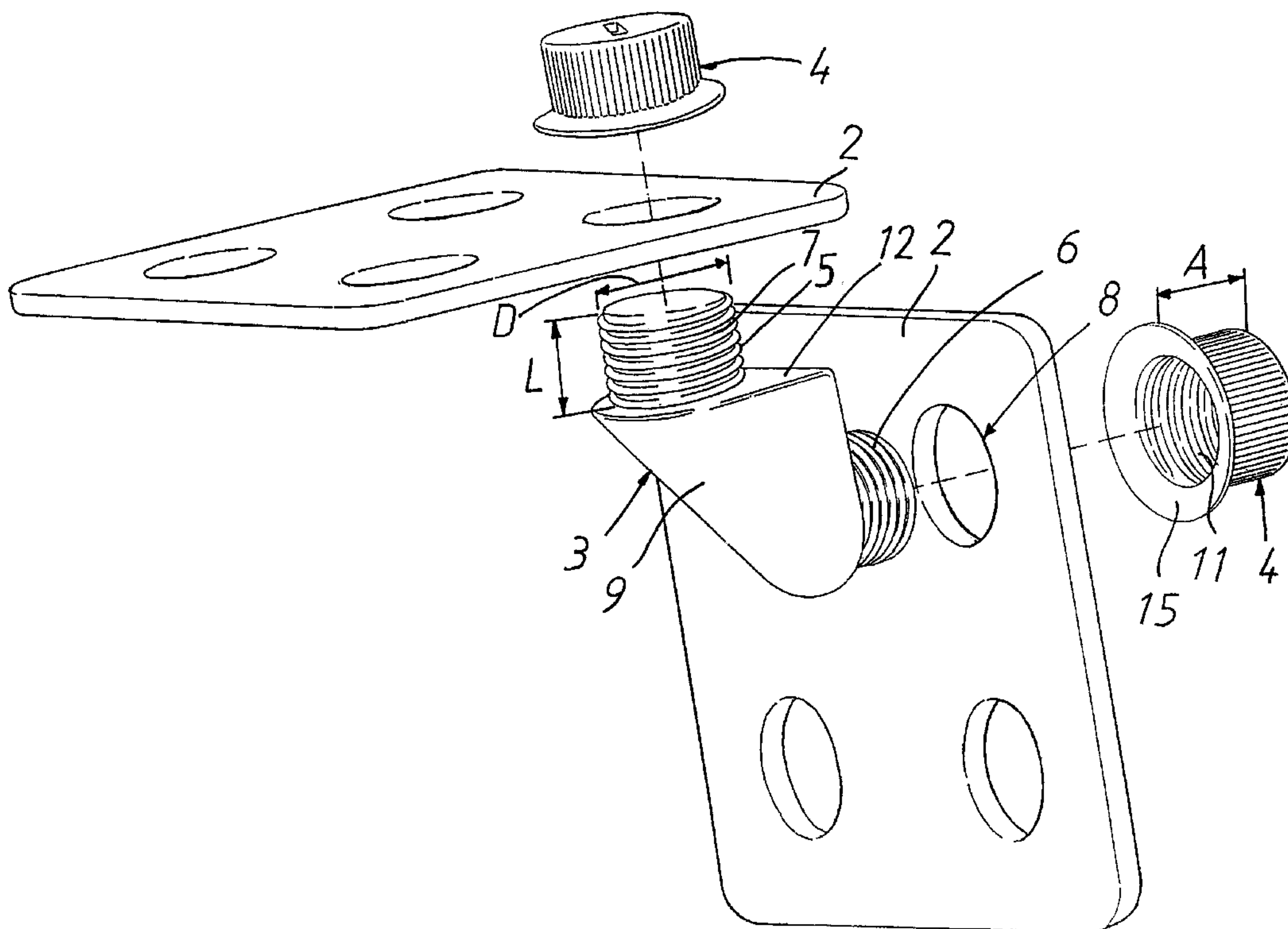




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(54) Title: **CONSTRUCTION SYSTEM**



(57) **Abrégé/Abstract:**

The present invention relates to a construction system (1) comprising construction elements (2) which exhibit a number of transcurrent holes (8) distributed along the aforementioned elements, connecting pieces (3) and locking devices (4) interacting with them for the purpose of connecting construction elements to one another. The aforementioned connecting pieces (3) consist of at least two threaded (5) connecting uprights (6, 7) projecting from a common connecting frame (9) which exhibit a form corresponding to the holes (8) in the construction elements, and threaded (11) connecting hats are so arranged, when screwed onto the aforementioned connecting uprights, as to clamp assembled construction elements (2) securely to an abutment (12) on the connecting piece (3) in question.



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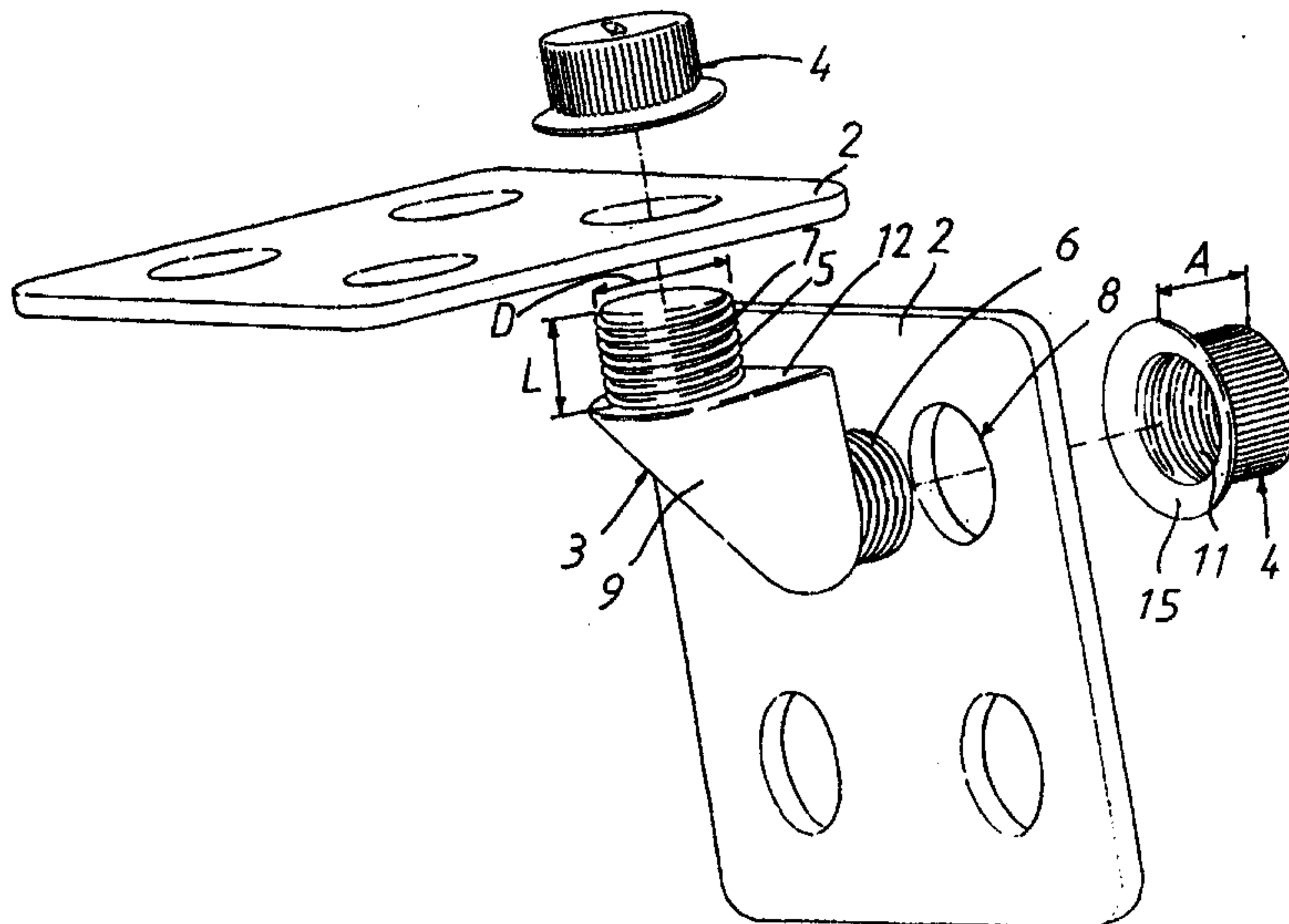
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amendments.**In English translation (filed in Swedish).*(54) Title: **CONSTRUCTION SYSTEM****(57) Abstract**

The present invention relates to a construction system (1) comprising construction elements (2) which exhibit a number of transcurrent holes (8) distributed along the aforementioned elements, connecting pieces (3) and locking devices (4) interacting with them for the purpose of connecting construction elements to one another. The aforementioned connecting pieces (3) consist of at least two threaded (5) connecting elements, and threaded (11) connecting hats are so arranged, when screwed onto the aforementioned connecting uprights, as to clamp assembled construction elements (2) securely to an abutment (12) on the connecting piece (3) in question.

Construction system

5 The present invention relates to a construction system comprising construction elements which exhibit a number of transcurrent holes distributed along the aforementioned elements, connecting pieces and locking devices interacting with them for the purpose of connecting
10 construction elements to one another.

