

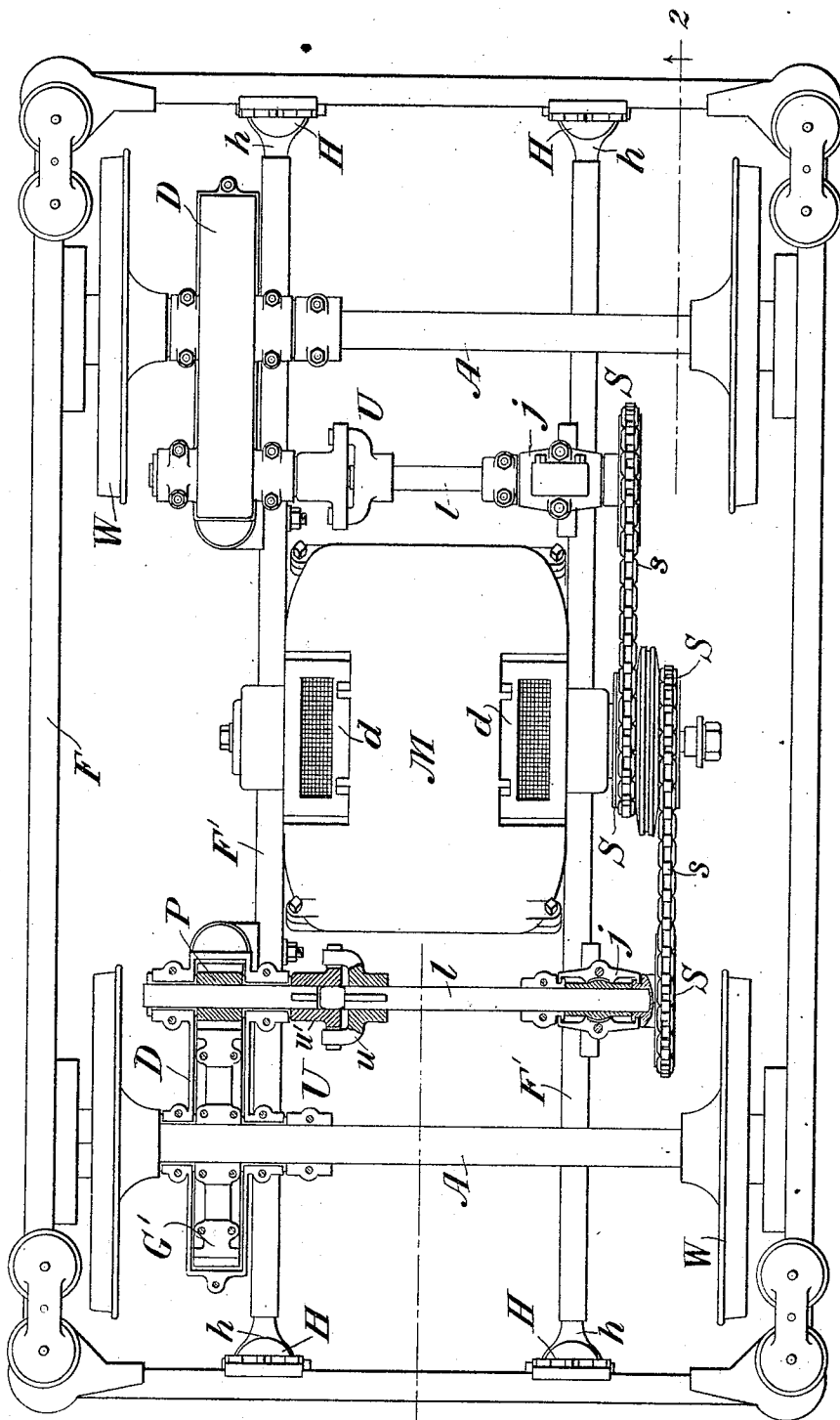
R. LUNDELL.

MEANS FOR SUSPENDING ELECTRIC MOTORS FROM CARS.

No. 522,067.

Patented June 26, 1894.

Fig. 1.



Witnesses  
W. W. Lloyd.  
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Inventor.  
Robert Lundell  
By his Attorney  
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Fig. 2.

