

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 means for varying the rate of springs subjected to varying loads and is particularly concerned with helical springs.

One practical application of our invention is to rear springing for a motor cycle of the type in which the wheel spindle is carried by members slidably mounted at each side of the wheel on substantially vertical rods carried by or forming part of the frame and the load is supported by helical compression springs on the upper parts of the rods. The load on the rear wheel varies within small limits with different riders but can be increased to a very great extent or even doubled by a pillion rider.

In applying our invention to this form of springing the spring is pegged or otherwise secured at one or each end to prevent it from rotating. A square thread is cut on the part of the rod within the upper part of the spring, this thread having substantially the same pitch as the spring coils when the spring is stressed only by the initial loading applied during assembly. A collar having a complementary internal screw thread works on this part of the rod and diametrically opposed studs or lugs on the collar project radially between coils of the spring, the studs being staggered axially by a distance equal to half the pitch of the spring coils. The outer ends of the studs engage in longitudinal grooves in a rotatable sleeve enclosing the upper end of the spring, the sleeve abutting against and being rotatably connected by a circlip or like means to a frame lug in which the upper end of the rod is held. Thus by rotation of the sleeve the collar carrying the studs is moved angularly, and as the collar is in screw-threaded engagement with the rod it is moved axially to engage with successive coils of the spring and so to bring

one or more of the coils at the upper end of the spring into or out of action according to the load to be supported. The sleeve is locked in the adjusted position by any convenient means as for example by a locking catch pivotally mounted on the frame lug and engaging with notches in the upper end of the sleeve.

It is desirable that there should be a visible indication of the position of the collar to ensure that the springs on each side of the wheel are adjusted to the same rate and this may be arranged in various ways.

In one practical arrangement for indicating four positions of the collar angularly spaced by 180° between each position an indicator ring is fitted frictionally around the sleeve and has two diametrically opposed openings or windows, one of which is visible on the outer side of the assembly in each locked position of the sleeve. The ring has a projecting lug adapted to engage a peg which prevents the ring from rotating through a full turn with the sleeve. In one limiting position of the sleeve the figure 1 on the sleeve is exposed through the visible window in the ring. An angular movement of the sleeve through 180° carries the ring with it and the figure 2 on the sleeve is exposed through the opposed window in the ring which is then visible. On a further angular movement of the sleeve through 180° the ring is stopped by the peg just before the movement is completed and the figure 3 on the sleeve is exposed through the first window in the ring. On a fourth angular movement of the sleeve through 180° the ring is held stationary and at the end of the movement the figure 4 on the sleeve is exposed through the second window in the ring.

Thus the rider can adjust the effective length of the spring by two complete coils and can make sure that the springs on each side of the wheel are adjusted to the same effective length.

Dated the 4th day of September, 1942.
BARKER, BRETTELL & DUNCAN,
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75 & 77, Colmore Row, Birmingham, 3.

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:—

10 This invention relates to improvements in rear springing for motor-cycles of the type in which the load on the wheel is supported by vertical or substantially vertical helical compression springs.

15 The load on the wheel varies within small limits with different riders but can be increased to a very great extent by a pillion passenger, and one of the objects of our invention is to enable the rider to vary the rate of the springs to suit the load.

According to our invention in rear springing for a motor-cycle in which the load is supported by helical compression springs the load is applied to each spring through an angularly and axially movable member engaging between adjacent coils of the spring and having means for locking it in different angular positions.

30 Thus by adjustment of the movable load-applying member one or more of the coils of the spring can be brought into or out of action according to the load to be supported.

35 The adjustment of the member is conveniently effected by a rotatable sleeve provided with a gravity or other catch for locking it in various positions and with an indicator showing the position of the member.

40 One practical application of our invention to a known type of rear springing for motor-cycles is illustrated by way of example in the accompanying drawings, in which:

Figure 1 is a sectional elevation of the spring assembly for one side of the rear wheel of a motor-cycle.

Figure 2 is a fragmentary side elevation of the upper end of the assembly.

Figure 3 is a cross-section on the line 3—3 of Figure 1.

55 The rear springing for a motor-cycle shown in the drawings is of the known type in which each end of the wheel spindle is carried by a fork end *a* slidable on a vertical rod *b* of which the ends are rigidly anchored in the rear ends of the upper and lower frame members *c* *d* of the motor-cycle frame which are

rigidly connected by a vertical member *e*.