FR 1, 174,756 A presents U-shaped fixing components (13) intended to be passed through pairs of holes (10) before being clamped securely with their elongated base part (13a) against the wall of a fixing plate (1, 2).

15 GB 16 858 A dating from 1912 presents an angle screw and a holder (1, 2) situated at a certain distance from the inner end piece of the thread; and

GB 461 094 A and GB 2241997 A present angled and straight bolts for the connection of different parts
20 respectively in parallel with and at an angle to one another.

No mention is made, however, of the positioning and the nature of an abutment and the linking of the connecting frame between the aforementioned threaded connecting uprights for the purpose of achieving strong construction elements
25 which exhibit a varying function.

An embodiment of the present invention to provide a simple and flexible construction system which is suitable for use in the construction of objects of varying kinds, such as toys, toy tools, training items, scaffoldings and
30 furniture, etc.

According to an aspect of the present invention, there is provided a construction system which is characterized essentially in that the aforementioned connecting pieces consist of at least two threaded connecting uprights projecting from a common connecting frame which
35

exhibit a form corresponding to the holes in the construction elements, in that locking devices executed as threaded connecting hats are so arranged, when screwed onto the aforementioned connecting uprights, as to clamp assembled
5 construction elements securely to an abutment on the connecting piece in question, and in that the connecting pieces are in the form of triangular connecting frames with abutment surfaces and with connecting uprights extending perpendicularly outwards from the respective abutment
10 surface.

According to another aspect of the present invention, there is provided a construction system comprising construction elements which exhibit a number of transcurrent holes distributed along the construction
15 elements, connecting pieces and locking devices interacting with the transcurrent holes for the purpose of connecting construction elements to one another, wherein the connecting pieces consist of two threaded connecting uprights projecting from a common connecting frame and
20 which exhibit a form corresponding to the holes in the construction elements, wherein the external diameter of the connecting uprights and the hole diameter of the holes in the construction elements essentially correspond to one another, wherein locking devices are threaded connecting hats are so arranged, when screwed onto the connecting
25 uprights, as to clamp assembled construction elements securely to an abutment on the respective connecting piece, wherein the connecting pieces are in the form of triangular connecting frames with an abutment surface and with connecting uprights extending perpendicularly
30 outwards from the respective abutment surface, wherein the abutment surfaces are situated at inner ends of external threads on the connecting uprights, wherein the threads on the connecting uprights extend for its entire length, and wherein the connecting pieces consist of injection-moulded pieces.

2a

The invention is described below as a number of preferred illustrative embodiments, in conjunction with which reference is made to accompanying drawings, in which:

Fig. 1 shows a perspective view of two connected
5 construction elements with an interjacent connecting piece;

Fig. 2 shows an exploded drawing prior to the connection of the constituent parts;

Fig. 3 shows a sectioned view along the lines I-I, II-II in Fig. 1;

Fig. 4 shows a procedural drawing for the
10 connection of the parts to one another;

Fig. 5 shows an example of the application of the invention for the assembly of a toy car illustrated at an angle viewed from above;

Fig. 6 shows the aforementioned toy car viewed at
15 an angle from below;

Fig. 7 shows the invention applied to the construction of a go-kart illustrated at an angle viewed from above;

Fig. 8 shows the go-kart viewed at an angle from below;

20 Figs. 9 and 9A show an example of a connecting piece which permits the connection of construction elements in three different directions;

Figs. 10 and 10A show an example of a connecting piece which permits the connection of construction elements at right angles in relation to one another;

Fig. 11 shows a perspective view of a specially
5 executed design of a connecting piece;

Figs. 12 and 12 A show an example of a locking device viewed at an angle from above and at an angle from below;

A construction system 1 comprising a desired number
10 of construction elements 2, 2¹, 2², 2³, 2⁴, 2⁵... and so on, which may be of varying form and may exhibit a number of transcurrent holes 8 distributed along the aforementioned elements, a number of connecting pieces 3, 3¹, 3², 3³, and locking devices 4 interacting therewith, which are so
15 arranged as to connect the aforementioned connecting elements to one another, have their connecting pieces 3-3³ arranged in a certain way. More specifically, the aforementioned connecting pieces consist of at least two connecting uprights 6, 7 projecting from a common connecting frame 9, which
20 uprights exhibit external threads 5, see Figs. 1-8 and 10, and exhibit a form corresponding to the holes 8 in the construction elements. The locking devices, which are executed as locking hats 4, which exhibit internal threads 11 matching the external threads 5 on the connecting uprights 6,
25 7, are so arranged, when screwed onto the aforementioned connecting uprights 6, 7, as to clamp construction elements 2-2⁵ assembled into a desired form to an abutment 12 on the connecting piece 3-3³ in question.

As illustrated in the drawings, the connecting
30 pieces 3, which have two connecting uprights 6, 7, are formed by triangular connecting frames 9 with or without extra reinforcements 17, e.g. in the form of external grooves, with curved abutment surfaces 12 and with connecting uprights 6, 7, 19 extending perpendicularly outwards from the respective
35 abutment surface 12.

The connecting pieces 3-3³ and the connecting hats 4 appropriately consist of blow-moulded or injection-moulded pieces of plastic material, although they may also consist of some other material produced by some other previously disclosed moulding method.

The threads 5 on the connecting uprights 6, 7 and the internal threads 11 in the connecting hats 4 extend for the entire length L, A of the respective connecting upright 6, 7 and connecting hat 4.

10 The external diameter D of the connecting uprights 6, 7 and the hole diameter H of the holes 8 in the construction elements 2-2⁵ essentially correspond to one another.

The aforementioned connecting uprights 6, 7 extend 15 perpendicularly and/or at an oblique or acute angle X from one another. Figs. 9, 9A show how three connecting uprights 6, 7, 10 depart from a common connecting piece 3³, are perpendicular in relation to one another along X, Y and Z axes, and are thus particularly suitable for connecting 20 together components at corners, i.e. for use in corner joints.

Each of the aforementioned connecting hats 4 preferably exhibits its own recess 28 or other unevenness on its closing cover 13 at the rear end 4A of the hat, 25 corresponding to a rotating tool 14, for example a screwdriver or a hexagon socket screw key, etc. It is possible in this way effectively to tighten and, naturally, also to slacken the aforementioned hats 4. In order to provide pretension between the hats 4 and the construction 30 elements 2, the hats 4 may exhibit a flexible peripheral edge 15 extending around the periphery of the hat at the front 4B of the hat.

The aforementioned connecting holes 8 in the construction elements 2 are distributed in a row 16 and at an 35 angle C in relation to one another.

Fig. 11 shows an example of a connecting piece 3², in which an extra connecting upright 19 is present on one extended abutment surface 12 of the connecting piece, whereby staying is achieved without the need to make use of a number
5 of connecting pieces.

Finally, the aforementioned Fig. 11 shows, among other things, how the ends of the aforementioned connecting uprights 6, 7, 19 are closed by means of caps 20 in the form of solid walls, whereas Figs. 10 and 10A show how the ends of
10 the connecting pieces 6, 7 are open 22 into their inner space 21.

The invention and its constituent parts have now been described and presented in detail, and the function should already have been appreciated. The principle of the
15 connection is illustrated in Fig. 3, which also shows how clamping takes place by means of the hat 4 against the construction element 2, which in turn is securely clamped to the associated abutment surface 12 of the connecting piece, as the hat 4 is rotated into place with its internal threads
20 11 on the external threads 5 of the associated connecting upright 6, 7. The connecting upright 7 illustrated in sequence I in Fig. 3 has its hat 4 only partly tightened, which can be appreciated from the fact that its brim-like peripheral edge 15 is not in contact with any great force
25 with the subjacent construction element 2, whereas the connecting upright 6 illustrated in sequence II in Fig. 3 and its supporting hat 4 is tightened to its maximum extent, which means that the aforementioned peripheral edge 15 of the hat has sprung outwards, and that the hat is pressing against
30 the subjacent construction element 2. This can be appreciated from the fact that the threads have been utilized to a further extent in tightening case II than in tightening case I.

It can be seen from Fig. 4 how the various
35 components must be assembled and screwed together in order to

produce the intended object; see also Figs. 5-8, where a completed toy car 23 and a go-kart 24 are illustrated. Wheels 25 have been attached in this case with the help of long, rotating axles 26 and hats 4, and a handle 27 is capable of attachment to upright supports 2⁶. Holes 8 in the construction elements 2... can be used in this case for the aforementioned attachment by passing the axles 26, 27 through the holes 8.

The construction elements 2... may be in the form of sheets consisting of fibrous material such as sheets of masonite, plywood or particle board, or of metal, plastic or composite materials.

The locking devices 4 may be in the form of blow-moulded or injection-moulded plastics, for example nylon.

The invention is not restricted to the illustrative embodiments described above and illustrated in the drawings, but may be varied within the scope of the Patent Claims without departing from the idea of invention.

