(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 195 647**
A2

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **86301970.9**

(22) Date of filing: **18.03.86**

(51) Int. Cl.⁴: **A 47 C 1/124**
A 47 C 7/68

(30) Priority: **18.03.85 AU 9778/85**

(43) Date of publication of application:
24.09.86 Bulletin 86/39

(84) Designated Contracting States:
DE GB IT

(71) Applicant: **SEBEL FURNITURE LTD.**
96 Canterbury Road
Bankstown New South Wales(AU)

(72) Inventor: **Brennan, James William**
96 Canterbury Road
Bankstown, New South Wales 2200(AU)

(74) Representative: **Warren, Keith Stanley et al,**
BARON & WARREN 18 South End Kensington
London W8 5BU(GB)

(54) **Linking mechanism for chairs.**

(57) The present invention discloses a linking mechanism to link like chairs (1) together to form a row. Each chair (1) has a pair of fittings located one to either side of the chair (1). One fitting has at least one male lug (7) of T-shaped cross-section, preferably inclined to the vertical, whilst the other fitting has a corresponding number of female grooves (6) of inverted T-shaped cross-section. An armrest (4) having substantially identical fittings is also disclosed. The chairs (1) can be releasably linked together to form a row by inter-engagement of the male and female fittings either directly or with an armrest (4) between adjacent chairs. An end cap for a row of chairs is also disclosed.

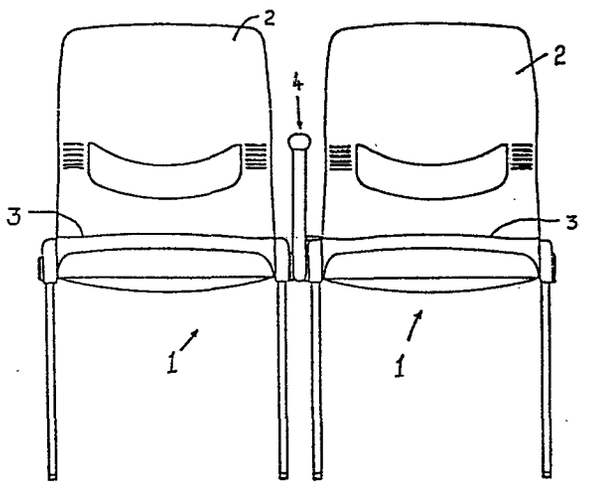
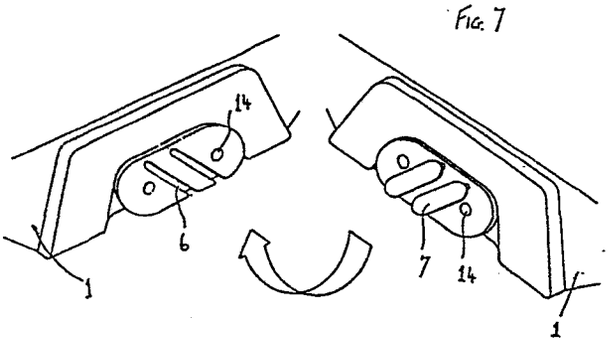


Fig. 3

Fig. 7



EP 0 195 647 A2

TITLE MODIFIED
see front page

AN ARTICLE OF FURNITURE

The present invention relates to furniture and, in particular, to chairs, a linking mechanism for chairs, and an arm rest for chairs.

A major market for chairs is represented by hotels, convention centres, and like establishments which are able to cater for meetings, lectures, demonstrations and the like. Such establishments require a flexible seating arrangement since the one room at various different times may be required to accommodate seating arranged in rows, seating arranged around tables, for example, and seating in other configurations. Furthermore, depending on the particular nature of the function to be held, the required seating may be either a side chair (that is without any arms), or an arm chair, or a chair having an arm rest or like support member. The term "arm rest" as used herein includes within its scope an arm support for an arm chair, the support for a writing tablet such as that disclosed in Australian Patent No. 472751 or Australian Patent Application No. 57821/80, or even a support for an ashtray.

Furthermore, it is a requirement of many local ordinances that chairs arranged in rows at public meetings be linked together within a row. This is particularly important in the event of a fire or other possible panic situation since the linking of the chairs side by side in rows prevents one chair in

a row being knocked over by a sitter jumping to his feet, thereby blocking both his own aisle and the aisle behind his row.

It is the object of the present invention to provide an arrangement whereby the overheads of such establishments can be reduced by use of a linking mechanism to join chairs together in a row, an arm rest which enables side chairs to be converted into arm chairs, and/or enables the easy provision of writing tablets, ashtrays and the like.

According to one aspect of the present invention there is disclosed a linking mechanism for chairs, said mechanism comprising a pair of fittings located one to either side of said chair; said pair comprising a male member having a substantially upwardly extending lug of substantially T-shaped cross-section, and a female member having a substantially upwardly extending groove open at one, lower, end; said groove having a substantially inverted T-shaped cross-section with the inner transverse width of said groove being larger than the outer transverse width of said groove; whereby two like chairs are able to be linked together by raising one chair relative to the other to locate said open end of the groove of the female member of said one chair above the male member of the other chair, and slidingly engaging said lug and groove whilst substantially lowering said one chair relative to said other chair, said lug being retained within said groove. Preferably a pair of inclined, parallel male members are provided and a pair of inclined, parallel female members are also provided with the inclination and spacing of the male and female members being substantially the same.

According to another aspect of the present invention there is disclosed an arm rest or like support member for chairs having the above described linking mechanism, said arm rest comprising a support stem having said pair of fittings located one to either side thereof; whereby linking the female member of one of said chairs with the male member of said arm rest, and/or by linking the female member of said arm rest with the male member of another one of said chairs, locates said arm rest on, and supports said arm rest by, either one of said chairs; or locates said arm rest on, and supports said arm rest by, both of

said chairs which are thereby linked together.

