Mar. 27, 1923. 1,450,141

E. A. DAVIS

SUPPORT FOR ELECTRIC CURRENT COLLECTOR SHOES

Filed April 30, 1921

Fig. 1

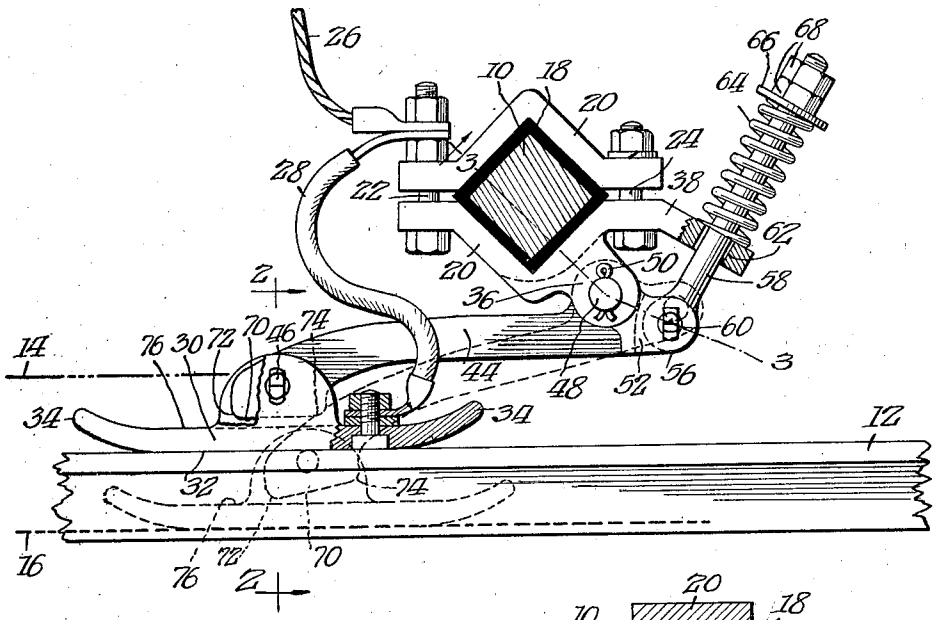



Fig. 2

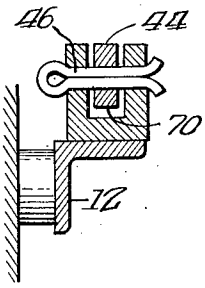
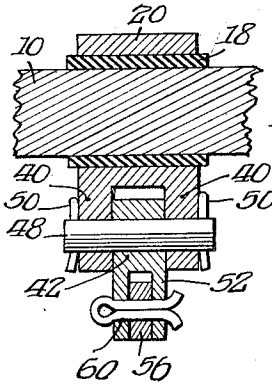



Fig. 3




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# UNITED STATES PATENT OFFICE.

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## SUPPORT FOR ELECTRIC-CURRENT-COLLECTOR SHOES.

Application filed April 30, 1921. Serial No. 465,791.

*To all whom it may concern:*

Be it known that I, ELMER A. DAVIS, a citizen of the United States, residing at Harvey, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Supports for Electric-Current-Collector Shoes, of which the following is a specification.

In a traveling crane the girders are equipped with a set of longitudinally extending current carrying bars, frequently angle irons. Above on the crane girders travels a trolley which thru electrically propelled apparatus handles the load for the crane. This mechanism has to be supplied with electric current taken off from said current carrying bars. As the trolley frequently has a load weighing many tons—sometimes of dangerous hot molten metal suspended from it—it is absolutely necessary for the safety of the load and the men working around the path of travel of the crane that collector shoe means be provided for insuring a continuous flow of electricity from the current carrying bars to the electrical apparatus without interruption of any kind, due to failure of contact between the shoe and said bar or bars. Owing to the fact that the current carrying bars in use are almost sure to warp out of alignment along the side of the trolley, and as the trolley in traveling along the crane girder necessarily has a certain amount of side sway which all cars have in traveling irregular rails, it is necessary to provide a mounting for the current collecting shoe which travels on the current carrying bars which will allow a mis-alignment of two or three inches between parts carried by the trolley and said current bar and yet under all conditions maintain such contact that a uniform current will pass from the current carrying bars thru the collector shoes to the electrical apparatus of the trolley.

The invention hereafter set forth is especially applicable to crane mechanism and it will, therefore, be so described, but it may be used in other apparatus without departing from the invention.

The object of the invention is to provide a mechanism which is capable of producing the desired result described. The invention consists in such means which can be easily and cheaply made, which is positive in operation and not readily liable to get out of order and more particularly in many features and details of construction to be hereafter more fully set forth in the specification and claims.

Referring to the drawings in which like numerals denote like parts thruout the several views,

Figure 1 is a plan view from a crane on which it is mounted of mechanism illustrating this invention in its preferred form applied conventionally to essential crane parts.

Figure 2 is a sectional detail view on the line 2—2 of Figure 1.

Figure 3 is a corresponding detail view on the line 3—3 of Figure 1.

