(No Model.) 2 Sheets—Sheet 1.

J. F. S. BRANTH.

ELECTRIC LOCOMOTIVE.

No. 506,358. Patented Oct. 10, 1893.

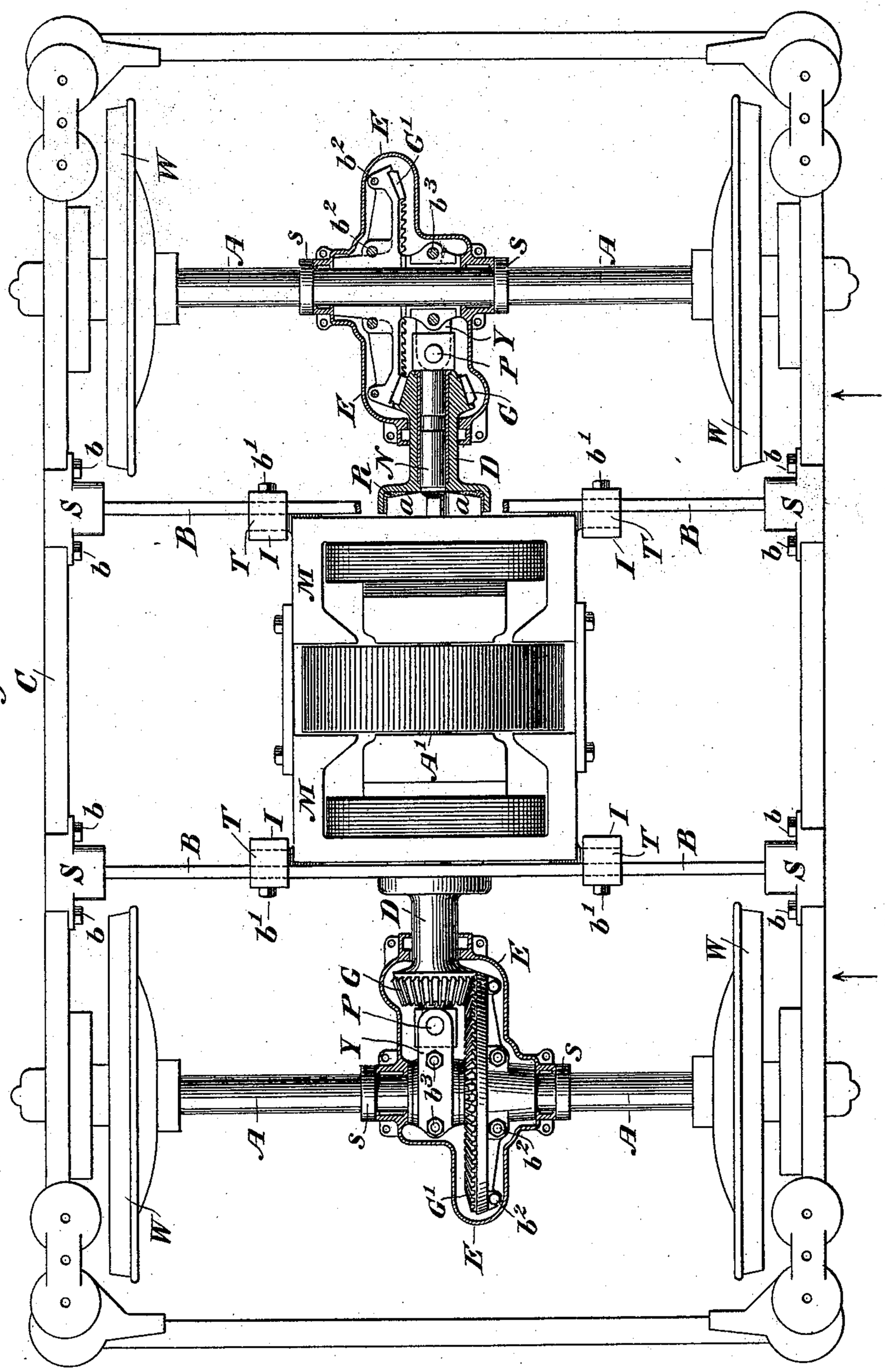