Embodiments of the present invention will now be described with reference to the drawings in which:

Fig. 1 is a front elevation of two side chairs linked in accordance with the linking mechanism of the preferred embodiment,

Fig. 2 is a plan view of the chairs of Fig. 1,

Fig. 3 is a view similar to Fig. 1 but showing two chairs linked by means of an arm rest located between the chairs,

Fig. 4 is a front elevation of a side chair showing a single arm rest linked thereon,

Fig. 5 is a right side elevation of the chair having the linking mechanism of the preferred embodiment,

Fig. 6 is a left side elevation of the chair of Fig. 5,

Fig. 7 is a perspective schematic view illustrating the actions required to link two of the chairs of Fig. 5 and 6,

Fig. 8 is a transverse vertical cross-section through the seat portion of two of the chairs of Figs. 5 and 6 showing the linking mechanism immediately prior to linkage,

Fig. 9 is a perspective view of an arm rest able to be interconnected between two chairs,

Fig. 10 is a perspective view of the other side of the arm rest of Fig. 9,

Fig. 11 is a side elevation of the arm rest of Fig. 9,

Fig. 12 is the opposite side elevation of the arm rest of Fig. 9,

Fig. 13 is a view similar to Fig. 8 but illustrating the interconnection of two chairs with an arm rest prior to linkage,

Fig. 14 is a view similar to Fig. 13 but showing the interconnection after linkage,

Fig. 15 is a perspective view of a row of side chairs interconnected by arm rests,

Fig. 16 is a perspective view similar to Fig. 9 but showing a writing tablet incorporated into the armrest,

Fig. 17 is the opposite perspective view of the arm rest of Fig. 16,

Fig. 18 is a perspective view illustrating the use of the writing tablet of Fig. 17 to terminate one end of a row,

Fig. 19 is a perspective, partially exploded, view of an end plate marking one end of a row,

Fig. 20 is a perspective view of the end plate of Fig. 19 engaged with the end chair of the row,

Fig. 21 is a perspective view of an alternative embodiment of an arm rest used to terminate one end of a row,

Fig. 22 is a transverse vertical cross-sectional view showing the termination of the one row end by means of the arm rest of Fig. 21 the cross-section of Fig. 22 being along a line spaced from that of Figs. 7, 8, 13 and 14,

Fig. 23 is a view similar to Fig. 22 but showing the termination of the other end of the row, and

Figs. 24 and 25 are respectively perspective views showing the termination of the right and left hand ends of a row with an inter-chair arm rest and end plate.

As seen in Figs. 1 to 3, the linking mechanism of the preferred embodiment is able to be provided on side chairs as illustrated in Figs. 1 to 3. Each side chair 1 has a backrest 2 and seat 3 and a plurality of the side chairs 1 are able to be linked together to form a row.

If desired, as illustrated in Figs. 3 or 4, the side chairs 1 can be converted into arm chairs by the provision of an arm rest 4. The arm rest 4 can be provided either intermediate two chairs 1 as illustrated in Fig. 3, or can be provided to one side of the end chair in a row, or to both sides of a free standing chair as will be apparent to those skilled in the art by a duplication of the arrangement illustrated in Fig. 4.

The linking mechanism itself is best illustrated in Figs. 5 to 7 from which it will be seen that the left hand side of each of the chairs 1 is provided with a pair of female members in the form of inclined, spaced apart, substantially parallel grooves 6 which each have a substantially inverted T-shape cross-section.

The right hand side of the chair 1 is provided with a pair of similarly inclined and spaced apart male members each of which takes the form of a lug 7 of substantially T-shape cross-section.

As will be appreciated from Figs. 7 and 8, the grooves 6

and lugs 7 are provided with a complimentary shape so that a pair of like chairs can be manipulated so as to pass the lugs 7 of one chair into the grooves 6 of another. As best illustrated in Fig. 8 this is easily accomplished by lifting the chair carrying the grooves 6, relative to the chair carrying the lugs 7 and then slidingly engaging same.

Figs. 9 to 12 illustrate an arm rest 4 which is provided on one side with a pair of grooves 6 and on the other side with a pair of lugs 7 which are arranged to mate with the corresponding lugs 7 and grooves 6 respectively on the chairs 1. As best illustrated in Fig. 13, this is accomplished by first raising the arm rest 4 so as to place the grooves 6 thereof above the lugs 7 of one chair, then sliding the arm rest 4 home by moving it downwardly relative to the chair carrying the lugs 7, and then sliding the chair carrying the grooves 6 downwardly on to the lugs 7 of the arm rest 4. Fig. 14 illustrates in cross-section the completed inter-engagement of two chairs and an arm rest 4 whilst Fig. 15 illustrates a row of side chairs linked together with inter-chain arm rests.

Figs. 16 and 17 illustrate how the arm rest 4 need not be restricted merely to a conventional arm rest but, if desired, can include a pivotally mounted writing tablet 10. Naturally, if desired, the arm rests 4 with writing tablet 10 can be located either only at one end of a row, or between each chair of a row.

Fig. 18 illustrates in perspective view one way in which an arm rest 4, in this instance carrying a writing tablet 10, can be used to terminate one end of the row. In this embodiment, the grooves 6 of the arm rest 4 are lifted upwardly and engaged with the lugs (not illustrated in Fig. 18) of the chair 1. Then an end plate 11 having a pair of spaced apart rods 12 is located on the arm rest 4 so that the rods 12 pass through corresponding apertures 13 in the arm rest 4 and thence into holes 14 (Figs. 5 to 7) provided at the side of the chair 1.

In some instances where, for example pre-booked seats are to be provided, it is often necessary to indicate the number of the row in order to assist patrons to find their intended seat. A substantial advantage offered by the end plates 11 is that

these can be numbered, and/or carry letters of the alphabet, in order to indicate the row. If desired, the end plates 11 can be used to terminate a row without arm rests 4 as illustrated in Figs. 19 and 20. Furthermore, the end plates 11 also effectively secure the end arm rest 4 of a row from possible removal by students, or the like as will be explained in more detail in relation to Figs. 22 and 23.

