

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 84302587.5

(51) Int. Cl.³: **E 04 B 1/346**
F 16 M 13/00

(22) Date of filing: 16.04.84

(30) Priority: 18.04.83 GB 8310427

(43) Date of publication of application:
21.11.84 Bulletin 84/47

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI NL SE

(71) Applicant: **Roberts, Peter Prosser**
Strawberry Hill
Much Birch Nr. Hereford Herefordshire(GB)

(72) Inventor: **Roberts, Peter Prosser**
Strawberry Hill
Much Birch Nr. Hereford Herefordshire(GB)

(74) Representative: **Frankland, Nigel Howard**
FORRESTER & BOEHMERT Widenmayerstrasse 4/
D-8000 München 22(DE)

(54) **A support for a rotatable building.**

(57) A support assembly for a rotatable building has a base element 1 to be secured to the ground comprising an open topped tube and a support element 6 to be connected to a building having a downwardly directed spigot 9 that can be telescopically received within the tube of the base element. A spring 15 biases the support element upwardly to a position in which it is free to rotate, but a bolt passing through an aperture in the support element and engageable with a nut 3 mounted in the base can clamp the support element to the base element to prevent further rotation of the building.

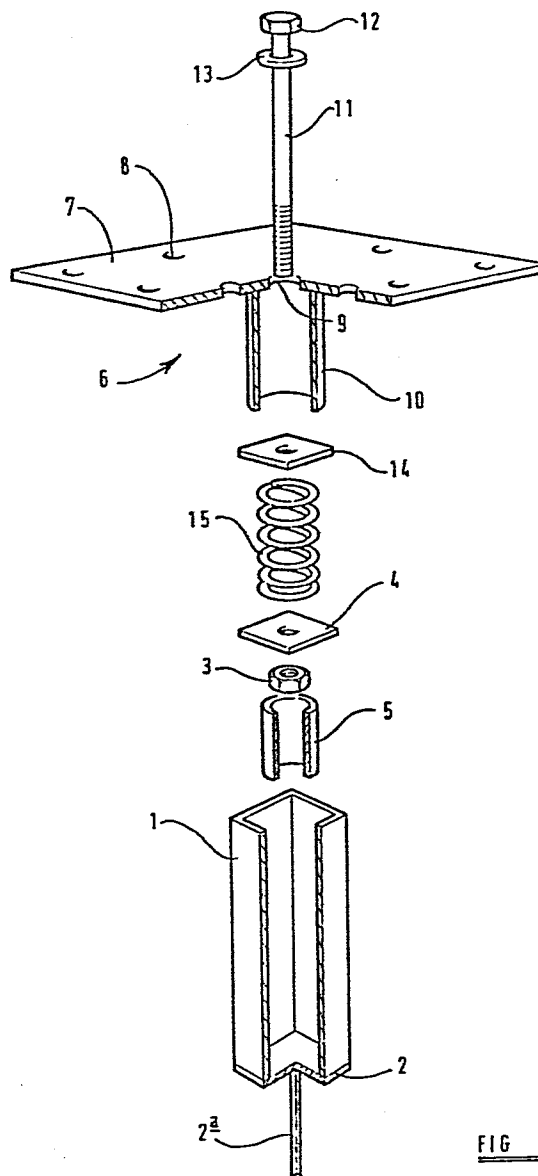


FIG 1

A support for a rotatable building

THE PRESENT INVENTION relates to a support for a rotatable building or structure such as a Summer house or similar small or "portable" rotatable structure such as a gazebo, barbecue shelter or supper house.

5 It has been proposed previously to provide rotatable buildings such as Summer houses or the like. Such a rotatable building may be rotated to face into the sun, or to back into the wind, although in hot climates it may be preferred to locate the building so that it is facing into the wind.

10 Previously proposed arrangements for such rotatable buildings have entailed a high installation cost and a high maintenance cost, and thus such rotatable buildings have not found wide spread favour.

15 In a typical prior rotatable building, a substantial concrete base is provided, therebeing a central pivotal unit supporting the building and a plurality of wheels or castors on the building acting as outriggers, usually riding on a metal ring set into the concrete base. Such an arrangement involves a substantial initial cost and results in a high floor level for the building. The building is not particularly stable, and the arrangement is only
20 suitable for structures that are substantially round or substantially square. Also the structure can be rotated whilst occupied either by high winds, or by mischievous children. The large number of moving parts of such a rotatable building must be regularly maintained.

25 The present invention seeks to provide an improved support for a rotatable building.

 According to this invention there is provided a support assembly comprising a base element adapted to be embedded in or secured to an

support element tending to elevate the support element to a position in which a building connected to the support element may rotate, and clamping means operable to clamp the support element to the base element to prevent further rotation of the support element.

5

Preferably parts of the base element and support element define two telescopically arranged components, the components moving telescopically as the support element is moved towards or away from the base element. The base element may include a substantially vertical tube open at its upper
10 end, and the support element may include a depending spigot that is telescopically movable within the tube defined by the base element. Said tube may be filled with oil or other lubricant.

