

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

A New or Improved Frame for a Motor-Cycle

We, NORTON MOTORS LIMITED, a British Company, of Bracebridge Street, Birmingham, 6, and RICHARD MCCANDLESS, a British Subject, of 60, Lisburn Road, Belfast, Northern Ireland, 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 and ascertained in and by the following statement:—

This invention relates to a new or improved frame for a motor-cycle.

According to our invention a frame for a motor-cycle comprises two substantially parallel rectangular loops each formed from a single length of tubing, and the ends of the tube forming each loop cross and are welded to each other at the top front corner of the loop, the free ends of the tube which extend beyond the crossing point being welded to the side of an inclined head tube adjacent to the top and bottom thereof.

The two loops are connected at spaced points by rigid tubular or other transverse members of which the ends are welded to the tubes, these members holding the loops rigidly in spaced relationship.

The assembled frame is extremely strong for its weight and is designed to provide the maximum resistance to any stresses applied to the frame by road shocks, by direct load, or by the driving torque of the power unit.

The head tube forms with the straight portions of each frame tube beyond their crossing point two rigid triangulated structures of which no distortion is possible without actual buckling of the tubes.

One practical frame for a motor-cycle in accordance with our invention is illustrated by way of example in the accompanying drawings in which:—

Figure 1 is a side perspective view of the frame.

Figure 2 is a rear perspective view.

The frame illustrated comprises two

substantially parallel rectangular loops *a b* each formed from a single length of steel tubing. The top and bottom members of each loop are substantially horizontal and the rear member is vertical, the rear member leading into the top and bottom members in smooth curves of convenient radius. The front member *c* is slightly inclined forwardly and its upper end is cut off at an angle to fit against the surface of the head tube *d* to which it is welded at *e* adjacent the upper end of that tube. The front end of the top member of the loop is carried forwardly outside and past the front member to which it is welded at *f*, and its extremity fits against and is welded at *g* to the side of the head tube adjacent the bottom thereof.

The spacing between the two loops of the frame may be substantially uniform throughout, but in the preferred arrangement illustrated the two top members diverge fairly sharply from their connection to the head tube for a short distance rearwardly to a point *h* of maximum spacing between the two loops, and then the spacing gradually lessens throughout the length of the tubes until the front members after passing on the inner sides of the horizontal top members practically come together at the point where they are welded to the head tube.

The two loops are rigidly connected at spaced points by transverse tubular members *j, k, l, m*, which may be welded at their ends directly to the loops as in the case of the members *j, l*, and *m* or to lugs or plates welded to the loops as in the case of the member *k*.

The transverse member *j* is located just in front of the point of maximum spacing between the loops. The point of maximum spacing may conveniently be arranged directly over an engine mounted in the frame and this allows room for the withdrawal of the cylinder head upwardly between the top members of the loops after removal of the fuel tank which is detachably mounted on lugs *n*

on the transverse members *j* and *k*. A detachable stay for the engine may be connected between the cylinder head and the transverse member *j*.

- 5 If the drive from the engine is taken by a primary chain to a gear-box, the gear-box is preferably mounted adjustably in engine plates fixed to the crankcase, the assembly forming a unit which is secured to the frame at spaced points. The primary chain load is thus taken by the engine plates and not by the frame.

- 10 The anchorage for the front end of the engine plates is conveniently formed by a spindle passing through lugs *p* on the front transverse member *m*, while the rear anchorage is formed by a spindle extending transversely between steel gusset plates *q* welded to the front of the frame tubes around the lower rear corners of the loops. These gusset plates may also carry a spindle for the front end of a fork in which the rear wheel is mounted, the spindle passing through a transverse distance tube *r* between the gusset plates. The load on the rear wheel may be taken by telescopic spring-loaded struts extending between the rear end of the fork and a rigid support extending rearwardly from the frame.

What we claim is:—

1. A frame for a motor-cycle comprising two substantially parallel rectangular loops each formed from a single length of tubing, the ends of the tube which forms each loop crossing and being welded to each other at the top front corner of the loop and the free ends of the tubes which extend beyond the crossing point being welded to an inclined head tube adjacent to the top and bottom thereof respectively.