The load on the fork end is supported by a compression spring *f* fitting over the upper part of the rod between the fork end and the frame member *c*, and a lighter rebound spring *g* is fitted over the lower part of the rod between the fork end and the lower frame member *d*.

In applying our invention to this form of springing the spring *f* is pegged by pegs *g'* at one or each end or is otherwise secured to prevent it from rotating. A square thread *h* is cut on the upper part of the rod *b* within the upper part of the spring, this thread having substantially the same pitch as the spring coils when the spring is stressed only by the initial loading applied during assembly.

A collar *j* having a complementary internal screw-thread works on this part of the rod, and diametrically opposed studs or lugs *k* on the collar project radially between adjacent coils of the spring, the studs being staggered axially by a distance equal to half the pitch of the spring coils. The outer ends of the studs engage in longitudinal grooves *l* in a rotatable sleeve *m* enclosing the upper end of the spring, the sleeve abutting against and being rotatably connected by a circlip *n* or like means to a lug *p* on the frame member *c* in which the upper end of the rod is anchored.

Thus by rotation of the sleeve *m* the collar *j* carrying the studs *k* is moved angularly, and as the collar is in screw-threaded engagement with the rod *b* it is moved axially so that the studs engage with successive coils of the spring and thus bring one or more of the coils at the upper end of the spring into or out of action according to the load to be supported. The sleeve is locked in the adjusted position by any convenient means as for example by a gravity locking catch *q* pivotally mounted in the lug *p* and engaging with notches or pegs on the upper end of the sleeve.

It is desirable that there should be a visible external indication of the position of the collar to ensure that the springs on each side of the wheel are adjusted to the same rate and this may be arranged in various ways.

One practical arrangement is shown in the drawings for indicating four positions of the collar angularly spaced by 180° between successive positions. An indicator ring *r* is fitted frictionally around the sleeve *m* and has two dia-

metrically opposed openings or windows *s*, one of which is visible on the outer side of the assembly in each locked position of the sleeve. The ring has a projecting lug *t* adapted to engage a stop peg *u* which prevents it from rotating through a full turn with the sleeve. In one limiting position of the sleeve the figure 1 on the sleeve is exposed through the visible opening in the ring. An angular movement of the sleeve through 180° carries the ring with it and the figure 2 on the sleeve is exposed through the opposed window in the ring which is then visible. On a further angular movement of the sleeve through 180° the ring is stopped by the peg *u* just before the movement is completed and the figure 3 on the sleeve is exposed through the first window in the ring. On a fourth angular movement of the sleeve through 180° the ring is held stationary and at the end of the movement the figure 4 on the sleeve is exposed through the second window in the ring.

Thus the rider can adjust the effective length of the spring by two complete coils and can make sure that the springs on each side of the wheel are adjusted to the same effective length.

The sleeve *m* may conveniently be formed, as shown in Figure 1, with an extended skirt *v* co-operating with a tubular shield *w* adapted to telescope into it to form a dust cover for the spring *f*. Preferably also the sleeve is fitted with a knurled ring or collar *x* to facilitate its operation by the rider.

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 for a motor-cycle in which the load is supported by helical compression springs and the load is applied to each spring through an angularly and axially movable member engaging between adjacent coils of the spring, and having means for locking it in different angular positions.

2. Rear springing for a motor-cycle as claimed in Claim 1 in which the angularly and axially movable member is in screw-threaded engagement with a rod extending axially within the spring and having a thread of substantially the same pitch as the spring coils.

3. Rear springing for a motor-cycle as claimed in Claim 1 in which the spring is held against rotation and fits over a rod having an external screw-thread of substantially the same pitch as the spring under the initial assembly loading, and the angularly and axially movable member comprises an internally screw-threaded collar working on the rod and carrying opposed studs or lugs projecting between the spring coils into sliding engagement with a sleeve fitting over the upper part of the spring and rotatably connected to a frame lug or the like in which the upper end of the rod is held.

4. Rear springing for a motor-cycle as claimed in Claim 3 in which a visual indicator is provided for indicating the angular position of the sleeve over one or more revolutions.

5. Rear springing for a motor-cycle substantially as described with reference to the accompanying drawings.

Dated the 31st day of August, 1943.