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2,

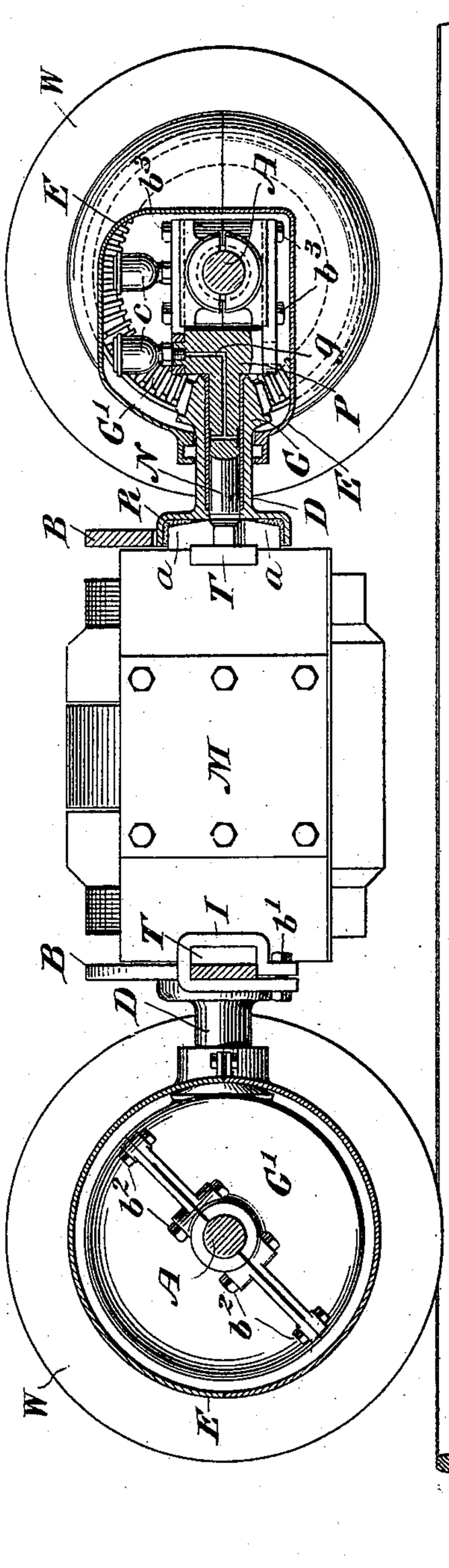


Fig. 6,

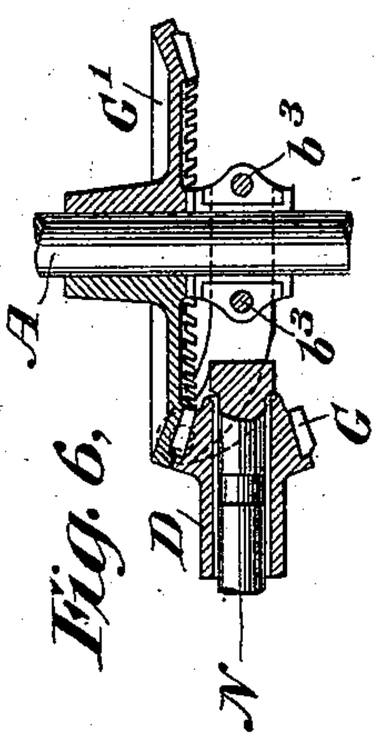


Fig. 7.

