

No. 823,969.

PATENTED JUNE 19, 1906

E. D. PRIEST.
ELECTRIC LOCOMOTIVE.
APPLICATION FILED JAN. 28, 1905.

Fig. 1.

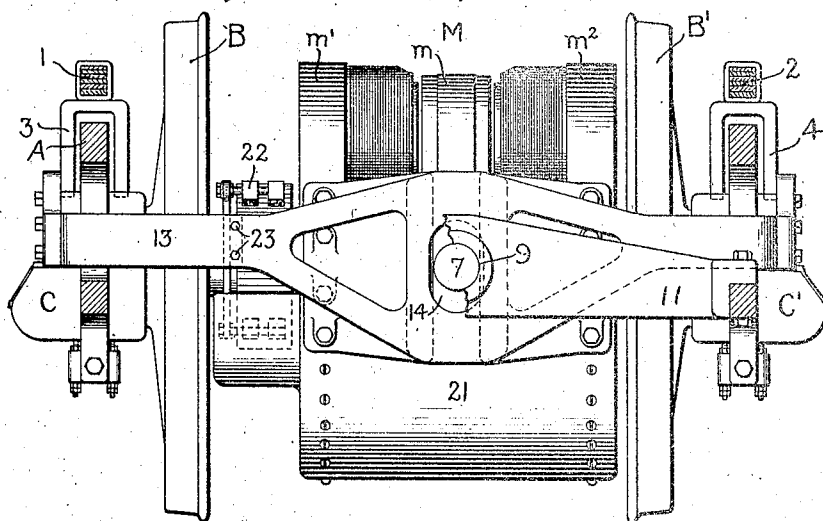


Fig. 2.

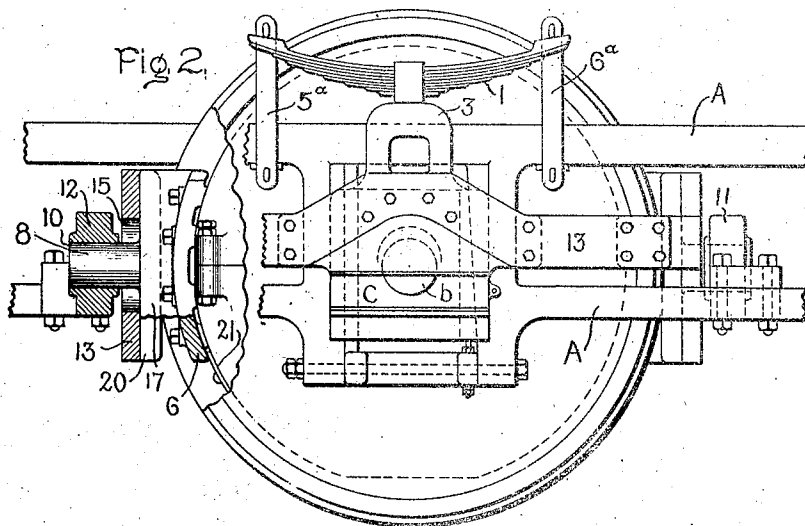
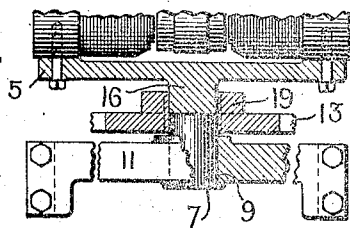


Fig. 3.



Witnesses.

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Att'y.

UNITED STATES PATENT OFFICE.

EDWARD D. PRIEST, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC LOCOMOTIVE.

No. 823,969.

Specification of Letters Patent.

Patented June 19, 1906.

Application filed January 28, 1905. Serial No. 243,000

To all whom it may concern:

Be it known that I, EDWARD D. PRIEST, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Electric Locomotives, of which the following is a specification.

