(No Model.)

W. CHAPMAN & P. W. DAVIES.

CURRENT COLLECTING DEVICE FOR ELECTRIC RAILWAYS.

No. 560,472. Patented May 19, 1896.

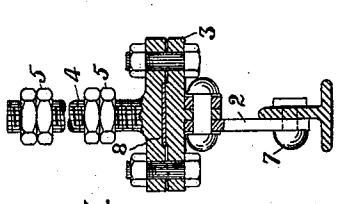

Fig. 3.

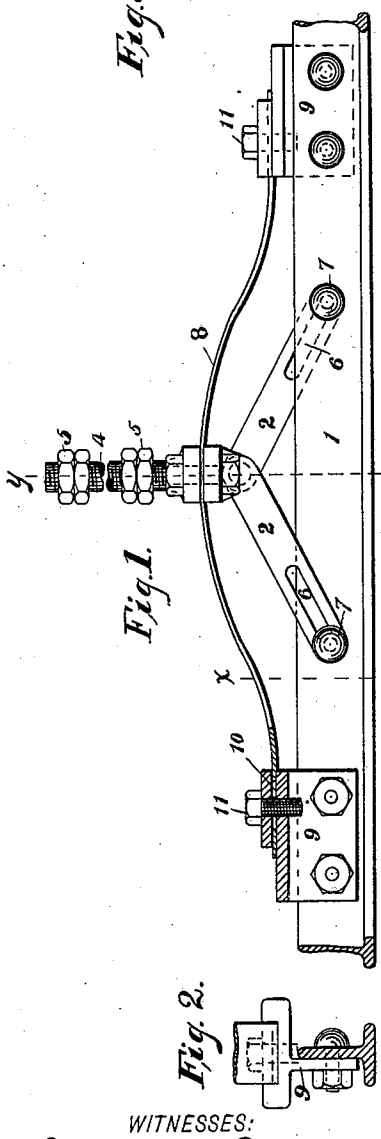

Fig. 1.

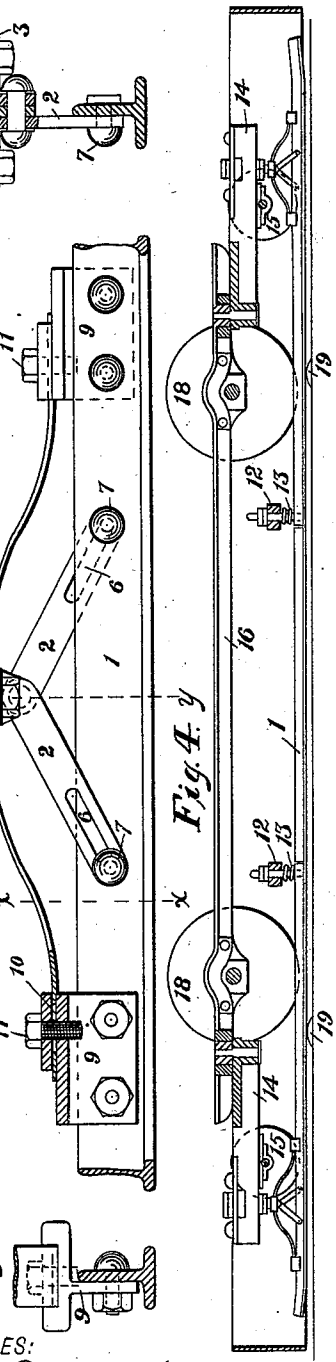

Fig. 4.

Fig. 2.