Alternatively the base element may define a vertically upstanding
15 member, and the support element may define a tubular portion open at its lower end, the tubular portion being telescopically mounted on the upstanding member.

Preferably when the support element has been elevated by the
20 resilient means the support element is relatively supported by said resilient means.

Advantageously the clamping means comprises a bolt that passes through an appropriate aperture formed in the support element and which
25 can be brought to engage a nut that is secured in the base element when the resilient means have been at least partially compressed, the bolt being tightenable to fully compress the resilient means to clamp the support element to the base element.

Conveniently the resilient means comprises a helical spring, the
30 helical spring surrounding the shank of the bolt when the bolt is engaged with the nut.

Preferably the telescopic members are a snug fit within each other to
35 minimise any tilting when an uneven load is applied to the support assembly.

Conveniently the support assembly incorporates an apertured substantially horizontal plate or a plurality of apertured vertical substantially

radially outwardly directed fins adapted to be connected to parts of a building to be supported by the support assembly.

5 The base element may incorporate a tubular member and a spike to facilitate the mounting of tubular member in position in the ground, or may incorporate a tubular member associated with a plurality of outwardly directed arms secured to the lower part of the tubular member to facilitate the mounting of the tubular member in position.

10 The invention also relates to a rotatably building supported by such an assembly.

In order that the invention may be more readily understood, and so that further features thereof may be appreciated, the invention will now be described by way of example with reference to the accompanying drawings in which:

15

FIGURE 1 is an exploded part sectional perspective view of a support assembly in accordance with the invention showing the base element and the support element;

20

FIGURES 2 to 4 are cross-sectional views of the arrangement shown in Figure 1 illustrating the arrangement in different conditions;

25 FIGURE 5 is a perspective view of a connection between a support plate 6 of the assembly of Figure 1 and a building supported thereby;

FIGURES 6 to 8 are cross sectional views of a second embodiment of the invention again showing the embodiment in different conditions;

30

FIGURES 9 is also also cross-sectional view of yet another embodiment of the invention; and

FIGURE 10 is a diagrammatic representation of an alternative a base element for use in an assembly in accordance with the invention;

35

FIGURES 1 to 4 illustrate a support assembly in accordance with the present invention. The support assembly comprises a base element which comprises a tubular member 1 of substantially square cross section, the bottom of the tubular member 1 being closed by a transverse wall 2, which carries a downwardly extending spike 2a. The tubular member 1 is intended to be mounted securely in position on a foundation of a building by being, for example, embedded in concrete.

A nut 3 is welded or otherwise secured to the base of a plate 4 which is illustrated of being of square section, and which has a size only just smaller than the interior of the tubular member 1. The plate 4 rests on a short loose section of tube 5 which extends upwardly from the transverse wall 2. The nut 3 is thus located in position adjacent the base of the tubular member 1, and cannot move rotationally.

15

A support element 6 is provided which comprises a square plate 7 which may be provided with a plurality of apertures 8 adjacent the periphery of the plate to enable the plate 7 to be secured by appropriate bolts to the floor of a structure such as a Summer house or gazebo. Alternatively the plate 7 may be welded to the floor of the structure. In the preferred embodiment, however, no holes are drilled near the periphery of the plate 7 and instead the plate is secured to the building as illustrated in Figure 5 (to be described later). A central aperture 9 is formed in the plate, and a tubular spigot 10, aligned with the aperture 9, extends downwardly from the base of the plate. The outer diameter of the spigot 10 is preferably the same as the internal dimensions of the square cross-sectioned tubular member 1, so that the spigot 10 is a snug sliding fit within the tubular member 1.

A bolt 11 is provided having a head 12, and a shank of the bolt is passed through a first washer 13, through the aperture 9 and the tubular spigot 10, through the central aperture of a second washer 14, which is larger than the internal hollow cross-section of the spigot 10, and then the shank of the bolt 11 extends into the upper part of a helical spring 15. The lower end of the spring rests on the plate 4 and the upper end of the spring engages the undersurface of the washer 14. The washer 14 is illustrated as a square washer dimensioned to be slidingly received within the square

interior of the tubular member 1, but dimensioned to be un-rotatable when within the square sectioned tubular member 1.

The support assembly is then in the condition illustrated in Figure 2.

- 5 When the assembly is in use the base element is mounted in position on a foundation for a building, such as a concrete foundation, and the building is mounted on the plate 7, with the vertical centre of gravity of the building being aligned with the axis of the support assembly. The building is thus (with the assembly in the position illustrated in Figure 2) biased upwardly
10 by the spring to a position in which it is free to rotate. The building is elevated above the ground by the upthrust provided by the spring 15, and the building is easily rotatable since a layer of grease or other lubricant will be provided between the upper surface of the washer 14 and the lower surface of the tubular spigot 10. If desired the washer 14 may be made of a
15 material having a very low coefficient of friction. However, it is preferred to fill the tubular member 1 with oil to provide a permanent lubrication for all the moving parts.

