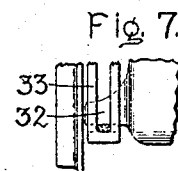
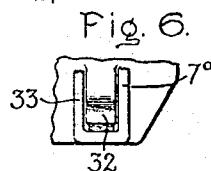
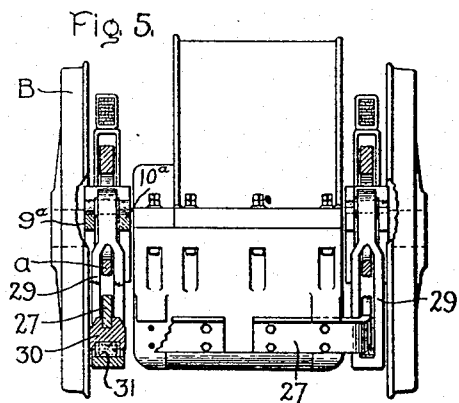
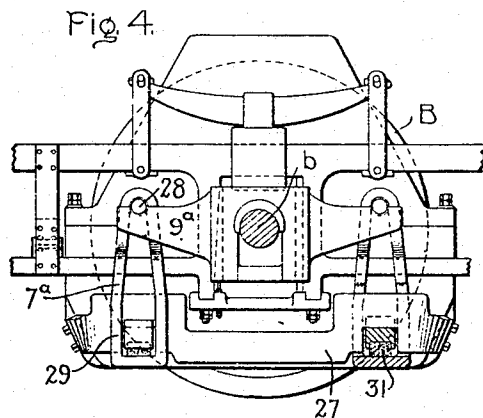
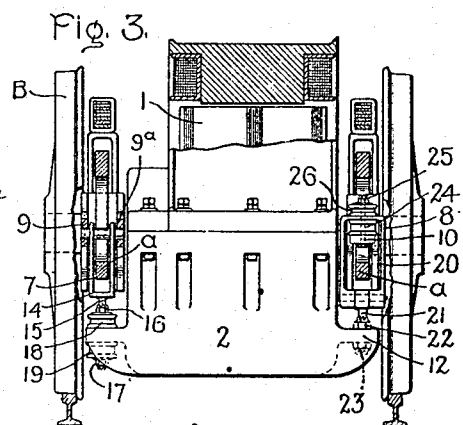
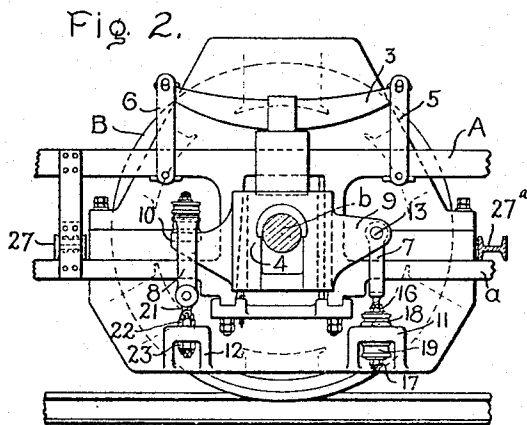
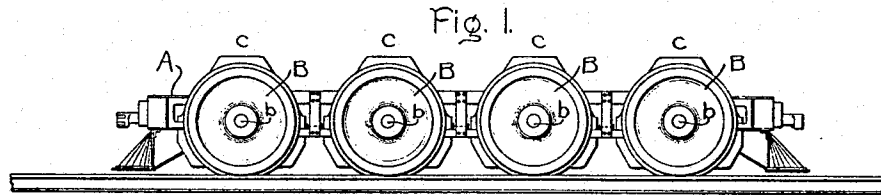


No. 823,968.

PATENTED JUNE 19, 1906.

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



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. 823,968.

Specification of Letters Patent.

Patented June 19, 1906.

Application filed January 28, 1905. Serial No. 242,999.

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 means for supporting the driving-motors in operative relation to the driving-axes.

Where it is desired to mount the motor-armature directly upon the driving-axle of a locomotive, the field-magnet structure must be supported in a manner to maintain a clearance between the pole-pieces and the armature notwithstanding the movements of the driving-axle relative to the locomotive-frame. In case the motor is of the type in which the field-magnet structure fully or partially surrounds the armature it is impracticable to support the field structure from the locomotive-frame, for the reason that the air-gap produced in such an arrangement would be too great to enable the motor to operate efficiently. It is furthermore undesirable to have the field-magnet structure carried as a dead-weight upon the axle between the main bearings of the locomotive or to provide the independent bearings upon the axle for the field-magnet structure which this arrangement would necessitate.

