(12) UK Patent Application (19) GB (11) 2 238 774 (13) A

(43) Date of A publication 12.06.1991

(21) Application No 9000272.6

(22) Date of filing 05.01.1990

(30) Priority data
(31) 8927486 (32) 05.12.1989 (33) GB

(51) INT CL[5]
B66F 13/00 3/12

(52) UK CL (Edition K)
B8J J11 J16
U1S S1820

(56) Documents cited
GB 1453421 A GB 1006603 A GB 0688350 A
GB 0658655 A

(58) Field of search
UK CL (Edition J) B7C CLG CLK, B8J
INT CL[4] B60B, B66F
Online databases: CLAIMS; INPADOC; WPI

(71) Applicant
Ford Motor Company Limited

(Incorporated in the United Kingdom)

Eagle Way, Brentwood, Essex, United Kingdom

(72) Inventor
Mark James Arthur Baker

(74) Agent and/or Address for Service
A Messulam & Co
24 Broadway, Leigh-on-Sea, Essex, SS9 1BN,
United Kingdom

(54) **A jack for a motor vehicle**

(57) A vehicle jack to be operated by a screw mechanism, is provided with a plate 16, having an aperture 18, connected to the screw mechanism, and the wheel brace 20 is correspondingly shaped so that it can be used as the jack handle. The jack may be a pantograph jack or a pillar jack.

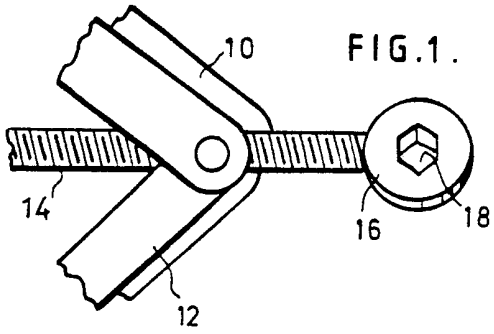


FIG.1.

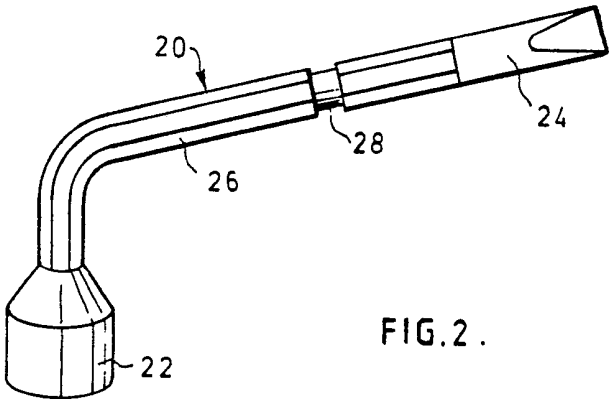


FIG.2.

GB 2 238 774 A

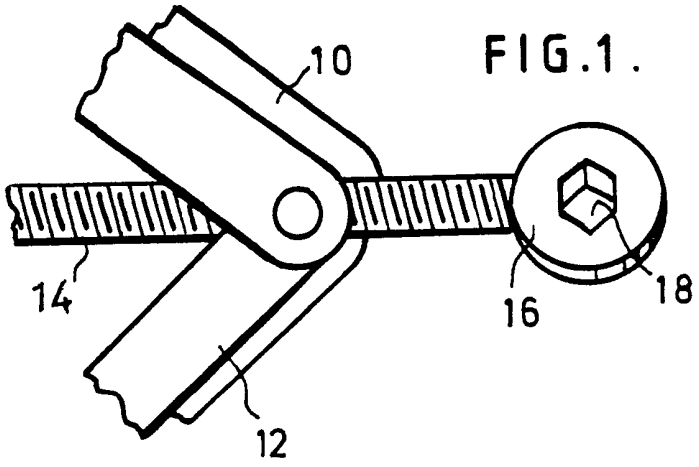


FIG.1.

