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(71) Applicant: **FIAT AUTO S.p.A.**
10135 Torino (IT)

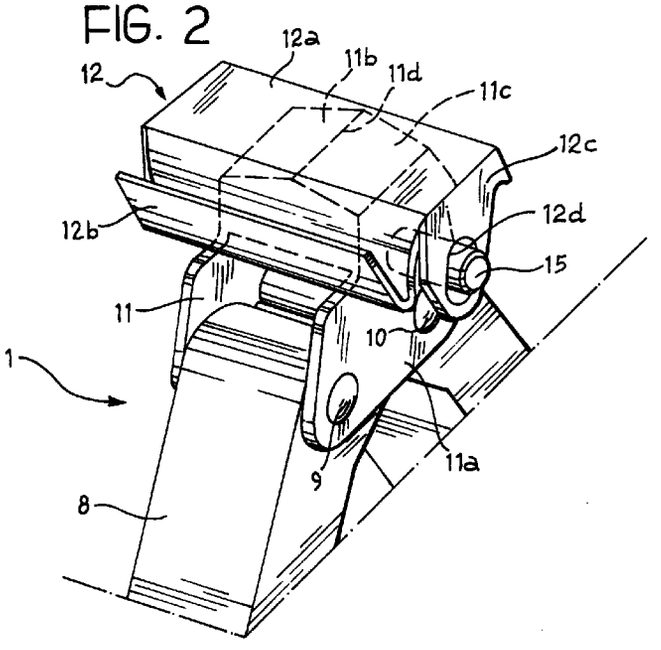
(72) Inventors:
- **Fabbro, Erman**
  10135 Torino (IT)
- **Rossi, Roberto**
  10136 Torino (IT)

(74) Representative: **Quinterno, Giuseppe et al**
c/o JACOBACCI & PERANI S.p.A.
Corso Regio Parco, 27
10152 Torino (IT)

(54) A lifting jack for a car

(57) A jack includes at least one lower arm (5, 6) and one upper arm (7, 8) pivotally connected to each other, a support bracket (12) connected to the upper arm (7, 8) for application to an engagement surface of the car, and a control and adjustment device (13, 14) connected to the said arms (5-8) and operable to vary their positions relative to each other. The jack (1) is characterised in that the support bracket (12) is connected to the upper arm (7, 8) so as to be pivotable about an axis perpendicular to the pivot axis between the said arms (5-8).

FIG. 2



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Description

The present invention relates to a lifting jack for a car.

The specific object of the invention is a lifting jack which includes

at least one lower arm and at least one upper arm pivotally connected to each other,

a support bracket fixed to the upper arm for applying to an engagment surface of the car, and

control and adjustment means connected to the said arms and operable to vary their positions relative to each other.

Jacks of this type are currently used for lifting cars, for instance when a wheel needs to be changed.

The most common examples of such jacks may comprise a single lower arm and a single upper arm, pivotally connected to each other, as described for example in European patent No. EP-A-O 407740, or may comprise a pair of lower arms and a pair of upper arms, pivotally connected so as to form an articulated parallelogram.

In some prior art jacks, the support bracket is rigidly fixed to one end of the, or an upper arm, as described for example in Italian Utility Model IT-U 220 450.

In other examples, for example in that described in European Patent Application EP-A-O 407 740, the support bracket is pivoted on the upper arm about an axis parallel to the pivot axis between the two arms.

The object of the present invention is to provide an improved jack which is particularly suited to enable the support bracket to be more easily, accurately and securely coupled to the appropriate engagement surface of the car, even when this is parked on a slope.

This object is achieved according to the invention by providing a lifting jack of the type specified above, characterised in that the support bracket is pivoted on the said at least one arm about an axis perpendicular to the axis about which the two aforesaid arms are pivotally connected to each other.