- When the building has been rotated to a selected position, a person
20 will enter the building in order to clamp the support assembly. The additional weight of the person in the building will move the support assembly to the position illustrated in Figure 3. This may bring the underside of the building into contact with the ground, preventing further rotation of the building. It will be observed that the spring 15 has been
25 partially compressed, and the threaded end of the bolt 11 has been brought into engagement with the nut 3. Since the outer diameter of the tubular spigot 10 is the same as the internal dimensions of the square cross-section tubular member 1, the spigot is a snug fit within the tubular member, thus minimising any tilting of the structure supported by the assembly, when any
30 additional items are located within the building which may tend to move the vertical centre of gravity of the building.

- The bolt 11 may then be tightened by applying a spanner or similar tool to the exposed head 12 of the bolt. The screw threaded part of the bolt
35 thus passes through the nut 3 and the spring 15 is compressed until the assembly has the condition illustrated in Figure 4, with the spring fully compressed to form a substantially rigid interconnection between the plate

4 and the washer 14. With the assembly in this condition the building is firmly anchored and cannot rotate.

5 It will be understood that in utilising the above described support assembly when the building is unoccupied and the spring 15 is in the fully extended state as shown in Figure 2 it is relatively easy to rotate the building. When the building is then occupied the spring is at least partially compressed, as shown in Figure 3, thus making it difficult for the wind to rotate the building, or for the building to be rotated in a mischievous way.
10 When the bolt has been fully tightened, as shown in Figure 4, the building is in a firmly anchored condition and cannot be rotated. The entire illustrated assembly may be filled with grease or oil to lubricate and preserve all the moving parts of the assembly, thus reducing maintenance of the assembly to an absolute minimum.

15

When the support assembly is in the condition illustrated in Figure 4, the weight of a person entering the building to release the bolt 11 will apply a compressing force to the spring 15 thus tending to facilitate the release of the bolt 11.

20

Figure 5 illustrates the preferred way in which the plate 7 of the above described assembly is secured to a building.

25 Two elongate angle iron elements 15, 16 of "L" section are secured, by means of screws or the like, to the undersurface of the building. The two angle line elements are parallel, with flanges depending from the remote edges thereof. The angle line elements 15, 16 are spaced apart by such a distance that the square plate 7 may be snugly received between the angle iron element. Apertures 17 are formed in the depending flanges such that
30 bolts 18 may be passed through the aperture 17 in the coalinged flanges, the threaded ends of the bolts then having nuts 19 mounted thereon. When the nuts 19 are tightened the plate 7 is securely fastened to the building.

35 Figures 6 to 8 illustrate an alternative embodiment of the invention. In this embodiment the support structure comprises a first tube 21 which

may be square that is embedded in a foundation, for example formed of concrete 22. A stud 24 extends upwardly from the base 25 of the tube 21 and mounted on the stud 24 is a second tube 26 which may be round which is closed at its lower end by a transverse lower wall 27 to which is welded or otherwise secured a nut 28. The length of stud protruding beyond the end of tube 26 may be adjusted before the tube 26 is inserted into the first tube 21, thus enabling the final height of the second tube 26 to be adjusted. The tube 26 is a snug fit within tube 21. The upper end of the tube 26 is closed by a plate 29 to which is connected a nut 30 which (in operation) corresponds with the nut 3 of the embodiment described with reference to Figures 1 to 4.

The support element comprises a plurality of radially directed wing like elements 31 which may have apertures therein to facilitate the connection to the wing like elements to the building. The wing like elements 31 all radiate outwardly away from a central vertical tubular member 32 which may be square and which is open at its lower end, and which is closed by a closure plate 33 at its top end. A spring 35 is provided which extends between the upper surface of the plate 29 and the lower surface of the closure plate 33 although a washer 36 may optionally be located in position between the top end of the spring and the undersurface of the closure plate 35. A bolt 37 is provided which extends downwardly through the closure plate 33 and any associated washer 36 and through the centre of the spring 35.

The apparatus illustrated in Figure 6 has a condition corresponding to that of the apparatus illustrated in Figure 2. Similarly the apparatus illustrated in Figure 9 has a condition corresponding to that of the apparatus illustrated in Figure 3, with the bolt 37 just coming into contact with the nut 30, and the spring 35 thus being partially compressed. The apparatus shown in Figure 8 has a condition corresponding to that illustrated in Figure 4, with the spring 35 being fully compressed. It will be noted that the embodiment illustrated in Figures 6 to 8 is mounted within a recess formed in a foundation so that, when the apparatus has been clamped into position as shown in Figure 7 the upper edges of the wing like members 31 are substantially at ground level 38.

The apparatus illustrated in Figure 9 corresponds with that illustrated in Figures 6 to 8, but in this embodiment the tubular member 26 is embedded directly in an appropriate foundation and is thus not secured to a mounting such as that constituted by the tube 21 in the embodiment
5 illustrated in Figures 6 to 8.

Figure 10 illustrates a modified base element which incorporates the base element illustrated in Figure 1 having the tubular member 1, the base plate 2 and the spike 2a. However the illustrated device has four outwardly
10 extending arms 39, each formed from a short length of angle line 39, one flange of the angle line element being welded to a side wall of the tubular member 1. Such a base element may be rapidly secured in position, for example in a grass lawn, or the like, and the extending arm-like element 39 will provide the base element with a sufficient degree of stability to support
15 a building of reasonable size.

