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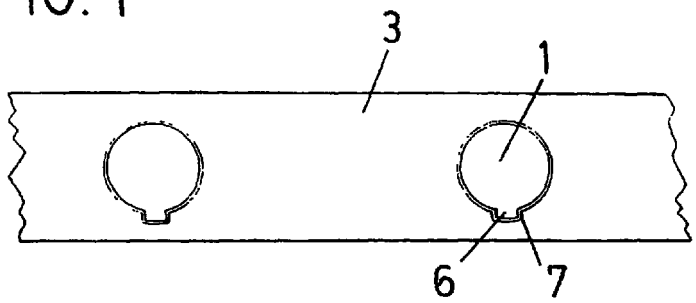
# (54) PROCESS FOR FABRICATING GRATINGS FOR WINDOWS, FENCES AND THE LIKE

(57) The invention is characterized by the connection between the plates (3 and/or 5) and the bars (1 and 2) which have narrowed or reduced section extremities; the extremities are provided with anchoring notches such as cottering, threading, saw teeth and the like, which are similar to those provided in the orifices of the plates (3 and 5), as well as means for fixing or connecting the gratings or bars to the wall, said means consisting of squares of which one of the wings (12) has backfolded extremities (13) while the other wing (10) has a hole (11).

FIG. 1




EP 1 033 468 A1

## Description

### OBJECT OF THE INVENTION

**[0001]** The present invention here disclosed relates to a process for fabricating gratings for windows, fences and the like, preferably for use in do-it-yourself.

**[0002]** The invention is characterised by a modular construction for windows, fences and the like by means of tick plates and bars which are connected to each other by means provided at the extremities of the bars, as well as by means for fixing the windows and fences in the walls or spaces where they will be housed.

**[0003]** Likewise, this modular construction characterises the inclusion of a means of attachment between the plates and tubes by use of further additional parts.

### BACKGROUND OF THE INVENTION

**[0004]** Modular fences and gratings of the same applicant are Model 1034506U and I.P. application number 9701116 and their addition certificates with application numbers 9702195 and 9800617.

**[0005]** All of these claim a modular construction of both windows and fences, as well as describing a series of means and devices for connecting the bars to the plates, as well as to the wall of the frame for windows.

**[0006]** The applicant is unaware of the prior existence of gratings, fences or the like of the characteristics described in this memory.

### DESCRIPTION OF THE INVENTION

**[0007]** The invention object of the present memory, as the other aforementioned ones of the same applicant, relates to a fabrication process for gratings or fences, preferably applicable in do-it-yourself, although their use by professionals is not ruled out given the simplicity and high modularity which they show, which in addition to their ease of transportation and on-site assembly make it extremely versatile, safe and inexpensive.

**[0008]** The gratings and fences claimed have both their horizontal and vertical components separate and in several modulated lengths, or in standard lengths.

**[0009]** The invention is characterised by the new means for connecting the vertical elements to the horizontal ones, which when considered jointly with those described and claimed in earlier Patents form a wide range of possible embodiments of this connection means between the components, which in this specific case consist of the ends of the bars and the perforations of the plates being provided with geometrically locking figures, such as saw teeth, threading, cottering and more, and even a narrowing of the bar section, which may be circular, square or any other shape.

**[0010]** Additionally, also described are means for connecting these windows to the space where they are housed quickly and simply, and without professional assistance such as from painters and masons.

**[0011]** Said means consist of L-shaped metallic elements, with one wing provided with a hole and the other of folds at their ends, suitable for housing the corresponding plates.

**[0012]** Other connection means proposed consist of using expansion rivets, and specifically the possibility of opening their bottom wings when they receive an impact, which in order to solidarily join the expansion rivet to the bar require an adaptor which allows the rivet to be held on said adaptor and this to the bar, while the rivet holds the plate by the wings on its head.

**[0013]** Another solution disclosed consists of the use of cotterings or wedges with saw teeth along their perimeter, which act as a pressure element between the bar and the plate, for which the plate must be provided with an orifice of the same size as the bar and a notch in which to insert the cottering or wedge, which will apply the pressure.

### DESCRIPTION OF THE DRAWINGS

**[0014]** Further characteristics of the present invention will become apparent in view of the accompanying drawings where, for purposes of illustration only and in no way meant to define the limits of the invention, the following is shown:

Figure 1 shows a plan view of one of the plates, specifically in the option of connection with a cottering.