2. A frame for a motor-cycle as claimed in Claim 1 in which the two loops are

connected at spaced points by rigid tubular or other transverse members of which the ends are welded to the tubes or to lugs which are themselves welded to the tubes, the transverse members serving to hold the loops rigidly in spaced relationship.

3. A frame for a motor-cycle as claimed in Claim 1 or 2 in which the top and bottom members of each loop are substantially horizontal and the rear member is vertical, the rear member leading into the top and bottom members in smooth curves, and the front member is slightly inclined forwardly and is welded to the front end of the top member is carried forwardly outside and past the front member to which it is welded and its extremity is welded to head tube adjacent to the bottom thereof.

4. A frame for a motor-cycle as claimed in any of the preceding claims in which the top members of the two loops diverge fairly sharply from their connection to the head tube for a short distance rearwardly to a point of maximum spacing between the loops, and then the spacing between them gradually lessens throughout the length of the loops up to the point at which the front members are welded to the head tube.

5. A frame for a motor-cycle as claimed in any of the preceding claims in which gusset plates are welded to the looped tubes at the rear end of the frame to provide an anchorage for the engine unit and to carry means for supporting the rear wheel.

6. A frame for a motor-cycle substantially as described with reference to the accompanying drawings.

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PROVISIONAL SPECIFICATION

A New or Improved Frame for a Motor-Cycle

We, NORTON MOTORS LIMITED, a British Company, of Bracebridge Street, Birmingham, 6, and RICHARD McCANDLESS, a British Subject, of 60, Lisburn Road, Belfast, Northern Ireland, do hereby declare the nature of this invention to be as follows:—

This invention relates to a new or improved frame for a motor-cycle.

- 95 According to our invention a frame for a motor-cycle comprises two substantially parallel rectangular loops each formed from a single length of tubing, and the ends of the tube forming each loop cross and are welded to each other at the top front corner of the loop, the free

ends of the tube which extend beyond the crossing point being welded to the side of an inclined head tube adjacent to the top and bottom thereof.

105 The two loops are connected at spaced points by rigid tubular or other transverse members of which the ends are welded to the tubes, these members holding the loops rigidly in spaced relationship.

115 The assembled frame is extremely strong for its weight and is designed to provide the maximum resistance to any stresses applied to the frame by road shocks, by direct load, or by the driving torque of the power unit.

The head tube forms with the straight portions of each frame tube beyond their crossing point two rigid triangulated structures of which no distortion is possible without actual buckling of the tubes.

In a preferred arrangement the top and bottom members of each loop are substantially horizontal and the rear member is vertical, the rear member leading into the top and bottom members in smooth curves of convenient radius. The front member is slightly inclined forwardly and its upper end is welded to the head tube adjacent the upper end of that tube. The front end of the top member is carried forwardly outside and past the front member to which it is welded and its extremity is welded to the side of the head tube adjacent the bottom thereof.

The spacing between the two loops may be substantially uniform throughout but preferably the two top members diverge fairly sharply from their connection to the head tube for a short distance rearwardly to a point of maximum spacing between the two loops, and then the spacing gradually lessens throughout the length of the tubes until the front members after passing on the inner sides of the horizontal members practically come together at the point where they are welded to the head tube.