Whilst the invention has been described above with reference to specific embodiments it is to be appreciated that many modifications may be effected without departing from the scope of the invention.
20

Many different materials may be utilised for forming the components of the invention, and whilst steel may prove to be an adequate material, it is envisaged that other materials such as aluminium or plastic may be found to be suitable. Whilst a conventional helical spring has been illustrated, it is to
25 be appreciated that a spring formed of rubber or other man-made compounds may be utilised, or the spring may be replaced by some other resilient device such as a gas-spring.

Whilst, in the illustrated embodiments, no lubrication channels are
30 illustrated, it is to be appreciated that such lubrication channels and appropriate lubrication nipples may be provided if required.

CLAIMS:

1. A support assembly for rotatably supporting a rotatable building, said support assembly comprising a base element adapted to be embedded in or
5 secured to an appropriate foundation and a support element adapted to be connected to the building, resilient means interposed between the base element and the support element tending to elevate the support element to a position in which a building connected to the support element may rotate, and clamping means operable to clamp the support element to the base
10 element to prevent further rotation of the support element.
2. An assembly according to claim 1 wherein parts of the base element and support element define two telescopically arranged components, the components moving telescopically as the support element is moved towards
15 or away from the base element.
3. An assembly according to claim 2 wherein the base element includes a substantially vertical tube open at its upper end, and the support element includes a depending spigot that is telescopically movable within the tube
20 defined by the base element.
4. An assembly according to claim 3 wherein said tube is substantially filled with oil or other lubricant.
- 25 5. An assembly according to claim 2 wherein the base element defines a vertically upstanding member, and the support element defines a tubular portion open at its lower end, the tubular portion being telescopically mounted on the upstanding member.
- 30 6. An assembly according to any one of the preceding claims wherein when the support element has been elevated by the resilient means the support element is relatively supported by said resilient means.
7. An assembly according to any one of the preceding claims wherein
35 the clamping means comprises a bolt that passes through an appropriate aperture formed in the support element and which can be brought to engage a nut that is secured in the base element when the resilient means have been

at least partially compressed, the bolt being tightenable to fully compress the resilient means to clamp the support element to the base element.

8. An assembly according to claim 7 wherein the resilient means comprises a helical spring, the helical spring surrounding the shank of the bolt when the bolt is engaged with the nut.

9. An assembly according to any one of the preceding claims wherein the base element incorporates a tubular member and a spike to facilitate the mounting of tubular member in position in the ground.

10. An assembly according to any one of claims 1 to 8 wherein the base element incorporates a tubular member associated with a plurality of outwardly directed arms secured to the lower part of the tubular member to facilitate the mounting of the tubular member in position.