Figure 2 shows a front view of anchoring on both ends with the cottering system.

Figure 3 shows a front view similar to the previous one but with one end housed on a lug.

Figure 4 as figure 1 shows a plan view of one of the plates, specifically where the bars are screwed onto the plates.

Figure 5 shows the bars connected to the plates by threading.

Figure 6 shows a similar connection to the previous one but with one end housed on a lug.

Figure 7 shows a front view of the anchoring of the bars to the plates by threading on pivots joined to the plates.

Figure 8 shows a similar anchoring as the previous one but with one end of the bars joined to a non-threaded pivot.

Figure 9 again shows a front view of a connection

between the bar and the plate by saw teeth provided on both the ends of the bars and on the orifices of the plates.

Figure 10 is similar to the previous one but with one end housed n a lug solidarily joined to one of the plates.

Figure 11 shows an enlargement of inset A of figure 9.

Figure 12 shows a connection between the grating and the bar by narrowing of one or both of the latter's ends.

Figure 13 shows the gripping part of the grating on the window frame.

Figure 14 shows a sectional view of the adaptor required by the expansion rivet.

Figure 15 shows an expansion rivet.

Figure 16 shows the bar-plate connection using the adaptor and the expansion rivet.

Figure 17 shows a solid bar which has been perforated in order to insert the expansion rivet.

Figure 18 shows an elevation and plan view of the connection system using a cottering or wedge.

## PREFERRED EMBODIMENT OF THE INVENTION

**[0015]** In view of the above, the present invention relates to a process for fabricating gratings for windows, fences and the like, preferably for do-it-yourself or even professional applications as it is a simple and safe assembly, since at most the tools required are a metal saw, a hammer and a wrench, which would be even fewer if using standard length gratings.

**[0016]** The aforementioned Patents of the same applicant already mentioned several means for connecting the bars to the plates, which is again done in this Patent, as the intention is to offer a wide range of connections between bars and plates to the market, so that users may choose the model which is best suited for their specific requirements (harder or softer steel, solid or hollow bars, round or polygonal cross-section).

**[0017]** Additionally, as regards the dimensions of the gratings or fences, standard or modular sizes are provided as well as non-standard ones, so tat in the latter case the size which is most suitable by excess may be chosen.

**[0018]** For this purpose, the figures described above show example of embodiments for modular gratings or fences wit the ends of the bars identical and other similar ones for use with non-standard lengths in which one end of the bar corresponds to the standard measurement and the other is ready to be housed in corresponding lugs or pivots connected to a plate of the fence or grating, while the other plate is provided with evenly-spaced orifices machined to the shape required to house the bar.

**[0019]** In this latter case the end meant to be housed in the pivot can also be used by narrowing of the pivot end, which would simply be inserted in the corresponding orifice provided in the plate.

**[0020]** Labelled with the number (1) are all bars whose ends have similar shapes, while (2) indicates bars with one free end without any particular shape and housed in lugs or pivots (4), which may advantageously be replaced by the narrowing described above, connected to plate (5) while a the other plate (3) always has orifices for receiving bars (1) and (2) machined so that they may receive the housing of the bars.

**[0021]** Thus, as mentioned before several configurations are projected for the ends of the bars which are shown in the accompanying figures.

**[0022]** The first of these configurations is shown in figures 2 and 3, where the bar ends which are always thinner than the rest of the bar is provided wit a notch in the form of a cottering (6) matching the notch (7) which is present in the orifices of plate (3).

**[0023]** Connection of the elements is achieved by interposing the corresponding cotters.

**[0024]** A further alternative disclosed consists of having threaded bar ends, and thus also the plate orifices, with threads in the opposite sense to the opposing one as shown in figures 5 and 6.

**[0025]** In turn, figures 7 and 8 show a similar system but where the ends of the bars are threaded onto the corresponding pivots or lugs, in the same conditions as in the previous case.

**[0026]** Figures 9, 10 and 11 show a further attachment system which here consists of machining saw teeth on the corresponding bar ends, taking into account that the metallic elements must have different hardness, that is, plates (3) are made harder than the bars so that the latter deform slightly when entering their opposites.