Further characteristics and advantages of the invention will become apparent from the following detailed description, provided purely by way of non-limitative example with reference to the appended drawings, in which:

Figure 1 shows a jack according to the invention;

Figure 2 is a partial perspective view of a portion of the jack of Figure 1;

Figure 3 is a partial perspective view of a variant of the jack according to the invention; and

Figure 4 is a partial perspective view of a further variant of the invention.

With reference to Figures 1 and 2, in the embodiment illustrated by way of example a lifting jack 1 according to the invention includes a base element 2 for resting on the ground, with two lower arms 5 and 6 pivoted on it at 3 and 4. Two further arms 7 and 8 are pivoted by their lower ends on the upper ends of the arms 5 and 6. The upper ends of the arms 7 and 8 are pivotally connected at 9 and 10 to a connecting element 11.

A support bracket 12, intended to be applied to an engagement surface of the car, is connected to the connecting element 11 in ways which will be described in detail later.

A screw-type control and adjustment device, indicated 13 in Figure 1 and of a type which is known per se, is fixed to the pivotal connections between the lower arms 5, 6 and the upper arms 7, 8. By manual operation of a control lever 14 this device enables the configuration of the articulated parallelogram formed by the arms 5-8 to be adjusted so as to alter the height of the support bracket 12.

In the embodiment illustrated in Figure 2, the connecting element 11 has two parallel, facing side portions 11a between which the upper arms 7 and 8 are pivoted.

These portions are joined by an upper portion the surface of which is substantially a convex dihedral shape having two faces 11b and 11c joined along a line 11d which is substantially perpendicular to the pivot axes between the arms 5-8.

The support bracket 12 of Figure 2 has an essentially rectangular flat support surface 12a resting on the top of the connecting element 11. A U or V-section channel-shape portion 12b is joined to the flat support surface 12a of the bracket 12 with its concave surface facing upwards.

This channel-shaped portion is intended to be engaged with a corresponding rib or fillet on the bottom of a car.

Two downwardly folded side tongues 12c extend from the shorter sides of the support portion 12a of the bracket 12, with only one being visible in Figure 2. These tongues 12c have respective vertically elongate apertures or slots 12d through which extend with clearance the ends of a transverse retaining pin or dowel 15 carried by the connecting element 11. This pin or dowel is parallel to the pivot axes between the arms 5-8. The pin may be engaged in corresponding apertures in the connecting element or be otherwise fixed thereto, for example by welding.

As a result of the clearance between the apertures 12d in the bracket and the ends of the pin or dowel 15, the support bracket 12 is pivotable about an axis perpendicular to the pivot axes between the arms 5-8.

Owing to the dihedral shape of the top of the connecting element 11, the bracket 12 tends to assume two stable working positions in which its portion 12a rests on the top surface 11b or on the top surface 11c respectively of the connecting element 11 and is able to assume all intermediate positions between these two extreme stable positions.

The ability of the support stirrup 12 to turn or pivot transversely, together with its ability to pivot about the axis of the pin 15, enables the bracket to be easily, accurately and securely engaged with the engagement surface of the car.

Figure 3 shows a first variant of the invention. In this drawing, parts and elements which have already been described have been given the same reference numerals.

In the variant of Figure 3, the connecting element 11 has a substantially planar top portion 11b. The support bracket 12 has a top portion 12a having a lower arcuate, convex surface 12e resting on the top surface 11b of the connecting element 11. The engagement between the internal tongues 12c of the bracket 12 and the pin or dowel 15 is substantially the same as described with reference to Figure 2.

In the variant of Figure 3 once again, the support bracket 12 is substantially pivotable about an axis perpendicular to the pivot axes between the arms 5-8.

Figure 4 shows a further variant of the invention. In this drawing once again parts and elements which have already been described have been given the same reference numerals.

In the variant of Figure 4, the connecting element 11 is substantially identical to that described with reference to Figure 2. Once again, the support bracket 12 has a planar upper surface resting on the dihedral top portion of the connecting element 11.

However this bracket has no lateral tongues but is pivoted on the connecting element 11 by means of a pin or the like 16 the axis of which is perpendicular to the pivot axes between the arms 5-8.

