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PATENT SPECIFICATION

763,393



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COMPLETE SPECIFICATION

“Front wheel suspension and springing for motor cycles and three-wheeled vehicles having a single front wheel.”

We, MAICO-Werk G.m.b.H., a German Company, of Pfaeffingen-Tuebingen/Wuertt, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns a front wheel suspension and springing for motor cycles and three-wheeled vehicles having a single front wheel. More particularly, the invention concerns a suspension in which the wheel axle is secured to the front ends of a pair of links extending forwardly from the lower part of an arcuate member disposed at the rear of the wheel and to which they are pivotally connected, the upper part of said member being connected to the steering column rotatable in a steering head, and shock absorbing means being interposed between the said front ends of the links and the steering column. A construction of this type is set forth in Specification No. 718520 in which the said arcuate member is a girder member rigidly connected to a steering stem mounted in the steering head of the motor cycle, the said member depending rearwardly from the steering stem and having attached to the lower end thereof links extending forwardly of the said member and connected at their forward ends to the axle of the road wheel, a shock absorbing device being disposed between the respective forward ends of the links and the forward end of the said member.

According to the present invention a front wheel suspension of the kind above referred to is characterised in that the said upper part of the arcuate member carries a steering box which encloses the front of the steering head, and in that the axes of the shock absorbing means at the opposite sides of the wheel are in a plane that is close to and substantially parallel with the plane in which

the pivotal axis of the steering head lies.

The invention will be further described, by way of example, with reference to the accompanying drawing, in which:—

Fig. 1 is a side elevation, partly in longitudinal section, of the front wheel suspension and springing of a vehicle having a single front wheel,

Fig. 2 is a horizontal section along the line 11-11 of Figure 1, through the swinging fork of the front wheel suspension at the hinged or pivoted position on a swinging bracket,

Fig. 3 is a partial section along the line 111-111 of Fig. 1, and

Fig. 4 is a cross section through the steering head of the single-track vehicle, taken along the line 1V-1V of Fig. 1.

The vehicle shown in the drawings has a steering arm which can be turned on the front end of a frame 1 and which consists of two separate handles 2, which are screwed in the usual way into a steering arm holder 3. The steering arm transmits the steering forces through the steering arm holder 3 to a crossbar 4, which receives the upper steering bearing 5 consisting of a roller bearing, and is screwed in with the upper part of a steering box 6. The lower surface of the steering box 6 is fixedly connected with an arcuate swinging bracket 8 by means of screws 7, although said steering box may alternatively, if desired, form an integral unit with the bracket 8. The upper steering bearing 5 and another steering bearing 9, also a roller bearing, situated at the lower part of the steering box, receive between them the usual steering head 10 situated at the front end of the frame 1 and are supported against this. Moreover the lower steering bearing 9 essentially transmits the forces occurring between the steering head 10 and the swinging bracket 8, and is protected against the penetration of foreign bodies by the almost enclosed cross section of the steering box 6,

(Price 3/-)

which also gives a smooth streamlined shape to the whole front part of the vehicle.

The swinging bracket 8, which may itself, if desired, be formed and fitted as a mudguard, is shown in the embodiment illustrated in the drawings as being proportioned and shaped according to the forces to be transmitted and conforms closely to the shape of a separate mudguard 11, which it follows downward as far as a point below the axle 12 of a front wheel 13. A swinging fork 14 clasps the axle 12 of the front wheel 13 with its two front ends, while at the back it is flexibly connected with the swinging bracket 8 by way of a swinging fork axle 15. In the vicinity of the axle 12 on both sides of the wheel 13, two ordinary spring legs 16 are connected with the swinging fork 14 by means of coupling pins 17. These spring legs in known manner contain pressure springs which are not visible, and shock absorbers, likewise not separately shown, for the springing of the front wheel 13. Upper coupling eyes 18 of the spring legs 16 are flexibly attached by means of coupling pins 20 on corresponding lugs 19 of the swinging bracket 8, in order to be able to carry out the necessary angular movements by the resilience of the wheel jointly with the spring legs.

A steering column 21 fixed in the swinging bracket 8 serves also to connect the swinging bracket 8 with the steering box 6, and is carried upwards through the steering head 10, in addition to the two steering bearings 5 and 9, together with the crossbar 4 situated above the upper steering bearing, in order to make possible the accurate adjustment of the steering bearings 5 and 9 at the top in known way by means of a nut 22 and lock nut 23. The screw coupling between the crossbar 4 and steering box 6 is so formed that an axial displacement in the direction of the steering column 21 is possible between the crossbar 4 and steering box 6, in order to make possible the fine adjustment of the steering bearings 5 and 9. This adjustment can be effected by passing a screw 24 situated on the crossbar 4 through the steering box in a slotted hole 25, so that the steering head can be moved within the necessary limits relative to the steering box before tightening the screw 24.