Figs. 21 and 22 illustrate an alternative embodiment of an arm rest 104 and how it can be used to terminate the end of a row. As seen in Fig. 21, the arm rest 104 is not provided with either slots 6 or lugs 7 but is instead provided with a pair of spaced apart rods 112 which pass directly into holes 14 in the chair 1, as indicated in Fig. 22.

In addition, the seat 3 is provided with a depending rib 15 having a pair of circular openings 16 therein and the free end of each of the rods 112 is located in the corresponding opening 16 when the arm rest 104 and seat 1 are assembled together.

Furthermore, in order to retain the arm rest 104 on the seat 1 an L-shaped metal clip 17 having an upstanding lip 18 is provided on the arm rest 104. The upstanding lip 18 engages with a detent 19 in the underside of the chair 1 when the chair 1 and arm rest 104 are assembled. A substantially similar arrangement is used to retain the end plates 11, however, the metal clip 17 is visible in Fig 25, is partially obscured in Fig. 18 and is not visible in either Figs. 19 or 20.

Fig. 23 illustrates the termination of the left hand end of a row (the right hand end being illustrated in Figs. 21 and 22). For the right hand end of a row the arm rest 114 is required to be a mirror image of the arm rest 104 of Fig. 21.

The above described arrangements provide a number of very substantial advantages. Firstly, the lugs 7 and grooves 6 can be fabricated from moulded plastic and therefore the linking mechanism can either be incorporated into the chair during its manufacture, or alternatively provided as low cost attachments which are secured, for example, by means of fasteners to the chair. Secondly, the same linking arrangement is used for the chairs and the arm rest and thus the same chairs can be provided

in a row linked together, in a row linked together with intervening arm rests, or as free standing chairs either with or without arm rests.

It will also be apparent that the inclined parallel nature of the grooves and lugs and the ability to link an entire row present a number of safety features. For example, the chairs can only be unlinked by manipulation and movement of each chair with a very small degree of rotational movement and longitudinal movement along a substantial distance. Thus in a panic situation, a single chair cannot be tilted out of the linking mechanism by a patron jumping suddenly to his or her feet. In addition, because all the chairs are linked together in a row, it is most unlikely that all the chairs in a row could be tipped over at the one time.

It will be appreciated in this connection, that the tendency of chairs to tip about either their front or rear legs gives rise to an arcuate motion or intended motion of the chair. Because of the length of the grooves 6 and lugs 7, their inclination, and their parallel nature, the sliding motion required to disengage the chairs acts against such intended arcuate motion and therefore prevents inadvertent disengagement.

Figs. 24 and 25 illustrate an alternative arrangement for terminating the end of a row with an inter-chair arm rest 4 and an end plate 11. In Fig. 4 the arm rest 4 includes a writing tablet 10.

The foregoing describes only some embodiments of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope of the present invention.

CLAIMS

1. A linking mechanism for chairs, said mechanism comprising a pair of fittings located one to either side of said chair; said pair comprising a male member having a substantially upwardly extending lug of substantially T-shaped cross-section, and a female member having a substantially upwardly extending groove open at one, lower, end; said groove having a substantially inverted T-shaped cross-section with the inner transverse width of said groove being larger than the outer transverse width of said groove; whereby two like chairs are able to be linked together by raising one chair relative to the other to locate said open end of the groove of the female member of said one chair above the male member of the other chair, and slidingly engaging said lug and groove whilst substantially lowering said one chair relative to said other chair, said lug being retained within said groove.

2. A mechanism as claimed in claim 1 wherein one of said fittings comprises a parallel pair of said male members (7), the other of said fittings comprises a parallel pair of said female members (6), said members of each said pair being substantially equally spaced apart and being located on said chair with a substantially equal inclination relative to the vertical.

3. A mechanism as claimed in claim 1 to 4 moulded in a single piece from plastics material.

4. A mechanism as claimed in claim 1 to 4 and moulded integrally with the seat of said chair.

5. A mechanism as claimed in any one of claims 1 to 4 and comprising a further pair of like fittings located one to either side of the base of a supporting stem for an arm rest (4), said two like chairs (1) being able to be linked together with said arm rest base located between said chairs, the male fittings of one chair being engaged with the female fitting of said armrest base and the male fitting of said arm rest base being engaged with the female fitting of said other chair.

6. A mechanism as claimed in claim 5 wherein said armrest comprises a writing tablet (10).

7. A mechanism as claimed in any one of claims 1 to 6 including a pair of spaced apart apertures (13) passing through each of said fittings, and an end cap (11) for terminating a row

of said like chairs (1), said end cap (11) having a pair of rods (12) spaced apart a distance substantially equal to that of said apertures (13), said rods (12) passing into said apertures (13) to locate said end cap (11) over the fitting terminating said row.

8. A mechanism as claimed in claim 7 wherein said end cap (11) includes an indicium (A) to indicate the number or order of said row.

9. A mechanism as claimed in claim 7 or 8 wherein said end cap (11) is retained on said row terminating fitting by clip means (17, 18, 19).

10. A mechanism as claimed in any one of claims 7 to 9 wherein said end cap (11) comprises the base of a supporting stem for an armrest (104).

11. A mechanism as claimed in claim 10 wherein said armrest comprises a writing tablet (10).

12. An arm rest or like support member (4) for chairs having the above described linking mechanism, said arm rest comprising a support stem having said pair of fittings (6, 7) located one to either side thereof; whereby linking the female member of one of said chairs with the male member of said arm rest, and/or by linking the female member of said arm rest with the male member of another one of said chairs, locates said arm rest on, and supports said arm rest by, either one of said chairs; or locates said arm rest on, and supports said arm rest by, both of said chairs which are thereby linked together.

