Feb. 15, 1949. A. MORNINGSTAR 2,461,696

COLLECTOR SHOE

Filed Nov. 16, 1944

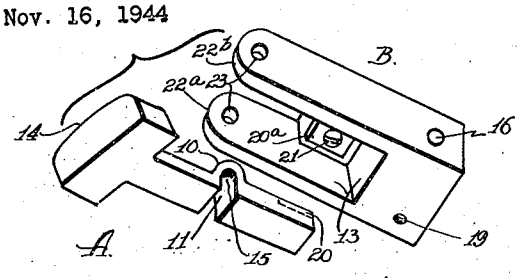



Fig. 6.

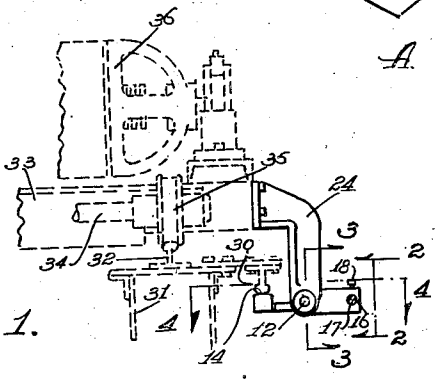



Fig. 1.

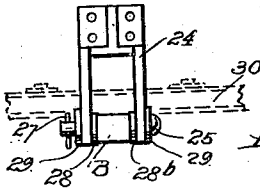



Fig. 2.

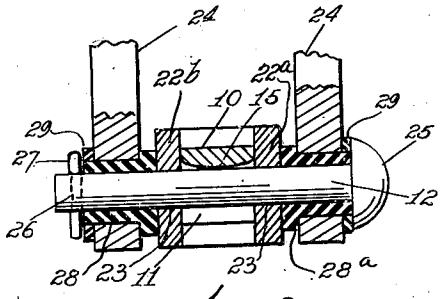



Fig. 3.

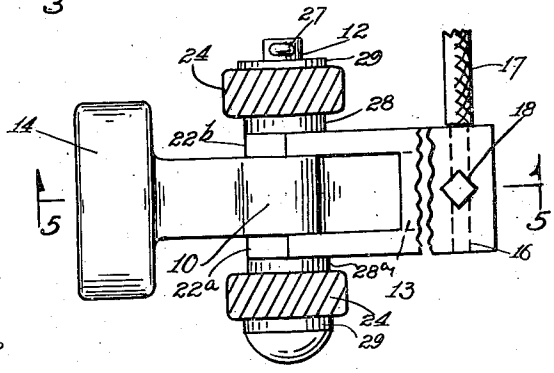



Fig. 4.

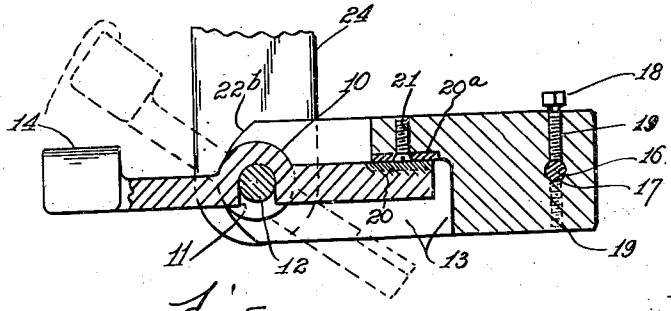



Fig. 5.

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## COLLECTOR SHOE

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5 Claims. (Cl. 191—49)

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My invention relates to a new and useful improvement in collector shoes for all manner and makes of movable electro-motive apparatus, machinery and conveyors such as cranes, hoists, lifts, elevated, subway and street cars motivated and impelled by means of contact rails, contact bars or contact wires.

The object of my invention is to provide a springless collector device, one member of which, the collector shoe, may by the simple expedient of unhooking or lifting out and away from the other member, a counterweight, be quickly and easily removed for necessary repairs or replacement without the need of tools to unbolt, unscrew or unfasten the collector shoe member upon which wear is greatest and the occasion for repair or replacement is most frequent.

A further object of my invention and of my new and useful improvement in collector shoes is to prevent waste of time and materials incident to the repairs and replacement of collector shoes constructed of more or less complex single or component units.

A further object of my invention is to provide means of maintaining constant and assured sliding contact of the collector shoe with the electrical contact element by means of a counterweight and its pressure upon the collector shoe to suit varying conditions.

Reference is made to the accompanying drawings and the reference characters marked thereon which form a part of my specification. Similar characters refer to similar parts in the several figures of the drawings.