When forces act on the front wheel axle 12, for example, due to unevenness of the road or on breaking, their horizontal components are transmitted through the swinging fork 14, the swinging bracket 8 and, furthermore, not only through the steering column 21 but also principally through the steering box 6 to the steering head 10 and by it to the frame 1 of the vehicle. The steering forces necessary to turn the front wheel 13 are transmitted from the handles 2 through the steering arm holder 3, the steering box 6, the swinging bracket 8 and the swinging fork 14 to the

axle 12 of the front wheel. The components of force of the chasis and of the vehicle which act in a vertical direction are supported on the front wheel axle 12 through the spring legs 16, whereby the built-in shock absorbers provide the best method for the adjustment of the springing and damping forces to the demands of traffic.

In conclusion, the swinging bracket can be further advantageously provided with surfaces 26 for the direct attachment and fixing of the mudguard.

What we claim is:—

1 A front wheel suspension and springing for motor cycles, and three wheeled vehicles having a single front wheel wherein the wheel axle is secured to the front ends of a pair of links extending forwardly from the lower part of an arcuate member disposed at the rear of the wheel and to which they are pivotally connected, the upper part of said member being connected to the steering column rotatable in a steering head, and shock absorbing means being interposed between the said front ends of the links and the steering column, characterised in that the said upper part of the arcuate member carries a steering box which encloses the front of the steering head, and in that the axes of the shock absorbing means at the opposite sides of the wheel are in a plane that is close to and substantially parallel with the plane in which the pivotal axis of the steering head lies.

2. A front wheel suspension and springing as claimed in Claim 1, characterised in that the steering box is connected at its lower end to the said arcuate member and is secured at its upper end to the end of the steering column projecting out of the steering head.

3. A front wheel suspension and springing as claimed in Claim 1 or 2, characterised in that the said arcuate member is detachably connected with the steering box.

4. A front wheel suspension and springing as claimed in Claim 1 or 2, characterised in that the said arcuate member and the steering box form an integral unit.

5. A front wheel suspension and springing as claimed in any of Claims 1 to 4, wherein the said arcuate member is adapted in its curvature and in its cross section to the shape of the corresponding part of a front wheel mudguard.

6. A front wheel suspension and springing as claimed in any of Claims 1 to 5, characterised in that the said arcuate member has surfaces for the direct abutment of and mounting of the mudguard.

7. A front wheel suspension and springing as claimed in any of Claims 1 to 4, characterised in that the said arcuate members is itself formed and fitted as a mudguard.

8. A front wheel suspension and springing for motor cycles and three-wheeled vehicles

having a single front wheel, constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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763,393 COMPLETE SPECIFICATION
 2 SHEETS This drawing is a reproduction of
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 SHEETS 1 & 2

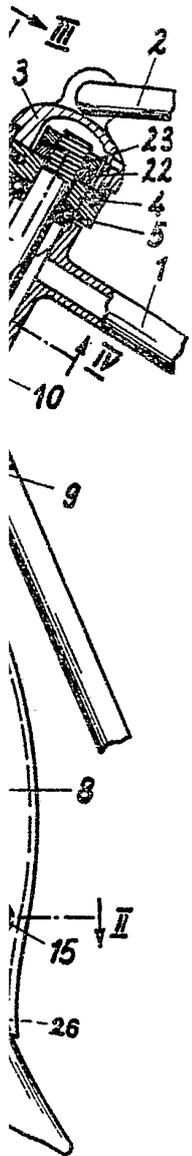


Fig. 3

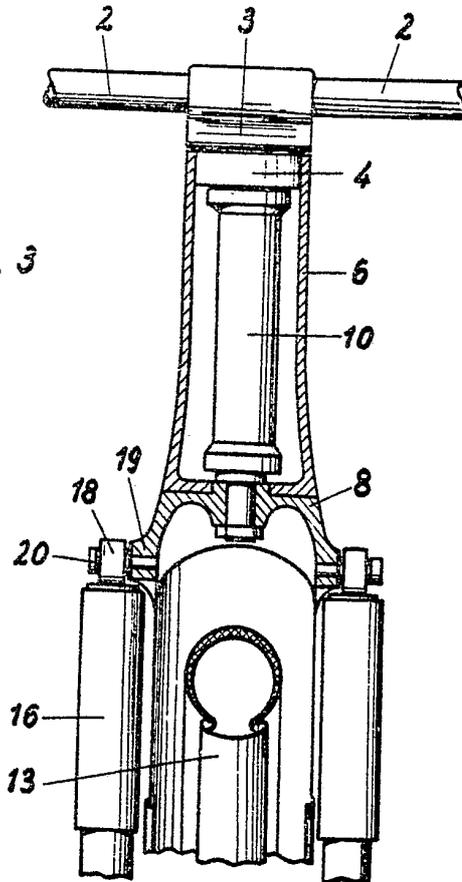


Fig. 2