Figure 1 shows in section a conventional form of collector mechanism supporting pole 10 ordinarily extending vertically up the side of a traveling crane girder and a current carrying bar 12 extending along the side of the crane girder. In conventional practice, these two parts 10 and 12 are movable to and from each other as viewed in Figure 1. in the manner and for the reasons described a distance of about four inches represented in its extreme limits by the dotted lines 14 and 16. The collector bar is shown in full lines in normal or mid position between these limits.

The pole 10 is enveloped in a fibre or other insulating member 18 about which is clamped a collector shoe support 20 of conventional form detachably secured in place by bolts 22 and 24. One of these bolts as 22 has detachably secured to it by conventional means a current carrying wire 26 leading to the electric mechanism of the trolley and it also has connected to it and to said wire 26 a flexible cable 28 leading to the current collector shoe 30 adapted to travel along current carrying bar 12. Attention is called to the fact that this collector shoe 30 is of considerable length in its surface 32 of contact where, between its outwardly turned ends 34 it engages the adjacent side of the collector bar 12, thus insuring uniform travel of current from the bar to the shoe in all positions of the shoe along the bar, and doing away with irregularities in current delivery which take place when the surface 32 is reduced to practically a line contact across the bar as in some prior constructions.

Projecting from the lower portion of gripping mechanism 20 are two bracket arms 36 and 38, the lower one separating into two parallel arms 40 between which enters a lug 42 between the ends of a lever of the first class to whose free swinging longer end 44 the collector shoe 30 is pivoted by any suitable means as for instance cotter pin 46. Lug 42 is pivotally mounted between the members 40 by a pin or shaft 48 carrying in the particular case here illustrated cotter pins 50. Projecting from the lever 44 in proximity to this pin 48 and in proximity to the arm 38, heretofore described, is a short lug or arm 52, in the particular case here illustrated, recessed at one side, as shown in Figure 3, to receive the looped end 56 of a bolt 58 pivoted on a cotter pin 60 passing also through the member 52. This bolt 58 passes thru a somewhat enlarged perforation 62 in bracket 38 and has on its opposite side coiled spring 64 bearing against a washer 66 detachably adjustable by nut 68 threaded onto the bolt.

The long lever end 44 which carries the cotter pin 46 is made with a relatively long flat surface 70 extending parallel with the upper surface 76 of a shoe 30 and fairly close thereto so that the rounded ends 72 and 74 of that surface prevent the shoe 30 from swinging very far out of the normal position shown in the drawings, with reference to the lever and with reference to the bar 12. As shown in the dotted line position of arm 44 in Figure 1, the corner 72 closely approaches the upper surface 76 of the shoe and thus insures that on any further downward movement of the parts as in Figure 1, corner 72 will strike the surface 76 to prevent further angular movement of the lever with reference to the shoe.

Special attention is called to the fact that the effective lever arm 42, viz, the distance between the center of pin 48 and the center of cotter pin 60, as shown in Figure 1, is approximately parallel to the arm 38 and at right angles to the axis of bolt 58, the result being that as the lever mechanism 44 and parts attached to it swing about the axis of pin 48, the spring produces practically uniform pressure of the shoe 30 on collector bar 12 in all positions of movement of the bar 12 between the lines 14 and 16.

The structure here shown, described, and hereafter claimed is one actually in use under the conditions described in this application and actually produces satisfactory results to the elimination of other prior devices which cause no end of trouble in the operation of the crane mechanism.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. In mechanism of the class described, a support for attachment adjacent to a traveling crane, a lever of the first class pivoted to the support, a collector shoe pivoted to one of the ends of the lever, a bolt pivoted to the other end of the lever, and extending away from said lever, a spring on the bolt, means on one portion of the bolt for adjusting the position of one end of said spring and a stationary part of said support engaged by the other end of the spring.

2. In mechanism of the class described, a support for attachment adjacent to a traveling crane, two generally parallel bracket arms extending therefrom, a lever pivoted intermediate of its ends to one of said bracket arms, a collector shoe pivoted to one of the ends of said lever, a bolt pivoted to the other end of said lever and extending beyond the other bracket, a spring bearing on the last mentioned bracket, acting along the bolt, and means for adjusting the control of said spring.

3. In mechanism of the class described, a support for attachment adjacent to a traveling crane, two generally parallel bracket arms extending therefrom, a lever pivoted intermediate of its ends to one of said bracket arms, a collector shoe pivoted to one of the ends of said lever, a bolt pivoted to the other end of said lever and extending beyond the other bracket, a spring bearing on the last mentioned bracket, acting along the bolt, and means carried by the bolt for adjustably compressing said spring.

4. In mechanism of the class described, a pole gripping mechanism, two generally parallel bracket arms extending therefrom, a long lever pivoted near one end to one of said bracket arms, a collector shoe pivoted to the free end of the lever which is farthest from the pivot point, a bolt pivoted to the other end of said lever, and extending thru a perforation provided for it in the other said bracket, a spring embracing said bolt and bearing on said last mentioned bracket, and means at the end of said bolt for adjustably compressing said spring, all of the parts being arranged as shown and described, for the purposes set forth.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

ELMER A. DAVIS.

Witnesses:
J. S. TOWNSEND,
GEO. E. GERLACH.