

PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements in or relating to Rear Springing for Motor Cycles

We, NORTON MOTORS LIMITED, a British Company, of Bracebridge Street, Birmingham, 6, and EDGAR MARTIN FRANKS, a British Subject, of the Company's address, do hereby declare the nature of this invention to be as follows:—

This invention relates to improvements in rear springing for motor cycles and refers particularly to springing of the type in which the wheel spindle is carried by members slidably mounted at each side of the wheel on substantially vertical rods secured to or forming part of the frame, the load being supported by helical compression springs on the upper parts of the rods.

It is desirable that provision should be made for adjusting the springing to suit widely varying loads as the machine may be ridden with or without a pillion passenger, and the object of our invention is to provide simple and effective means for making such adjustments.

According to our invention the abutment for the upper end of each spring is formed by a member which is axially slidable on the rod and is located by an angularly movable cam or the like mounted on a relatively fixed part and having a number of steps or shoulders of progressively varying height measured from the axis of the cam. Any one of these steps or shoulders can be brought into action by angular movement of the cam so that the spring abutment member is adjusted axially on the rod to vary the extent to which the spring is compressed in accordance with the load which it will have to support.

In one practical arrangement the rod on which the spring is mounted is a hollow tube or sleeve and its upper end is slotted transversely. The abutment for the upper end of the spring is formed by a collar which is slidable on the rod and is rigidly connected to a plunger sliding within the rod. The upper end of the plunger is rounded and is adapted to engage with any one of a number of progressively graded steps or shoulders on a cam fitting within the slot and pivotally mounted on a transverse pin in the rod. The angular movement of the cam may be effected by a lever integral with the cam or by a hand-wheel. Usually four steps or shoulders on the cam will be sufficient to give the required range of adjustment and the lever or handwheel may be provided with an indicator showing which step or shoulder is in use. This facilitates the setting of the springs on each side of the wheel to the same loading.

In a modification of this arrangement a double or forked cam is used having identical limbs lying on each side of the upper end of the rod and adapted to engage with a sleeve which is slidably on the rod and forms the abutment for the upper end of the spring. Small projections may be provided on the sleeve to engage with complementary recesses in the steps on the cams so that there is no risk of accidental movement of the cams.

Dated the 4th day of September, 1942.

BARKER, BRETTELL & DUNCAN,
Chartered Patent Agents,
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COMPLETE SPECIFICATION

Improvements in or relating to Rear Springing for Motor Cycles

We, NORTON MOTORS LIMITED, a British Company, of Bracebridge Street, Birmingham, 6, and EDGAR MARTIN FRANKS, a British Subject, of the Company's address, 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 improvements in rear springing for motor cycles and refers particularly to springing of the type in which the wheel spindle is carried by members slidably mounted at each side of the wheel on substantially vertical rods secured to or forming part of the frame,

the load being supported by helical compression springs on the upper parts of the rods.

It is desirable that provision should be made for adjusting the springing to suit widely varying loads as the machine may be ridden with or without a pillion passenger, and the object of our invention is to provide simple and effective means for making such adjustments.

It has already been proposed to provide means for adjusting rear springing of this type by attaching the upper end of the spring to a ring rotatably anchored on a bush which is in screw-threaded engagement with the vertical rod or with a frame member carrying the rod so that the upper abutment for the spring is adjusted axially on the rod by rotating the bush. As an alternative to that arrangement it has been proposed to effect the axial movement of the bush to which the upper end of the spring is secured by means of an eccentric mounted in the frame member and guided in a transverse slot in the bush, which eccentric can be moved manually by a lever provided thereon.

According to our invention the abutment for the upper end of each spring is formed by a member which is axially slidable on the rod and is located by an angularly movable cam or the like mounted on a relatively fixed part and having a number of steps or shoulders of progressively varying height measured from the axis of the cam. Any one of these steps or shoulders can be brought into action by angular movement of the cam so that the spring abutment member is adjusted axially on the rod to vary the extent to which the spring is compressed in accordance with the load which it will have to support.

One practical arrangement of adjustable rear springing for a motor cycle in accordance with our invention and a modification thereof are illustrated by way of example in the accompanying drawings in which:—

Figure 1 is a diagrammatic side elevation in part section of one practical arrangement.

Figures 2 and 3 are a fragmentary side elevation and plan of a modified form of adjustment.