0125304

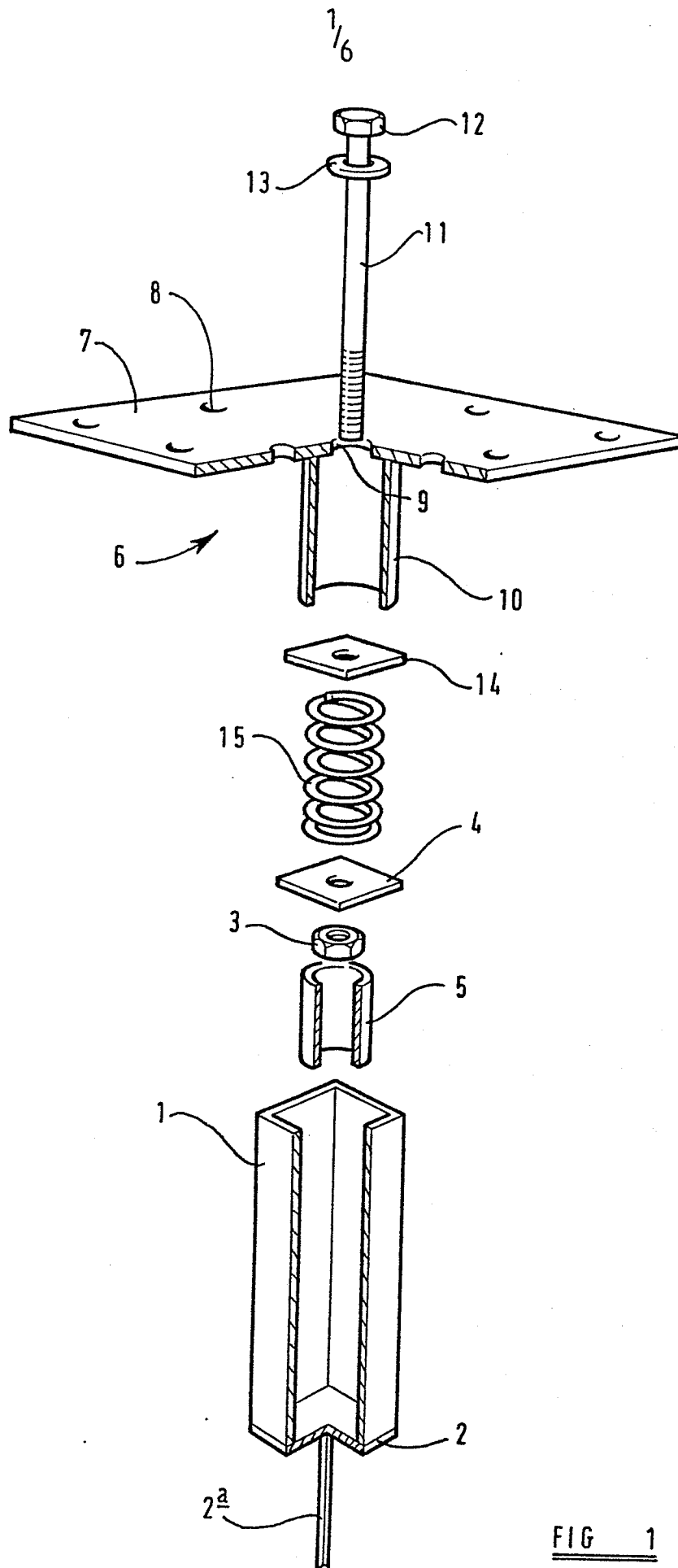
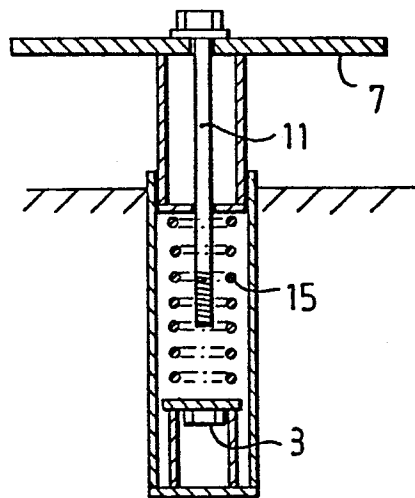
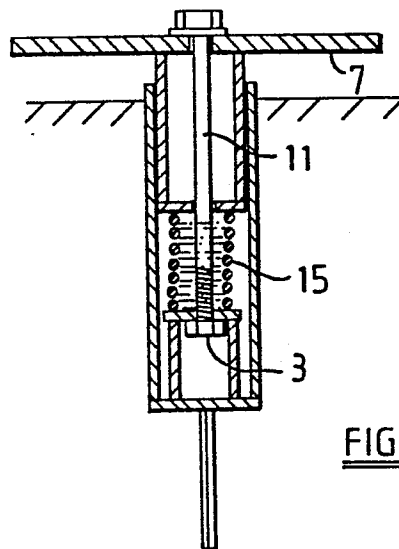