In the variant of Figure 4 the support bracket 12 is once again pivotable about an axis perpendicular to those of the pivotal connections between the aforesaid arms.

Naturally, the principle of the invention remaining unchanged, embodiments and manufacturing details may vary widely from those described and illustrated purely by way of non-limitative example, without departing thereby from the scope of the invention.

Claims

1. A lifting jack (1) for a car which includes at least one lower arm (5, 6) and at least one upper arm (7, 8) pivotally connected to each other,

   a support bracket (12) connected to the upper arm (7, 8) to be applied to an engagement surface of the car, and

   control and adjustment means (13, 14) connected to the said arms (5-8) and operable to adjust their positions relative to each other;

   the lifting jack being characterised in that the support bracket (12) is connected to the said at least one upper arm (7, 8) so as to be pivotable about an axis perpendicular to the pivot axes between the said arms (5 to 8).

2. A jack according to Claim 1, characterised in that the said at least one upper arm (7, 8) has an associated bearing element (11) with an upper surface (11b, 11c) on which bears a lower surface (12a; 12e) of the support bracket (12); at least one of the said surfaces (11b, 11c; 12a, 12e) being shaped so as to cooperate with the other to define at least two different possible working positions of the support bracket (12).

3. A jack according to Claim 2, characterised in that the upper surface (11b, 11c) of the said bearing element (11) has a substantially convex dihedral shape.

4. A jack according to Claim 2, characterised in that the upper surface (11b) of the said bearing element (11) is substantially planar, and the support bracket (12) has an arcuate, convex lower surface (12e) which cooperates with the said planar surface (11b) of the bearing element (11).

5. A jack according either to Claim 3 or Claim 4, characterised in that the support bracket (12) has a pair of apertures or slots (12d) engageable with clearance by a pin or dowel (15) fixed to the bearing element (11) and parallel to the pivot axes between the arms (5-8).

6. A jack according to either Claim 3 or Claim 3, characterised in that the support bracket (12) is pivoted on a bearing surface (11) associated with the said at least one upper arm (7, 8) by a pin (16) arranged perpendicular to the pivot axes between the said arms (5-8).

7. A jack according to any one of the preceding Claims, which includes two lower arms (5, 6) and two upper arms (7, 8) connected to each other so as to form an articulated parallelogram.

8. A jack according to Claim 7 and any one of Claims 3 to 6, characterised in that the bearing element (11) is constituted by a connecting element (11) on which are pivoted the ends of the upper arms (7, 8) remote from the lower arms (5, 6).