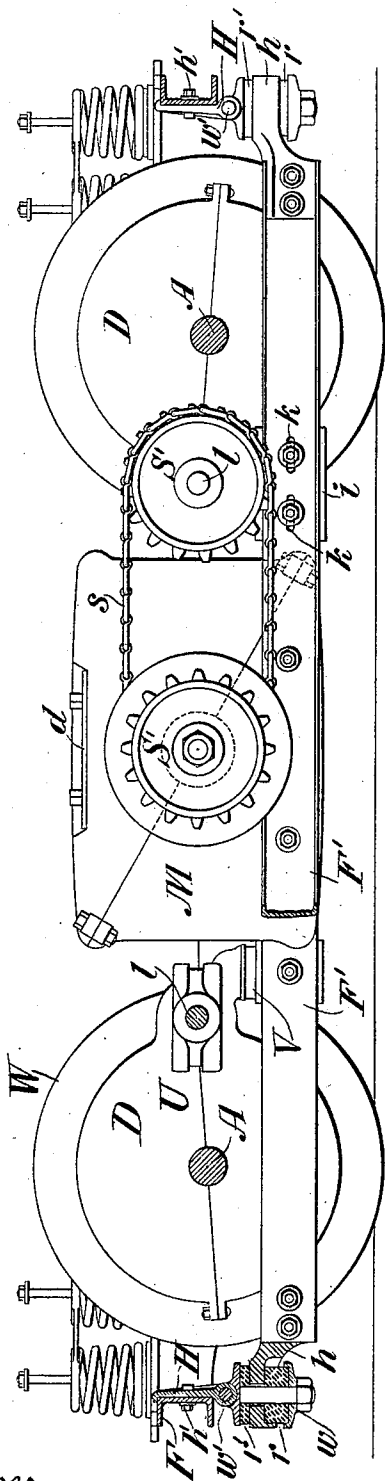
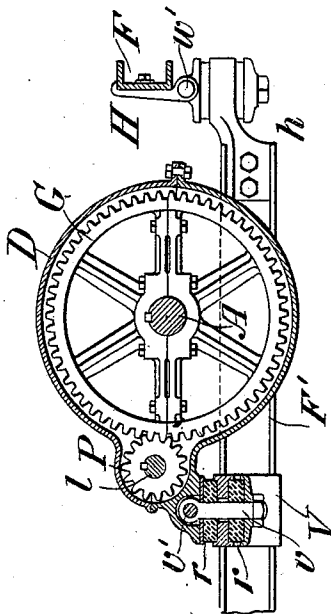


Fig. 3.



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(No Model.)

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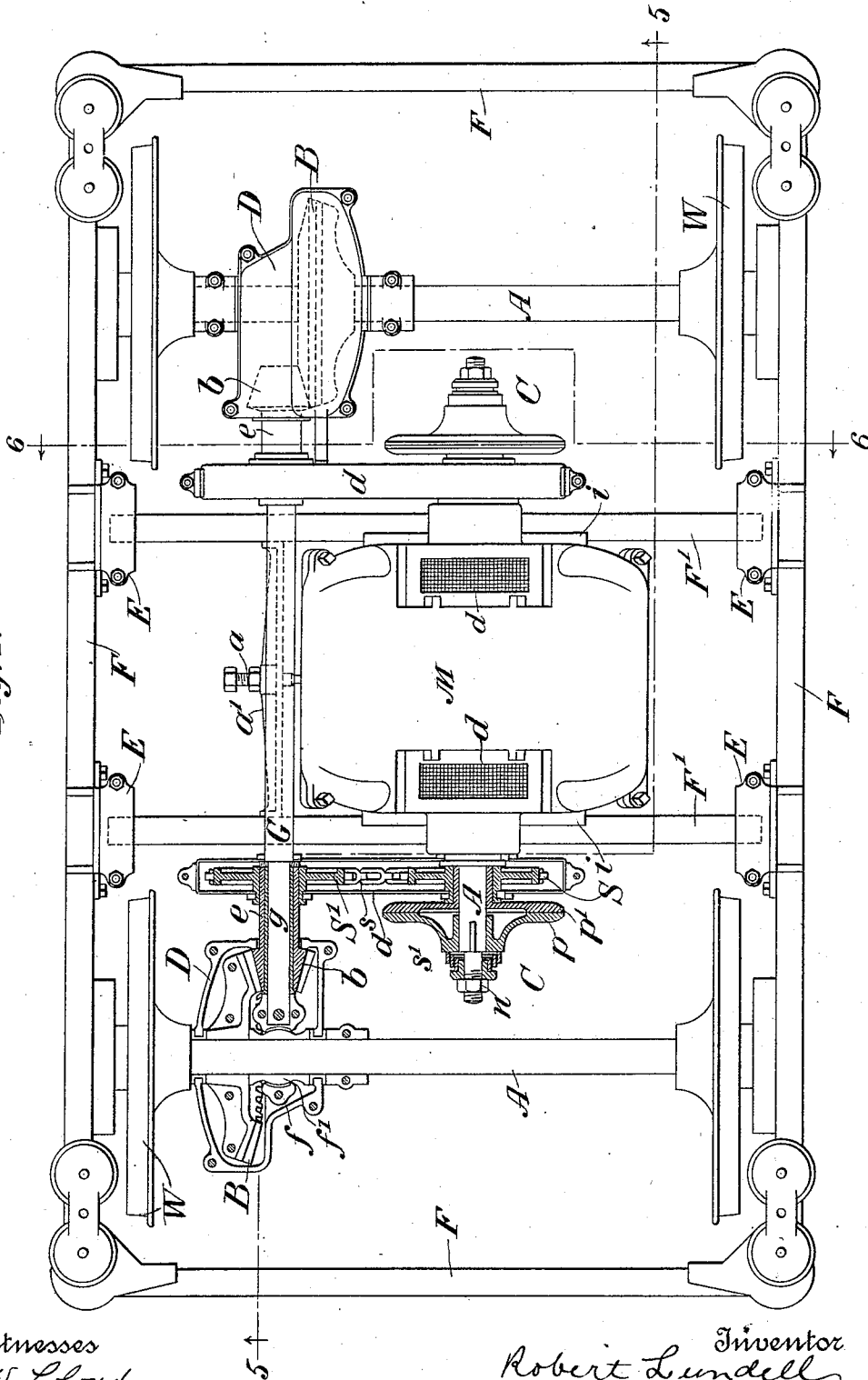
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Fig. 4.



