No. 767,863. PATENTED AUG. 16, 1904.

A. E. BROWN.

ELECTRICAL LOCOMOTIVE.

APPLICATION FILED APR. 20, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

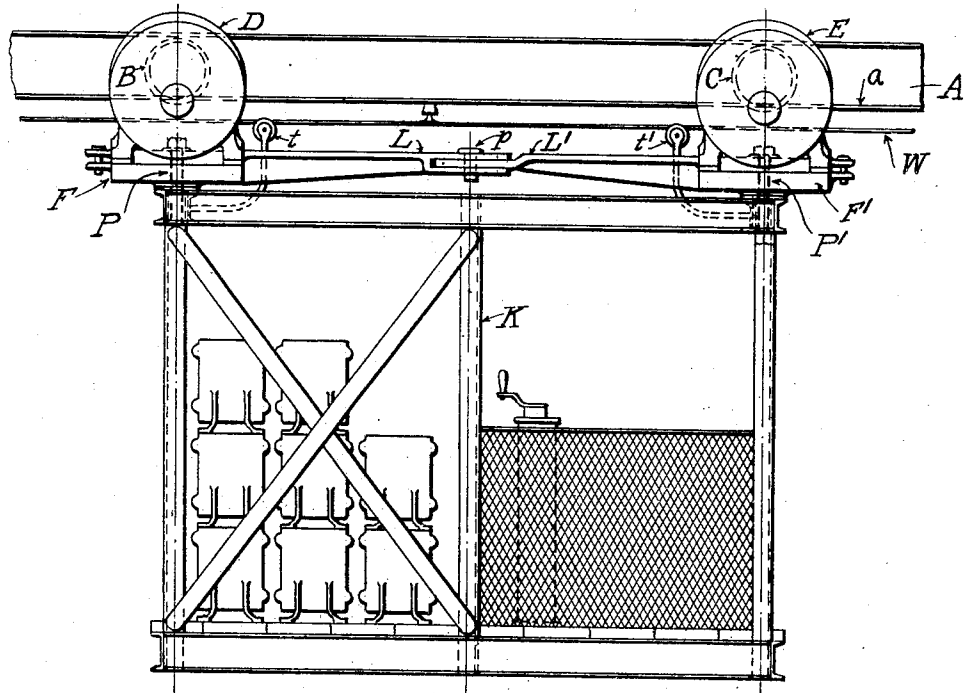


Fig. I.

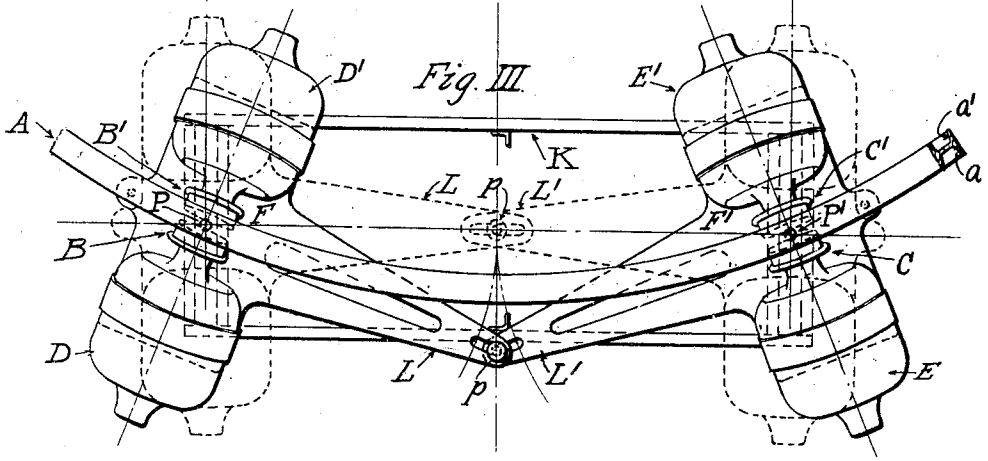


Fig. III.

WITNESSES:

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NO MODEL. 2 SHEETS—SHEET 2.