Fig. 1 is a side view of my invention as shown in operation with the fractional part of trolley and motor shown for illustration only and not a part of my invention, depicting one of the modes of mounting my collector shoe to the frame of a truck or cab.

Fig. 2 is a broadside view of supporting means of collector device and of the device as it would appear in use on inverted (underside) third rail, as viewed from the right hand side of carrier, truck or vehicle.

Fig. 3 is a vertical cross-sectional view along lines 3—3 of Fig. 1, of supporting means of collector devices with particular detail as to rounded non-straight underside of surface 15 of recess 11.

Fig. 4 is a horizontal cross-sectional view along lines 4—4 of Fig. 1, of members A and B of Fig. 6, indicating their position over pin or bolt 12, with part of member B of Fig. 6 shown broken away.

Fig. 5 is a longitudinal sectional view of members A and B in their assembled relationship to

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each other upon pin or bolt 12 as viewed along lines 5—5 of Fig. 4.

Fig. 6 is an exploded perspective view of the two main members A and B comprising my collector device.

Referring first to Fig. 6, A shows the collector member, which about midway of its longitudinal extremes has an intermediate saddle 10, which defines the transversely extending slot or recess 11, and which slot normally rests upon the pin or bolt 12, as shown in Figs. 3, 4 and 5, in a manner which will bring one end of the arm of the collector shoe member to rest squarely within side opening recess 13 of counterweight member B (Fig. 6). The convex surface of said saddle 10 may preferably be substantially parallel with the contact surface 14.

To make allowance for rocking or swaying as the contact surface 14 travels upon or in contact with a non-level contact rail, contact bar or contact wire, a transverse curvature or rounded non-straight surface 15, of recess 11, is provided, as illustrated in Fig. 3. An electricity conducting cable connecting means is provided through passage or perforation 16 in said counterweight body, and the cable 17 may be securely, though releasably, held by means of set screw 18 at hole 19 as shown in Figs. 1, 4, 5 and 6.

The counterweight member of my new and improved collector shoe device is preferably provided with a detachable copper, brass or alloy insert 20—*a*, either molded in or suitably fastened or secured to recess 13, by means of a screw 21, or it may be held by flange or other suitable means. One end portion of contact shoe member A, which is opposite the contact surface thereof, has fused or otherwise secured therein and thereupon a copper, brass or alloy element 20, the material of which is an efficient conductor. Any suitable mode of attachment or fusion may be followed in the mounting of element 20, though the mode as stated is preferable and permits quick and easy replacement as normally these parts wear away in a much shorter time than the life of the entire device.

The outer end portions of the arms 22—*a* and 22—*b* formed by the bifurcation of counterweight member B have formed therein a passage or passages 23 which are adapted to receive and releasably hold a pin or bolt 12 which pin or bolt 12 is connected to any suitable portion of a portable cab or frame thereof, such as for example by bracket or support 24 illustrated in Fig. 1. The pin or bolt 12 in the alternative may have a head 25 at one end, and a perforation or hole 26 at

the other end for the reception of a removable cotter pin 27 or the like. The style of mounting, illustrated by bracket 24, may be on rigid or swivel base, frame or support, and may be varied according to the needs and nature of the conveyor and other movable electro-motive means requiring a moving contact with an electrified rail or cable.

In instances where the means for mounting my separable collector device is not in itself non-conductively mounted with respect to the cab or frame thereof, it is important to insulate the pivotally movable collector shoe and said separable counterweight from the bracket or other equivalent unit to which it may be pivotally connected. I illustrate one such means of non-conductively mounting the said device in Fig. 3 by a pair of bushing-like sleeves 28 and 28—*a* which are mounted in the passages 23 of the respective arms of the counterweight member B, the inner flanged portions of said sleeves acting as spacers to maintain the intermediate portion of the arm of the collector shoe member spaced from the bracket arms. Said sleeves 28 and 28—*a* are formed of fabric or other suitable non-conductive material, and preferably extend outwardly beyond the outer side surfaces of the arms of the supporting bracket 24 as shown in Fig. 3. Optional washers 29 are mounted about the projecting end portions of said sleeves 28 and 28—*a* to aid in maintaining the head 25 of pivoting bolt 12 and the cotter pin 27 from the arms of supporting bracket 24. Accordingly, the current will be prevented from entering the supporting means of my collector device or any part of the cab or frame to which it is connected.

In the illustration of Fig. 1 my collector device is shown as pivotally mounted in the depending bracket 24 with the beveled collector shoe contact surface 14 illustrated in its normal position of sliding contact with a supported downwardly extending rail 30, and in which the said rail 30 is illustrated in cross section and suitably mounted upon a supporting truss or post 31, only a fragment of which is illustrated, and which also supports a traction rail 32 which is also shown in cross section therein.