CLAIMS:

1. Construction system comprising construction elements which exhibit a number of transcurrent holes distributed along the construction elements, connecting pieces and locking devices interacting with the transcurrent holes for the purpose of connecting construction elements to one another, wherein the connecting pieces consist of two threaded connecting uprights projecting from a common connecting frame and which exhibit a form corresponding to the holes in the construction elements, wherein the external diameter of the connecting uprights and the hole diameter of the holes in the construction elements essentially correspond to one another, wherein locking devices are threaded connecting hats are so arranged, when screwed onto the connecting uprights, as to clamp assembled construction elements securely to an abutment on the respective connecting piece, wherein the connecting pieces are in the form of triangular connecting frames with an abutment surface and with connecting uprights extending perpendicularly outwards from the respective abutment surface, wherein the abutment surfaces are situated at inner ends of external threads on the connecting uprights, wherein the threads on the connecting uprights extend for its entire length, and wherein the connecting pieces consist of injection-moulded pieces.

2. Construction system in accordance with claim 1, wherein the connecting uprights extend perpendicularly or at an oblique or acute angle from one another.

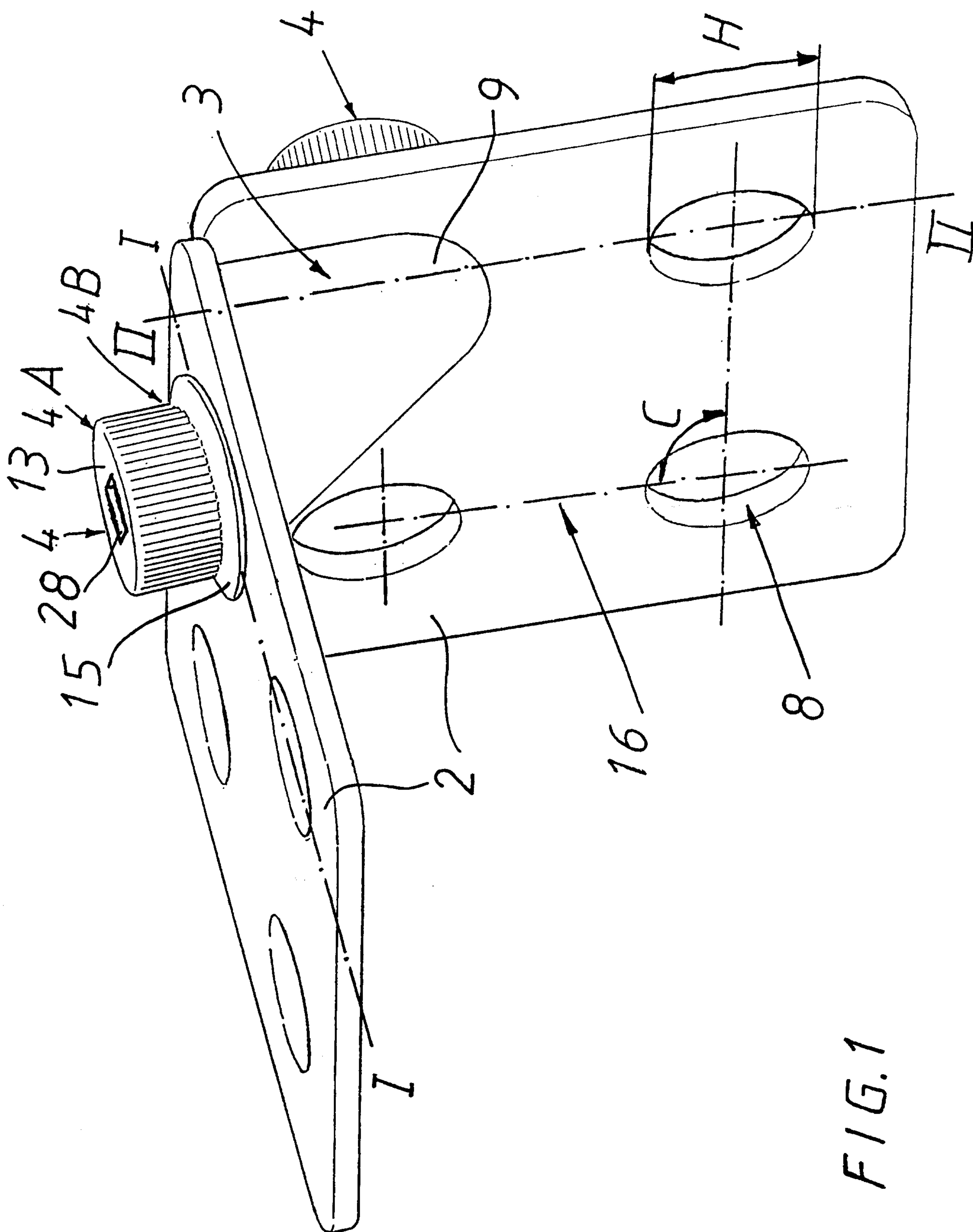
3. Construction system in accordance with claim 1 or 2, wherein the connecting hats exhibit a recess corresponding to a rotating tool on its closing cover at a rear end of the hat.

4. Construction system in accordance with any one of claims 1 to 3, wherein the connecting hats exhibit a flexible peripheral edge extending around the periphery of the hat at a front of the hat.

5. Construction system in accordance with any of claims 1 to 4, wherein the transcurrent holes in the construction elements are distributed in a row and at an angle in relation to one another.

6. Construction system in accordance with any one of claims 1 to 5, wherein the ends of the connecting uprights are closed or open.