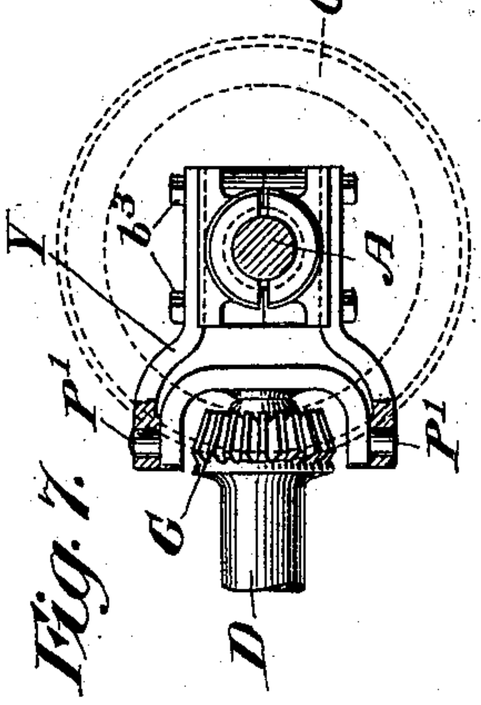


Fig. 4,

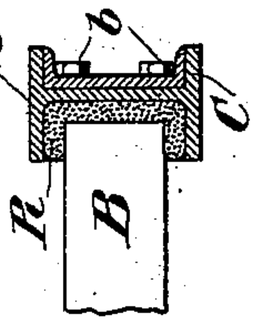


Fig. 3,

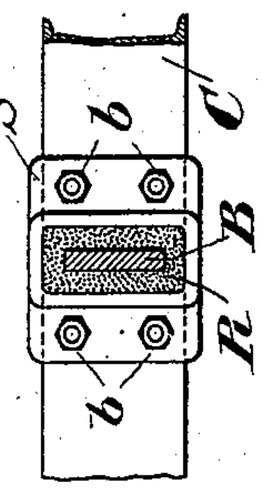
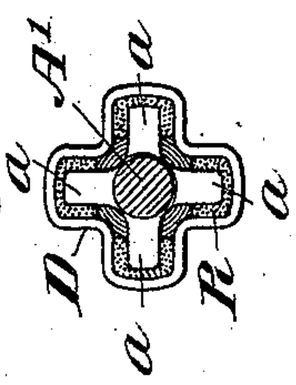


Fig. 5,



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UNITED STATES PATENT OFFICE.

JOHAN F. S. BRANTH, OF NEW YORK, N. Y., ASSIGNOR OF TWO-THIRDS TO EDWARD H. JOHNSON, OF SAME PLACE.

ELECTRIC LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 506,358, dated October 10, 1893.

Application filed March 23, 1892. Serial No. 426,061. (No model.)

To all whom it may concern:

Be it known that I, JOHAN F. S. BRANTH, a subject of the King of Sweden, residing at New York, in the county of New York and State of New York, have made a new and useful Invention Appertaining to the Application of Electric Motors to Wheeled Vehicles, of which the following is a specification.

The objects of my invention are:—first, to secure an electric motor to the body or frame of a vehicle in such manner that undue strains resulting from irregularities in the level of the road bed will not produce evil effects upon the motor itself; second, to so connect the rotary or power-imparting part of the motor, as the armature, to the traction portion or portions of the moving vehicle that the latter may assume variable positions dependent upon the inequalities of the road bed or curvature of the track or roadway over which the vehicle is adapted to move; third, to permit the motor and its attached parts to be quickly and easily removed from the body of the vehicle for repairs, &c. I accomplish these objects in the use of the apparatus hereinafter described, but particularly pointed out in the claims which follow this specification.

Attempts have heretofore been made to accomplish the several objects above named in varoius ways. Electric motors have been elastically or yieldingly suspended from the bodies of vehicles and their armatures or rotary parts geared to the axles (one or more) of moving vehicles in various ways. Electric motors have also been elastically suspended from the bodies of cars and provided with hollow armature shafting connected elastically or in a yielding manner directly with one of the driving axles which was connected to the traction wheels. Such motors have also been suspended beneath the bodies of tram cars in such manner that the driving shafting carried by the armature was located substantially at right angles to the axles of two pairs of truck wheels. I am not aware, however, that any one has, prior to my invention, elastically suspended an electric motor beneath the body of a moving vehicle and connected both ends of the armature shaft thereof through the agency of yielding bearings in such manner that the gearing may adapt itself to the inequalities of the roadbed or roadway and short curvatures of track, &c. These especial features constitute the essence of my invention.

My invention will be fully understood by referring to the accompanying drawings, in which—

Figure 1 is a plan view of a tram car with the flooring removed and illustrating an electric motor suspended from the frame thereof and having its armature shaft geared at opposite ends to the axles of two independent pairs of truck wheels, portions of the gearing and assembled parts being illustrated in section. Fig. 2 is a side elevational view of the same as seen looking at Fig. 1 in the direction of the arrows, parts also being shown in section. Figs. 3 and 4 are sectional detail views taken at right angles to each other, illustrating the elastic or yielding connections between the suspended motor and the frame. Fig. 5 is a similar view illustrating the elastic or yielding connection between the opposite ends of the armature shaft and the shafting which is geared to the axles of the car. Fig. 6 is a detail sectional view of a modified form in the nature of a universal joint which permits the gearing to adjust itself for irregularities of the roadbed, curvature of track, &c., and Fig. 7 is a side elevational view of the same.

Referring now to the drawings in detail, in all of which like letters of reference represent like parts—C represents the frame of a tram car of well known pattern, and W W, W W, two pairs of tram wheels secured to axles A A journaled in the usual manner to the frame C.