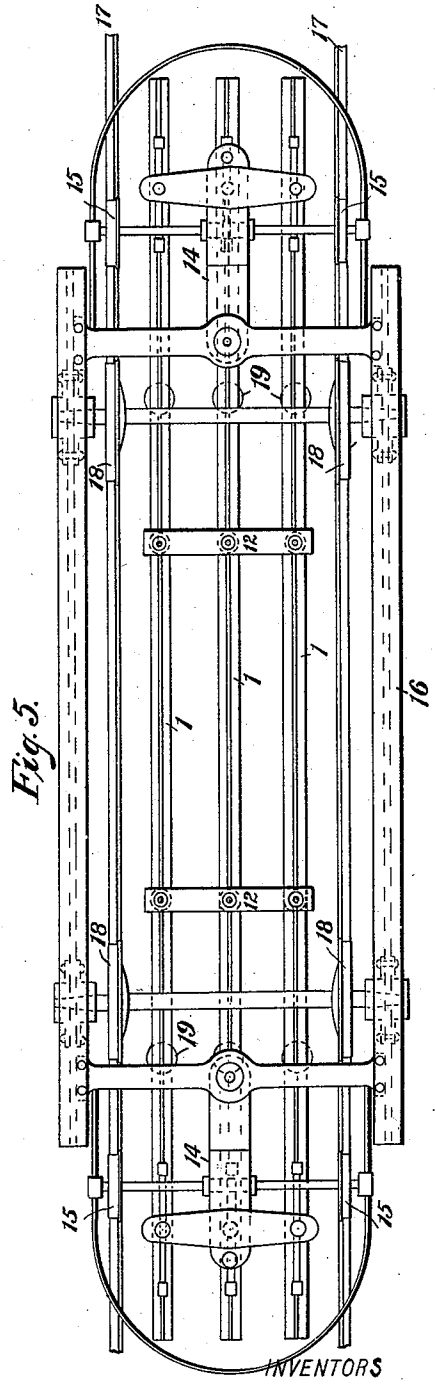

Fig. 5.

WITNESSES:

Ethan D. Dodd

Hubert C. Tener

INVENTORS

Wm. Chapman & P. W. Davies

BY

Terry, MacKaye & Carr

ATTORNEYS.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

UNITED STATES PATENT OFFICE.

WILLIAM CHAPMAN AND PERCY W. DAVIES, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNORS TO THE ELECTRO-MAGNETIC TRACTION COMPANY, OF SAME PLACE.

CURRENT-COLLECTING DEVICE FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 560,472, dated May 19, 1896.

Application filed July 29, 1895. Serial No. 557,468. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM CHAPMAN, a citizen of the United States, and PERCY W. DAVIES, a subject of the Queen of Great Britain and Ireland, residing at Washington, in the District of Columbia, have invented a new and useful Improvement in Current-Collecting Devices for Electric Railways, (Case No. 656,) of which the following is a specification.

Our invention relates to electric railways, and more particularly to that class in which the electric current is collected from isolated contacts arranged at intervals along the roadway by means of collecting-bars supported and carried by the car-truck, such a system being set forth in the patents to Malone Wheless, No. 524,773, of August 21, 1894, and No. 534,238, of February 12, 1895.

The objects of the invention are, first, to provide a means for supporting the collecting-bars which shall limit their downward movement, but which shall permit a vertical upward movement in case the bars should come into contact with obstructions or in case there should be some variation in the elevation of the contact-pins with reference to the car-track; second, to provide a spring connection between the collecting-bars and the car-truck whereby the bars will be pressed against the stationary contacts and a good electrical contact therewith thus secured and all objectionable noise due to the jumping or rattling of the bars avoided, and, third, to provide means whereby the collecting-bars may be so guided with reference to the car-track as to be at all times in position to engage with the contact-pins of the roadway, whatever may be the curvature of the track, without modifying the size or position of such contact-pins. With these ends in view we have devised the improvements illustrated in the accompanying drawings, in which—

Figure 1 is a view, partly in side elevation and partly in section, of a portion of a collecting-bar and its supporting means. Fig. 2 is a detail sectional view taken on line *x x* of Fig. 1, and Fig. 3 is a similar view taken on line *y y* of Fig. 1. Fig. 4 is a view, partially in side elevation and partially in section, of a car-truck equipped with our improvements; and Fig. 5 is a plan view of the same.

Referring now in detail to the drawings, 1 is a collecting-bar, which extends approximately from one end of the car to the other, but which may be made of any convenient length adapted to the road in connection with which it is intended to be used. We have shown in the present case three of these collecting-bars carried by the car, but it is obvious that only two need be employed where the rails are employed as return-conductors. Each of the rails 1 is preferably of T shape in cross-section and has upturned ends, as shown, and is supported at each end by means of a pair of links 2, pivoted to a supporting-bracket 3, which in turn is supported by the truck-frame, a bolt 4 and nuts 5 being shown for this purpose. Each of these links 2 has a longitudinal slot 6 extending from its lower end upwardly for some distance, and the rail is provided with headed bolts or pins 7, which extend through these slots and are free to slide therein.

It will be readily understood that with this construction the conducting-bar is limited in its downward movement by the engagement of the bolts 7 with the lower ends of the slots 6, but that it may rise a considerable distance when necessary. This construction is particularly useful for the reason that the collecting-bar may engage with obstructions or may be pressed upward by means of inequalities in the elevation of the contact-pins in the roadway. It is obvious that a supporting means of different construction from that shown, but which would permit of the elevation of the bar whenever necessary, might be employed, and I therefore do not desire to limit my invention to the particular form of supporting means shown in the drawings.