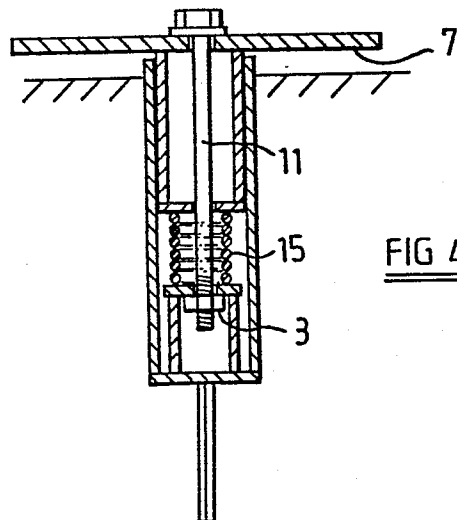
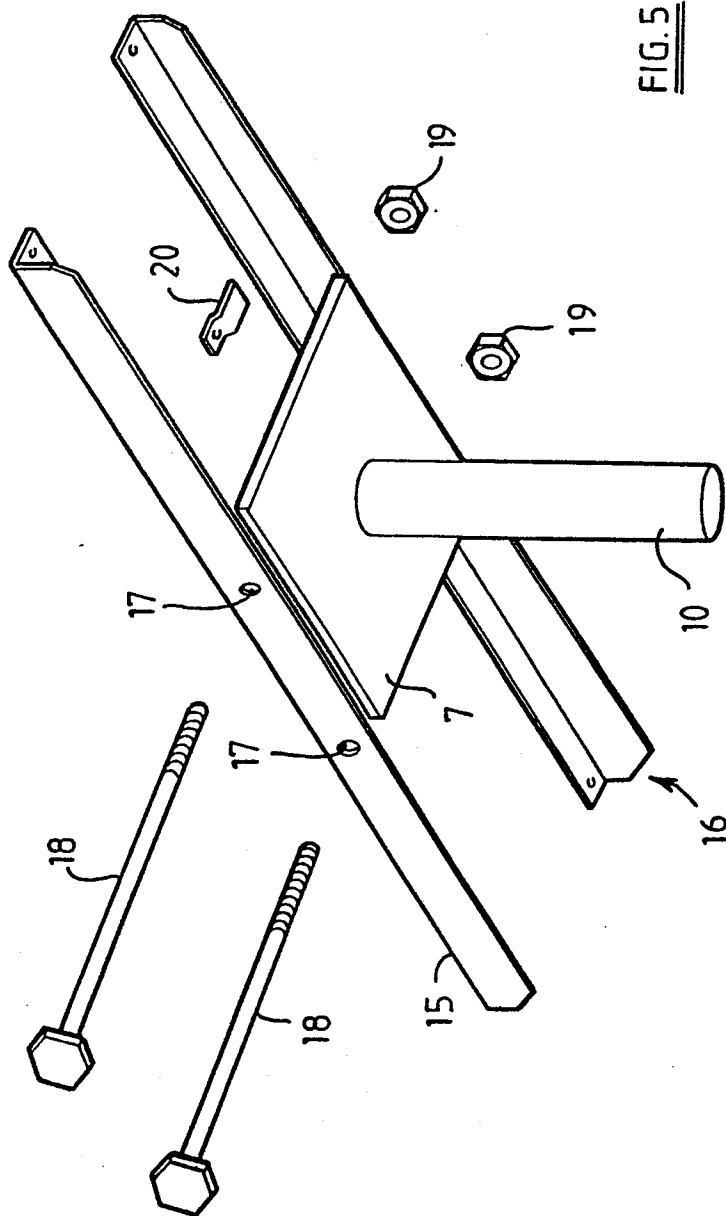
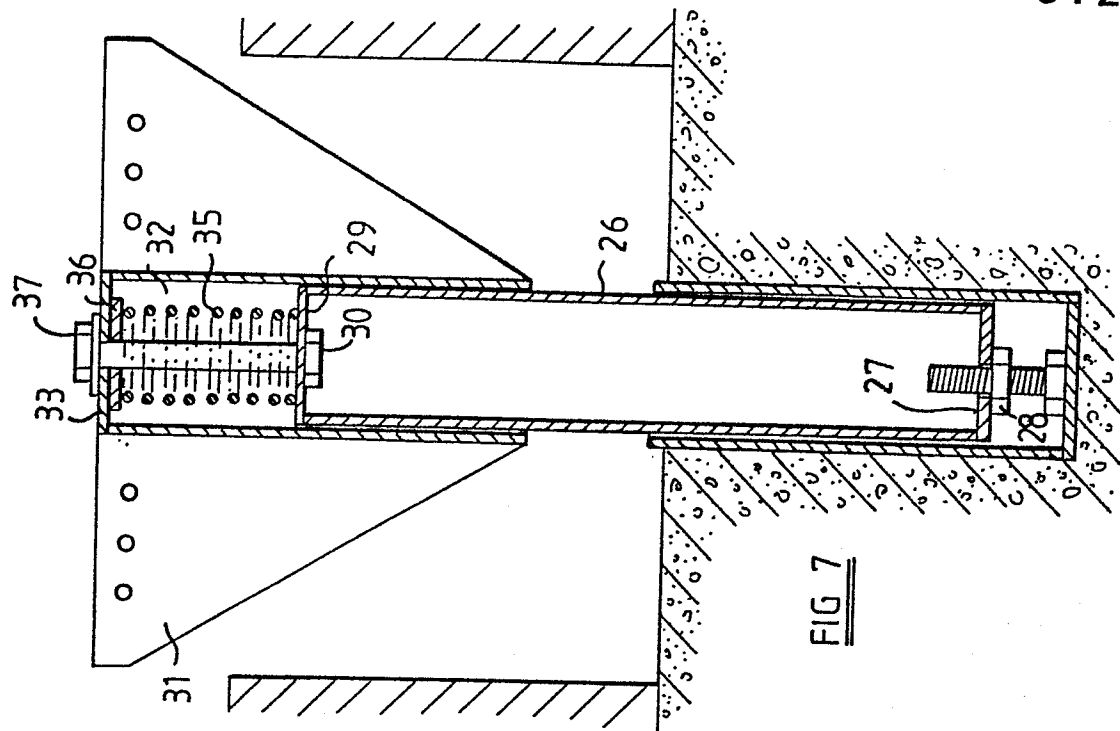