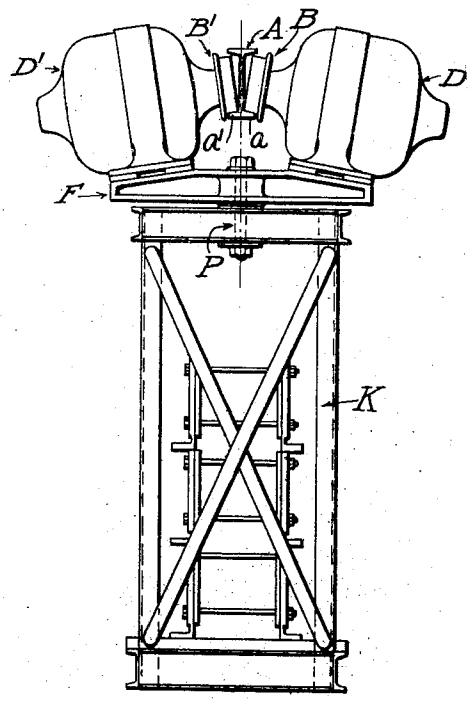


Fig. II

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No. 767,863. Patented August 16, 1904.

UNITED STATES PATENT OFFICE.

ALEXANDER EPHRAIM BROWN, OF CLEVELAND, OHIO, ASSIGNOR TO THE BROWN HOISTING MACHINERY COMPANY, OF CLEVELAND, OHIO, AN INCORPORATED COMPANY.

ELECTRICAL LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 767,863, dated August 16, 1904.

Application filed April 20, 1904. Serial No. 203,995. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER EPHRAIM BROWN, mechanical engineer, a citizen of the United States, residing at Cleveland, Ohio, have invented a certain new and useful Electrical Locomotive, as to which I hereby declare the following is a full, clear, and exact description, due reference being had and intended to the several drawings accompanying this specification and which I mean to have considered as a part of the same.

My invention relates more particularly to that class of mechanical implements above named which are suspended from an I-beam by a series of two sets or pairs of wheels, the members of which pairs are severally mounted and travel upon opposite flanges of said I-beam and are, furthermore, directly connected with a motor specially provided for the purpose of driving the same. The main and important difficulty that is encountered in the operation of an electric motor of this type is in traversing curves that occur in the horizontal plane of the track. In such cases the tracks for the two wheels being similar arcs, but with radii of different lengths, the outer track or flange is longer than the inner, and in consequence the distance to be traversed by the outer wheel in a given time and by a fixed number of revolutions is greater than that to be traveled under the same conditions by the inner wheel. It is manifest, therefore, that in passing a curve under the above circumstances a pair of wheels whose axes are fixed in the same line one with respect to the other will invariably shift the center of their motion from that of the arcs of their flanges or tracks. In other words, the inner wheel will reach a given point on its track before the outer wheel has attained the same relative point, and the flanges of each wheel will thereby be forced into a close bearing and binding contact with the sides of its track.

It is the object and purpose of my present invention to provide a locomotive of the above class wherein the binding action of the wheels just referred to is greatly modified and reduced to the minimum. I accomplish this object and purpose by the mechanical arrangement I shall now proceed to describe, having reference to the accompanying drawings, wherein in each case similar parts are denoted by similar letters.

In said drawings, Figure I is a side view or sketch of said locomotive when mounted upon its I-beam rail. Fig. II is a front view or sketch of the same, and Fig. III is a down plan view of a truck composed of a series of two pairs of wheels for my said locomotive so placed that the axes of the wheels in each case are radial to the curve of the track on which they are mounted. The dotted lines indicate the normal position of the same on straight tracks.

A is a suspended I-beam whose flanges *a a'* constitute an overhead track for any desired distance upon which the locomotive is to travel and be operated.

B B' and C C' are the supporting or driving wheels on which said travel is made, and D D' and E E' are motors, with whose shafts, respectively, said wheels are directly connected. Said motors are firmly fixed in place on opposite sides of the I-beam A upon the top of a platform-like frame or part F and F'. Said frames F F' project or are prolonged inwardly from each pair of wheels B B' C C' to which they severally pertain into arms or lever-like members L and L', which latter are movably coupled or linked together at their inner extremities by the pin *p*, passing through suitable slots for the purpose.