In order to insure good electrical contact between the collecting-bar and the contact-pins and to obviate the noise which would otherwise be incident to the apparatus when running at high speed, I provide a leaf-spring 8, the middle portion of which is clamped between the two parts of the bracket 3. The

ends of the spring are supported by brackets 9, the latter being bolted to the collecting-bar, as shown in Figs. 1 and 2. Each end of the spring is provided with a slot 10, through which passes a bolt 11, the engagement between the spring and the walls of the aperture in the bracket 9, through which it extends, being sufficiently loose to permit a longitudinal movement of the spring ends within the limits determined by the length of the slot 10. This construction is obviously necessary in order to permit the collecting-bar to rise. The spring is of sufficient strength, however, to perform its function of steadying the collecting-bar to the necessary degree.

A rigid collecting-bar extending substantially throughout the length of the car and supported as above described is admirably adapted for use in connection with roads which contain no considerable curves. Where there are curves, however, it becomes necessary either to place the pins in different positions with reference to the tracks to enlarge their contact-surface or to provide some means whereby the bars may be so guided as to conform approximately to the curve of the track. In many if not all cases the last-named arrangement is desirable, and in order to meet the requirements in such cases we have devised the improvement shown in Figs. 4 and 5, in which each collecting-bar is made in three lengths or sections, so jointed together that the end sections may have a horizontal swinging movement to any necessary or desired degree with reference to the middle section. The jointed collecting-bars are preferably connected together at the joints by means of cross-bars 12, a spring 13 being interposed between each joint and such cross-bar, as shown in Fig. 4.

The means for supporting the end sections are preferably those above described; but in addition to such means and the jointing of the conducting-bars just described we provide an auxiliary truck-frame 14, supported upon small guiding-wheels 15. This auxiliary truck-frame 14 is pivoted to the ends of the main truck-frame 16, the small truck-wheels 15 being supported upon and guided by the main track-rails 17, on which run the main truck-wheels 18.

It will be apparent from the description above given that the contact-pins 19 may be all of the same size and have the same location with reference to each other and the car-tracks and that the small truck will serve to guide the ends of the collecting-bars, so that they will always make the necessary contact with the pins.

Where long cars and double main trucks are employed, it may be necessary and advisable to use a different number of supplemental trucks and to locate such supplemental truck or trucks differently with reference to the main truck and the sections of collecting-bar. Hence we desire to be understood that our invention is not limited to any particular number or location of supplemental guiding-trucks.

Whatever may be the construction or dimensions of the collecting-bars, it is necessary to so locate the contact-pins with reference thereto that the bars shall remain in contact with the pins which they are leaving long enough after the engagement of the other ends of the bars with the next succeeding pins to enable the switches coöperating therewith to act and make the necessary connection with the feeding-conductor. This is particularly necessary when the car is running at a high rate of speed, and the distance will be determined for each particular road in accordance with the length of the collecting-bars employed and the maximum speed at which the cars are to be run.

For convenience of description we have herein employed the term "collecting-bar" to designate both the auxiliary and main circuit contact-bars.

We claim as our invention—

1. In an electrically-propelled vehicle, the combination with a collecting-bar, of a plurality of pairs of supporting-links pivoted to the vehicle-truck at their upper ends and having a sliding engagement with the collecting-bar at their lower ends.

2. The combination with a traveling collecting-bar, of a curved leaf-spring rigidly fastened substantially midway of its ends to the car-truck and having a sliding engagement at its ends with the bar whereby the latter is held in yielding engagement with stationary contacts in the roadway.

3. In an electrically-propelled vehicle, the combination with a collecting-bar, of supporting-links pivoted to the truck and having a movable sliding connection with said bar and a spring supported by the truck and having a movable engagement at its ends with the bar whereby the latter is held in yielding engagement with the stationary contacts.

4. The combination with a car-truck, of a current-collecting bar, two pairs of links pivoted to the truck and having a sliding connection with the bar, a pair of springs supported by the truck and having a sliding connection with the bar.

5. The combination with a car-truck, of a current-collecting bar, a pair of links at each end of the bar pivoted together and to the truck at their upper ends and each having a slot-and-pin connection with the bar at its lower end, and a spring at each end of the bar rigidly attached at its middle to the truck and having a limited sliding connection with the bar at its ends.

6. The combination with a car-truck and jointed collecting-bars, of a supplemental truck for guiding said collecting-bars.

7. The combination with a car-truck, of a supplemental truck pivoted to each end there-

of, jointed collecting-bars and means for connecting the end sections of the bars with the supplemental trucks.

8. The combination with a car-truck, of supplemental trucks pivotally connected to its ends, a plurality of jointed collecting-bars the end sections of which are supported by the supplemental trucks, and means for connecting the bars together at the joints.

In testimony whereof we have hereunto subscribed our names this 26th day of July, A. D. 1895.

WILLIAM CHAPMAN.
PERCY W. DAVIES.

Witnesses:
WESLEY G. CARR,
HUBERT C. TENER.