

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: **90303020.3**

(51) Int. Cl.⁵: **E04G 5/02, E04G 25/06**

(22) Date of filing: **21.03.90**

(30) Priority: **21.03.89 GB 8906435**

(43) Date of publication of application:
26.09.90 Bulletin 90/39

(84) Designated Contracting States:
AT BE CH DE DK ES FR GR IT LI LU NL SE

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(54) **Jacks for building supports.**

(57) A jack for a building support (15) comprises a jack screw (1) with an external screw thread, a jack handle (2) with an internal screw thread in engagement with the external screw thread and a bearing cap (3) which engages the jack handle (2) and includes a base (9) through which the jack screw (1) passes and which, in use, engages and supports the building support. The bearing cap (3) includes connecting means (14) by which it may be connected to the building support and the bearing cap has a radially outwardly directed annular groove (13) into which extend at least two radially inwardly extending projections (8) on the jack handle.

JACKS FOR BUILDING SUPPORTS

The present invention relates to jacks for building supports which are generally of tubular construction and may comprise either a single tube or two or more tubes mounted to slide with respect to one another in the manner of a telescope. Such building supports are typically used to support scaffolding or formwork or for shoring purposes. Since it is impracticable to produce building supports in the very wide range of lengths in which they are commonly required it is usual to mount them on a jack so as to permit their effective length to be readily altered.

A typical known jack of this type is disclosed in DE-A-3641349 and comprises an externally screw-threaded jack screw which passes through an internally threaded hole in a jack handle. In use, the upper surface of the jack handle engages the lower surface of the building support and as the jack handle is rotated it moves up and down the jack screw and thus moves the building support with it.

It is frequently necessary or desirable in the building industry to be able to lift a building support and the associated jack from above, that is to say by lifting the building support and it is therefore necessary that the building support and the jack be connected by means which permit relative rotation during adjustment of the vertical height of the support but which nevertheless prevent relative longitudinal movement to ensure that when the support is lifted the jack is lifted also. This connection is commonly effected by way of a toggle connector which is connected to the building support and includes a retractable latch which engages behind a shoulder on the jack handle.

However, such toggle connectors constitute a separate mechanical component which must be connected to the building support and are prone to damage and to becoming clogged or otherwise rendered inoperative by the concrete and the like which is normally present in the environment in which such supports are used. More importantly, it is usual to use only one toggle connector and such connectors are inherently relatively weak and are sometimes unable to maintain the connection between the building support and the jack when the building support is lifted, particularly when further, relatively heavy building accessories are connected to the jack, e.g. cross-braces, a supporting platform or the like. It will be appreciated that if such further building accessories are connected to the jack their weight must be carried by the toggle connector if the building support is lifted from above.

It is therefore an object of the present invention to provide a jack for a building support which includes connecting means which enable the jack

to be simply and reliably connected to the building support to enable the jack to be lifted by way of the building support without the risk of failure but which are also both simple, cheap and reliable.

5 According to the present invention a jack for a building support comprises a jack screw with an external screw thread, a jack handle with an internal screw thread in engagement with the external screw thread and a bearing cap which engages the jack handle and includes a base through which the jack screw passes and which, in use, engages and supports the building support, the bearing cap including connecting means by which it may be connected to the building support and the jack handle or the bearing cap having a radially outwardly directed annular groove into which extends at least radially inwardly extending projections on the bearing cap or the jack handle. Thus in the jack in accordance with the invention the building support is not connected to the jack handle but may be firmly connected to a bearing cap which is in turn connected to the jack handle by a cooperating groove and projection which permit relative rotation but no relative longitudinal movement. The elimination of the conventional toggle clip enables the building support to be firmly connected to the bearing cap and the latter to be firmly connected to the jack handle by means which permit relative rotation whereby the risk of the jack and the building support becoming disconnected when lifted by way of the building support is eliminated. The use of a simple annular groove and projections is not only cheap, simple and reliable but also eliminates the risk of the connector becoming clogged or damaged.

35 When the jack is assembled it is of course necessary to be able to position the projections in the annular groove and for this purpose both projections may be movably or removably secured to the bearing cap or the jack handle. In this event the projections may both be of part annular form. It is however preferred for reasons of both simplicity and manufacturing convenience that one and preferably two projections are integral with the bearing cap or the jack handle. It is preferred that the two projections are diametrically opposed so as to provide the maximum security of the connection and in this event the opposing edges of the two projections will be substantially straight and parallel. The jack is then assembled by moving the projections laterally with respect to the groove to insert them into the groove and subsequent undesired lateral movement is then prevented by the jack screw. In order to eliminate unnecessary play it is preferred that the distance between the opposing edges of

the said two projections is substantially equal to the diameter of the base of the radial groove. However, it will be appreciated that it is not necessary that there be only two projections and that there might be a third projection, which could be of part annular shape, which extends transverse to the lateral direction of relative movement of the jack handle and the bearing cap when they are assembled together.