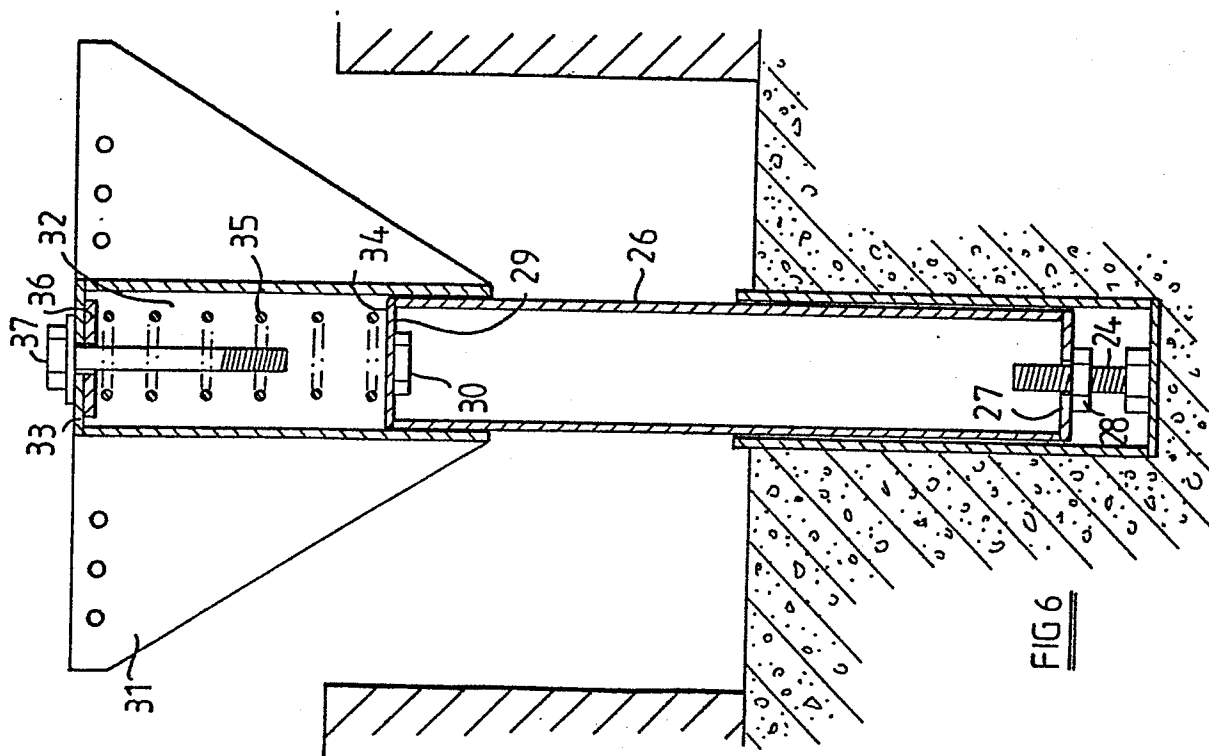
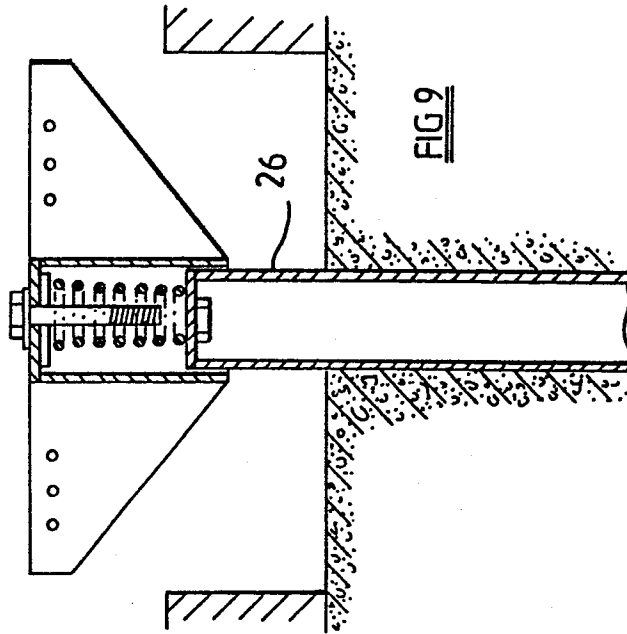
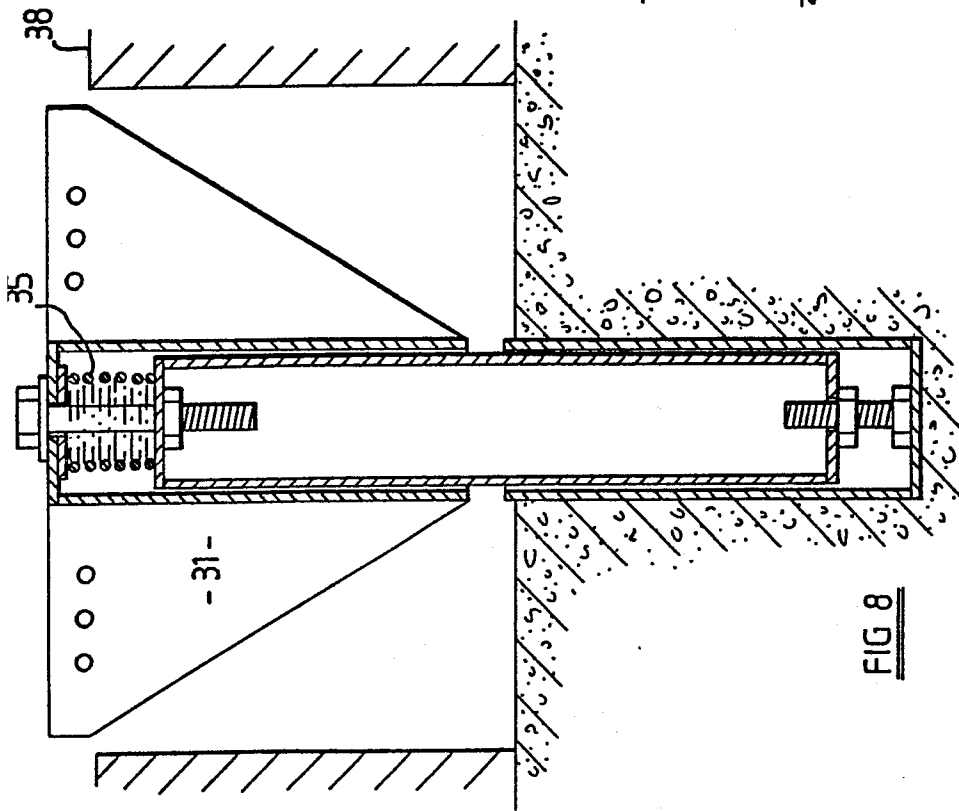


