PATENT SPECIFICATION

405,518

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COMPLETE SPECIFICATION.

Improvements in the Mounting of the Steering Road Wheels of Motor Vehicles.

We, LANCIA & C. FABBRICA AUTOMOBILI TORINO S.A., an Italian Company, of 99, via Monginevro, Turin, Italy, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the mounting of the steering road wheels of motor vehicles, in which the front axle or a cross-member replacing the said axle, is provided at either end with a substantially vertical guide, relatively to which a member carrying the stub-axle for the wheel is adapted to be displaced resiliently in the vertical direction and to be swivelled angularly.

It is known to give, in an arrangement of this kind, each guide the form of a sleeve in which the member carrying the stub-axle is movably mounted beneath the suspension spring, or to utilise for forming the guide on which the member carrying the stub-axle may move, a rod connected by its two ends with the arms of a fork of the axle, and the upper connection of which with the axle is constituted by a sleeve in which is situated the suspension spring.

Furthermore, for mounting resiliently in the chassis of a vehicle, an axle carrying the wheels directly, it has been proposed to provide the axle, at each end, with a support from which project upwardly and downwardly vertical rods adapted to slide in corresponding sockets of the chassis, the lower socket being connected to the chassis by a sleeve, into which the upper end of the suspension spring enters, the other end of the said spring bearing against a disc fixed to the rod integral with the axle.

According to the invention, the member which carries the stub-axle embraces by both its ends a guide rod, also serving as a swivel pin, an intermediate zone of which is connected to the axle or cross-member by means of an attachment which leaves around the said rod an annular space, closed at the top, into which enters the suspension spring inserted between the axle and the lower end of the wheel-carrying member.

In this manner, the suspension spring can extend above the lower limit of the axle or cross-member, and above the upper limit if desired, and this, despite the length of the deflection which the spring must have to ensure the suspension of the vehicle, renders it possible to lower the axis of the axle or cross-member below the stub-axle, and to give to the wheel-carrying member a sufficiently small length to enable it to be accommodated within the rim of the wheel, and hence to reduce at will the distance between the axis of the guide rod and the central plane of the wheel.

A construction of the invention is shown by way of example in the accompanying drawings.

Figure 1 is a front view of half the front portion of a motor vehicle, in which this mounting of the steering road wheels is applied, and

Figure 2 is the corresponding plan thereof.

Figure 3 shows separately in section and on a larger scale one end of the axle with the member carrying the stub-axle for the corresponding wheel.

Figure 4 is a section in plan along the line 4—4 of Figure 3.

In these Figures, 1 denotes the front portion of the vehicle body, the radiator of which can be seen, and which is supported by the front axle 2. At each of its ends, the said axle carries a sleeve 3 with its axis vertical, which in its upper portion forms an annular seat and a coaxial collar 4 wherein is fixed a swivel pin 5. The said swivel pin 5, which constitutes the guide for the element carrying the wheel, is extended above the sleeve 3 and below the collar 4, passing axially through the sleeve 3, so that an annular space is left between the swivel pin 5 and the sleeve 3.

For mounting the wheel on the swivel pin 5 there is provided a sleeve 6 which slides over the upper end of the swivel pin, and another sleeve 7 which slides over its lower end, the said sleeves 6 and 7 being fixed to the ends of an element 8 of curved cross-section, which occupies a

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position on the outer side of the sleeve 3 and which carries the stub-axle 9, whereon the wheel is mounted in any appropriate manner.

On the upper end of the swivel pin 5 is preferably mounted, in a housing 10, a spring 11 intended to contact with the closed end of the sleeve 6, thereby absorbing the shocks when the base of the sleeve 6 approaches the end of the swivel pin 5.

The sleeve 7 comprises on its lower end an expanded cup-shaped portion 12 which is fixed to the element 8 by means of a collar 13 on the said element. The cup 12 forms an annular seat which corresponds with and is opposite to the annular seat provided around the collar 4 on the top of the sleeve 3. Between the said two annular seats, which limit upwardly and downwardly the space surrounding the swivel pin 5, there is disposed a spring 14 which constitutes the principal member of the suspension and by means of which the sleeve 3, and hence the axle 2, bear on the cup 12 and hence on the wheel.

The swivel pin 5 is hollow and in its interior there is housed a shock absorber of any appropriate type, one member of which comprises the rod 15 connected to the base of the cup 12. The said shock absorber will naturally be constructed in such a manner as to oppose the rebounds which are transmitted to the wheels by the spring 14 after its compression, this being accomplished by causing only the downward displacements of the cup 12 to be checked by the shock absorber.

The element 8 may have the form of a sleeve with a large opening which extends from one end to the other and which reduces its transverse dimension to about one half. In this way, the element 8 is able to turn about the axis of the swivel pin 5 to a degree sufficient to allow of the maximum steering lock, and at the same time it partly covers the ends of the axle with the sleeve 3 and the swivel pin 5, protecting them from the exterior. In this manner, the possibility of the sliding surfaces of the assembled members becoming fouled by mud etc., is reduced.

The protection from mud, which is more particularly required for the lower portion of the swivel pin 5, is completed in this region by a casing 16 fixed to the cup 12 and surrounding the spring 14, The said casing 16 has a length such that, with the wheel in its lowermost position, the casing 16 enters the sleeve 3 and also enters a casing 17 fixed to the said sleeve and in which the casing 16 is adapted to slide telescopically during the raising of the wheel. In this manner, the internal members are always protected, irrespective of the position of the stub axle of the wheel.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed. we declare that what we claim is:—

1. An arrangement for the resilient mounting of the steering road wheels of motor vehicles, in which the wheel is carried by a member movably mounted on a substantially vertical guide fixed to the front axle or to a cross-member, characterised in that the wheel-carrying member, embraces by both its ends a guide rod, the intermediate zone of which is connected to the axle or cross-member by means of an attachment which leaves around the said rod an annular space closed at the top, into which enters the suspension spring inserted between the axle and the lower end of the wheel-carrying member.