Whilst the annular groove could be provided on either of the bearing cap and the jack handle it is preferred that it is formed on the bearing cap and that the projections are formed on the jack handle.

In the preferred embodiment the bearing cap includes a cylindrical wall upstanding from the outer edge of the base which defines a space which, in use, accommodates the lower end of the building support. This imparts yet further structural rigidity to the combination of the jack and the building support.

The invention also embraces a jack of the type referred to above in combination with a tubular building support whose lower end engages the base of the bearing cap and into whose interior the jack screw extends. This combination also preferably includes a stabilising member connected to the jack screw within the tubular support which engages opposed internal walls of the support. The means by which the bearing cap and the tubular support are connected may take various forms but it is preferred that it is constituted by holes in the cylindrical wall of the bearing cap and in the building support through which bolts, pegs or other similar fasteners pass.

Further features and details of the invention will be apparent from the following description of one specific jack in accordance with the invention which is given by way of example with reference to the accompanying drawings, in which:-

Figure 1 is a diagrammatic side elevation of the jack and an associated building support, partly in section;

Figure 2 is a plan view of the jack handle;

Figure 3 is a longitudinal sectional view of the jack handle; and

Figure 4 is a longitudinal sectional view of the bearing cap of the jack.

The jack comprises an externally threaded jack screw 1 which passes through a hole in a jack handle 2 and a hole in the bottom plate of a cup-shaped bearing cap 3.

The jack screw 1 comprises a hollow tube whose lower end is welded to a base plate 4. On its outer surface the jack screw has an external screw thread which meshes with a corresponding internal thread on the inner wall of an annular portion 5 of the jack handle 2. The jack handle is a one-piece casting and integral with its annular portion 5 are two diametrically opposed, radially out-

wardly extending handles 6. Integral with the upper surface of the two handles are respective, diametrically opposed retaining formations, each of which is straight and extends parallel to the tangent at the nearest point of the hole in the annular portion 5. Each retaining formation comprises an upstanding web 7 integral with whose upper end is an inwardly extending web or rim 8 whose inner edge is also straight.

The bearing cap 3 is also a one-piece casting and comprises a lower circular plate 9 in which there is a circular central hole 10 whose diameter is substantially the same as that of the jack screw 1. Integral with the edge of the plate 9 is an upstanding cylindrical wall 11 in which two diametrically opposed holes 14 are formed. Integrally depending from the plate 9 is a coaxial annular flange with a thickened portion 12 at its lower end whose diameter is greater than that at its upper end whereby an annular groove or recess 13 is defined whose diameter is substantially the same as the space between the inwardly directed edges of the webs 8 on the jack handle.

The jack is assembled by sliding the thickened portion 12 on the bearing cap laterally into the spaces beneath the horizontal webs 8. The jack screw 1 is then threaded through the jack handle 2 and passed through the hole in the bearing cap 3. The jack handle is thus laterally located with respect to the bearing cap by the jack screw and vertically located by engagement of the webs 8 in the annular groove 13. If the jack handle is rotated with respect to the jack screw the webs 8 can rotate without impediment in the groove 13 and the jack handle will move up or down the jack screw and move the bearing cap with it.

In use, the lower end of a tubular building support 15, whose outer size and shape correspond to those of the internal space of the bearing cap 3, is placed within the bearing cap 3. Bolts or retaining pegs 16 are then passed through the holes 14 in the bearing cap and corresponding holes in the building support. The matching shapes of the building support and the bearing cap coupled with the retaining pegs 16 impart considerable lateral stability to the building support but this stability is further enhanced by a metallic stabiliser 17 which is fitted over the top of the jack screw and connected thereto by a fastener 18 and which engages or is a close fit within the building support. The stabiliser 17 also prevents the jack screw being inadvertently screwed out of the jack handle.

The building support is thus securely located with respect to the bearing cap which in turn is securely located laterally and axially with respect to the jack handle by the webs 8 and the jack screw 1, respectively.

The bearing cap and the jack handle are of

course normally urged against one another by the load supported by the building support. However, if it is necessary to lift the jack by way of the building support, the longitudinal connection of the bearing cap and the jack handle enables the lifting force to be reliably transmitted to the jack handle and thus the jack screw without any risk of the jack becoming wholly or partially disassembled by the lifting force.

