No. 810,674. PATENTED JAN. 23, 1906.

F. B. RAE.

VEHICLE MOTOR SUSPENSION MECHANISM.

APPLICATION FILED SEPT. 7, 1905.

Fig. 1.

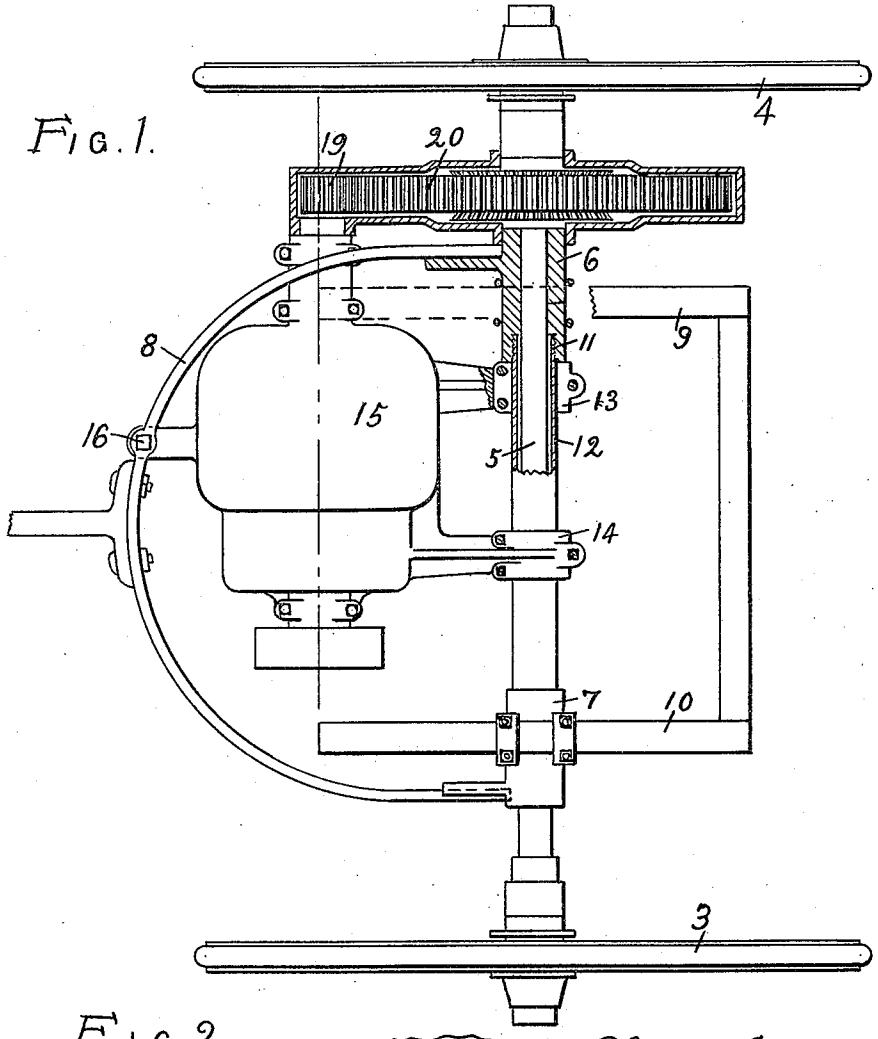
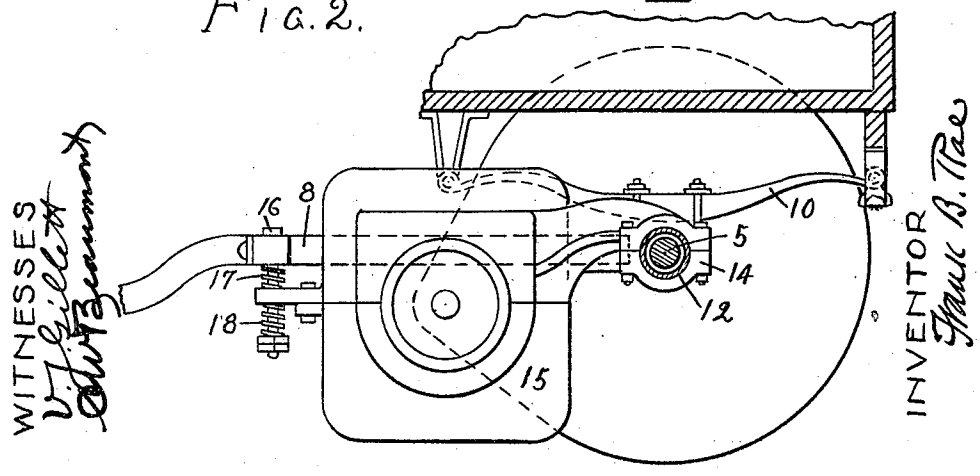


Fig. 2.



WITNESSES

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VEHICLE-MOTOR-SUSPENSION MECHANISM.

No. 810,674. Specification of Letters Patent. Patented Jan. 23, 1906.

Application filed September 7, 1905. Serial No. 277,470.

To all whom it may concern:

Be it known that I, FRANK B. RAE, a citizen of the United States, residing in Detroit, Wayne county, Michigan, have invented certain new and useful Improvements in Vehicle-Motor-Suspension Mechanism, of which the following is a specification.