7. Construction system in accordance with any one of claims 1 to 6, wherein the abutment surfaces are curved.



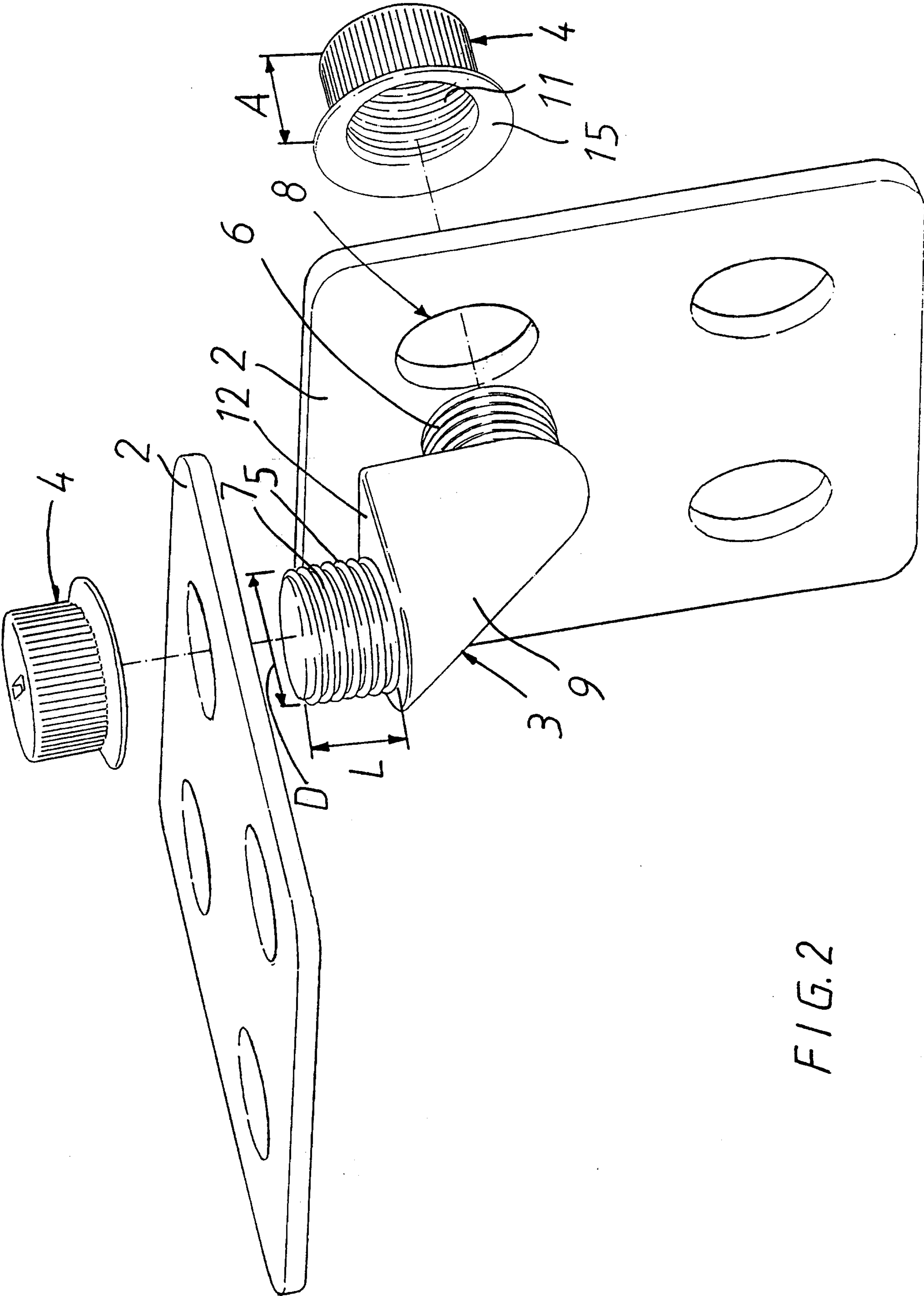


FIG. 2

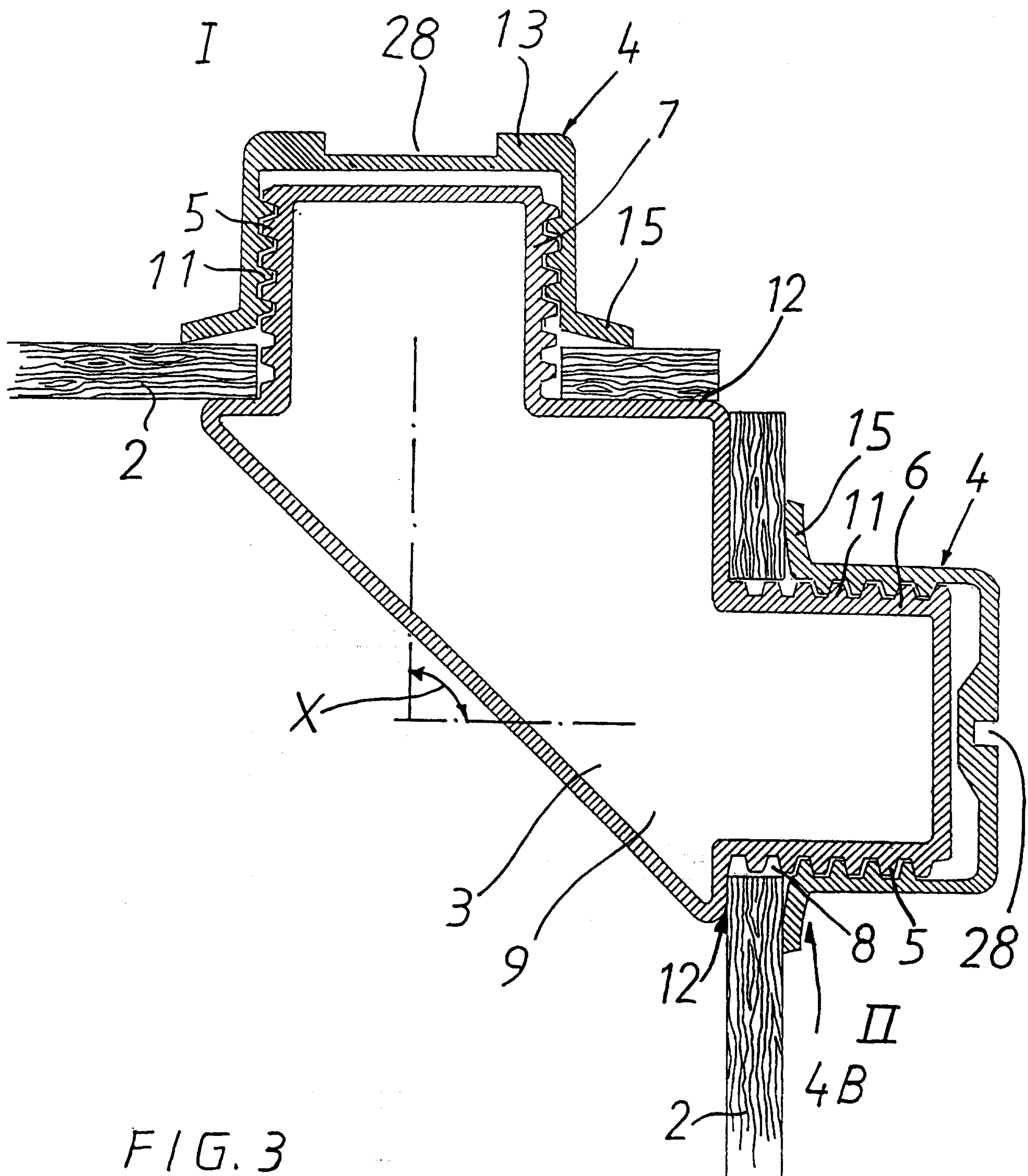
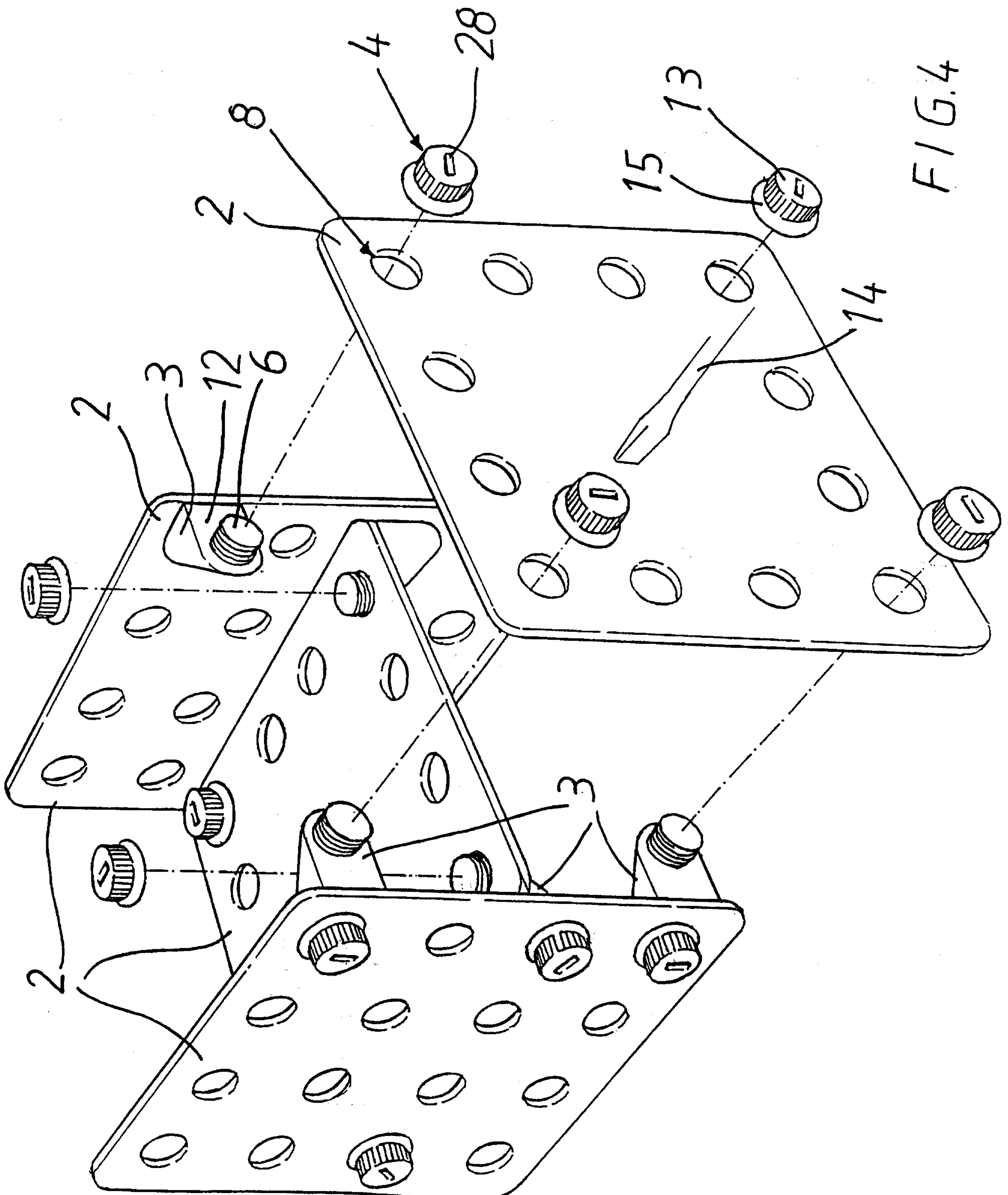