It will be appreciated that numerous modifications may be made to the construction described above. In particular, whilst the retaining formations on the jack handle have been described as straight and fixed, one of them may be movable radially and this opens up the possibility of their being of part-annular shape.

In a further alternative, the upstanding formation on the jack handle is a full annulus with a groove in its outer surface and the lower end of the bearing cap is provided with two separate straight formations, i.e. the relative positions of the two halves of the connection between the bearing cap and the jack handle are reversed.

Claims

1. A jack for a building support (15) comprising a jack screw (1) with an external screw thread, a jack handle (2) with an internal screw thread in engagement with the external screw thread and a bearing cap (3) which engages the jack handle (2) and includes a base (9) through which the jack screw (1) passes and which, in use, engages and supports the building support, characterised in that the bearing cap (3) includes connecting means (14) by which it may be connected to the building support (15) and that the jack handle (2) or bearing cap (3) has a radially outwardly directed annular groove (13) into which extend at least two radially inwardly extending projections (8) on the bearing cap (3) or the jack handle (2).

2. A jack as claimed in claim 1 characterised in that at least one of the projections (8) is integral with the bearing cap (3) or the jack handle (2).

3. A jack as claimed in claim 2 characterised by two projections (8) which are integral with the bearing cap (3) or the jack handle (2) and are preferably diametrically opposed.

4. A jack as claimed in claim 3 characterised in that the opposing edges of the said two projections (8) are substantially straight and parallel.

5. A jack as claimed in claim 4 characterised in that the distance between the opposing edges of the said two projections (8) is substantially equal to the diameter of the base of the radial groove (13).

6. A jack as claimed in any one of the preceding claims characterised in that the annular groove

(13) is formed on the bearing cap (3) and the projections (8) are formed on the jack handle (2).

7. A jack as claimed in any one of the preceding claims characterised in that the bearing cap (3) includes a cylindrical wall (11) upstanding from the outer edge of the base (9).

8. A jack as claimed in any one of the preceding claims characterised in that the lower end of the building support engages the base (9) of the bearing cap (3) and into whose interior the jack screw (1) extends.

9. A jack as claimed in claim 8 characterised by a stabilising member (17) connected to the jack screw (1) within the tubular support (15) which engages opposed internal walls of the support (15).

10. A jack as claimed in claim 8 or 9 characterised in that the external shape of the building support (15), which is received within the bearing cap (3), is substantially the same as the shape of the interior of the bearing cap (3) and the building support (15) is restrained against longitudinal or rotational movement with respect to the bearing cap (3) by at least one bolt (16) or the like which passes through holes (14) in the cylindrical wall (11) of the bearing cap (3) and in the building support (15).

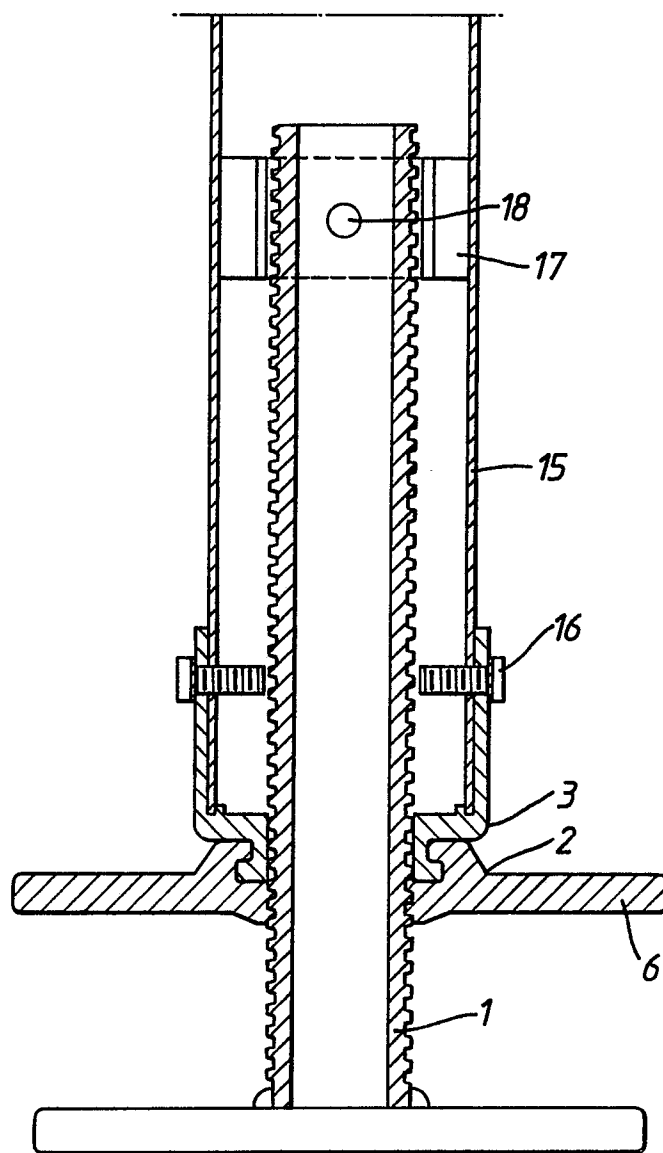


Fig.1.