**[0027]** A further alternative provided, shown in figure 12, can in certain cases replace the above ones, particularly for standard grates where one end may adopt any shape described in this Patent or any of the other Patents of the applicants, and consists of using the narrowing of bar (2) in order to house it directly in the orifice of plate (5).

**[0028]** A new attachment has been designed of both the gratings or fences to the corresponding holes or spaces, used for both modular and other elements, which has the advantage of not requiring any construction work for its installation as it is sufficient to drill suitable holes and insert dowels or tap screws of the commercially available types but with a head which breaks off under pressure, making removal considera-

bly complicated.

**[0029]** Its structure consists of a first wing (10) with a button-hole type orifice (11) for the screw, and a second wing (12) with back-folded U-shaped extremities (13) for housing plates (3) and (5). If the grating is placed overhanging the window gap, wing (10) will be rotated 90° as shown in figure 13.

**[0030]** Figure 14 shows a sectional view of adaptor (14) required so that expansion rivet (15) is useful and allows union of bar (1) to plate (3). Adaptor (14) inserts in the gap of bar (1), and so its outer diameter is equal to the inner diameter of bar (1), and said adaptor (14) is provided with a tooted outer surface thus ensuring that after inserting adaptor (14) by pressing on the gap of bar (1) the connection is secure. The top of said adaptor (14) has a hole (16) of a diameter so that it allows inserting expansion rivet (15), said hole (15) covering the top part, from which a truncated cone hole is defined with a tooted outer surface, so that when expansion rivet (15) enters and due to impact its wings (18) are opened (figure 15), the latter are held in place by teeth (17) of said outer surface.

**[0031]** Figure 16 shows the expansion rivet (15) with its wings (18) open and held by the toothed surface (17) of adaptor (14), thus holding bar (1) to plate (3).

**[0032]** In the event that bars (1) are solid, it is not possible to insert adaptor (14), so that machining of the interior of the bar is required to give it a shape similar to that of the hole of adaptor (14). All of this is shown in figure 17.

**[0033]** The other means of connection between bar (1) and plate (3) is shown in figure (18) which consists, as explained above, of using a wedge or cottering (19) of a prismatic or rectangular shape but having a saw tooth perimeter. Said cottering (19) is pressed into notch (6) provided for this purpose in plate (3), which naturally has an orifice of the same diameter as bar (1) so that it may be inserted in said orifice (20).

**[0034]** The essence of the invention is unchanged by variations in materials, shape, size or arrangement of its component elements which are described in a non-limiting manner, so that it may be reproduced by an expert in the field.

## Claims

1. PROCESS FOR FABRICATING GRATINGS FOR WINDOWS, FENCES AND THE LIKE among those formed by plates and bars offered to the public in both standard and non-standard sizes, essentially characterised in that connection of bars (1), (2) to plates (3) and/or (5) is achieved by narrowing of the former's extremities, where several types of notches may be provided, such as cottering, saw teeth and others, on one or both extremities, in all cases antagonistic of the orifices of plates (3) and/or (5) which may be machined or not, and further provided that attachment of plates (3) and/or (5) to the wall or window gap is performed by means of a type of bracket with one of its wings (12) folded back and the other (1) having a central orifice (11).

2. PROCESS FOR FABRICATING GRATINGS FOR WINDOWS, FENCES AND THE LIKE, as claimed in previous claim, characterised in that in certain cases the non-machined extremity of bar (2) may not be narrowed and be housed on corresponding pivots or lugs (4) solidarily joined to plate (5).

3. PROCESS FOR FABRICATING GRATINGS FOR WINDOWS, FENCES AND THE LIKE as claimed in claim 1 characterised in that if the grating is installed overhanging the window gap, plate (10) is rotated at 90° to plate (12).

4. PROCESS FOR FABRICATING GRATINGS FOR WINDOWS, FENCES AND THE LIKE as claimed in claim 1, characterised in that plates (3) and bars (1) are connected by means of additional parts (14) which are inserted in the orifice of bars (1) and where the bars are connected to the plates by expansion rivets (15), which upon receiving an impact open their wings (18) inserting them on toothed surface (17) of additional part (14); if the bars are solid an interior machining is performed so that they may hold the expansion rivets, additionally, it is possible to hold these by cottering or toothed wedges (19) which press between bar (1) and plate (3).