The point of maximum spacing between the top member of the two loops

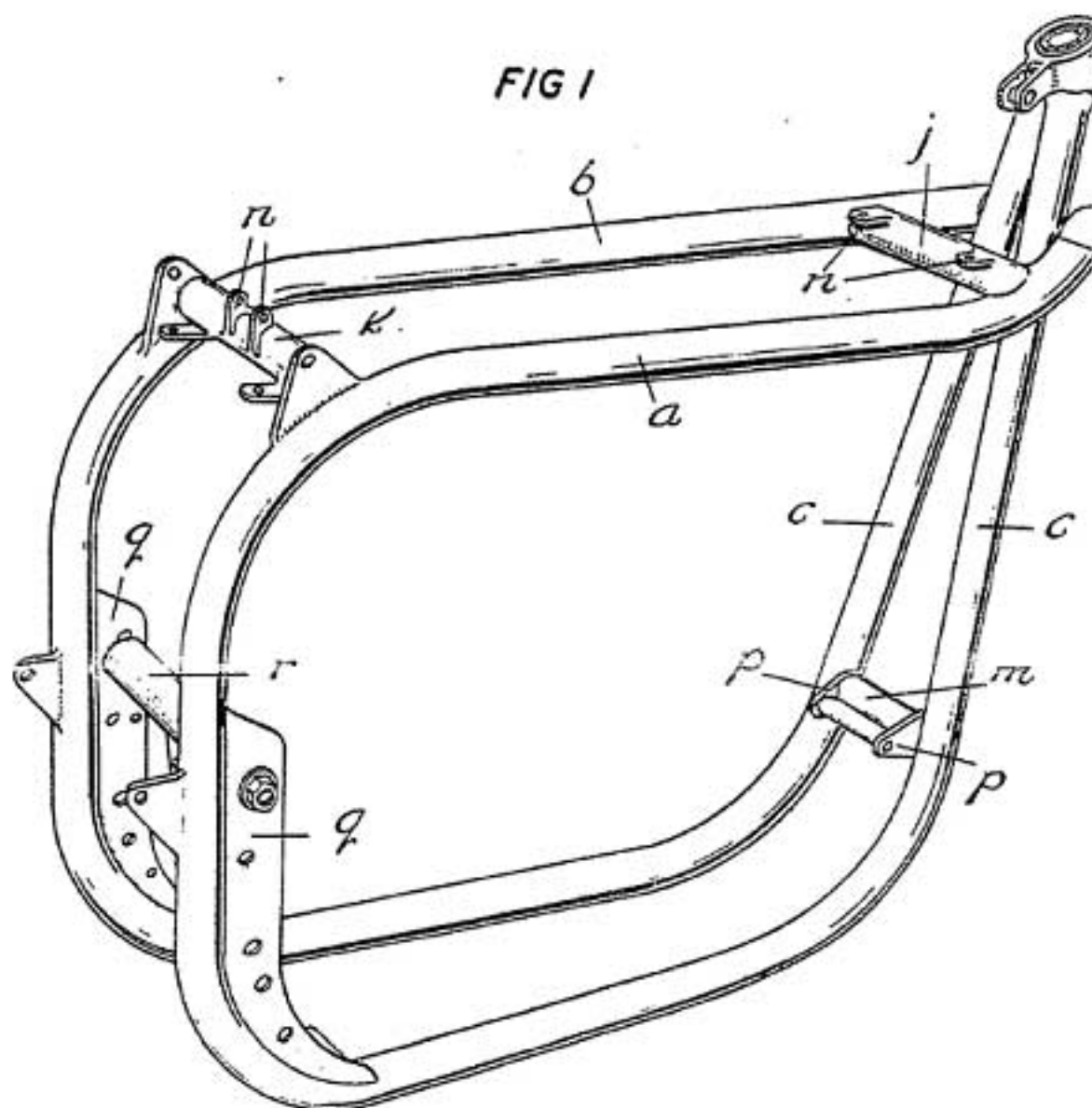
may conveniently be arranged directly over an engine mounted in the frame and this allows room for the withdrawal of the cylinder head upwardly between the top members after removal of the petrol tank which will usually be detachably mounted on the two top members. A detachable stay for the engine may be connected between the cylinder head and a cross member extending between the loops in front of the head.