FIG. 1

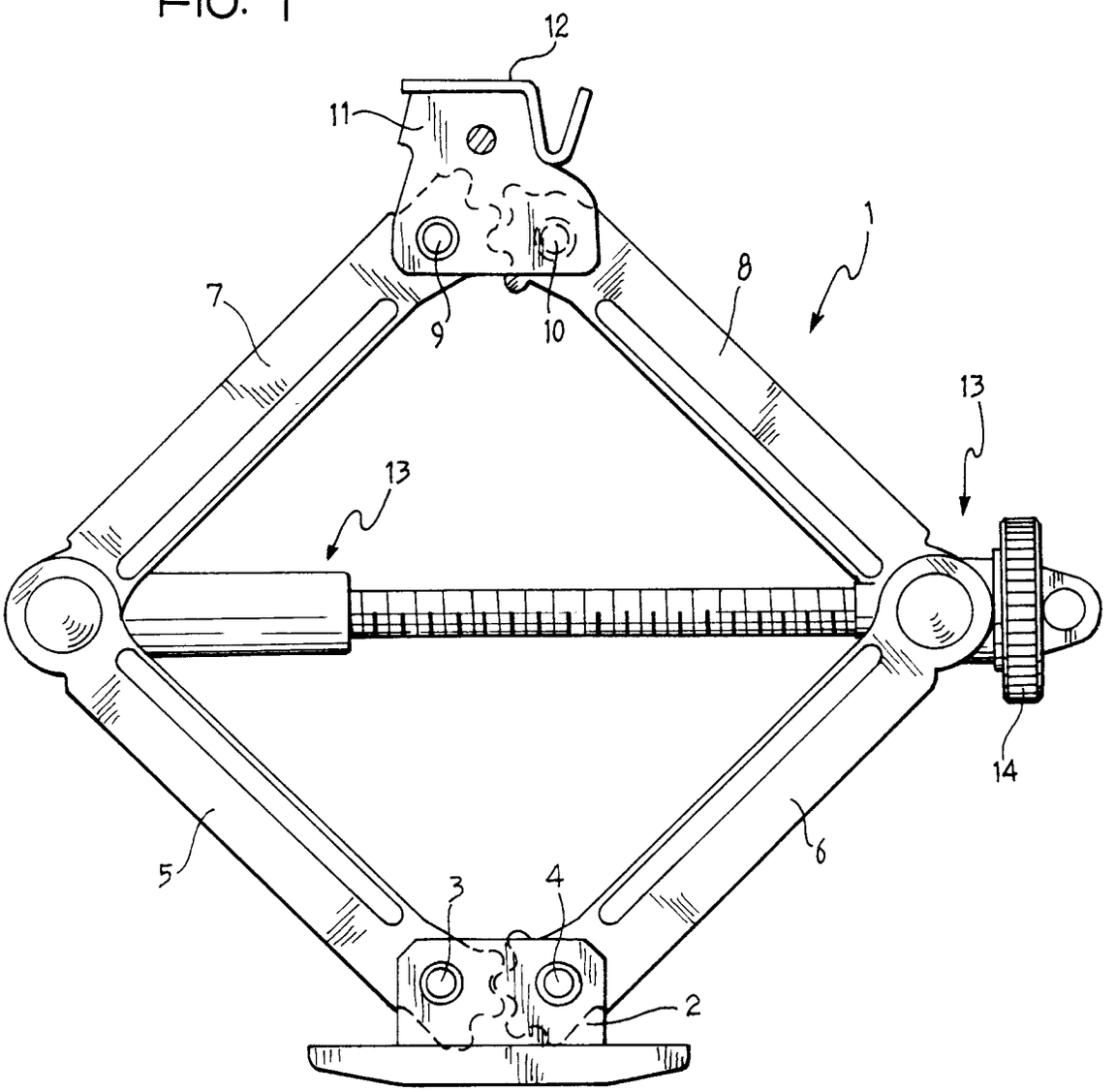
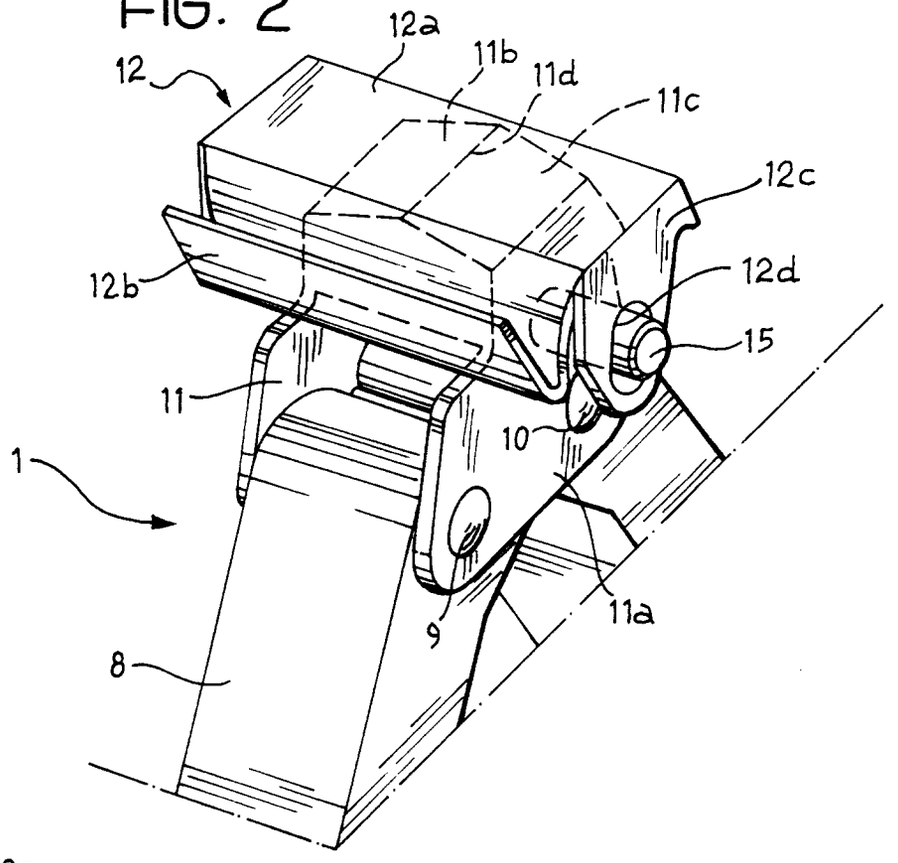