In my Patent No. 625,802, granted May 20, 1899, for railway-motor I have illustrated one form of support for the field-magnet structure or motor-frame whereby it is mounted directly upon the axle-boxes, thereby avoiding the necessity of separate supporting-bearings for the field-magnet structure and removing the dead-weight from the middle portion of the axle.

In one of its aspects the present invention may be considered as relating to improvements in the motor suspension illustrated in my aforesaid prior patent.

In another aspect the present invention contemplates a construction and arrangement of the parts of a motor suspension in such a manner that undue strains in the various members are prevented.

The present invention consists, further, in certain structural details in a motor suspen-

sion to be hereinafter described, and particularly pointed out in the claims.

The present invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a locomotive-frame mounted upon four sets of driving-wheels, each set of which is driven by a motor suspended in accordance with the present invention. Fig. 2 is a side elevation, upon an enlarged scale, of one motor and the means for suspending it, one of the drivers being omitted in order to clearly show the parts. Fig. 3 is a view, partly in section and partly in elevation, of the parts shown in Fig. 2. Figs. 4 and 5 are views corresponding to Figs. 2 and 3, respectively, illustrating further modified forms of the present invention; and Figs. 6 and 7 are views of details showing further modifications.

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

Reference being had to the drawings, A represents a locomotive-frame, B B B B drivers attached to axles b b b b, and C C C C motors arranged to rotate the driving-wheels. Each of the motors consists of an armature or rotor 1, mounted directly upon a driving-axle, and a field structure or stator 2. The part 2 comprises the fixed portions of the motor and will be hereinafter designated the "motor-frame." The frame A is yieldingly supported upon the driving-axes through elliptic springs 3, which rest upon the axle-boxes 4 and upon the ends of which the frame is hung by means of links 5 and 6. All these parts may have any usual or desired construction, since they in themselves constitute no part of the present invention. The wheels are shown arranged outside of the axle-boxes; but the present invention is equally applicable to constructions in which the axle-boxes are outside of the wheels. Instead of causing the motor-frame to rest, as it were, upon the top of the axle-boxes, as in my prior patent previously referred to, I propose to suspend or hang it from the axle-box in such a manner that the point of connection of the suspending means therewith is located below the center of gravity thereof, whereby a very stable form of support is secured. At the same time the suspension is made flexible, so that the motor-frame is ca-

pable of slight movements in any direction, avoiding unnecessary strains in the component parts.

In Figs. 2 and 3 the suspending means consists of hangers 7 and 8, supported from ears 9 and 10, secured to or forming part of the axle-boxes. These hangers are in turn connected to lugs or bosses 11 and 12, projecting from the lower halves of the motor-frames. The hanger 7 is illustrated as hung from a pintle 13, carried by double ears 9 and 9^a, the upper portion of the hanger being forked, as at 14, to enable it to pass the lower chord *a* of the locomotive-frame. The lower end of the hanger 7 is screw-threaded, as at 15. The threaded portion 15 extends through the lug 11, and by adjusting the nuts 16 and 17 on opposite sides of the lug 11 the motor-frame may be properly positioned with respect to the armature. If desired, cushions or springs 18 and 19 may be arranged between the nut 16 and the lug 11 and the nut 17 and lug 11, respectively, in order to provide for taking up the jar occasioned by the travel of the locomotive. Four hangers, similar to hanger 7, may be employed for suspending each motor—namely, two upon each axle-box. The supporting-hangers may all be similar to hanger 8, which differs from hanger 7, in that the pivotal connection is adjacent the lug on the motor-frame instead of adjacent the supporting-ear of the axle-box. The hanger 8 consists of a yoke 20, which surrounds the chord *a* of the locomotive-frame and also the ear 10 upon the axle-box. To the lower end of the yoke 20 is pivotally secured the screw-threaded bolt 21, which passes through the lug 12 and which is provided with nuts 22 and 23 for engaging, respectively, with opposite sides of the lug 12. The upper end of yoke 20 may rest upon the ear 10, or a cushion 24 may be interposed between the yoke and the ear. The yoke is held in position upon the ear by means of a bolt 25, which passes through the two members, and, if desired, a second cushion 26 may be interposed between the head of the bolt and the top of the yoke, whereby the yoke is free to vibrate slightly in either direction from its normal position without straining the bolt. Transverse beams 27^a are secured to the locomotive-frame A adjacent the motor-frames, whereby upon reversing the motor while the locomotive is moving or otherwise loading the motor suddenly the motor-frames may come into contact with the beams and relieve the strain upon the motor suspension.