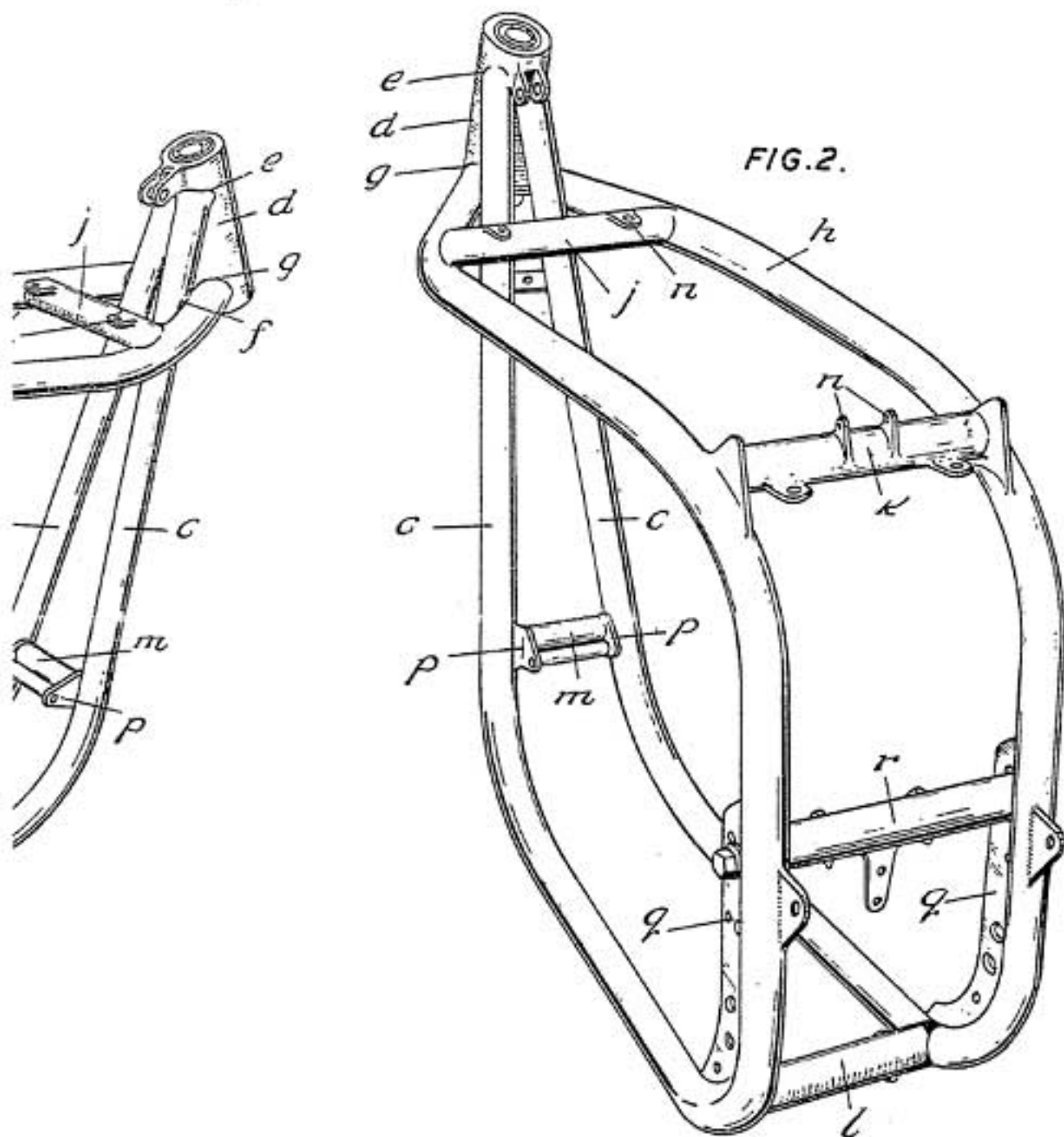
If the drive from the engine is taken by a primary chain to a gear-box we preferably mount the gear-box adjustably in engine-plates fixed to the crankcase, the assembly forming a unit which is secured to the frame at three points. The primary chain load is thus taken by the engine-plates and not by the frame.

The anchorage for the rear end of the engine plates may be formed by a spindle extending transversely between gusset plates welded to the front of the tubes around the rear lower corners of the frame. These gusset plates may also carry a pivot for the front end of a fork in which the rear wheel is mounted, the load on the wheel being taken by telescopic spring-loaded struts extending between the rear end of the fork and a rigid support extending rearwardly from the frame.

Dated this 27th day of September, 1949.
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This Drawing is a reproduction of the Original on a reduced scale





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