the contact surface gives rise to overheating and the resultant deterioration of the unit.

Furthermore, the extreme simplicity of the assembly and the ease with which it can be dismantled and reassembled for the replacement of the current collecting insert, add to the advantages of the device.

From the foregoing it is believed that the invention may be readily understood by those skilled in the art, without further description, it being borne in mind that numerous changes may be made in the details of construction, without departing from the spirit of the invention as set forth in the following claims.

I claim:

1. A positive pressure current collector, comprising a housing formed of a pair of opposed side plates, said side plates being internally recessed to form a current collector chamber, means for mounting said housing on a current conducting support, an elongated current collecting insert fixed in said chamber and having a wire engaging contact face for slidably embracing one side of a trolley wire extending longitudinally through said chamber, a pair of pressure rollers disposed in said chamber, in opposed relation to said contact face and spaced longitudinally thereof for peripheral engagement with the opposite side of said wire, said rollers being mounted on shafts respectively ex-

4

tending transversely through aligned slots provided in said opposed side plates, the slots for respective shafts lying in converging planes which intersect the plane of said contact face, and spring means connected between each shaft and a common anchor point on said housing for urging said shafts toward said insert, to maintain a positive contact pressure with said wire throughout the length of said contact face.

2. A positive pressure current collector, comprising a housing having an elongated internal recess to form a current collector chamber, said housing adapted to be mounted on a current conducting support, an elongated, non-rotatable current collecting insert fixed in said housing and defining the bottom wall of said chamber, for slidably embracing one side of a trolley wire, the elongated face of said slidable insert being parallel to the elongated dimension of said recess, a pair of rollers spaced along the longitudinal axis of said recess within said chamber in opposed relation to said insert, for peripheral engagement with the opposite side of said wire, said rollers being respectively mounted on shafts, the ends of which are slidably supported in aligned bearing slots in opposite walls of said housing, said slots being elongated in planes which intersect a horizontal plane through the longitudinal axis of a trolley wire embraced by said insert, whereby respective rollers and shafts are radially shiftable in said slots, and spring means connected to the shafts and housing for urging respective shafts toward said insert to maintain positive contact pressure with said wire, throughout the length of said insert.

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