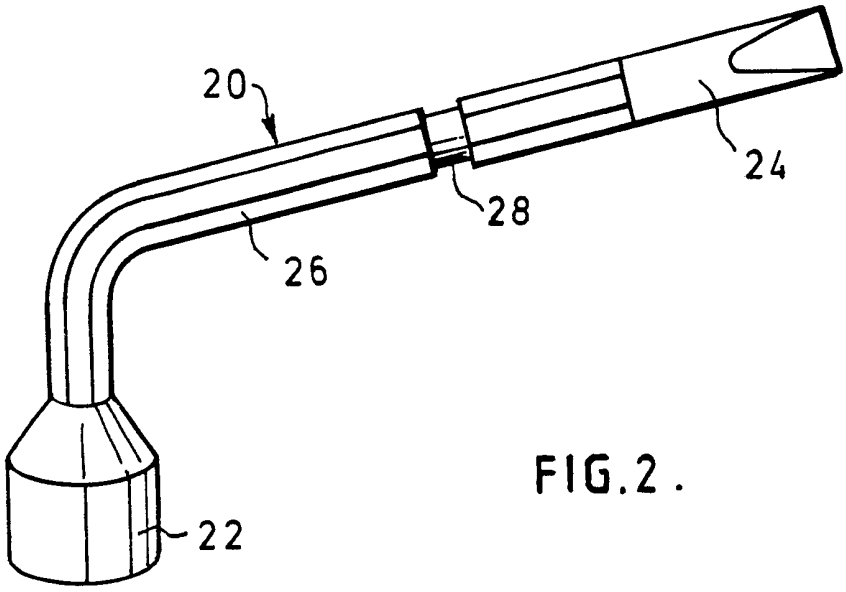


FIG.2.

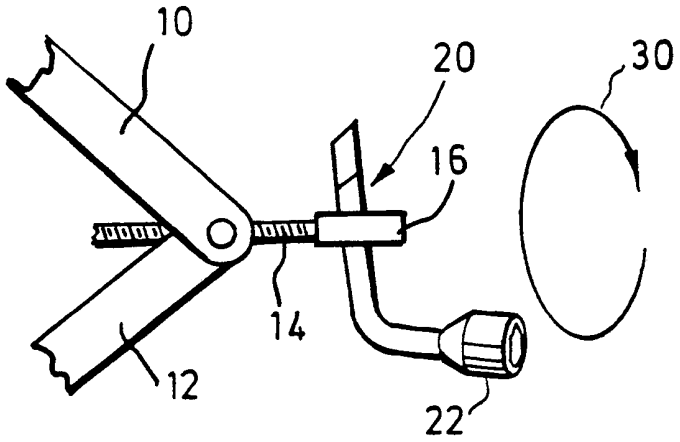
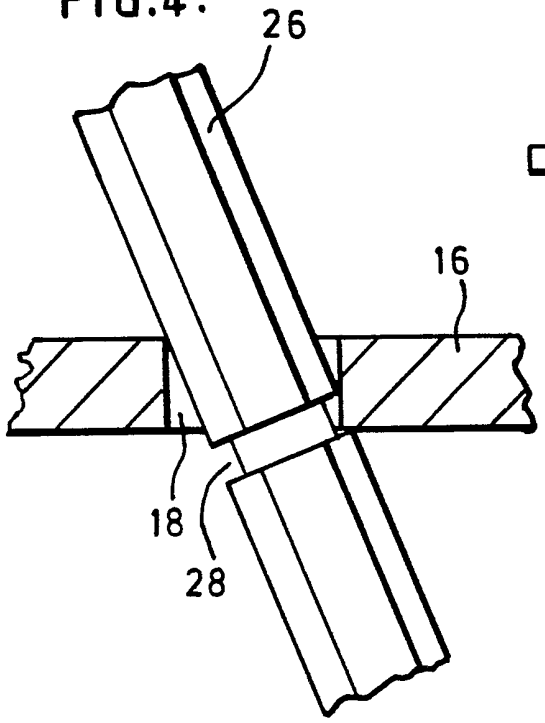


FIG.3.