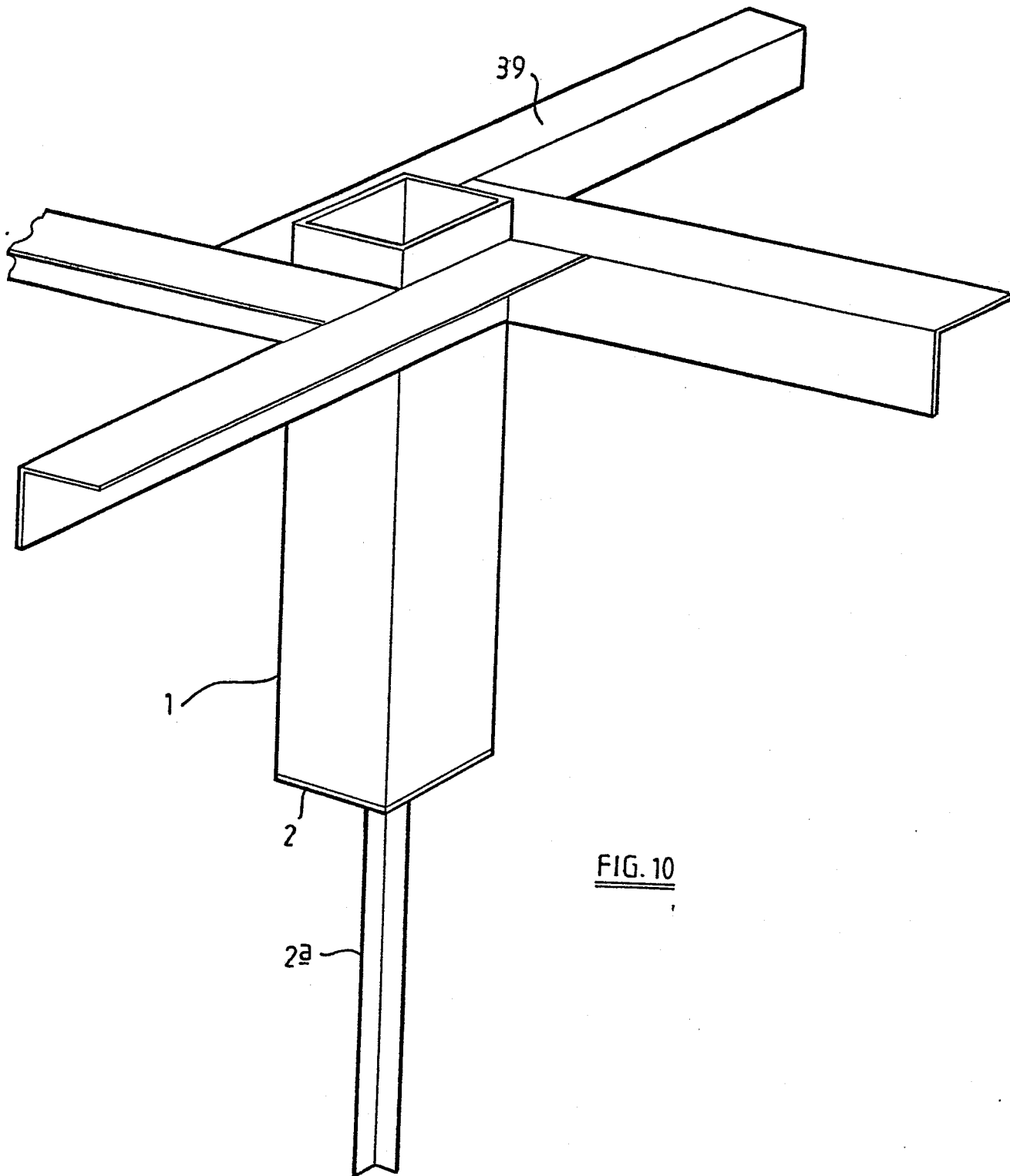
FIG 1

FIG 2FIG 3FIG 4







FIG. 10



European Patent
Office

EUROPEAN SEARCH REPORT

01 25804

Application number

EP 84 30 2587

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. ³)
A	US-A-3 408 777 (GHIRELLI) * Column 6, lines 1-20; figures 5-7 *	1-3, 6, 8	E 04 B 1/346 F 16 M 13/00
A	--- US-A-2 266 283 (SPENGLER) * Page 2, left-hand column, line 53 - right-hand column, line 41; figure 1 *	1-3, 7, 8	
A	--- US-A-3 599 378 (KACHNIC) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			E 04 B E 04 H F 16 M A 45 F F 16 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26-07-1984	Examiner GOLDSMITH H.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	