In Figs. 4 and 5 the motor-frame is likewise suspended flexibly upon the ears 9^a and 10^a of the axle-box; but the structural details are somewhat different from those shown in Figs. 2 and 3. The motor-frame instead of having the suspending-lugs 11 and 12 has secured thereto a pair of yokes 27, which pass across the ends thereof. The hangers 7^a are

pivotally hung from the ears 9^a by means of the pintles 28 28, and the lower ends of the hangers 7^a are formed yoke shape, as at 29, in order to pass the chord *a*. The yokes 27 pass directly through the yokes 29 and are properly positioned therein in any suitable manner, as by means of keys 30, which engage with the yokes 27 and with the two arms of the yokes 29. Cushions 31 may be interposed between yokes 27 and the hangers 7^a.

In Figs. 6 and 7 the motor-frame is illustrated as being provided with lugs 32, which project into yokes 33 in the lower part of the hangers 7^a.

In all of the modifications illustrated the motor-frame is effectually supported in proper relation to the armature and partakes of all the bodily movements of the armature due to the unevenness of the road-bed or other causes resulting from the nature of the use to which the motor is put; but the motor-frame is not rigidly supported in the sense that all shocks and vibrations must be borne by an unyielding structure, provision being made, on the other hand, for permitting the parts to yield to some extent, as occasion may require.

Although I have described the present invention with particularity as embodied in some of its preferred forms, yet I do not intend to limit the present invention to the structural details illustrated and described, except to the extent specified in the appended claims, since in its broader aspects the present invention may be embodied in various forms other than those illustrated.

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

1. In an electric locomotive, a locomotive-frame, a driving-axle, a motor-armature mounted upon and supported by said axle, a bearing member between the locomotive-frame and axle, and a motor-frame suspended from said bearing member.

2. In an electric locomotive, a locomotive-frame, a driving-axle, a motor-armature mounted upon and supported by said axle, a bearing member between the locomotive-frame and axle, and a motor-frame adjustably suspended from said bearing member.

3. In an electric locomotive, a locomotive-frame, a driving-axle, a motor-armature mounted upon said axle, a bearing member between the locomotive-frame and axle, a motor-frame, and suspending means for said motor-frame supported by said bearing member and connected to said motor-frame at a point or points below the center of gravity thereof.

4. In an electric locomotive, a locomotive-frame, a driving-axle, a motor-armature mounted upon said axle, a bearing member arranged between the axle and the locomotive-frame, a motor-frame, and suspending means for said motor-frame supported upon

said bearing member and engaging with the motor-frame adjacent the lower end thereof.

5 5. In an electric locomotive, a locomotive-frame, a driving-axle, a motor-armature mounted upon and supported by said axle, a bearing member arranged between the locomotive-frame and axle, a motor-frame, and a flexible connection between said motor-frame and said bearing member.

10 6. In an electric locomotive, a driving-axle, a motor-armature supported thereon, a motor-frame surrounding or partially surrounding said armature, and a flexible connection between said axle and said motor-frame.

15 7. In an electric locomotive, a driving-axle, a motor-armature mounted thereon, a motor-frame, a bearing member arranged upon said axle, and a plurality of hangers
20 flexibly connecting the motor-frame to said bearing member.

8. In an electric locomotive, a driving-axle, a motor-armature mounted thereon, a motor-frame, a bearing member arranged

upon said axle, a plurality of hangers flexibly 25 connecting the motor-frame to said bearing member, and means for adjusting said frame relatively to said bearing member.

9. In an electric locomotive, a frame, a driving-axle, a motor-armature mounted 30 upon said axle, a bearing member arranged between the frame and axle, a motor-frame, and a plurality of hangers secured to the said bearing member and to the motor-frame at points below the center of gravity thereof. 35

10. In an electric locomotive, a locomotive-frame, a driving-axle, a motor-armature mounted upon said axle, a motor-frame yieldingly supported from said axle, and stops carried by the locomotive-frame for limiting the 40 movement of the motor-frame upon the axle.

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

EDWARD D. PRIEST.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.