FIG. 3



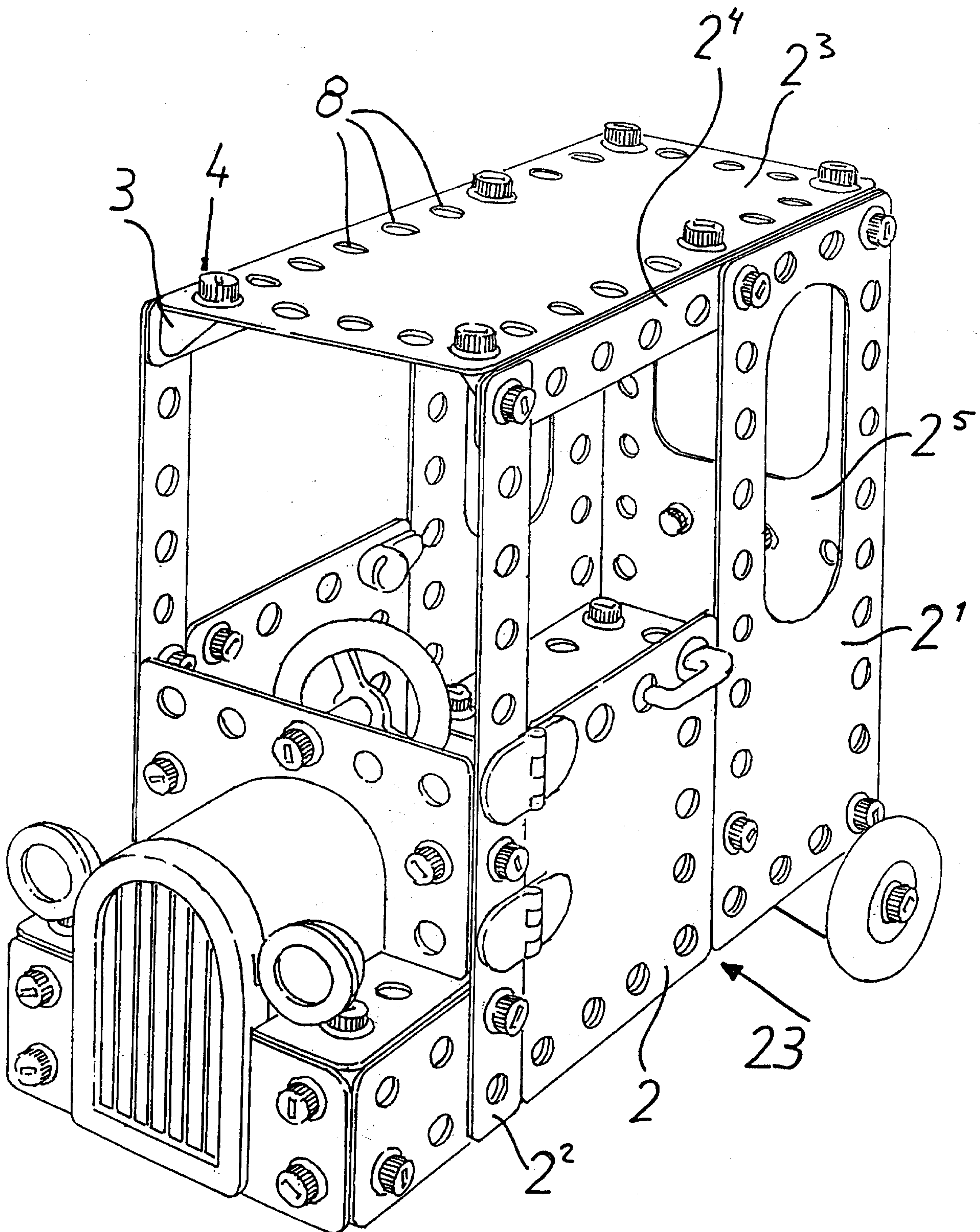


FIG. 5

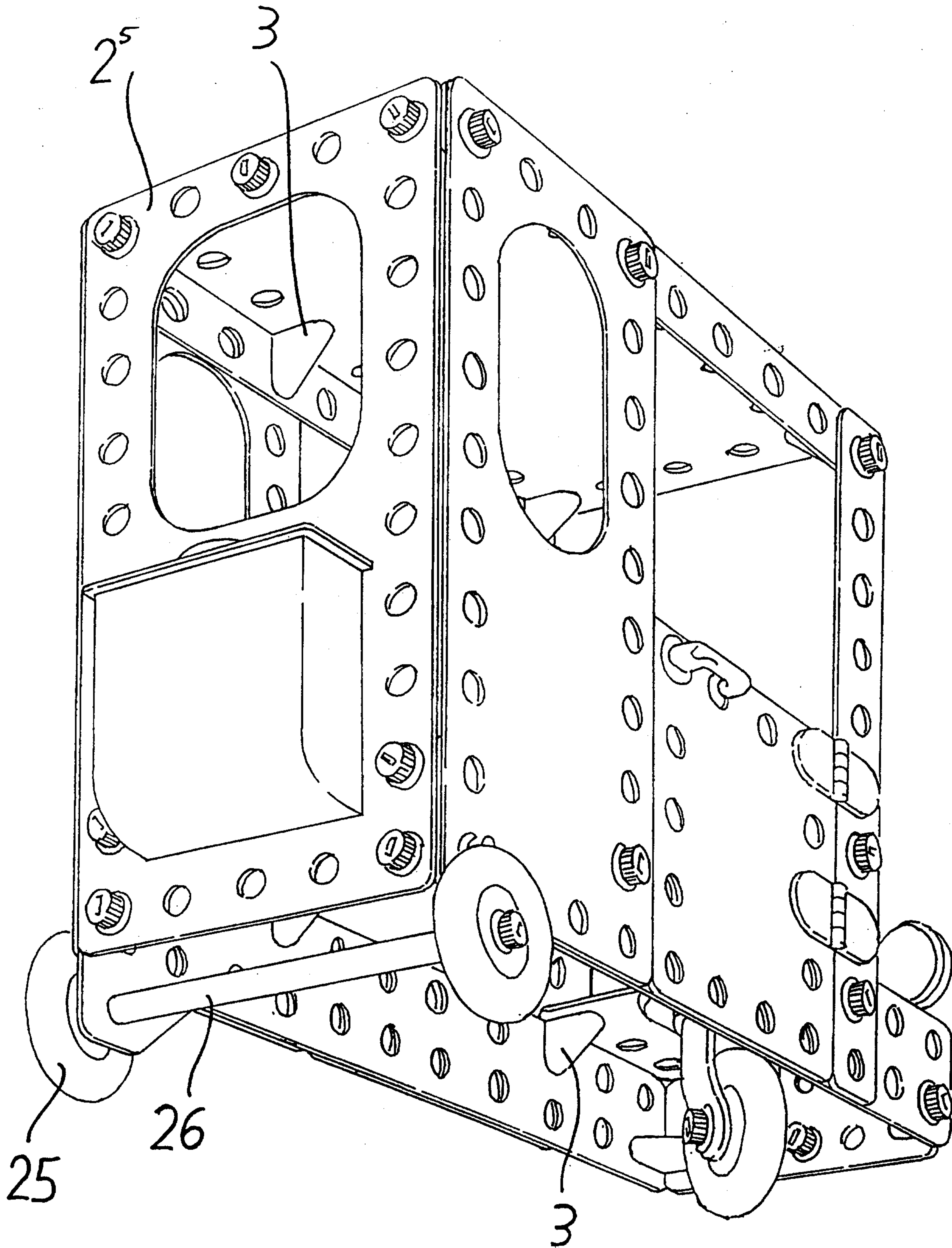