5. PROCESS FOR FABRICATING GRATINGS FOR WINDOWS, FENCES AND THE LIKE as claimed in claim 4, characterised in that the additional parts are provided at their top with an orifice of a diameter such that it matches the hole made in plate (3) and the diameter of expansion rivet (15), and occupying the top part of said part (14), and from there it opens to form a truncated cone orifice with a toothed surface (17) on which wings (18) of expansion rivet (15) will lock, additionally, part (14) has a toothed perimeter and has a diameter equal to that of the orifice of bar (1) so that it inserts in it under pressure, attaching part (14) to bar (1).

6. PROCESS FOR FABRICATING GRATINGS FOR WINDOWS, FENCES AND THE LIKE as claimed in claim 4, characterised in that for solid bars (1) a machining is performed on the extremity of bar (1), leaving a space similar to that which would be made by inserting additional part (14).

7. PROCESS FOR FABRICATING GRATINGS FOR WINDOWS, FENCES AND THE LIKE as claimed in claim 4, characterised in that connection of bar (1) and plate (3) is performed by wedges (19) which

may be prismatic or triangular in shape with a toothed surface, which are inserted in notch (6) made in orifice (20) of plate (3) and which attach bar (1) to plate (3) by pressure.

FIG. 1

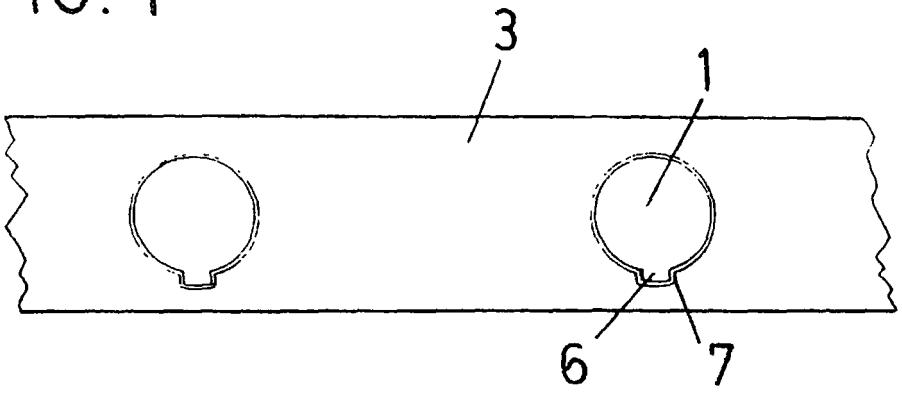



FIG. 2

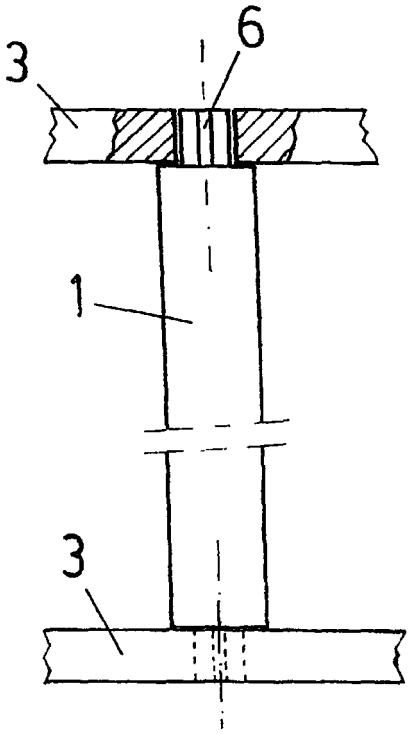



FIG. 3

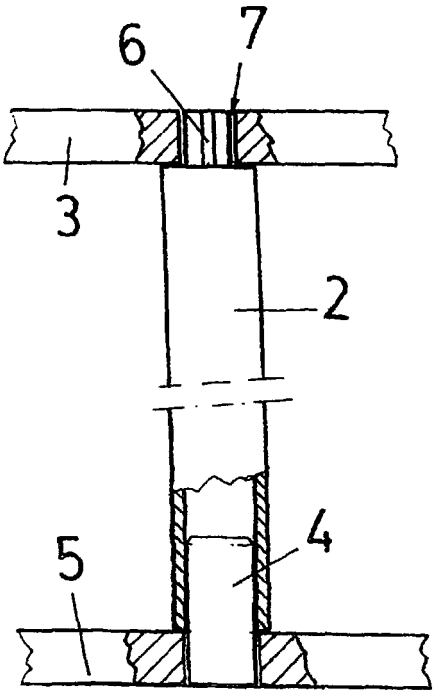


FIG. 4

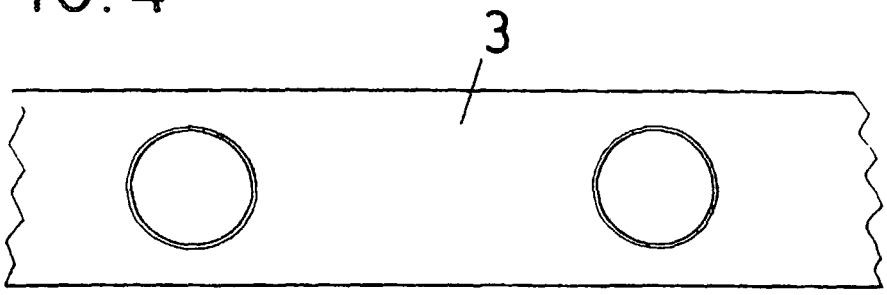



FIG. 5

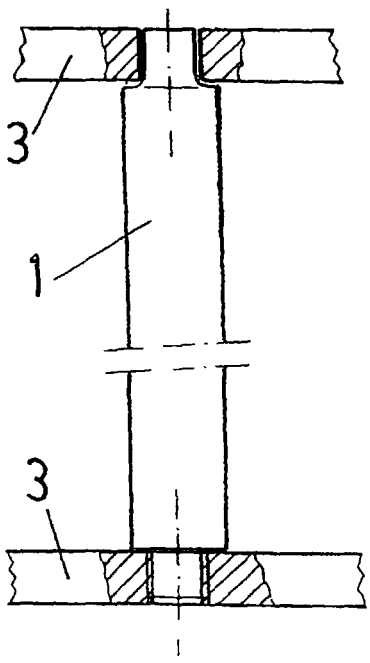
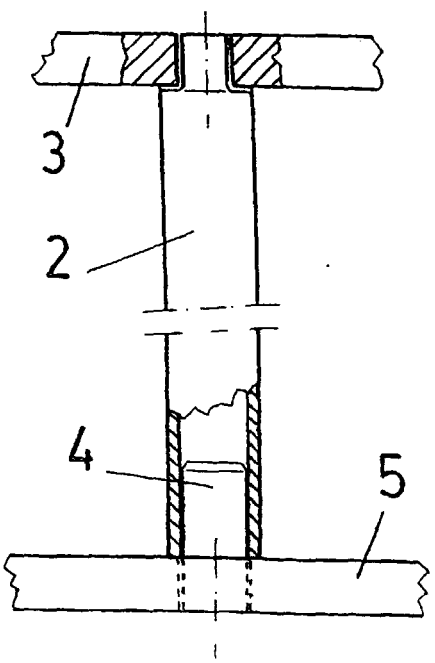