Heretofore it has been common to mount vehicle-motors—such, for example, as hydrocarbon, pneumatic, or electric motors—by suspending one end of the motor from collars surrounding the vehicle-axle, the other end being supported by means of a spring or plurality of springs connected with the vehicle-frame. Such a method of motor-suspension is open to objection for a number of reasons, prominent among which may be mentioned the fact that each of the suspending-collars forms an additional bearing or journal box within which the axle must rotate, causing waste of power or additional friction, a necessity for additional lubrication, and compelling frequent renewal or repair, because such suspending-collars will soon become worn by the rotation of the axle therein. In the most common form of the arrangement described, which is that in use on nearly all electrically-propelled street-cars, the motor is supported upon the axle by two separate collars, and these, together with the two journal-boxes which suspend the vehicle-body, make practically four friction-bearings upon the axle. Such arrangement is also open to the further objection that because of a tendency sometimes encountered of the axle to oscillate endwise when the car-journals become worn the motor is affected by a like tendency, and this may result in uneven wear or difficulty in the proper running of the driving-gears.

The object of my invention is primarily to overcome all of the above-mentioned objections, while at the same time securing absolutely the fixed relative distance between the axis of rotation of the motor driving-shaft and the axis of rotation of the driven shaft, which is so essential to the correct operation of the driving-gears, and also to provide for a spring-support of the free end of the motor which will afford a yielding resistance for any movement of the same, either up or down, and thus relieve the motor itself, as well as the gears, from undue strain in starting, stopping, or acceleration.

A further object of my invention is the mounting of the axle end of the motor upon the journal-bearings of the vehicle, eliminating the use of support-bearings upon the axle for the motor-supports, as well as to secure such mounting upon the journals in such manner that the motor will be rotatable relative thereto, so as to enable the suspension of the outer or free end of the motor upon the yielding support heretofore already referred to.

Another object of my invention is the provision of a fixed connection between the two journal bearings or boxes of the vehicle and the rotatable mounting of the axle end of the motor upon such fixed connection, whereby the weight of the motor is carried or transferred to the journal-bearings.

Still another object of my invention is the provision of a tube connecting the two vehicle-supporting journal-boxes and encircling the axle itself, such tube being of sufficient internal diameter to permit the rotation of the axle therein without contact therewith and the mounting upon said tube of the axle end of the motor, so that there may be rotation of the motor thereon.

For a better understanding of my invention I have illustrated it as applied to an electromobile or electrically-driven vehicle in the accompanying drawings, in which—

Figure 1 is a plan view showing the rear driving wheels and axle of the electromobile with a motor suspended in accordance with my invention, and Fig. 2 is a side view of the same.

The two driving-wheels 3 4 are supported or carried by an axle 5, upon which are two journal-bearings 6 7, which carry two of the ends of the frame portion 8 and the vehicle-springs 9 10 by threaded connections. (Shown at 11.) I connect the journals 6 7 by a tube 12, which, as indicated in the drawings, is of an internal diameter larger than the external diameter of the axle 5, which is arranged to revolve within the same. Encircling the tube 12 are two rotatably-mounted collars 13 14, which form the axle end or support of the motor 15, the outer end of the motor being supported upon the frame 8 by

means of the suspension-bolt 16 between the two springs 17 18, two springs being provided instead of one in order to allow a partial rotation of the motor in either direction and to absorb the strain thereon either in starting forward or backward. The driving-gear 19, upon the end of the motor-shaft, meshes with a driven gear 20 upon the vehicle-axle.

From the above description, taken in connection with the accompanying drawings, it will be clearly evident that the relative distance of the center of rotation of the driving-gear 19 and the center of rotation of the axle 5 and attached driven gear 20 will remain constant regardless of the amount of movement or give that may be encountered in the springs 17 18 during the starting and stopping of the motor. It will also be evident that the suspension-collars 13 14 of the motor have no bearing upon the axle proper, but that the weight carried by the same is transferred directly to the vehicle journal-boxes 6 7, and that as there is no direct frictional contact between the axle 5 and the suspension-collars 13 14 there will be no wear of the latter due to the rotation of the axle within the same.

While I have illustrated and described my invention as applied to an electromobile, it is clearly apparent that, broadly speaking, my invention is applicable to any style of motor-driven vehicle, and I do not, therefore, limit myself to the exact construction or class of vehicles shown.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A vehicle-motor-suspension mechanism comprising a driving-axle, a plurality of vehicle-supporting journal-boxes thereon, a tube connecting two adjacent boxes and inclosing said axle, and a motor having its axle end rotatably mounted upon said tube and its free end yieldingly supported from some other portion of the vehicle, substantially as described.

2. A vehicle-motor-suspension mechanism comprising a driving-axle, a plurality of vehicle-supporting journal-boxes thereon, a tube connecting two adjacent boxes and inclosing said axle, and a motor having its axle rotatably mounted upon said tube and having its free end engaged between yielding supports upon both sides thereof and connected with some other portion of the vehicle, whereby strain upon the motor in moving either forward or backward is reduced to a minimum.

3. A vehicle-motor-suspension mechanism comprising a driving-axle, a plurality of vehicle-supporting journal-boxes, a vehicle-frame supported on said boxes, a connection between two adjacent boxes, and a motor having its axle end rotatably supported upon said connection and its free or outer end yieldingly supported from said frame, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK B. RAE.

Witnesses:
C. W. BEAUMONT,
V. J. GILLETT.