0195647

Fig. 1

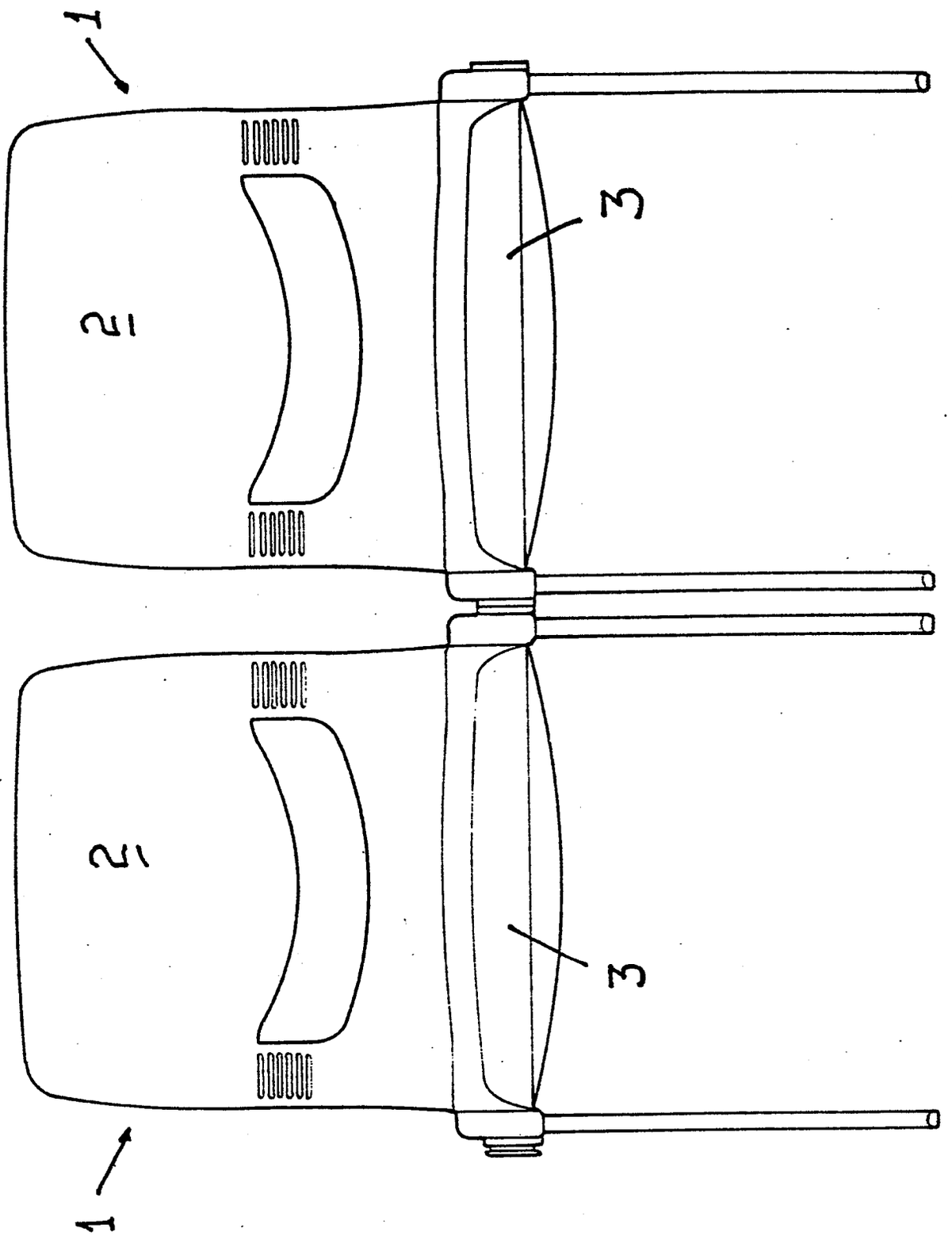