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Fig. 5.

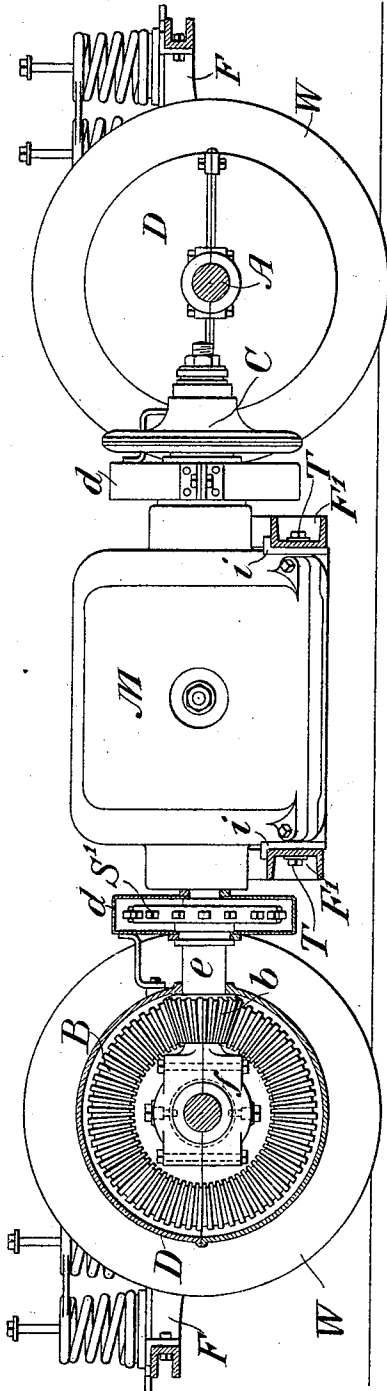
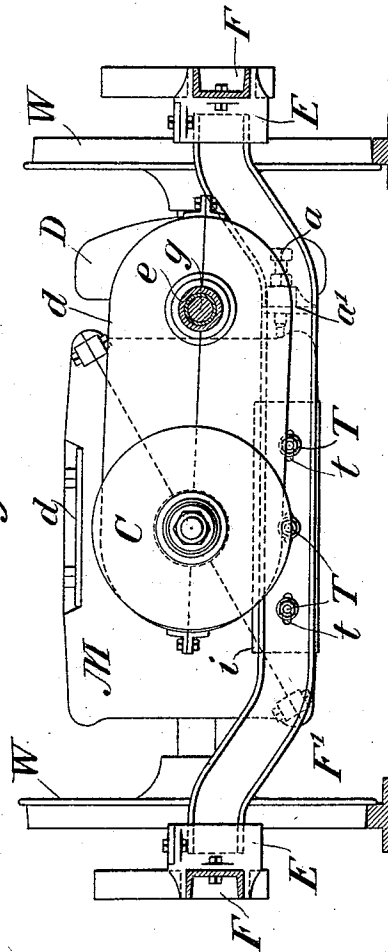