In the arrangement shown in Figure 1, *a*, *b* are tubular members of one side of a motor-cycle frame rigidly connected by a vertical member *c*. A vertical rod *d* is anchored in the rear ends of the members *a*, *b* and a fork end carrying one end of a wheel spindle is slidable on the rod. The load on the wheel is supported by a compression spring *e* on the rod between the fork end and the upper frame member *a*,

a lighter rebound spring *f* being mounted on the rod between the fork end and the lower frame member *b*. This type of rear springing is well known.

According to our invention the upper end of the compression spring *e* instead of abutting directly on the upper frame member *a* has its abutment formed by a collar *g* which is slidable on the upper part of the rod and the position of the collar is vertically adjustable on the rod to vary the compression of the spring.

The rod *d* or the upper part of it is hollow and the collar *g* is keyed by pins passing through a transverse slot in the rod to a plunger *h* sliding within the rod. The upper end of the plunger is rounded and is adapted to engage with any one of a number of progressively graded steps or shoulders on a cam *i* fitting within the slotted upper end of the rod and pivotally mounted on a transverse pin *k* in the rod. A lever handle *l* is made integral with the cam for moving it angularly to bring any one of the steps or shoulders on the cam into engagement with the plunger. The cam illustrated has four steps or shoulders and this will usually be sufficient to give the required range of adjustment. The cam is shown in the position in which the spring is compressed to the maximum extent. If desired an indicator may be provided to show which step or shoulder on the cam is in use. This facilitates the setting of the springs on each side of the wheel to the same loading.

Instead of providing the cam with a lever handle it may be moved angularly by a hand wheel as shown at *m* in dotted lines in Figure 1.

In the modified arrangement shown in Figures 2 and 3 the upper end of the rod is not slotted and the abutment for the upper end of the spring is formed by a sleeve *n* which is slidable on the rod and engages with identical stepped cams *p* formed on the limbs of a double or forked lever *q* pivoted at *r* on the upper frame member *a*, the cams lying on opposite sides of the upper end of the rod.

Small projections *s* are formed on the upper end of the sleeve to engage with complementary recesses in the steps on the cams so that there is no risk of accidental movement of the cams.

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. Rear springing of the type set forth for motor-cycles in which the abutment for an end of each spring is formed by a member which is axially slidable on the rod and is located by an angularly mov-

able cam or the like mounted on a relatively fixed part and having a number of steps or shoulders of progressively varying height measured from the axis of the cam, any one of these steps or shoulders being brought into engagement with the spring abutment to locate the abutment in different axial positions on the rod and hence to vary the compression of the spring.

2. Rear springing for motor-cycles as claimed in Claim 1 in which the rod on which the spring is mounted is a hollow tube or sleeve and the abutment for the spring is formed by a collar sliding on the rod and rigid with a plunger slidable within the rod, the upper end of the plunger being adapted to engage with any one of a number of progressively graded steps or shoulders on a cam fitting within a transverse slot in the upper end of the rod and pivotally mounted on a transverse pin therein.

3. Rear springing for motor-cycles as claimed in Claim 1 in which the abutment for the spring is formed by a collar slidable on the rod and engaging with pro-

gressively graded steps or shoulders on a pair of coupled identical cams arranged on opposite sides of the rod.

4. Rear springing for motor-cycles as claimed in any of the preceding claims in which the angular movement of the cam is effected by a lever integral with the cam or by a handwheel.

5. Rear springing for motor-cycles as claimed in any of preceding claims in which a projection on the collar is adapted to engage with complementary recesses in the steps or shoulders of the cam to prevent accidental movement of the cam.

6. Rear springing for motor-cycles as claimed in any of the preceding claims in which an indicator is provided to show which step or shoulder of the cam is in use.

7. Rear springing for motor-cycles substantially as described with reference to the accompanying drawings.

Dated the 31st day of August, 1943.
BARKER, BRETTELL & DUNCAN,
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FIG. 1