M represents an electric motor of any preferred type suspended beneath the body of the car by a pair of iron or steel cross-bars B B preferably curved upward as shown in Fig. 2, at their middle portions so as to permit the motor to be suspended as near the bottom of the car as possible. The free ends of these cross bars are secured in metal shoes S S S S held to the framework C by bolts *b b b b*.

R represents rubber or analogous elastic or yielding packing between the ends of the cross bars B B and the retaining shoes S S S S, for preventing the transmission of undue jars or

strains to the body of the motor M which is secured to the cross bars B B by four metallic clamps I I I I which surround projections or lugs T T T T, the clamps being provided with bolts *b' b' b' b'*.

The armature shaft A' is journaled in the framework of the motor M in the usual manner the journal bearings being secured in the ends of the frame of the motor and it has keyed to its opposite ends spiders having each two or more radial arms *a*, see Figs. 1 and 5. These spiders are surrounded by the enlarged ends of the sleeves D, which enlarged ends have internal conformations or shapes corresponding with the arms *a*, as clearly shown in Fig. 5, and the spaces between said arms and the enlarged angular portions of the sleeves D are filled with rubber or equivalent yielding packing. The sleeves D are provided with internally secured Babbitt metal journal bearings adapting them to rotate upon long journals N, N, pivotally secured by pins P to yokes Y journaled to the axles A. Integral with the outer ends of sleeves D are bevel gear wheels or pinions G meshing with larger gear wheels G' G', the latter keyed to the axles A A and preferably made of two separable parts held together by bolts b^3 b^3.

c c are oil cups, the former adapted to supply oil to the journal bearings of the yoke Y, and the latter to the long journal bearings between the sleeves D and the pivoted journals N, through the agency of the oil grooves *g*.

E E represent housings journaled on the axles A, said housings being in each instance constructed in two parts and held together by bolts, their function being to protect the gearing from dirt, &c.

By supporting the motor upon horizontal cross bars B B through the agency of clamps I I I I, it (the motor) may be readily moved laterally, and as readily detached from the car, and through the agency of the yielding rubber supports R R around the ends of the cross bars B B severe jars are not imparted to it, nor is the racking influence which inequalities in the roadbed exert upon the framework C felt by it. It is also apparent that by virtue of the elastic or yielding connections between the arms *a* of the spiders carried at the ends of the armature shaft A' and the journaled sleeves D, together with the pivotally supported long journals N, there is sufficient elasticity or yield to permit the axles A to assume various angular positions in relation to each other without extending to the motor or the intermediate gearing any abnormal or undue strains.

In the modified forms of the support for the journals N N and sleeves D shown in Figs. 6 and 7, I bring the pivot points nearer to the pitch lines of the gear wheels G G' by giving the yoke Y a forked form and affording two lateral pivots P' P' of support on one side, thereby diminishing the angular displacement or play between the gear wheels G and G', due to angular variations given to the sleeves D and journals N. In other words, in the modified form of the support shown in Fig. 6, I bring the fulcrum or pivot of the journal N to a point located substantially in a plane passing through the body of the gear wheel G, so that any angular variation imparted to the journal N causes the teeth of the gear wheels G to move substantially in a plane parallel with the face of said gears.

I do not limit myself to the specific details of construction herein shown and described for affording yielding connections between the armature shaft and the gearing connected with the traction wheels of a vehicle; nor do I limit myself to the applications of the principles herein described and claimed to wheeled vehicles, as these yielding connections for the rotary part of an electric motor may be applied in any place where it is desired to transmit power to any point through the agency of shafting, and my claims are, therefore, of a generic nature in this respect.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. An electric motor sustained beneath the body of a car or vehicle by a pair of cross bars the opposite ends of which rest upon elastic or yielding supports carried by the body or frame of the car, the motor being detachably secured to said cross bars and the opposite ends of its armature shaft connected through gearing and yielding connections with the axles of two pairs of drive wheels, substantially as described.

2. An electric motor elastically sustained by the frame or body of a car; one or more long journal bearings pivotally secured to one or more of the axles of the car and a surrounding sleeve for each journal with gearing between the sleeves and the axles and elastic connections between the sleeves and the ends of the armature shaft, substantially as described.

3. An electric motor sustained beneath the body of a car and having the opposite ends of its armature shaft elastically connected to sleeves carrying pinions journaled on long pivoted journals with gear wheels on the sleeves and intermeshing gear wheels on axles of the car, substantially as described.

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Witnesses:
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