K is a cage to contain and carry the rheostats and controller and the operator himself. At or near each end of the same the cage K is connected to the frames F F', beneath the wheels and motors, by the bolts or pins P P', that loosely pass through holes in said frame and cage at the proper points therefor.

W is the trolley-wire beneath the track, and *t t'* indicate trolleys properly led to the cage below.

The mode of operation of my said device is as follows: When the trucks are traversing a horizontal curve in the overhead track A, the axes of the front truck carrying the wheels B and B' for the reason heretofore referred to will tend to depart more and more from a ra-

dial with the curve of the track. The motors D and D′ (as well as the motors E and E′) are each regulated by the same controller and must consequently travel and cause said wheels to travel at all times at an equal pace; but the space to be covered by the wheel B in the same time and with the same speed as the wheel B′ is the greater, and relatively to the course each wheel has to travel along the curve the wheel B′ will therefore more and more tend to cover more degrees of the curvature of the track than its companion wheel B and to bring the line of their axes without or crosswise of the radius of their track. Under these circumstances by reason of the rigid connection of the two wheels with the frame F and the latter's pivoted connection by the bolt P with the cage K the truck carrying the wheels B and B′ will tend to swivel about said bolt and to a degree that if not overcome would bring said wheels into close contact with their tracks at an angle that would effectually brake further progress. With the tendency, however, on the part of the wheel B′ and its motor D′ just pointed out to advance and the consequent swivel of the frame F the arm of the lever L will correspondingly tend to be deflected inwardly toward the center of the track curve and being jointedly coupled to the similar arm or lever L′ to carry with it said lever L′ and the companion truck or pair of wheels C and C′, to which said lever L′ pertains. This latter or rear pair of wheels, however, have meanwhile been tending from the normal in the same manner and to the same degree as the front pair, but with the manifest difference that while such rear pair has thus tended to swivel about the bolt or pin P′ the arm or lever L′ has tended to be deflected outwardly from the center of the track curve and in direct opposition to the tendency of the lever L, to which it is movably linked. The result is that the combined movements or efforts of said levers L L′ under the circumstances described is to regulate or distribute any aberrations on the part of said trucks and to prevent the flanges of their wheels from coming into a binding or undue bearing with the tracks. Should the arc or curve of the track encountered by the front truck become less acute, for instance, than that portion for the moment being traversed by the rear truck, it is plain that the front truck will at once adjust itself nearer to the normal or straight-track position, and thereby increase the inwardly-pulling effect of the lever L upon the lever L′ and correspondingly rectify the position of the rear truck. In like manner when the front truck first encounters a curve the normal position of the rear truck, which is still upon a straight track, will, through the action of its lever L′, hold the front truck closer to the proper radial.

Although I have a working device embodying my invention that employs a series of two-wheel trucks, it is manifest that a large number of wheels could be used without departing from my invention and that an electrical locomotive could be made without the scope of the invention that in other respects varied the form and detail of that which the drawings set forth. I do not intend, therefore, to limit my invention to the precise arrangement these specifications describe, but mean that it shall include any adaptation whereby electrically-driven wheels are arranged in pairs with equalizing connecting members between the same of the same general character and function as those I have shown.

What I claim, and desire to secure by Letters Patent, is—

An electrical locomotive for travel upon an overhead I-beam, or like trackway, having suitable electric connections, composed of two pairs or sets of supporting-wheels upon said trackway, the wheel members of said pairs or sets being mounted upon the opposite flanges of said track and directly connected with driving-motors provided for the purpose; a frame or base beneath and connecting each pair of wheels; a suitable body or cage suspended from said frame or base by a swivel-like connection, and, an arm or lever-like part on each of said pairs jointedly coupled or linked one with the other, substantially as shown and described.

ALEXANDER EPHRAIM BROWN.

In presence of—
HOWARD A. COUSE,
F. G. TALLMAN.