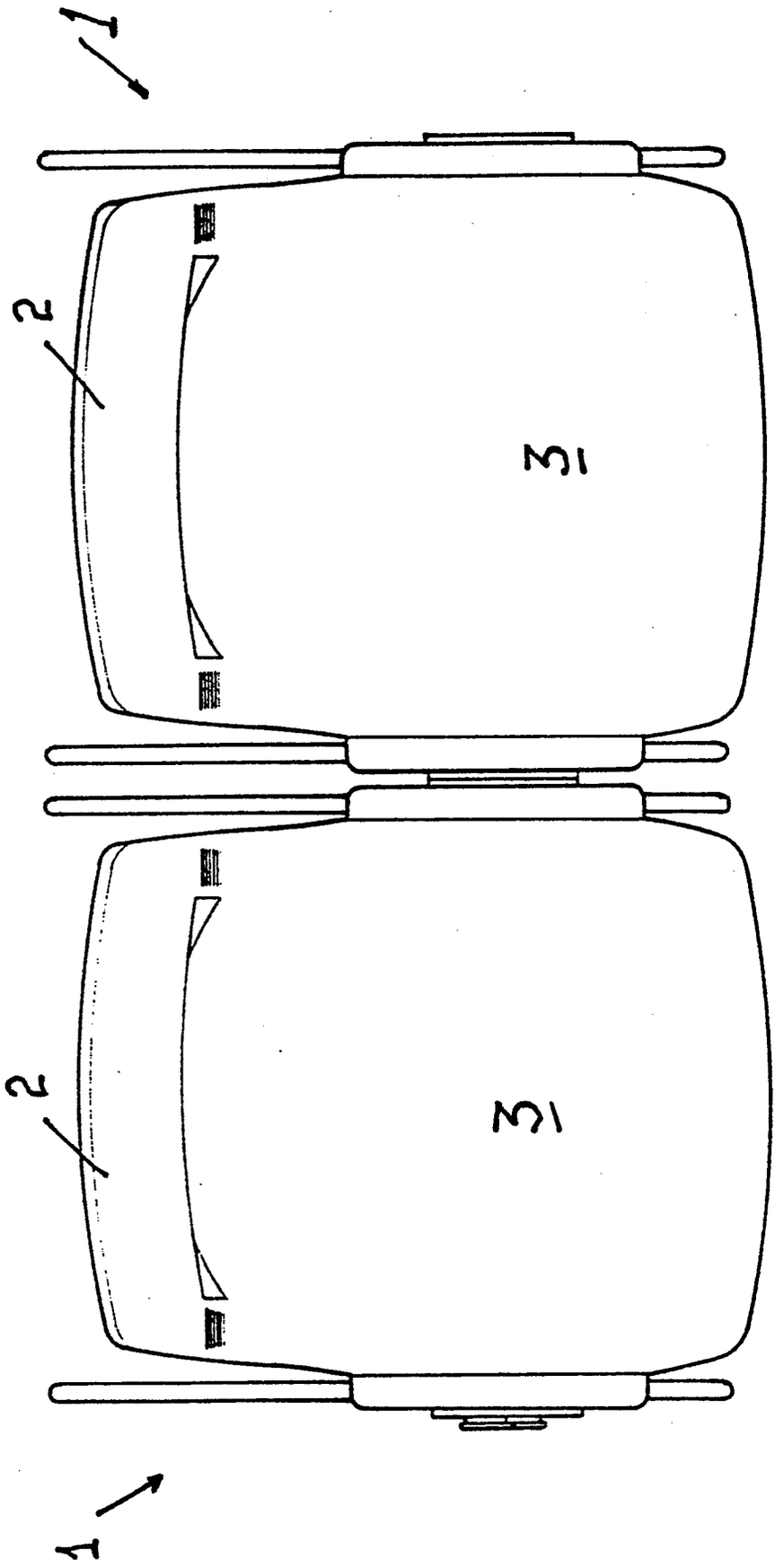
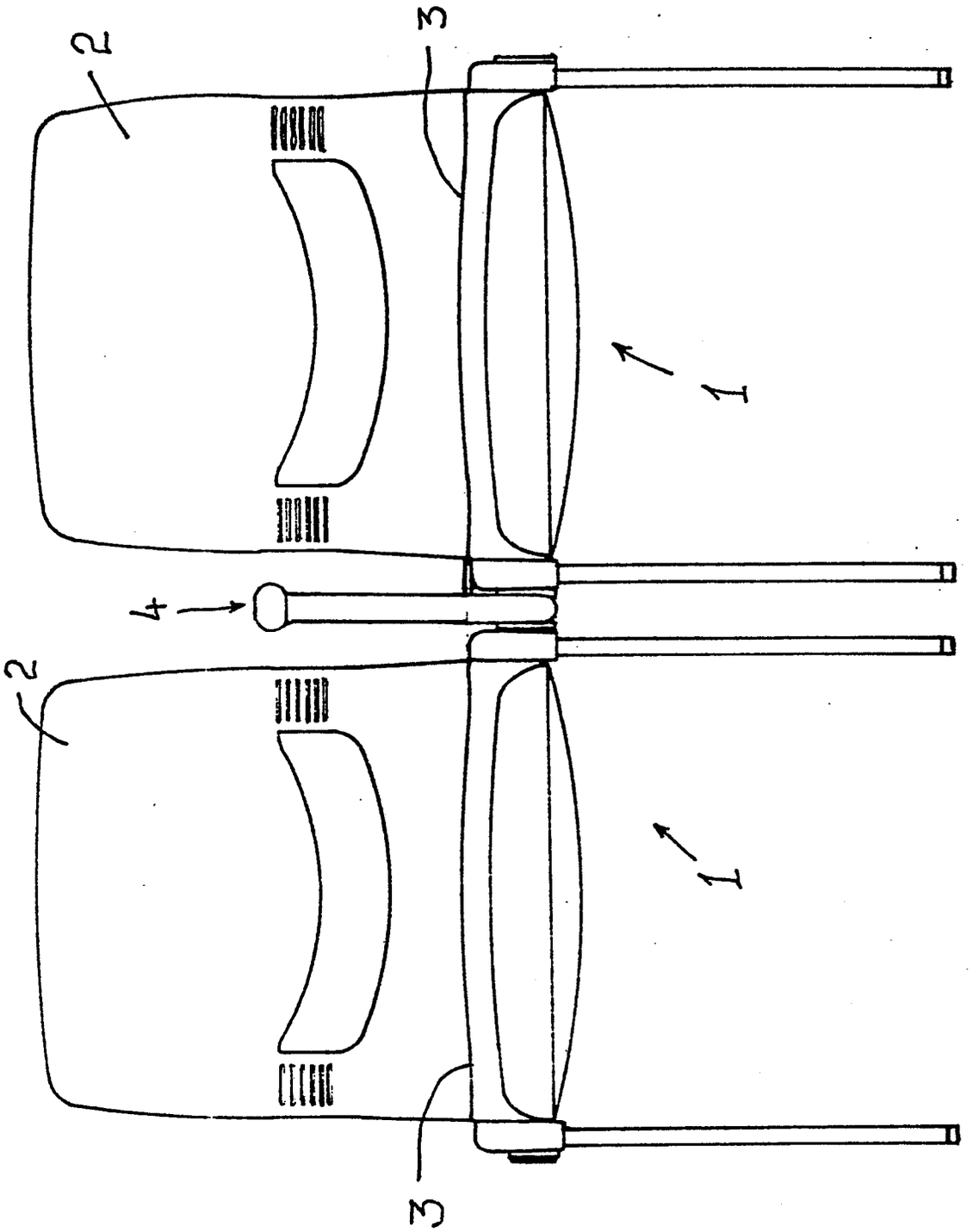