FIG.4.



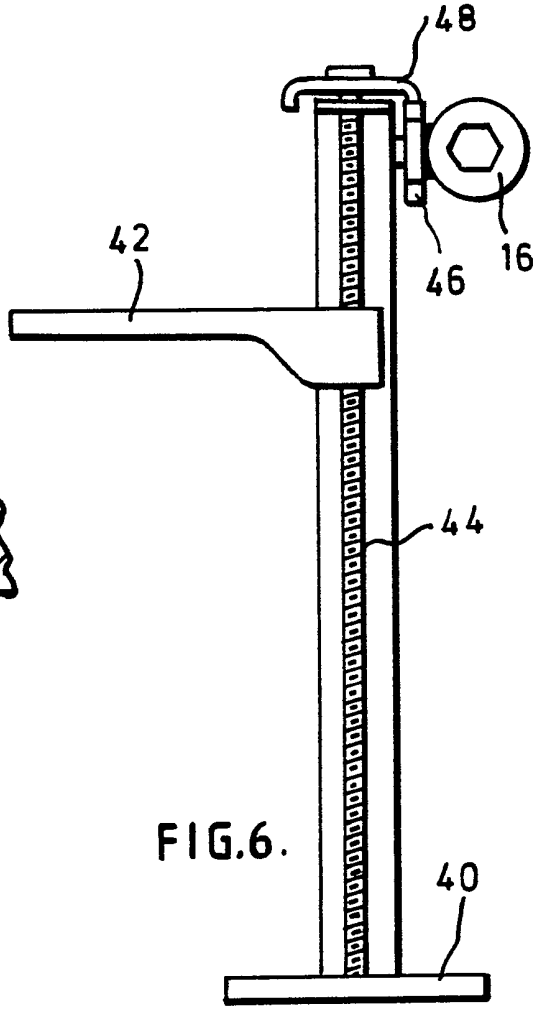
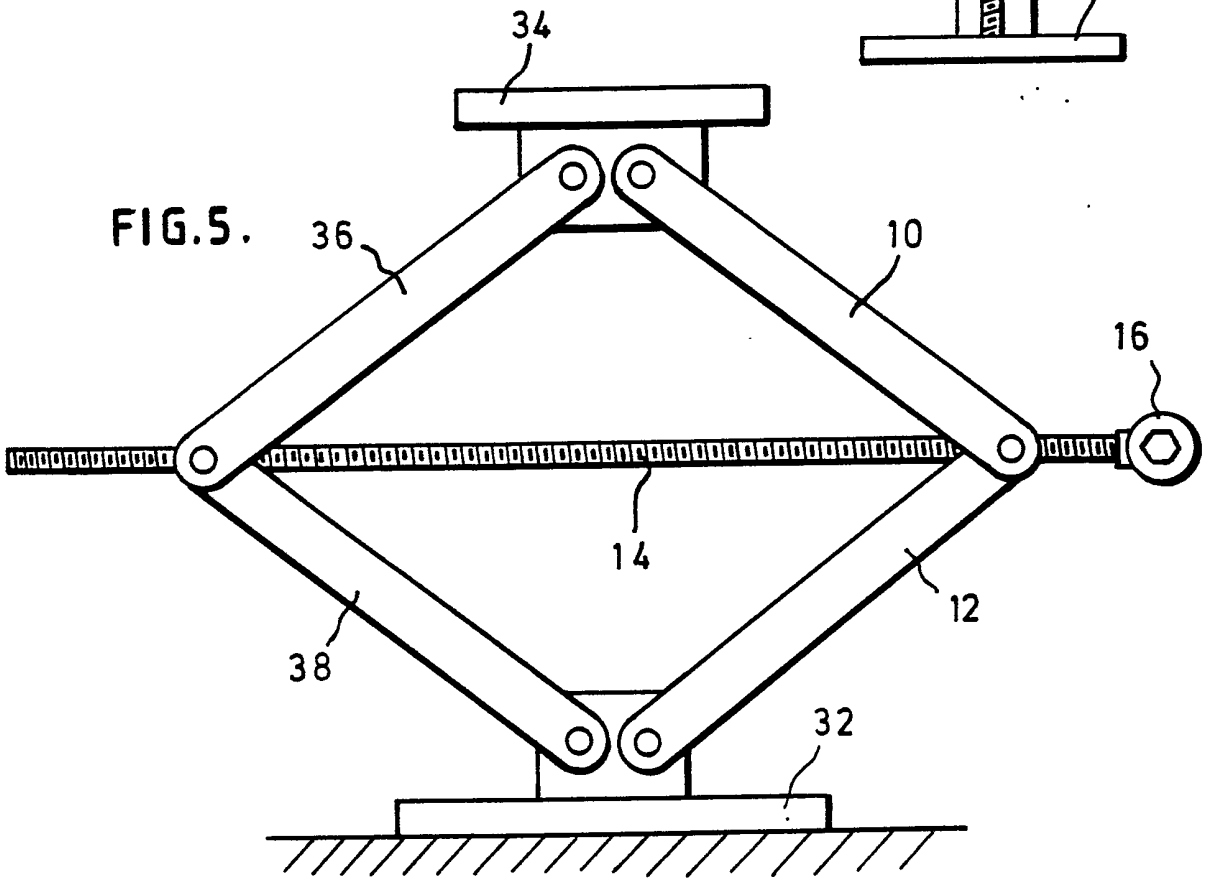