Fig. 6



Witnesses  
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# UNITED STATES PATENT OFFICE.

ROBERT LUNDELL, OF BROOKLYN, ASSIGNOR OF TWO-THIRDS TO EDWARD H. JOHNSON, OF NEW YORK, N. Y.

## MEANS FOR SUSPENDING ELECTRIC MOTORS FROM CARS.

SPECIFICATION forming part of Letters Patent No. 522,067, dated June 26, 1894.

Application filed September 4, 1893. Serial No. 484,725. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT LUNDELL, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have made a new and useful invention in means for suspending electric motors beneath tram-cars and gearing the rotary parts of such motors to the traction-wheels thereof, of which the following is a specification.

My invention has for its objects: First to provide a simple and efficient yielding support for an electric motor and speed reducing gearing with adjustments for compensating for the wear or strain upon the parts. Second to adapt a single electric motor to tram car propulsion through the agency of sprocket wheels, sprocket chains and speed reducing gearing attached to two of the axles of such a car. Third to provide means whereby a single electric motor may be sustained beneath the body of a tram car and geared through sprocket wheels, sprocket chains and speed reducing gearing to two axles of the car and adjustment made for undue stretching of the sprocket chains. These several objects are fully accomplished by the novel apparatus shown in the accompanying drawings, described in the following specification and particularly referred to in the claims which follow.

Figure 1 of the drawings is a plan view of the wheels, axles and lower part of a tram car, showing also an electric motor provided with one form of my improved means of support and operative connections. Fig. 2 is a longitudinal sectional view of the same, taken on the broken line 2—2, Fig. 1, and as seen looking at that figure in the direction of the arrows at each side of the drawings. Fig. 3 is a sectional view through one pair of the gear wheels and their supporting parts. Fig. 4 is a similar view to Fig. 1 of a modified form of the apparatus, the axis of the motor being located in this instance parallel with the length of the car. Fig. 5 is a longitudinal sectional view of Fig. 4 taken on the broken line 5—5, and as seen looking in the direction of the arrows at each side of the drawings. Fig. 6 is a cross sectional view of Fig. 4 on the broken line 6—6.

Referring now to the drawings in detail and

first to Figs. 1, 2 and 3, A A are the axles and W W the wheels of the car.

F is the car frame journaled in the usual manner upon the outer ends of the axles A A.

F' F' are longitudinally disposed side bars preferably of T-form, connected to the opposite ends of the frame F by hangers H H, bolts h' h' and downwardly extending shanks w w passing through holes in the flattened ends h h of the side bars F' F'.

r r' are cushions or springs of rubber or other yielding material.

M is the propelling motor supported on the side bars F' F' by a platform z. This motor is preferably of the iron-clad type and provided with removable gauze protecting coverings d d located over the commutators as shown in Fig. 1.

l l represent shafts journaled in long journal bearings j j carried by one of the side bars F' F' and connected each through an individual universal coupling U with a short piece of shafting journaled in the remaining side bar and carrying a pinion P adapted to mesh, with a gear wheel G' secured, one to the front and the other to the rear axle A A.

D D are housings for the gear wheels.

u u' are the individual parts of the couplers U U being of well-known type.

S S S are sprocket wheels located one on the armature shaft of the motor and one on each of the shafts l l, said sprocket wheels being connected together by sprocket chains s s.

The journal boxes j j are supported on slidable blocks which are bolted to the side bar F' by bolts k k, extending through oblong bolt holes whereby the sprocket wheels on the shafting l l may be adjusted relatively to the central sprocket wheels and the sprocket chains thus tightened or loosened at will. The pinions P P and the short sections of shafting which support them, are secured to the other side bar F' by universal connectors V V having pivotal parts V V'. See Fig. 3. It is apparent therefore that the motor M will be securely held in place by the side bars F' F' and that any twisting or unusual racking strain will not be transmitted to it, and also that the driving strains will all be transmitted through the universal joints U U and V V. Should the sprocket chains

s stretch unduly they may be quickly and effectually tightened by adjusting the bolts  $\frac{1}{2}$  in the oblong bolt holes, through which they extend.