FIG.2



0195647

Fig. 3



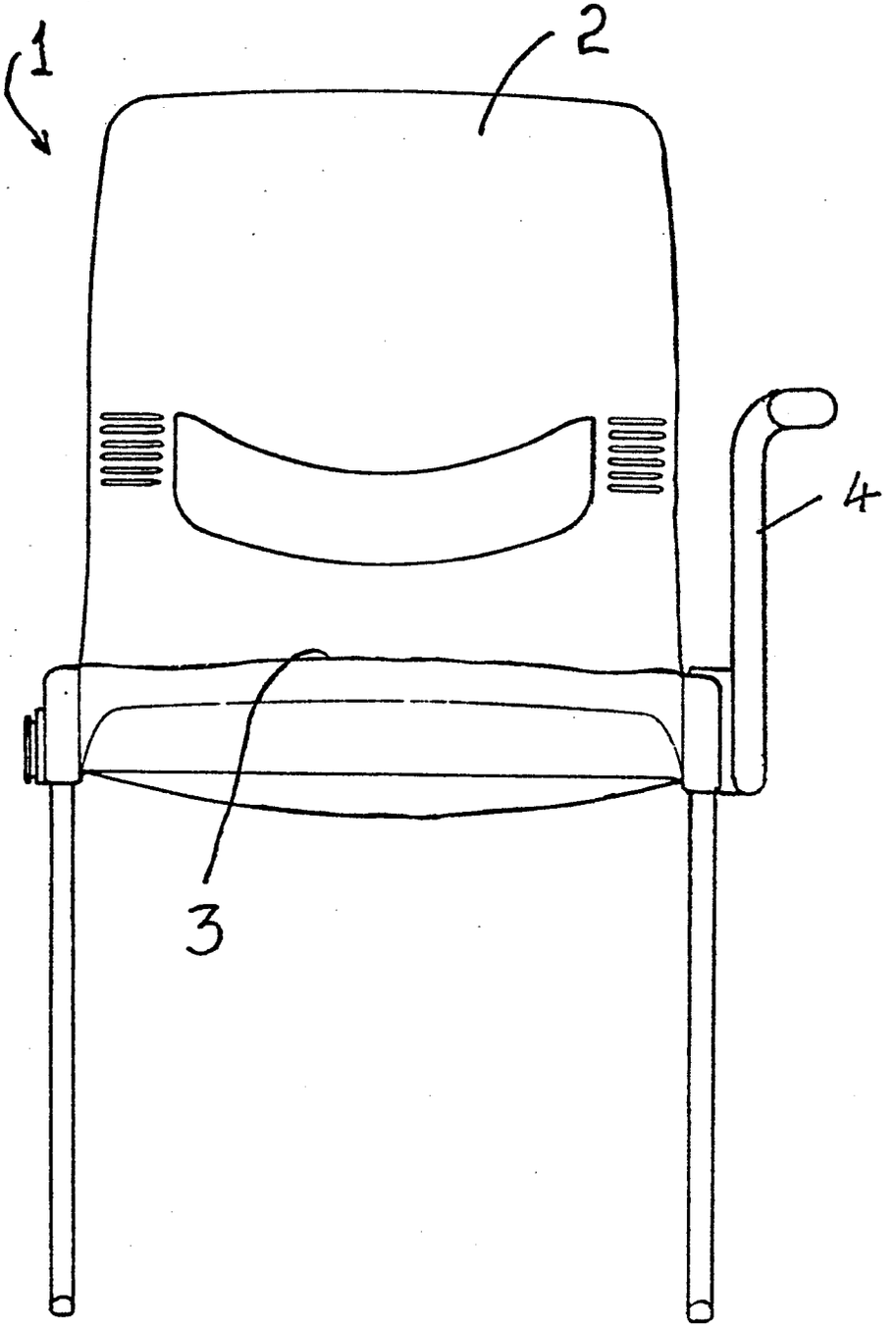


FIG. 4