FIG.6.

FIG.5.



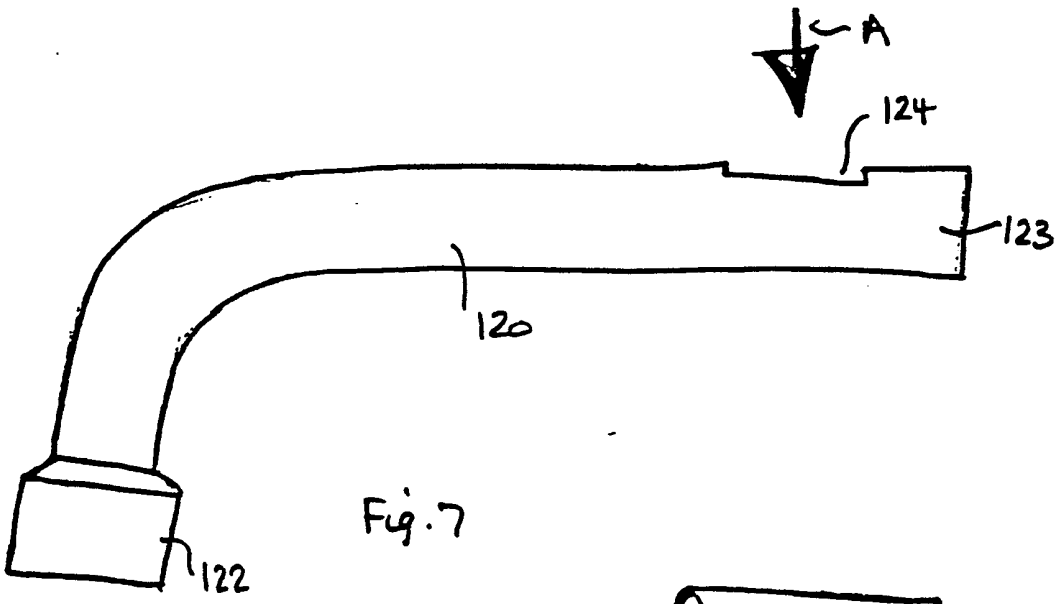


Fig. 7

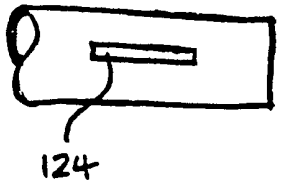


Fig. 7a

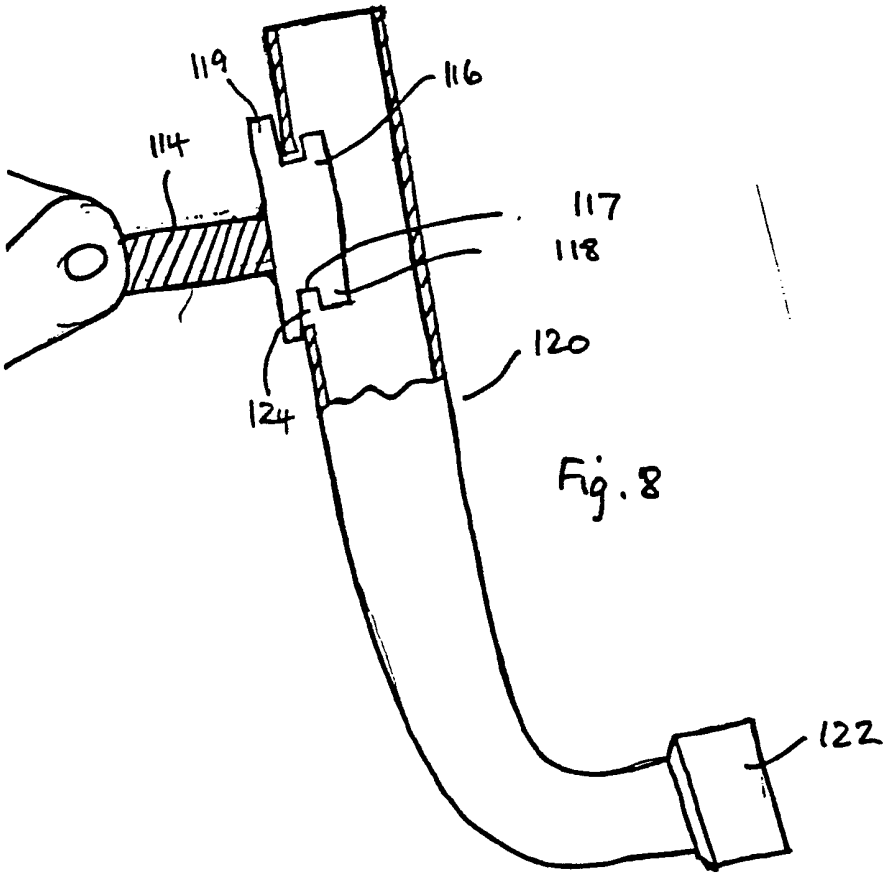


Fig. 8

2238774

A JACK FOR A MOTOR VEHICLE

This invention relates to a jack for a motor vehicle, for raising or lowering the vehicle. The jack has a base which will be placed on the ground, a load platform which will engage part of the vehicle and a screw-operated mechanism between the base and the load platform which causes the load platform to be raised or lowered relative to the base.

In jacks of this type it is necessary to provide an operating member by which part of the screw mechanism can be rotated to operate the jack. Conventionally a handle is permanently attached to part of the screw mechanism. Often this handle can be folded to an inactive position for storage and is then moved to an active position when the jack is to be used. Provision of the jack handle in this way leads to two difficulties. Firstly if the jack handle is permanently attached to the jack, the packaging of the jack assembly can be difficult. Secondly, there is a problem with the jack handle rattling against the jack body, and steps have to be taken to prevent this happening.

According to the present invention, there is provided a jack for raising a motor vehicle, the jack having a base and a load platform and a screw mechanism arranged between the base and the load platform to raise or lower the load platform relative to the base, wherein the screw mechanism is operable by a handle which is detachable from the mechanism and can be used for other wheel changing functions.

If the jack handle functions also as a wheel brace and/or a wheel cover removal tool, then one extra component in the jacking system can be omitted.

Preferably the screw mechanism comprises a rotatable screw threaded bar which can rotate relative to a screw threaded nut to cause the low platform to be raised or lowered. The screw threaded bar may end in an apertured plate set on the end of the bar so that the plane of the plate coincides with the axis of rotation of the bar. The size of the aperture should be such that the handle can pass through the aperture.