The present invention relates to electric locomotives, and more particularly to a motor suspension for supporting the parts of the propelling-motor in operative relation to the locomotive driving-axle. It is in some cases desirable to mount the motor-armature directly upon the driving-axle, and in such cases the field-magnet structure must be supported independently in operative relation to the armature. The field-magnet structure may be supported directly upon the axle by means of bearings carried thereby and surrounding the axle, or it may be carried directly from the mechanical frame of the locomotive. The first of these expedients is objectionable, inasmuch as it places the weight of the field-magnet as a dead-weight intermediate the ends of the axle and necessitates the use of separate bearings. The second mode of support is inapplicable where the mechanical frame is flexibly supported upon the driving-axle and the field-magnet wholly or partially surrounds the armature or the driving-axle unless the air-gap between the poles and armature is made undesirably large. In my prior patent, No. 625,802, granted May 20, 1899, I have disclosed means for avoiding certain of the disadvantages in prior motor-suspension apparatus by supporting the field-magnet directly from the axle-boxes. By supporting the field-magnet directly upon the axle-boxes the dead-weight of the field-magnet is removed from the central portion of the axle and the armature and field-magnet are always maintained in proper relative position independently of the movement of the locomotive-framework upon the axle. The patented construction necessitates the use of a yoke or yokes passing over the driving-wheels to the axle-boxes when the field-magnet is carried directly from the locomotive-frame when the axle-boxes are placed outside the wheels, a much weaker construction than that in which the field-magnet is supported directly from the main frame, and in any event increases the number of parts

which must be supported in carefully-adjusted positions from the axle-box.

The object of the present invention is to provide means for supporting the field-magnet from the locomotive-framework when the armature is mounted directly upon the axle, together with means for controlling one of the motor parts as the driving-axle moves relatively to the locomotive-framework in such a manner that the pole-faces of the field-magnet structure are at all times maintained in parallelism with the armature.

Further objects of the present invention will appear in connection with the following description thereof.

One form of the present invention is illustrated in the accompanying drawings, in which—

Figure 1 is a transverse section through a locomotive substructure, showing in elevation one set of driving-wheels and a propelling-motor arranged in accordance with the present invention. Fig. 2 is a view, partially in side elevation and partially in cross-section, of the parts shown in Fig. 1. Fig. 3 is a detail of a portion of the motor suspension.

Similar reference characters will be used throughout the specification and drawings to indicate corresponding parts.

I have illustrated the present invention as applied to a locomotive in which the axle-boxes are placed outside the wheels and the motor is one of the disk-armature type. It is of course understood that the axle-boxes may be otherwise arranged with respect to the driving-wheels, and the motor may be of any other suitable or desired type.

A represents the locomotive-framework; B B', a pair of drivers mounted upon the axle b; C C', axle-boxes arranged between the ends of the axle b and the frame A. The frame A is yieldingly supported upon the axle-boxes through elliptic springs 1 and 2, which are carried upon the axle-boxes C C' by means of the yokes 3 and 4 and from the ends of which the locomotive-frame is hung by means of links 5^a and 6^a. These parts may all have any usual or preferred construction, provided only that means is afforded for permitting the axle and the frame to have a slight relative movement.

The motor M consists of the armature or rotor m and the field-magnet or stator mem-