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FIG. 1

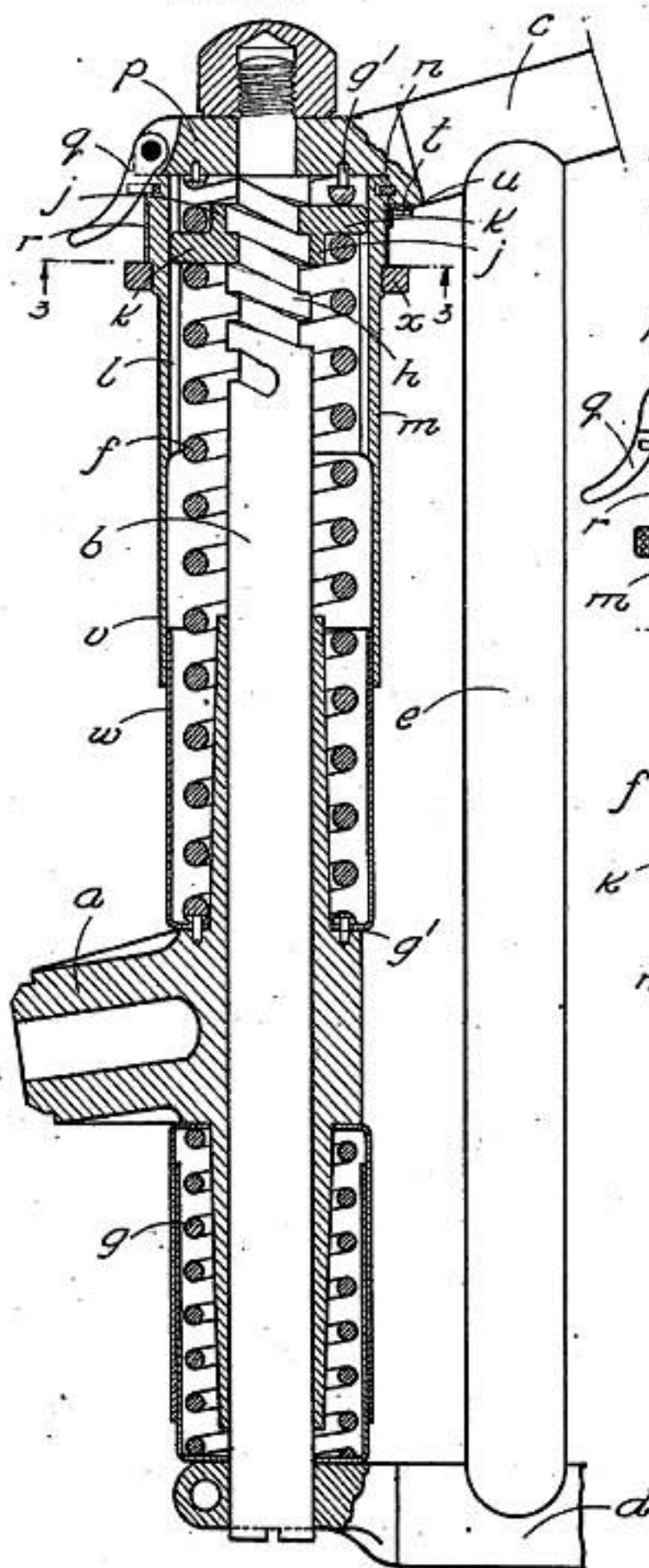


FIG. 2

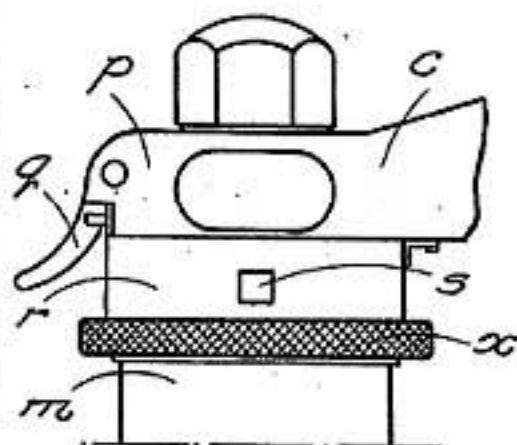
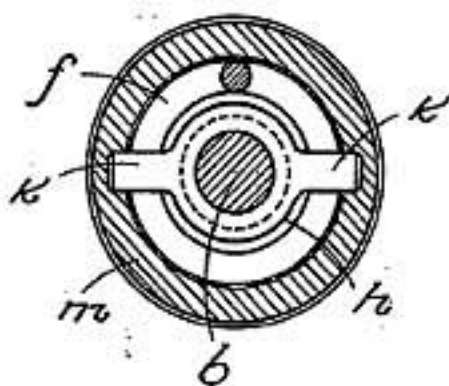


FIG. 3



[This Drawing is a reproduction of the Original on a reduced scale.]