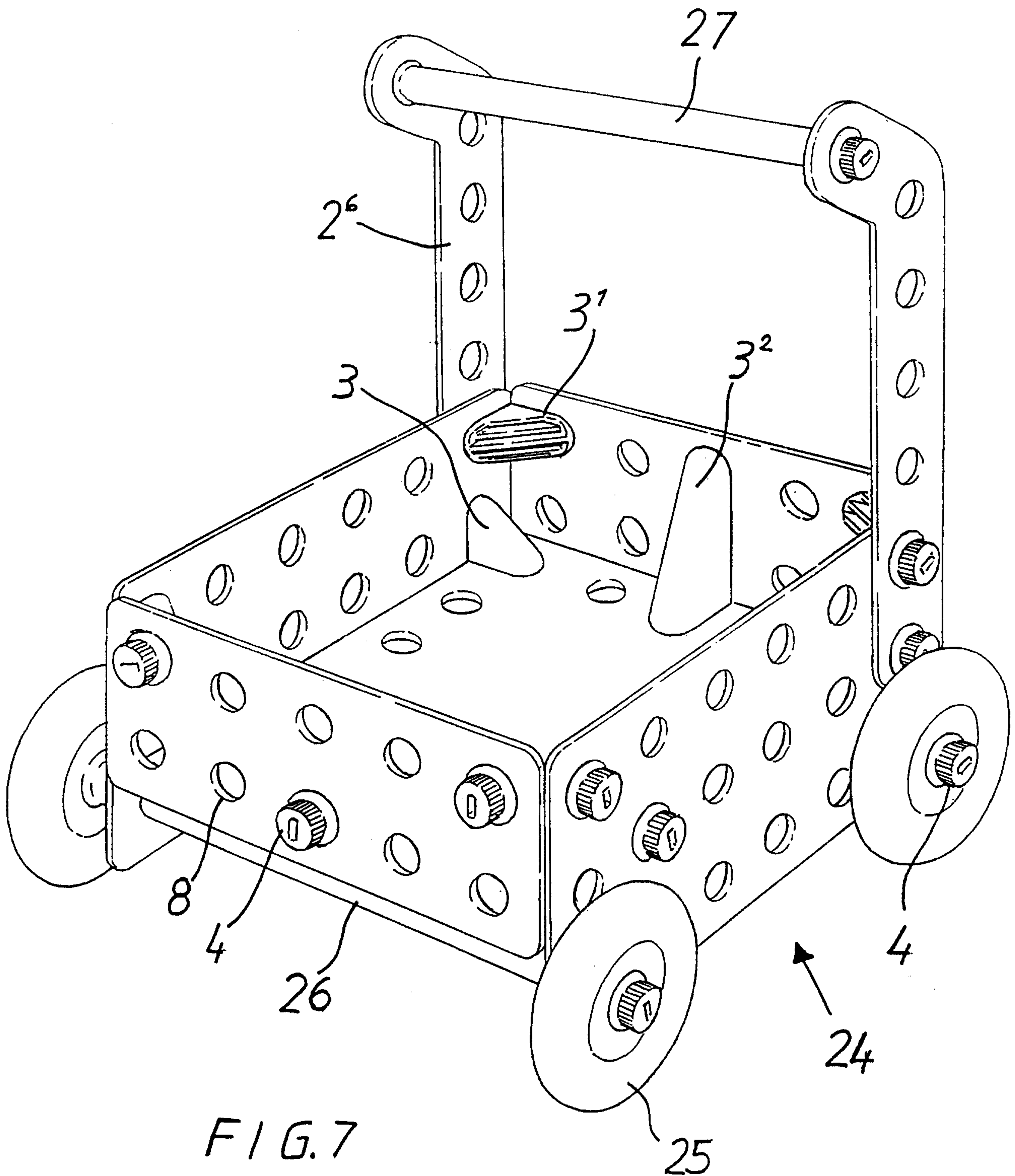
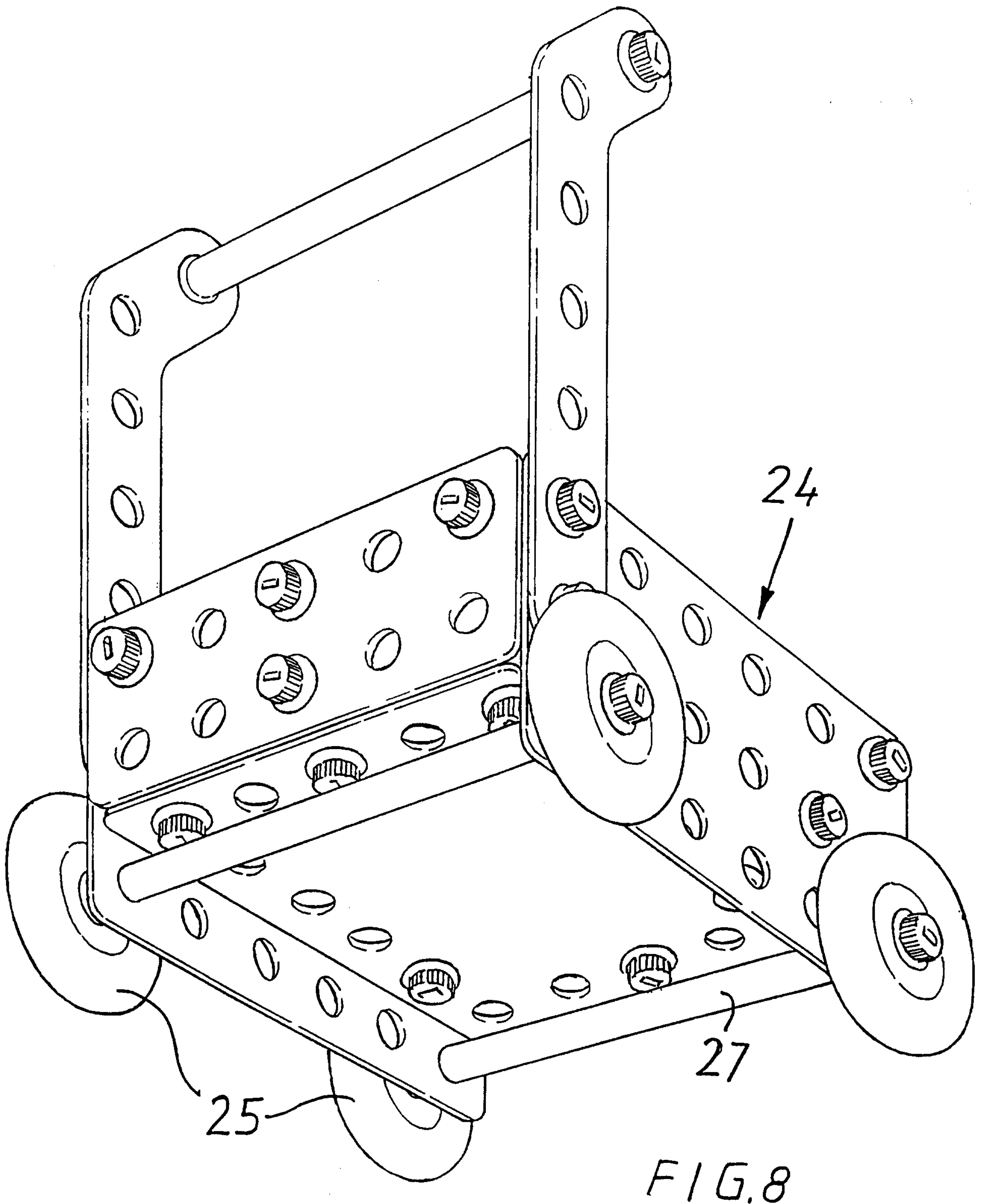