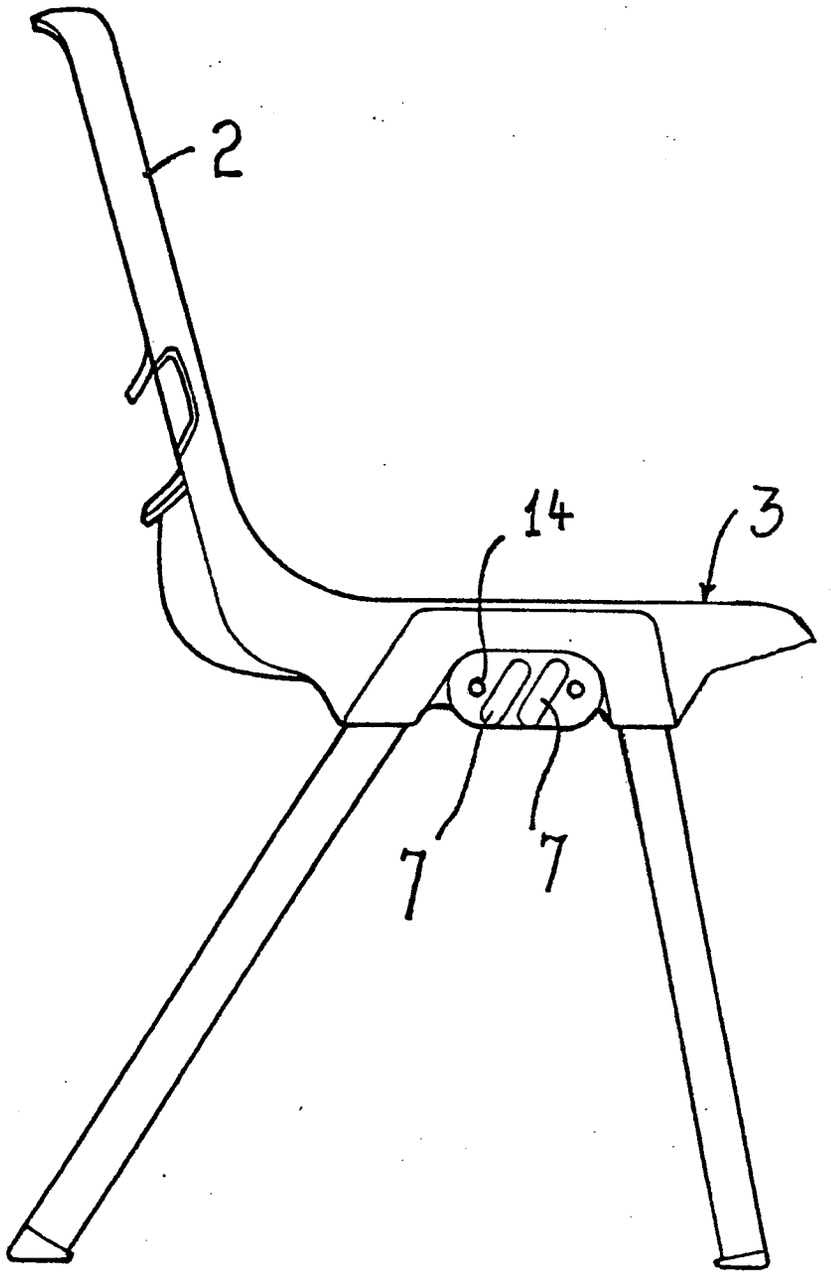


FIG.5

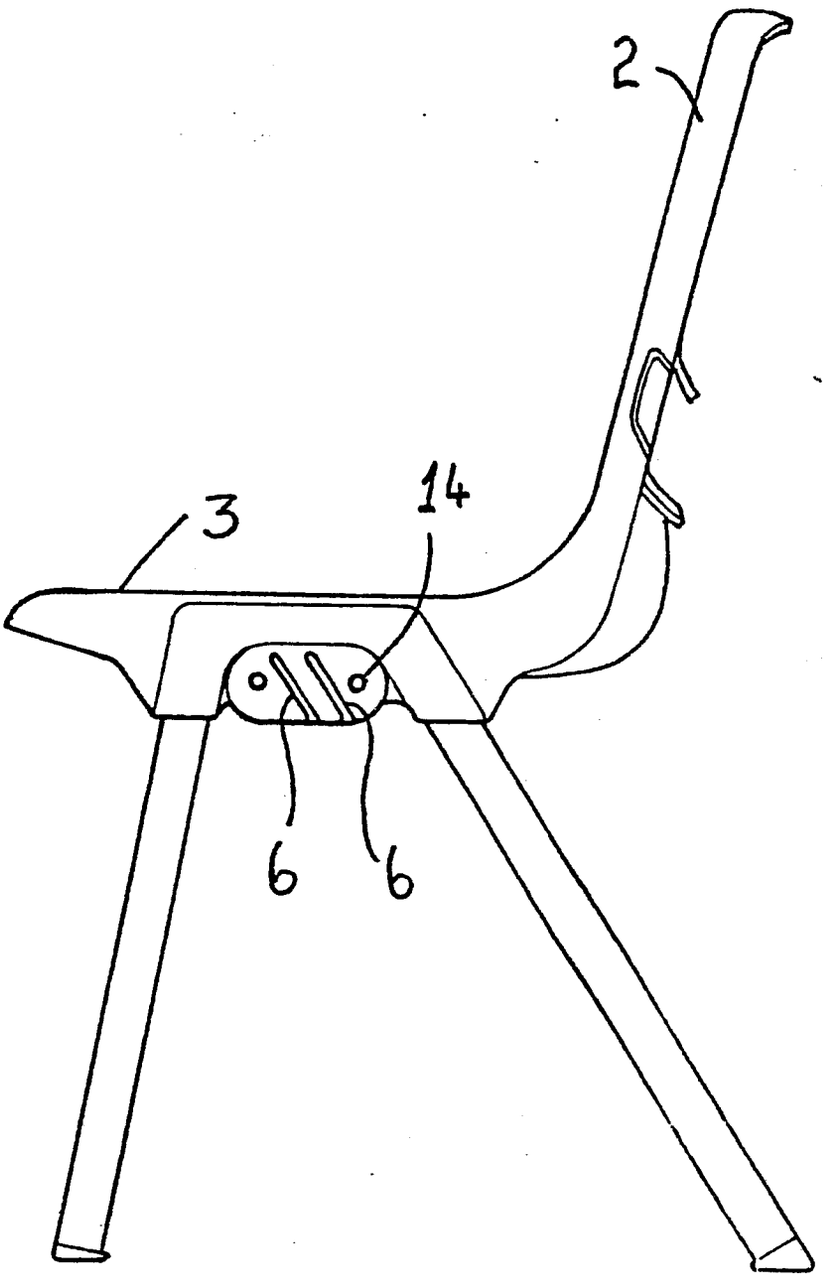


FIG. 6

FIG. 7