bers $m^1 m^2$. The armature is mounted directly upon the axle b , while the two members of the field-magnet structure are united by plates 5 and 6, secured thereto or forming part thereof. For convenience the connected field-magnet structure or stator will be referred to hereinafter as the "motor-frame." The plates 5 and 6 are provided with trunnions 7 and 8, which are journaled in bearings 9 and 10 in cross-pieces 11 and 12, secured to or forming part of the locomotive-frame A. The field-magnet is therefore pivotally arranged on an axis at right angles to the driving-axle. By making the central openings in the motor-frame sufficiently large the locomotive-frame and axle may move relatively to each other without causing the axle to come into contact with the motor-frame, and if the relative movement is at right angles to the normal position of the axle then the parallelism between the pole-faces and the armature will not be affected. If, however, by reason of irregularities in the rails or road-bed one wheel should drop or be raised so as to tilt the axle, the pole-faces, or some of them; if the motor-frame were rigidly supported from the locomotive-framework, would come into contact with the armature. By arranging the motor-frame so that it may oscillate on axis at right angles to the driving-axle it may be tilted concurrently with the driving-axle in order that the parallelism between the pole-faces and the armature may at all times be maintained. The mechanism for tilting the motor-frame consists of a light yoke 13, secured to or carried by the axle-boxes C C'. The yoke 13 is provided with elongated slots 14 and 15, through which the trunnions 7 and 8 pass in order to permit relative movement between the axle and the locomotive-framework in a direction at right angles to the axle. The plates 5 and 6 are provided with elongated vertical ribs 16 and 17 adjacent the inner ends of the trunnions 7 and 8, and the yoke 13 is provided with inwardly-projecting flanges 19 and 20, which engage with the ribs 16 and 17, respectively. It will be seen that the motor-frame may move vertically with respect to the yoke 13 without interference on the part of the yoke; but if one of the driving-wheels moves up or down without a corresponding movement of the other wheel taking place the flanges 19 and 20 will bear against the sides of the ribs 16 and 17 and will slightly rotate the motor-frame about its axis, thereby maintaining the proper adjustment between the pole-faces and the armature. The lower half of the motor is inclosed by a casing 21; and a similar casing may be placed over the upper half to keep out dirt and moisture. The motor-brushes 22 may be conveniently supported from the yoke 13, as at 23.

Although I have described the present in-

vention as embodied in the best form now known to me, I do not desire to limit it to the particular type of motor illustrated or to details of the suspension except to the extent indicated in the appended claims, since in its broader aspects the present invention may be constructed and arranged in various forms other than the form illustrated and specifically described, and in the appended claims I contemplate covering all modifications within the spirit and scope of the present invention.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an electric locomotive, a driving-axle, a motor-armature mounted upon said axle, a locomotive-framework yieldingly supported upon said axle, a motor-frame having a pole-face carried by said locomotive-framework, and means connected with the axle for causing said pole-face to be maintained in parallelism with the armature during the relative bodily movements of the axle and locomotive-framework.

2. In an electric locomotive, a driving-axle, a motor-armature mounted upon said axle, a locomotive-framework yieldingly supported upon said axle, a motor-frame having a pole-face or pole-faces carried by said framework, and means for tilting said motor-frame to keep the pole face or faces in parallelism with the armature when the axle is tilted relatively to the locomotive-framework.

3. In an electric locomotive, a driving-axle, a bearing member arranged thereon, a locomotive-framework yieldingly supported upon said bearing member, a motor-armature mounted upon said axle, a motor-frame having a pole-face or pole-faces mounted upon said locomotive-framework, and means carried by said bearing member for moving said motor-frame.

4. In an electric locomotive, a driving-axle, a locomotive-framework flexibly supported upon said driving-axle, a motor-armature mounted upon said axle, a motor-frame pivotally supported upon said locomotive-framework, and means for oscillating said motor-frame about its pivot.

5. In an electric locomotive, a driving-axle, a locomotive-framework flexibly supported upon said axle, a motor-armature mounted upon said axle, a motor-frame pivoted to said locomotive-framework, and means carried by the axle for oscillating the motor-frame about its pivot.

6. In an electric locomotive, a driving-axle, a plurality of bearing members mounted thereon, a locomotive-framework flexibly supported upon said bearing members, a motor-frame pivoted to said locomotive-framework, and means carried by said bearing members for oscillating said motor-frame.

7. In an electric locomotive, a driving-axle, axle-boxes mounted thereon, a loco-

tive-framework movably supported upon
said axle-boxes, a motor-armature mounted
upon said axle, a motor-frame movably sup-
ported upon said locomotive-frame, and a
5 yoke carried by said axle-boxes and opera-
tively connected to said motor-frame for
moving the same.

8. In an electric locomotive, a driving-
axle, a locomotive-framework flexibly sup-
10 ported upon said axle, a motor-armature

mounted upon said axle, a motor-frame sup-
ported upon said locomotive-framework, and
means for maintaining a definite angular rela-
tion between the axle and motor-frame.

In witness whereof I have hereunto set my 15
hand this 25th day of January, 1905.

EDWARD D. PRIEST.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.