FIG. 6





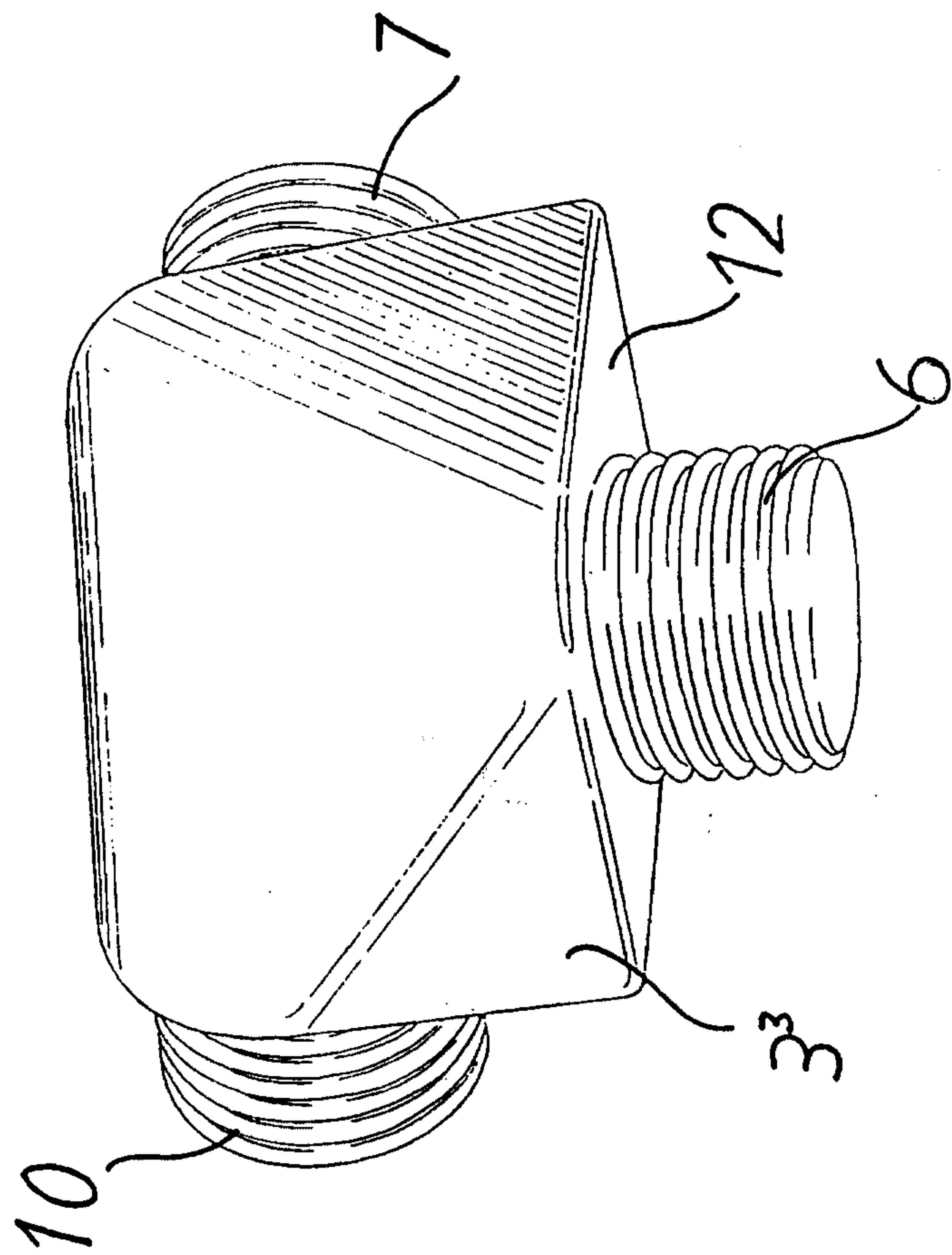


FIG. 9A

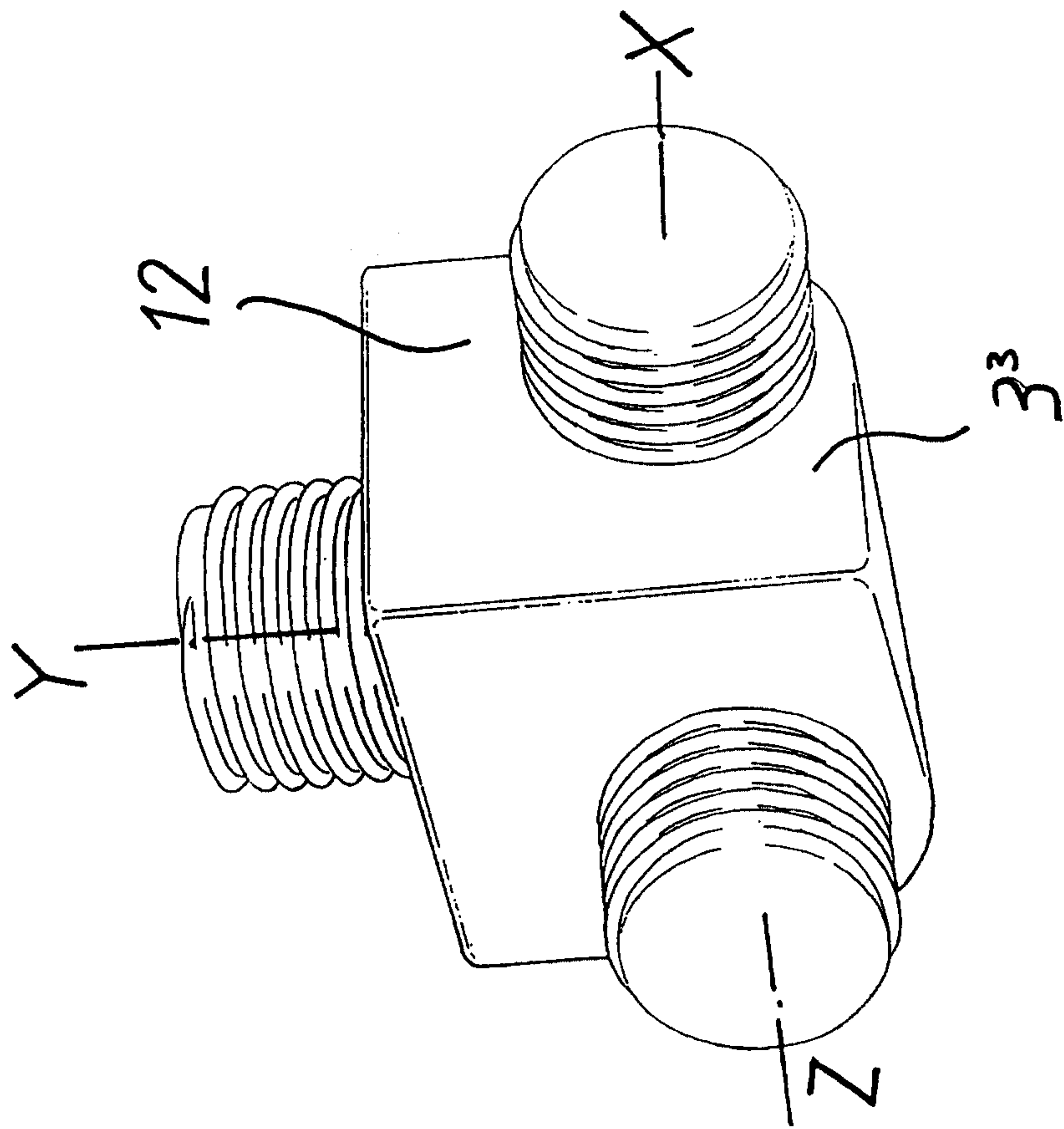
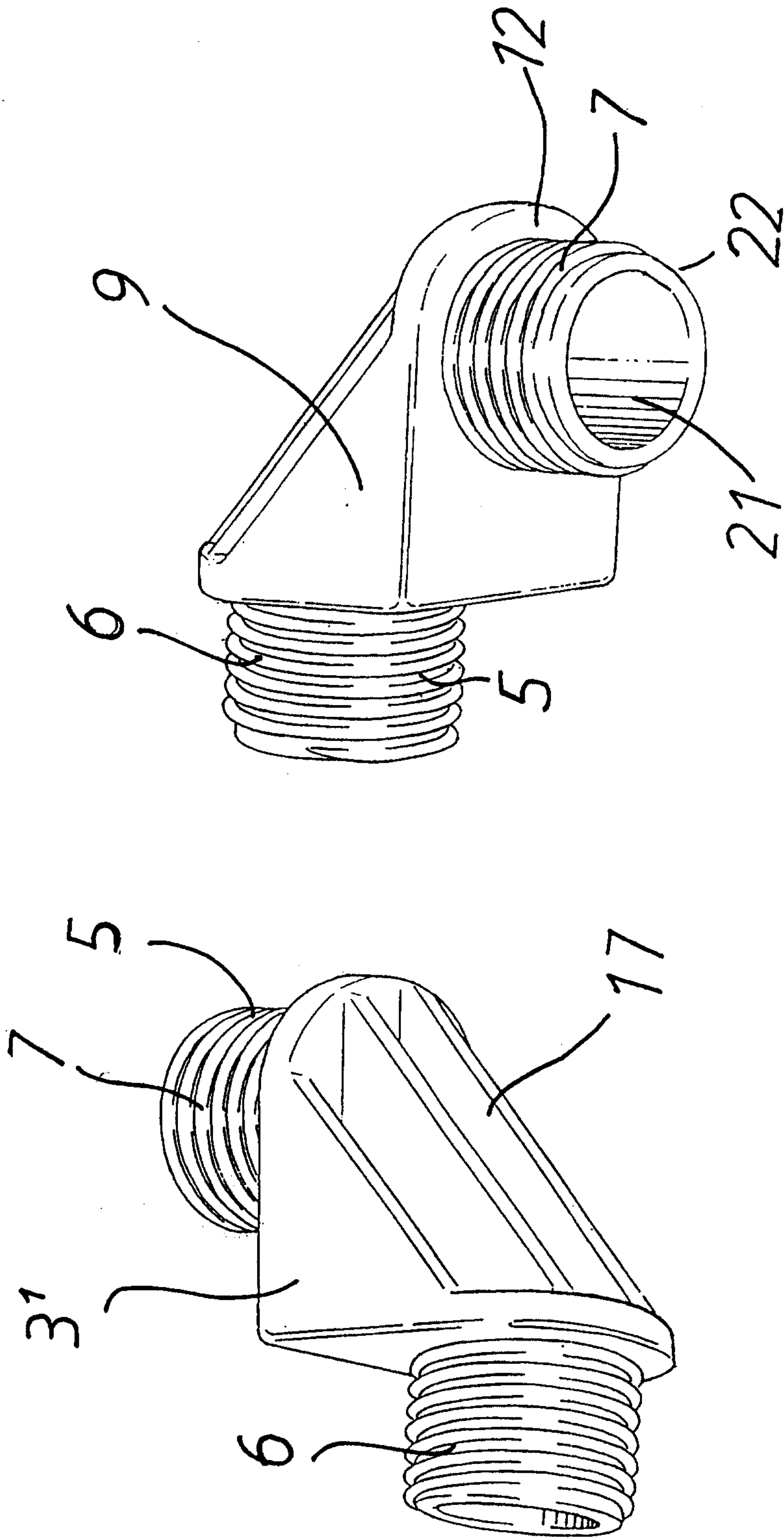