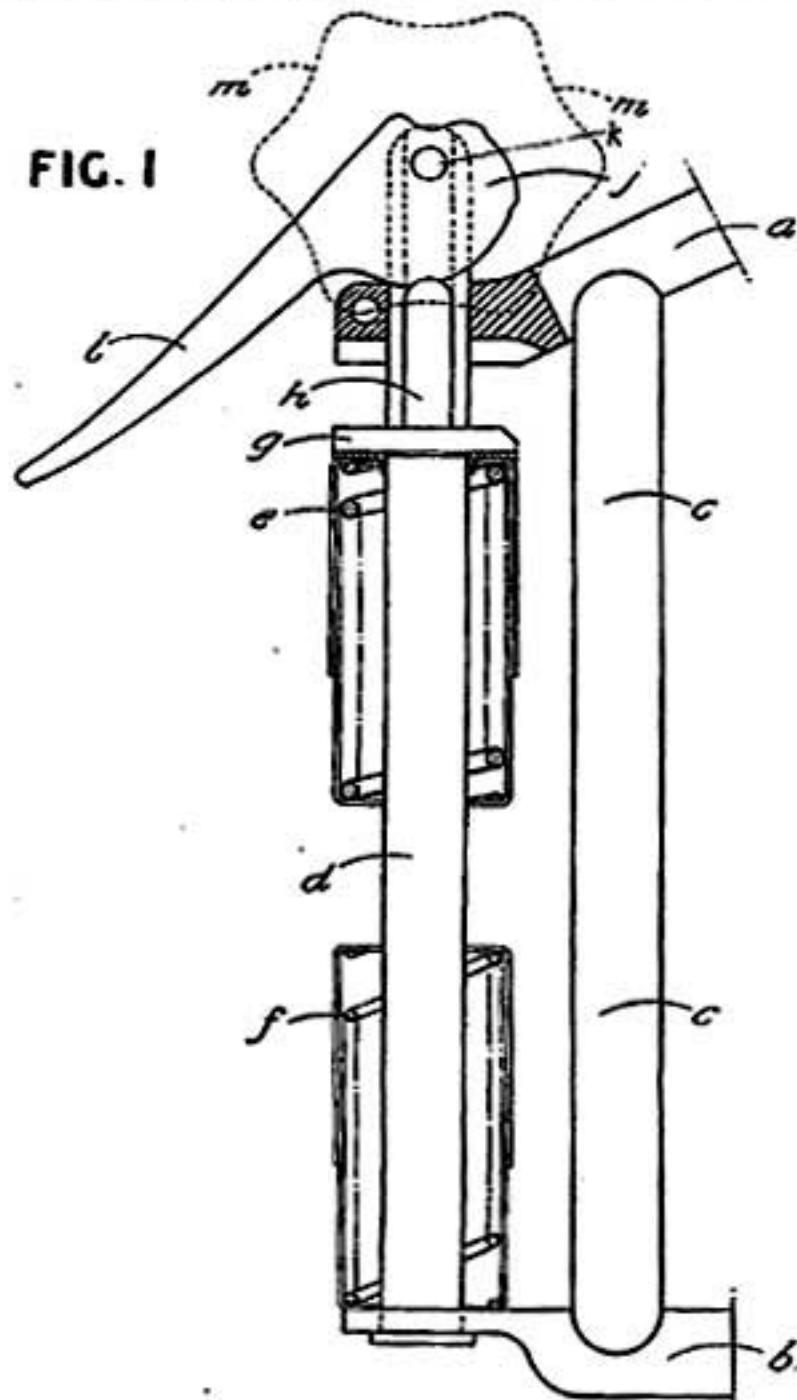


FIG. 2

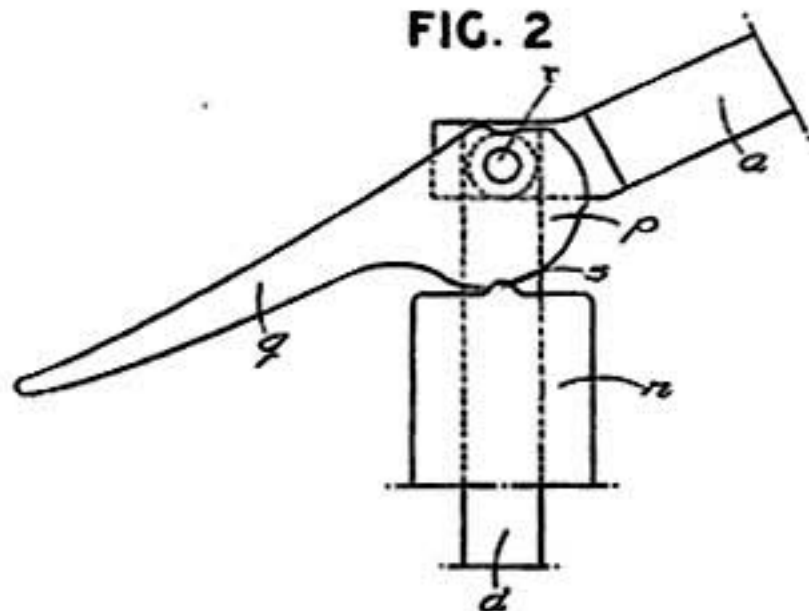


FIG. 3