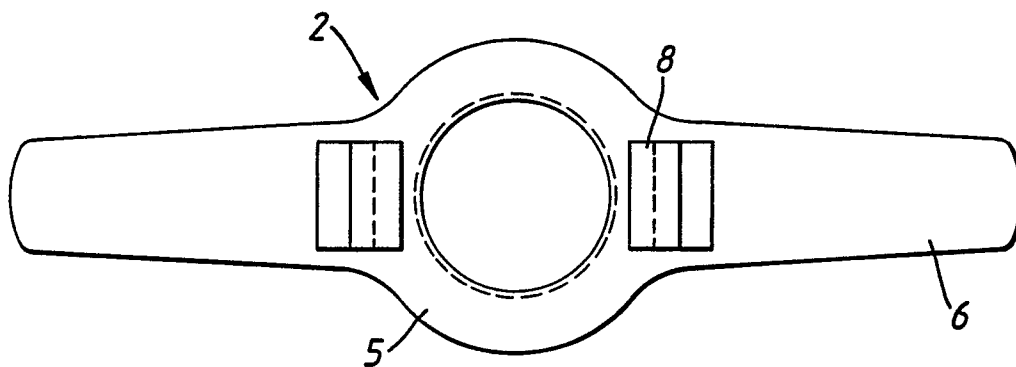


Fig. 2.

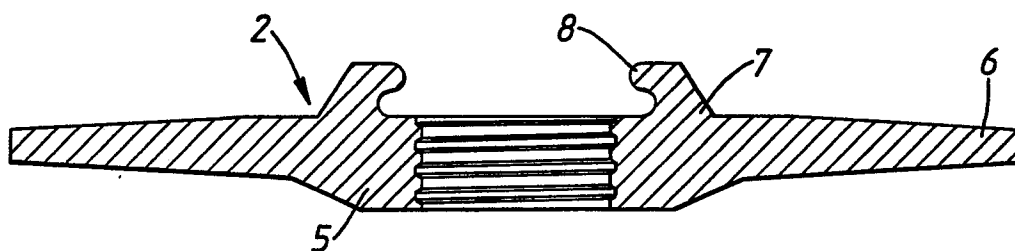


Fig. 3.

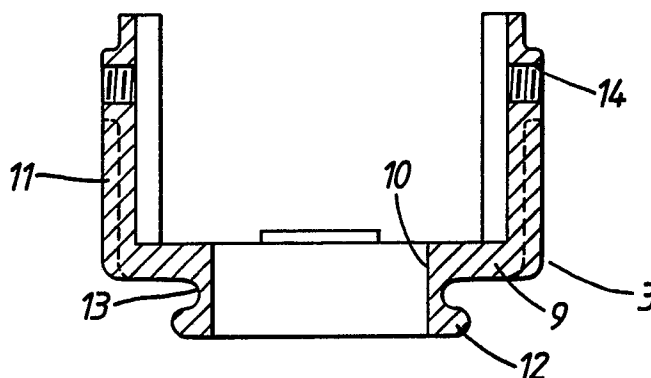


Fig. 4.



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.5)
X	DE-A-3 014 212 (PLETTAC) * Page 16, lines 24-34; page 17, lines 1-7; figures 17,21,22,23 *	1,2,3,4	E 04 G 5/02 E 04 G 25/06
A	---	5,6	
X	FR-A-2 266 781 (SOC. DES ETS. RENNEPONT) * Pages 1,2; figures 1,2 *	1,2,6	
A	---	3,4,5,10	
A	FR-A-2 026 534 (ACCESS EQUIPMENT LTD) * Page 2, lines 26-40; pages 3-5; figures 1-6 *	8,9	
A	---		
A	DE-U-8 232 446 (HÜNNEBECK)		
A	---		
A	GB-A-1 154 630 (A.B. MOULD & CONSTRUCTION CO., LTD)		
A	---		
A	GB-A- 864 729 (RD WERNER CO.)		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E 04 G
Place of search		Date of completion of the search	Examiner
THE HAGUE		18-06-1990	VIJVERMAN W.C.
CATEGORY OF CITED DOCUMENTS			
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