FIG. 9



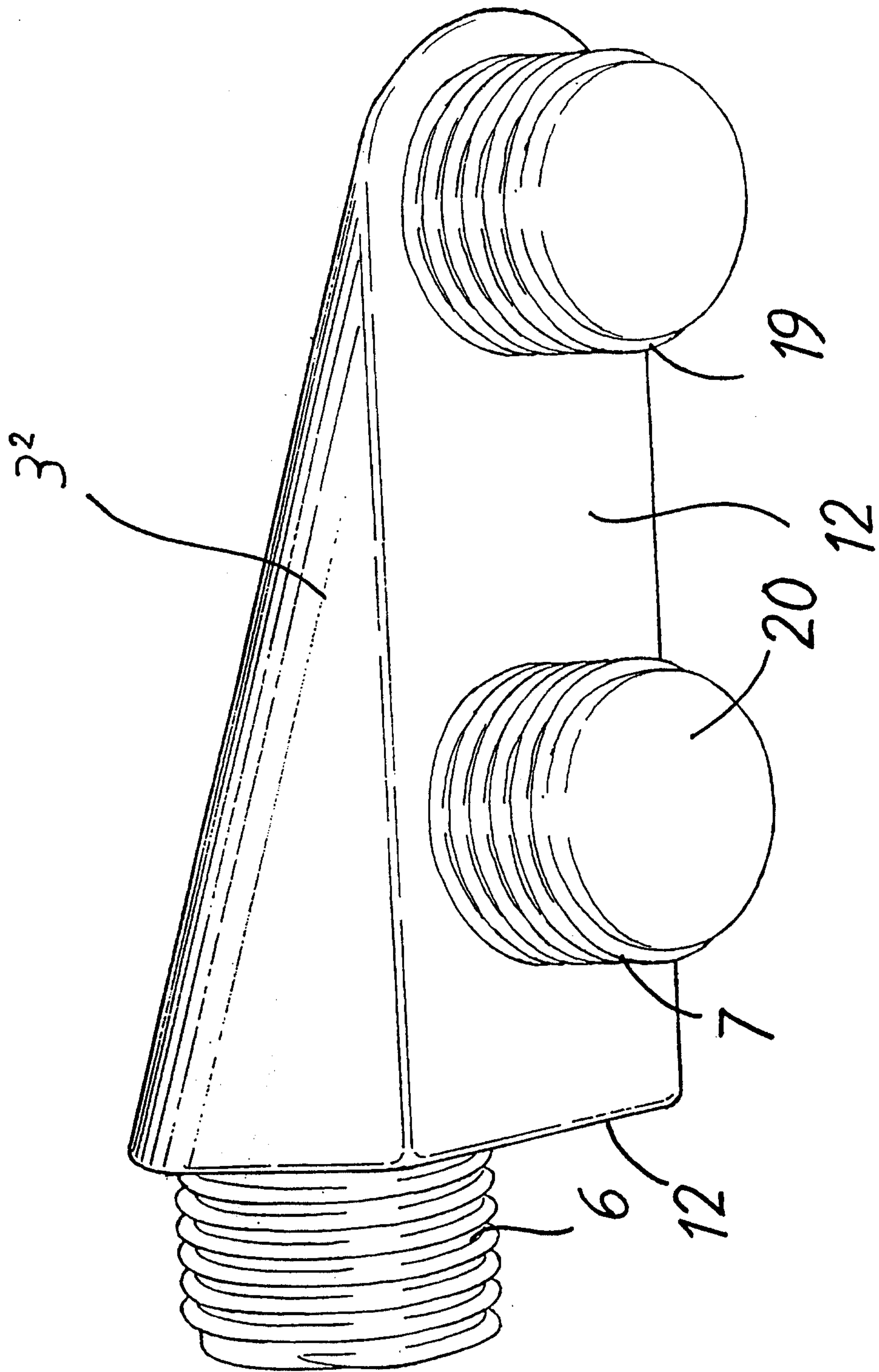


FIG. 11

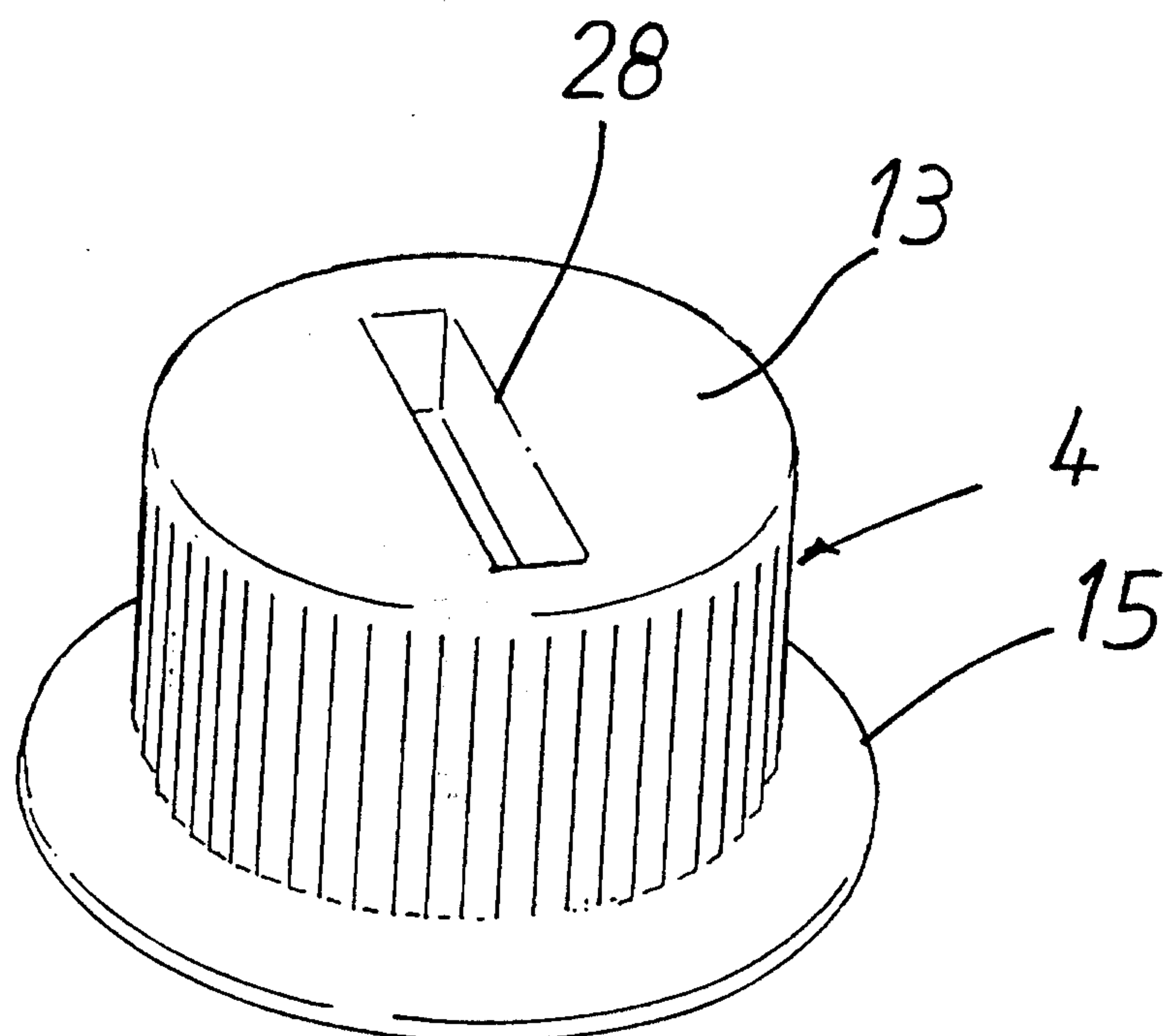


FIG. 12

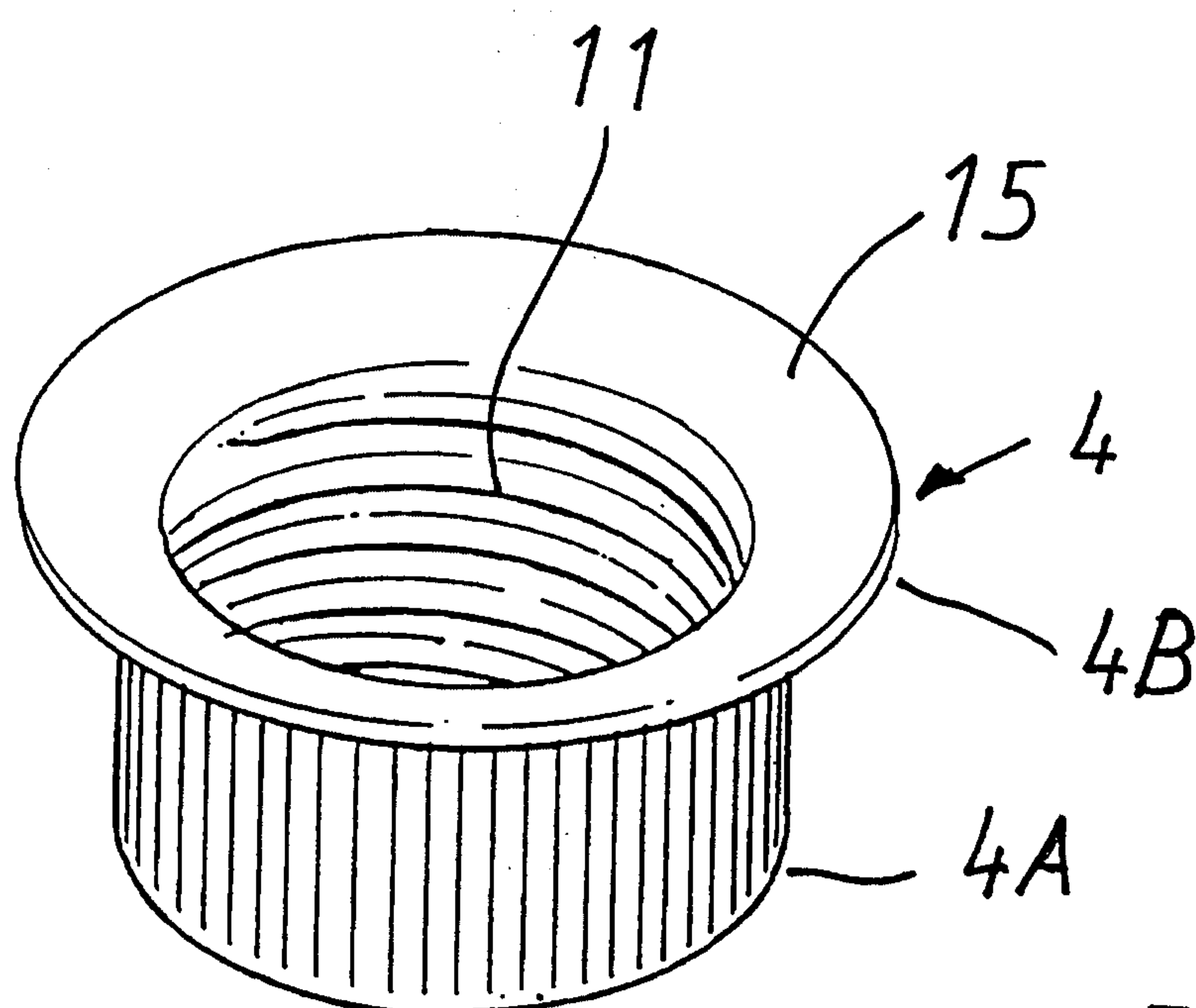


FIG. 12A