5 Referring now to the modified form of my invention shown in Figs. 4, 5 and 6 it will be seen that the sustaining side bars  $F' F'$  are supported at the sides of the truck frame  $F$  upon detachable metallic shoes  $E E$  provided  
10 preferably with yielding or elastic cushions of well-known form. The motor  $M$  is sustained by a platform  $i$  the opposite ends of which rest upon the side bars  $F' F'$ , the sprocket wheels  $S' S'$  being secured each to  
15 a hollow sleeve  $e$  having a long journal bearing  $g$  upon a shaft  $G$  which in turn is journaled with spherical bearings  $f f'$  to the inner parts of the housings  $D D$  about the axles  $A A$ . The sprocket wheels  $S' S'$ , one or both,  
20 may be attached directly to the shaft  $G$  said shaft being in this event provided with journal bearings at its opposite ends carried by the axles. With such an arrangement if preferred only one sprocket wheel  $S'$  might be used, but I  
25 prefer two in order to more equally divide the strains upon the mechanism. The sprocket wheels  $S S$  are secured frictionally by a two part disk like friction clutch  $p p'$ , the part  $p$  being splined to the armature shaft  $A$  and  
30 held securely in place by nut  $n$ . Housings  $d d$  cover up the sprocket wheels  $S S$  and sprocket chains  $s' s$ .

$a'$  is a fixed bar attached at its opposite ends to the side bars  $F' F'$  and provided at  
35 its center with a screw threaded bearing adapted to receive the adjusting screw  $a$ , the arrangements being such that as the sprocket chains stretch their slack may be taken up by turning the screw, the inner end of which  
40 rests against the side of the motor  $M$  thereby causing it and the sustaining platform  $i$  to slide laterally on the side bars  $F' F'$ . With this form of the apparatus the motor may partake of considerable vibratory motion and  
45 not in any manner strain the connections between the armature shaft and the traction parts of the car.

I do not limit myself to the specific details of construction herein described and also illustrated in the accompanying drawings as it is  
50 obvious that the sprocket wheels and chains might be replaced by belts and pulleys, or rope belting and pulleys; or frictional gearing might replace the cog gearing shown. My  
55 claims therefore include all such well known equivalent mechanism.

Having thus described my invention, what

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

1. A car or vehicle having a single propelling motor yieldingly sustained beneath its frame and the rotary part thereof connected at its opposite ends through sprocket wheels, and sprocket chains to shafting which in turn is geared through speed reducing gearing to  
65 two of the axles thereof, in combination with a sliding support for the motor and means for compensating for undue stretching of the sprocket chains, substantially as described.

2. An electric motor carried by a pair of bars or supports  $F' F'$  yieldingly sustained beneath a car frame and having its armature connected through sprocket wheels and sprocket chains to speed reducing gearing geared to two of the axles of the car, in combination with means for compensating for  
75 undue stretching of the sprocket chains, substantially as described.

3. An electric motor sustained beneath the body or frame of a car with its armature shaft located in the direction of the length of the body of the car, in combination with sprocket wheels, sprocket chains and speed reducing gearing connecting the opposite ends of the armature shaft to independent car axles, the  
85 arrangement being such that strains due to the vibrations of the motor are compensated for through the sprocket chains.

4. An electric motor sustained beneath the body or frame of a car upon yielding supports with its armature shaft located in the direction of the length of the car and sprocket and chain gearing connecting said armature shaft with an additional rotary shaft which in turn is geared through speed reducing gearing to  
95 two independent car axles, substantially as described.

5. An electric motor sustained beneath the body or frame of a car upon yielding supports with its armature shaft located in alignment  
100 with the length of the body of the car, in combination with a second rotary shaft carried by the frame of the car and sprocket chains, sprocket wheels and speed reducing gearing for connecting the armature shaft  
105 through the second shaft to one or more of the car axles, substantially as described.

In testimony whereof I have hereunto subscribed my name this 30th day of August, 1893.

ROBERT LUNDELL.

Witnesses:

EUGENE R. POMMER,  
VICTOR LÜER.