Reference numeral 33 designates an illustrative end fragment of a conventional frame, and numeral 34 designates an end fragment of an axle on which is mounted a conventional traction wheel 35, it being understood that said axle of said traction wheel is operatively connected to conventional driving means (not shown). Reference numeral 36 illustrates diagramatically a fragment of a conventional electric motor which is normally positioned in any suitable manner and desirable location with respect to the portable frame and cab. The cable 17, only a fragment of which is illustrated in the upper right hand portion of Fig. 4, leads to and is connected to the electrical power unit of the portable cab, one diagmamatic illustration of which power unit is illustrated at 36 in Fig. 1.

The contact shoe member A is readily and easily removed from the counterweight body B by simply raising the counterweight upward and away from the elongated end portion of the collector shoe and disengaging the collector shoe member from the pin or bolt. The simplicity of removal of the contact shoe member from the counterweight body reduces the cost of labor in making necessary replacements, repairs and reconditioning of parts or of the several units of my collector shoe device.



I am aware that various changes may be made in the embodiment of the invention herein specifically described without departing from or sacrificing any of the advantages of the invention or any features thereof, and nothing herein shall be construed as limitations upon the invention, its concept or structural embodiment as to the whole or any part thereof.

What I claim is:

1. A collector shoe device having two main members comprising an elongated collector shoe member having a transversely extending recess intermediate its ends and having a collector shoe integral with one end thereof adapted to engage a conductor rail, and a counterweight member having one end portion recessed to form two arms with transversely aligned passages therein for the reception of a pin when the device is operatively connected and an undercut flat topped recess, said two main members adapted to be normally held in their proper relative position by linking the counterweight member to supporting means by a pin extending through said passages, and placing the collector shoe member at its recess over the pin with the end opposite said shoe extending under and into the flat-topped recess of said counterweight member.

2. A collector shoe device having two main members comprising an elongated collector shoe member having a transversely extending recess intermediate its ends and having a contact surface at each end thereof; a counterweight member having one of its ends bifurcated to form two arms, said arms having transversely aligned passages therein; a pin removably mounted in said apertures of said arms and extending through said recess of said collector shoe member, said collector shoe member being normally pivotally mounted on said pin and being separably removable; an apertured bracket for supporting said pin, said pin being mounted in the apertures of said bracket, the other end portion of the counterweight member having a portion thereof engaging the collector shoe member at its end opposite the contact surface end to normally hold said collector shoe member in contact with an electrical conductor unit.

3. In a col'ector shoe device, supporting means adapted to be fixedly connected to a movable carrier or the like, the combination comprising an elongated collector shoe member having a transversely extending recess intermediate its ends and having a contact surface on one face of said member at one end thereof, the recess thereof being slightly rounded to allow for rocking motion as the collector shoe member travels over a rail or conductor unit; an elongated counterweight member having an inner end portion and having its opposite end bifurcated and having transverse passages adjacent the end of said bifurcated end, a pin removably mounted in said supporting means and in said passages of said counterweight member, the collector shoe member being removably connectable with and to the counterweight body by placing its recessed portion over the pin and its other end portion under and into engagement with the inner end portion of the counterweight member.

4. A collector shoe device comprising an elongated collector shoe member having a transversely extending recess intermediate its ends and having a collector shoe on one end thereof, the said recess being slightly rounded to allow for rocking motion as the collector shoe passes over a rail; an elongated counterweight body having

one end bifurcated and having a recessed portion opening into said bifurcation, said bifurcated end having transverse aligned apertures; a pin removably mounted in the apertures of said counterweight body and extending through said recess of said collector shoe member, said collector shoe member being removably connected to and pivotally mounted with respect to said pin, said pin normally rockably engaging said collector shoe member recess; a metal contact element mounted in said recessed portion of said counterweight member facing downwardly; and a metal contacting element mounted on the adjacent end portion of said elongated collector shoe member.

5. In an easily removable collector shoe device, a member forming a counterweight having one end bifurcated and terminating in two passaged arms, and having a longitudinal recessed portion extending into said bifurcation, said bifurcated end being connectable to supporting means; a pin removably mounted in the passages of said arms; a bracket in which the ends of said pin are supported; an elongated collector shoe member having a longitudinally extending contact arm



formed integral therewith, said arm having a transversely extending downwardly opening and slightly rounded recess intermediate its ends normally engaging said pin to provide for rocking-like engagement thereof; and a contact element on said arm normally contacting the surface partially defining the recessed portion on said counterweight, the said counterweight member being adapted to normally hold the upper and outer portion of said collector shoe in contacting engagement with an electrical power carrier unit.

ALFRED MORNINGSTAR.

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