FIG. 2


12
12a
11b
11d
11c
12c
12b
12d
15
11
10
1
11a
9
8

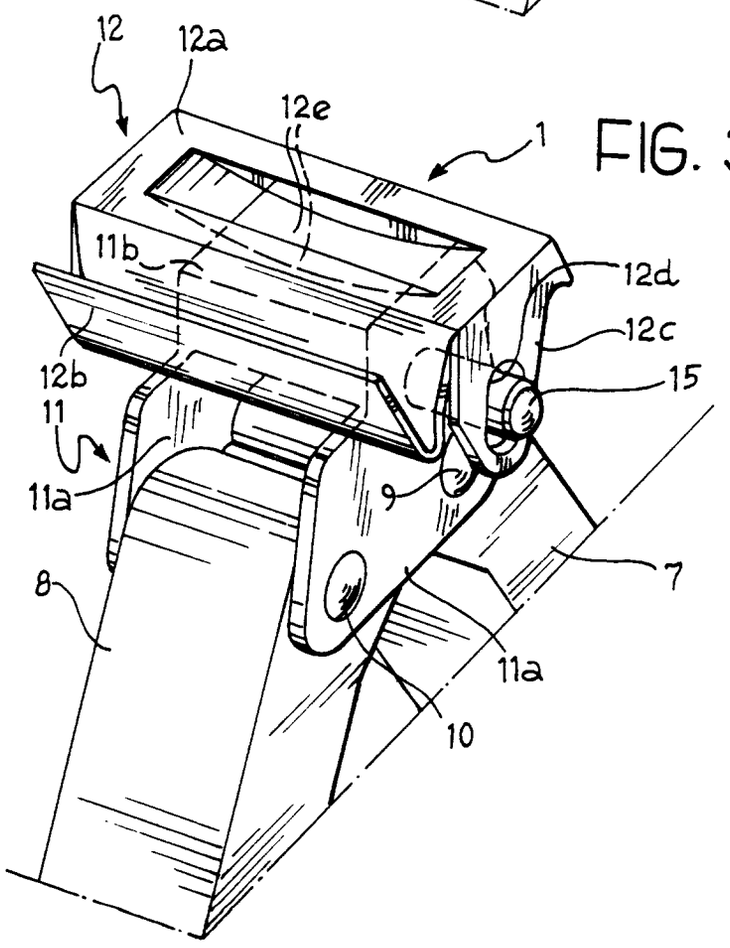
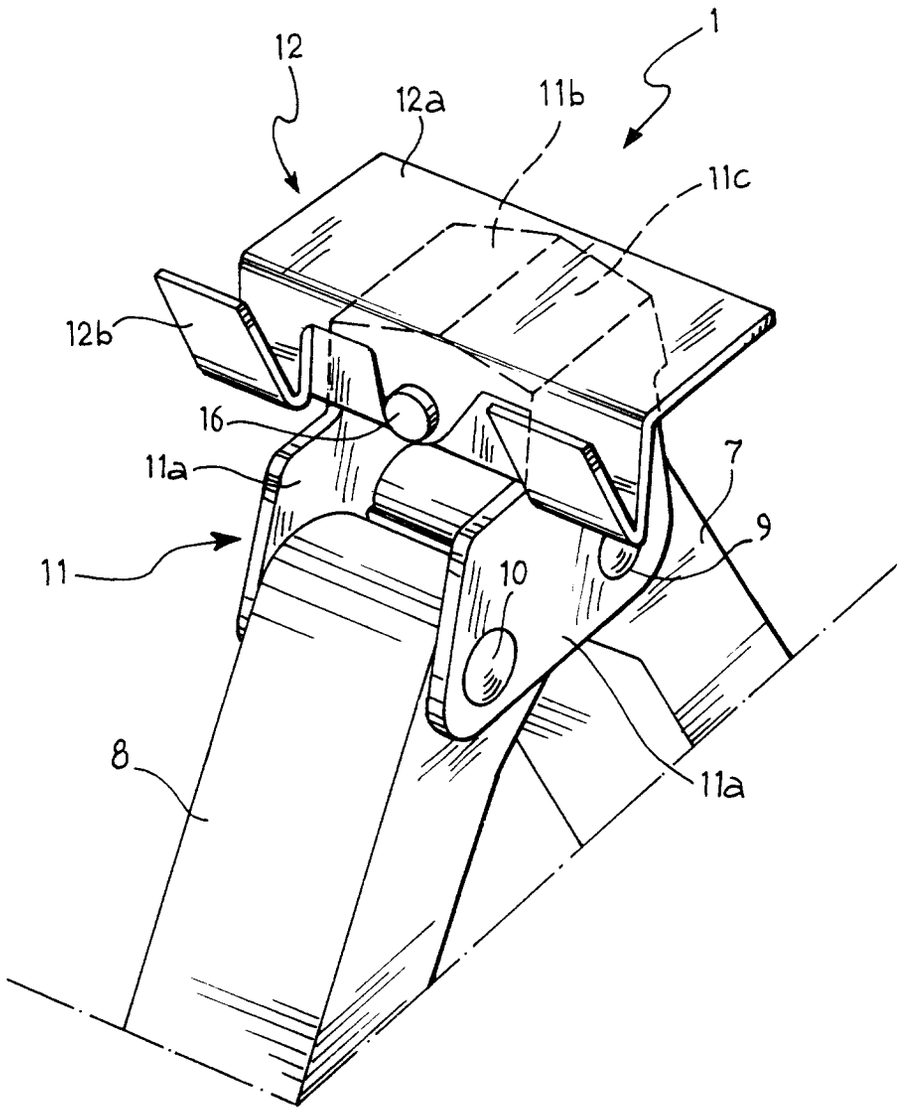

12
12a
12e
1
11b
12d
12c
12b
15
11
11a
9
7
8
11a
10

FIG. 3

FIG. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 96 10 8252

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	DE-U-94 18 720 (PANNE G.M.B.H.) * claims 1,5; figures 13-15 *	1,2 3,4	B66F3/12
X A	DE-A-37 24 113 (TUB S.A.) * column 5, line 23 - line 65; figures *	1 6	
X A	US-A-2 672 243 (MARSH) * column 3, line 34 - line 44 * * figures 1,2,4 *	1,7 2,6,8	
X A	EP-A-0 622 329 (TUB S.A.) * column 9, line 41 - line 47 * * figures 1,5-7 *	1,2 3,4	
A	EP-A-0 529 355 (A. BILSTEIN G.M.B.H.) * column 2, line 12 - line 14; claim 1 * * figure 2 *	1,4	
A	EP-A-0 469 234 (SALVADOR ROVIRA)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B66F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	2 September 1996	Guthmuller, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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