FIG. 6



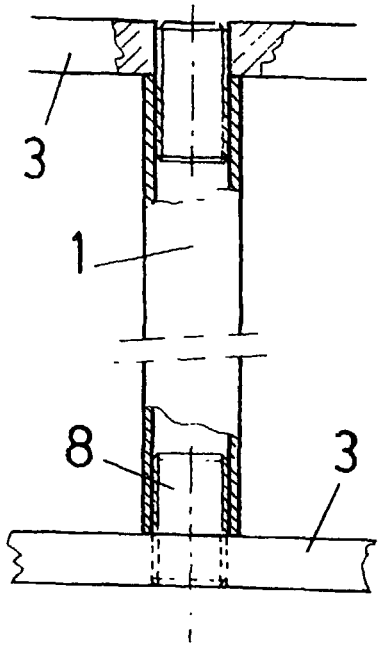



FIG. 7

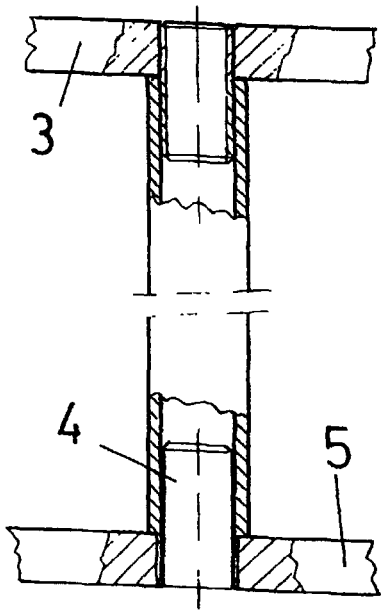



FIG. 8

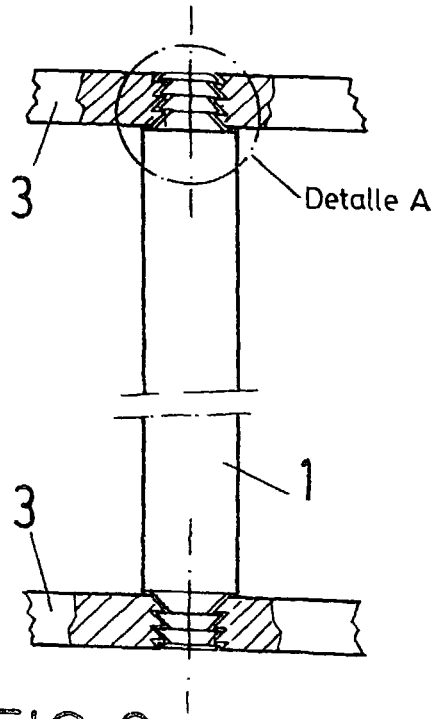



FIG. 9

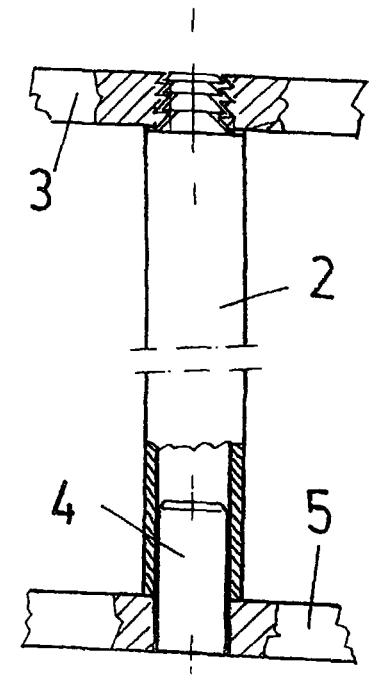



FIG. 10