In a preferred embodiment, the aperture is non-round (conveniently hexagonal) and the cross section of the handle matches the shape of the aperture. The handle may have a groove at one point around its circumference to help the handle to locate at the correct point along its length in the apertured plate.

In another embodiment the screw threaded bar ends in a flat plate set on the end of the bar so that the plane of the plate coincides with the axis of rotation of the bar. The handle is then tubular and has a slot through the tube wall so that the plate can engage through the slot to allow the handle to turn the threaded bar.

Preferably the handle has a cranked end with a socket for the wheel nuts so that the handle can be used as a wheel brace. Additionally, the other end of the handle may include a chisel point which can be used to remove a wheel cover.

According to a second aspect of the invention, there is provided a jack for raising a motor vehicle, the jack having a base and a load platform and a screw mechanism operable between the base and the load platform to raise or lower the load platform relative to the base, wherein the wheel brace forms the handle for operating the screw mechanism.

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

Figure 1 shows a detail of part of a scissor jack in accordance with the invention;

Figure 2 shows a wheel brace for operating the jack of Figure 1;

Figure 3 illustrates the jack being operated;

Figure 4 is a detail showing the engagement between the wheel brace shaft and the apertured plate;

Figures 5 and 6 show respectively a scissor jack and a pillar jack in accordance with the invention;

Figure 7 shows a wheel brace in accordance with a second embodiment of the invention;

Figure 7a shows a detail of part of the wheel brace of Figure 7, in the direction of the arrow A; and

Figure 8 illustrates the wheel brace of Figure 7 being used to operate a suitably equipped scissor jack.

Figure 1 shows two limbs 10 and 12 of a scissor jack with a threaded bar 14 forming the operating member for the jack. On the outer end of the bar 14 a plate 16 is welded, and the plate has a hexagonal aperture 18 through it. The plane of the plate 16 contains the axis of rotation of the threaded bar 14. The dimensions of the plate 16 should be as small as possible consistent with providing the correct size aperture 18 and having adequate strength. In the present embodiment the plate 16 is in the form of a disc.

Figure 2 shows a wheel brace 20 having a wheel nut socket 22 at one end, a chisel point 24 at the other end and a hexagonal section shaft 26 between. About midway along the length of the shaft 26 is an annular groove 28.

Figure 3 shows the jack in use. The shaft 26 of the wheel brace is placed through the aperture 18 and as can be seen in Figure 3 forms a handle by which the bar 14 can be rotated as indicated by the arrow 30. In this way the load platform of the jack can be raised and lowered. The socket end 22 of the wheel brace will be gripped by the operator so as to form a convenient and comfortable handle for operating the jack.

The sectional shape 26 of the wheel brace shaft matches the cross sectional shape of the aperture 18 so that when the wheel brace is inserted it will not rotate in the aperture. This ensures that the cranked end of the wheel brace with the socket 22, one correctly inserted, will always point outwards to the position shown. In addition however in order to locate the wheel brace axially in the plate 16, the groove 28 is provided. Figure 4 shows, on an exaggerated scale, how this will work. The internal dimension of the aperture 18 will be slightly greater than the external dimensions of the shaft 26. The mismatch here will be such as to allow the shaft to tilt a certain amount relative to the aperture, but to prevent the shaft 26 rotating in the aperture. When the handle is used, the application of a turning force to the wheel brace will cause the shaft to tilt to the extent permissible in the aperture 18 and when this happens one corner of the aperture will enter the groove 28 and therefore prevent the wheel brace from sliding longitudinally through the aperture whilst the jack is being operated.

The invention can be applied to any type of jack which is operated by a rotating action. Figure 5 shows a conventional scissor jack with a base 32 and a load platform 34 and pivoted limbs 10, 12, 36, 38. Apart from the mounting of the aperture plate 16 at the end of the bar 14, the jack is conventional. Figure 5 shows a full scissor jack but the invention can equally be applied to half-scissor jacks.