2. An arrangement as claimed in claim 1, characterised in that, on the lower end of the member carrying the stub axle of the wheel, there is fixed a casing which surrounds the lower end of the spring and which enters the annular space of the attachment.

3. The arrangement for mounting the steering road wheels of motor vehicles, substantially as described or substantially as shown in the accompanying drawing.

Dated this 7th day of June, 1933.

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Fig. 1

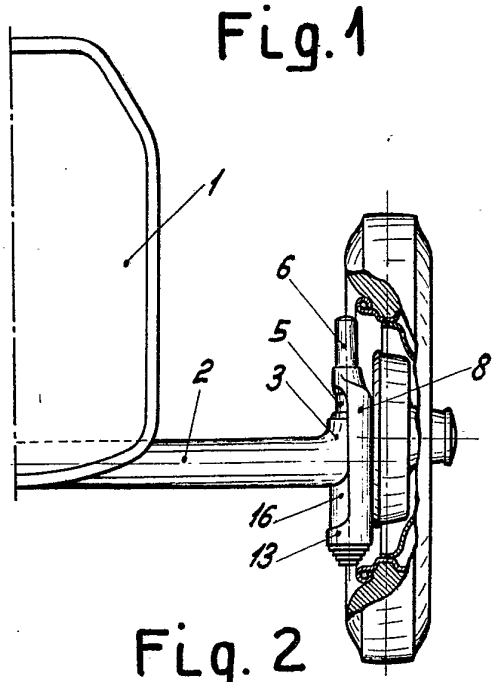


Fig. 2

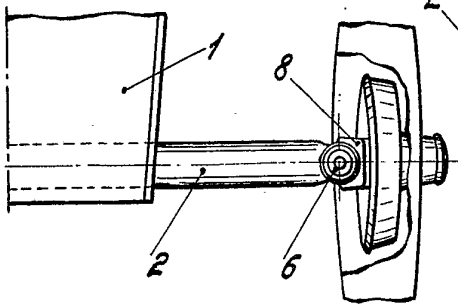


Fig. 3

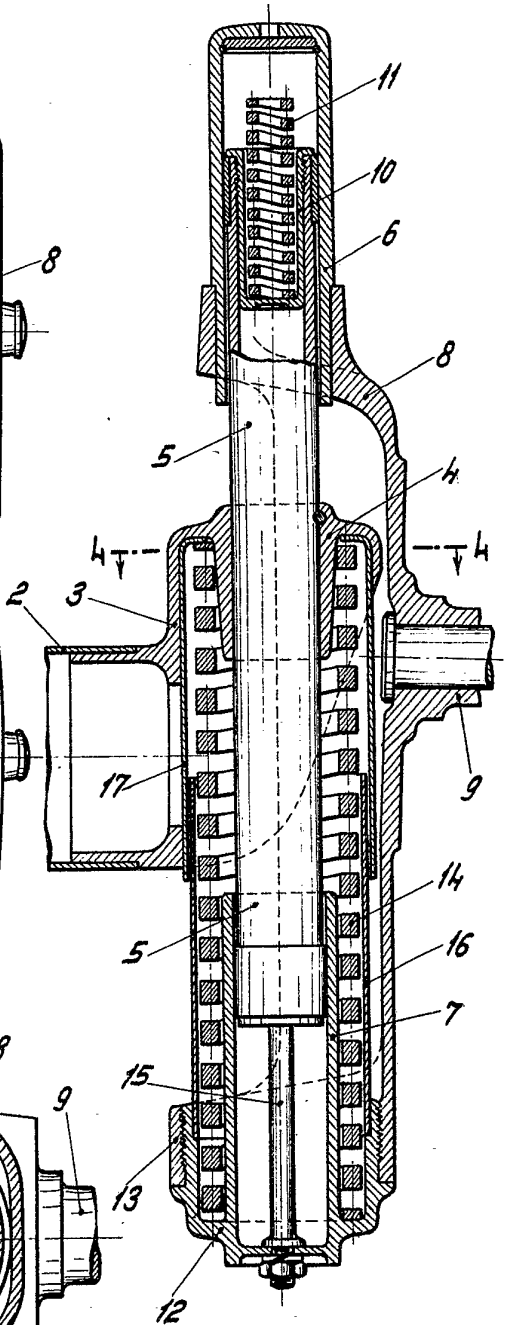
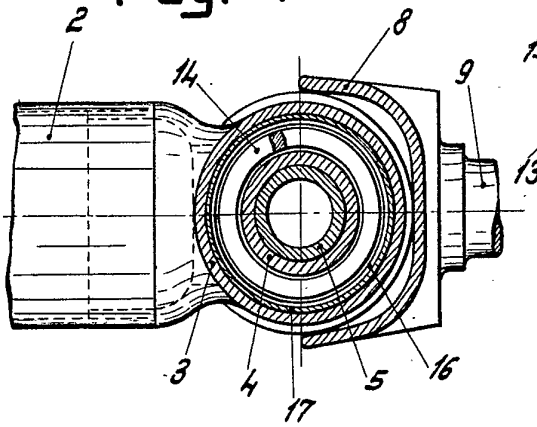


Fig. 4



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