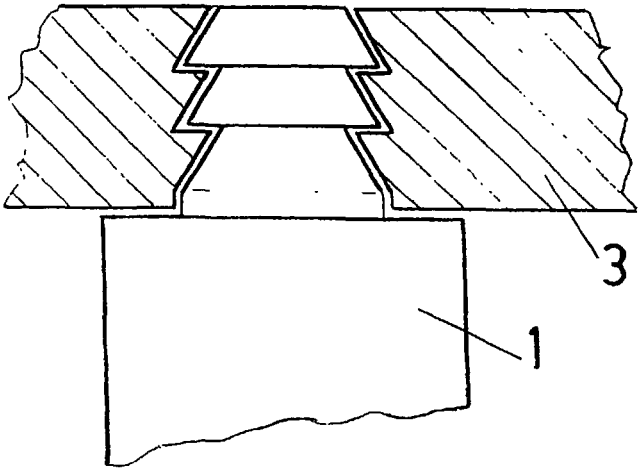



FIG. 11

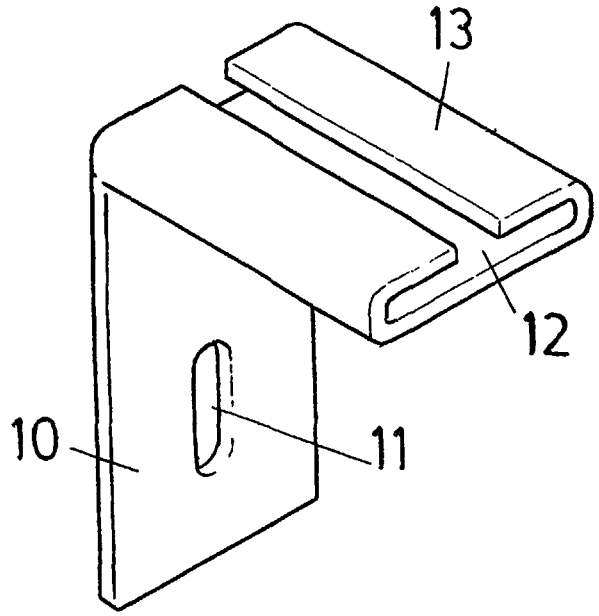



FIG. 13

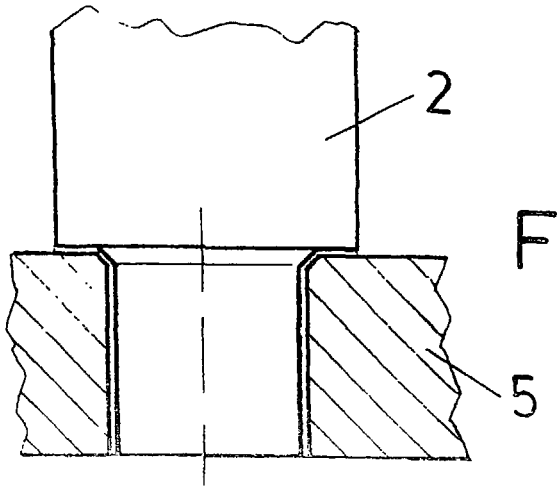



FIG. 12

FIG. 14

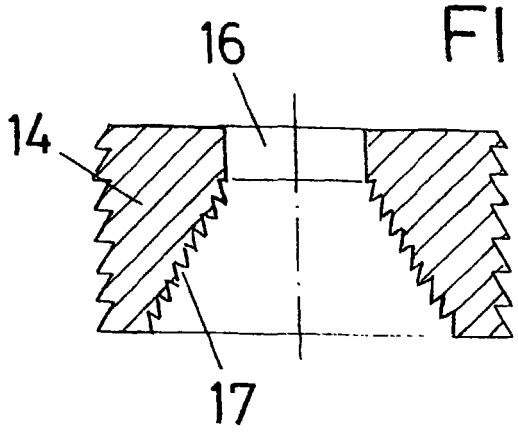
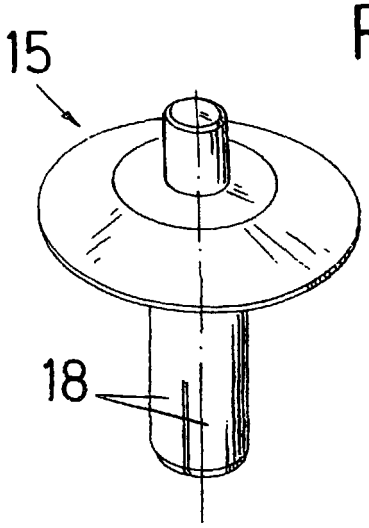