Figure 6 shows a pillar jack with a base 40 and a load platform 42 in the form of a lateral arm. The platform 42 rides up and down on a threaded bar 44 which is rotated by an apertured plate 16 through two gears 46 and 48 in a manner which is in itself known. As with the scissor jacks previously described, a wheel brace as shown in Figure 2 can be inserted through the aperture in the plate 16 to operate the jack.

Figures 7 and 8 show an alternative way in which the connection between the wheel brace and the jack can be accomplished. In Figure 7, the wheel brace 120 is tubular in form and has a wheel nut socket 122 at one end. When the wheel brace is tubular as in this embodiment, the opposite end 123 of the brace can also be formed into a socket shape to fit a differently sized nut.

The socket wall has a slot 124 formed through the tube wall, for engagement with the operating screw of the jack. The jack has an operating screw in the form of a threaded bar 114, and a drive plate 116 is welded to the end of the bar 114 in the same way as the plate 16 is welded to the bar 14 in Figure 1. The plate 116 has a neck 117 between an outer region 118 and a shoulder 119. The width of the outer region 118 is such that it can just pass through the slot 124. However the width of the shoulder 119 is greater than the length of the slot so that it cannot pass through the slot. When a force

is applied to the end of the wheel brace in order to turn the bar 114, the wheel brace will slide so that one end of the slot 124 engages in the neck 117 so that the wheel brace is held onto the jack while the jack is being used.

Jack assemblies conventionally provide for storage of the wheel brace, and therefore the jack of the invention does not require any additional steps to be taken for storage or packaging of the combined wheel brace/jack handle. The plate 16 is an integral part of the jack and will not give rise to any rattling when the jack is stored.

CLAIMS

1. A jack for raising a motor vehicle, the jack having a base and a load platform and a screw mechanism arranged between the base and the load platform to raise or lower the load platform relative to the base, wherein the screw mechanism is operable by a handle which is detachable from the mechanism and can be used for other wheel changing functions.

2. A jack as claimed in Claim 1, wherein the jack handle functions also as a wheel brace and/or a wheel cover removal tool.

3. A jack as claimed in Claim 1 or Claim 2, wherein the screw mechanism comprises a rotatable screw-threaded bar which can rotate relative to a screw threaded nut to cause the load platform to be raised or lowered.

4. A jack as claimed in Claim 3, wherein the screw threaded bar ends in an apertured plate set on the end of the bar so that the plane of the plate coincides with the axis of rotation of the bar.

5. A jack as claimed in Claim 4, wherein the size of the aperture is such that the handle can pass through the aperture.

6. A jack as claimed in Claim 4 or Claim 5, wherein the aperture is non-round and the cross section of the handle matches the shape of the aperture.

7. A jack as claimed in any one of Claims 4 to 6, wherein the handle has a groove at one point around its circumference to help the handle to locate at the correct point along its length in the apertured plate.

8. A jack as claimed in Claim 3, wherein the screw threaded bar ends in a flat plate set on the end of the bar so that the plane of the plate coincides with the axis of rotation of the bar and wherein the handle is tubular in form and has a slot formed in the tube wall, which slot can engage over the plate on the end of the threaded bar so that turning of the handle turns the threaded bar.

9. A jack as claimed in any preceding claim, wherein the handle has a cranked end with a socket for the wheel nuts so that the handle can be used as a wheel brace, and wherein the other end of the handle includes a chisel point which can be used to remove a wheel cover.

10. A jack for raising a motor vehicle, the jack having a base and a load platform and a screw mechanism operable between the base and the load platform to raise or lower the load platform relative to the base, wherein the wheel brace forms the handle for operating the screw mechanism.

11. A jack for raising and lowering a motor vehicle, substantially as herein described with reference to the accompanying drawings.

Published 1991 at The Patent Office, State House, 66/71 High Holborn, London WC1R 4TP. Further copies may be obtained from Sales Branch, Unit 6, Nine Mile Point, Cwmfelinfach, Cross Keys, Newport, NP1 7HZ. Printed by Multiplex techniques ltd, St Mary Cray, Kent.