FIG. 15



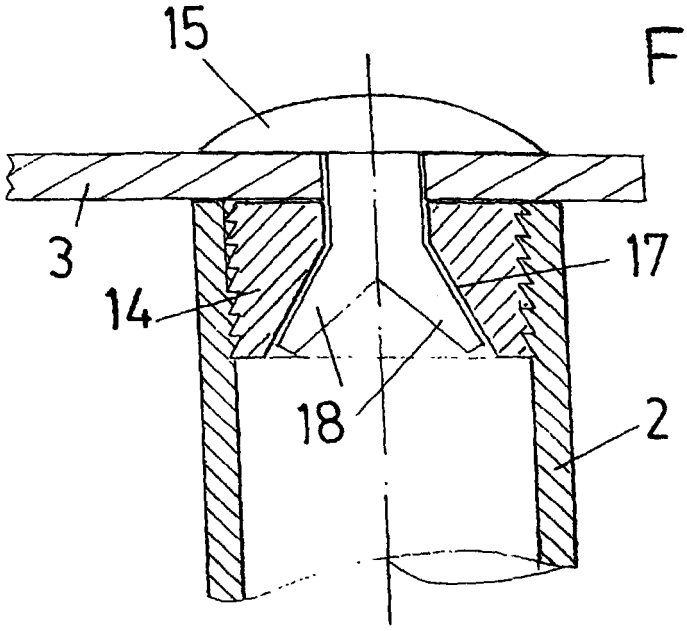



FIG. 16

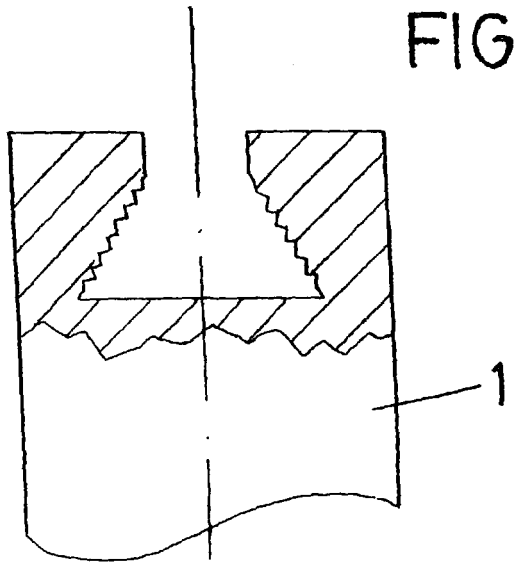



FIG. 17

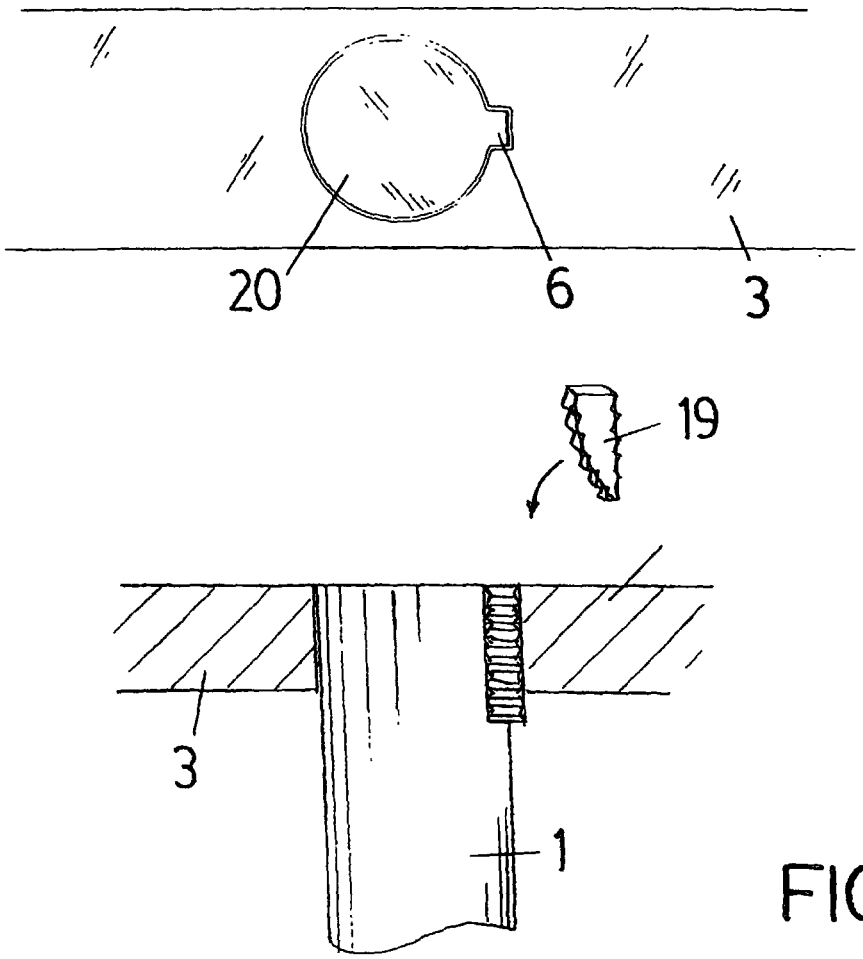



FIG. 18

# INTERNATIONAL SEARCH REPORT

Interna al Application No
PCT/ES 99/00192

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E06B9/01

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 E06B E04H F16B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | GB 2 313 394 A (BIRKS STEPHEN ;KNOTT CHRISTOPHER (GB)) 26 November 1997 (1997-11-26) abstract; figure 2 --- | 1 |
| A | US 4 027 855 A (LAUZIER RENE) 7 June 1977 (1977-06-07) abstract; figure 1 ----- | 1 |

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 4 October 1999 | 15. 10. 99 |

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| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Peschel, G |

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