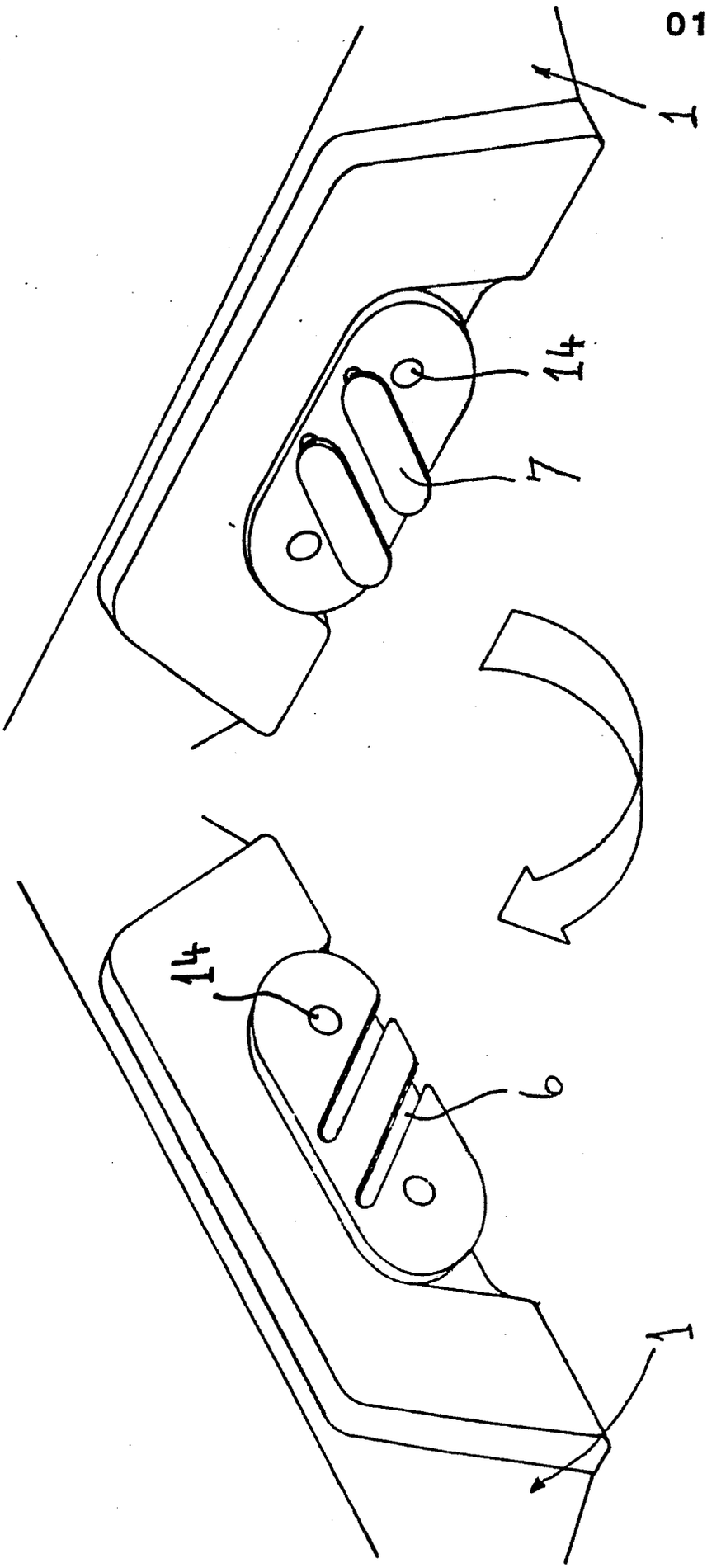


FIG. 8

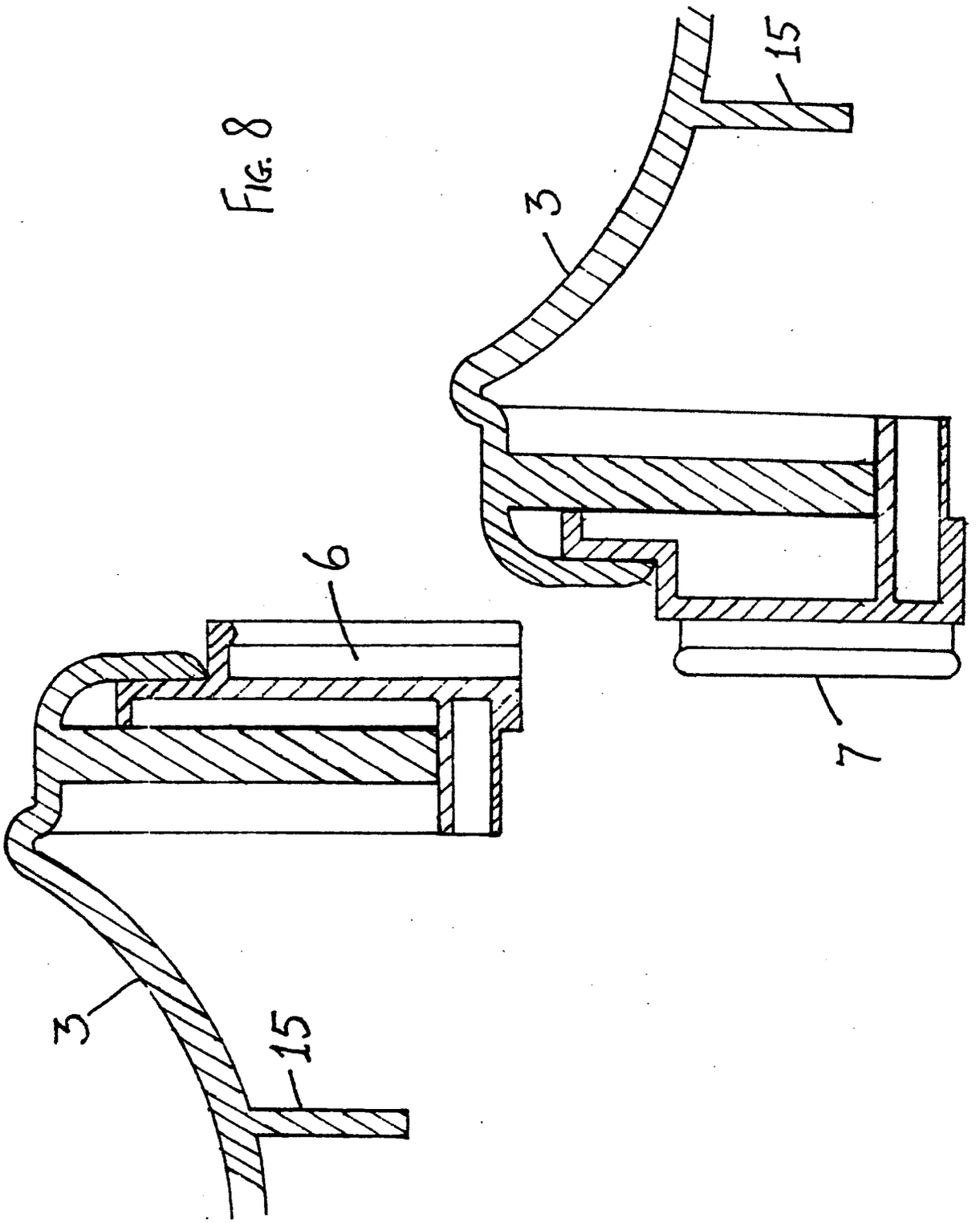
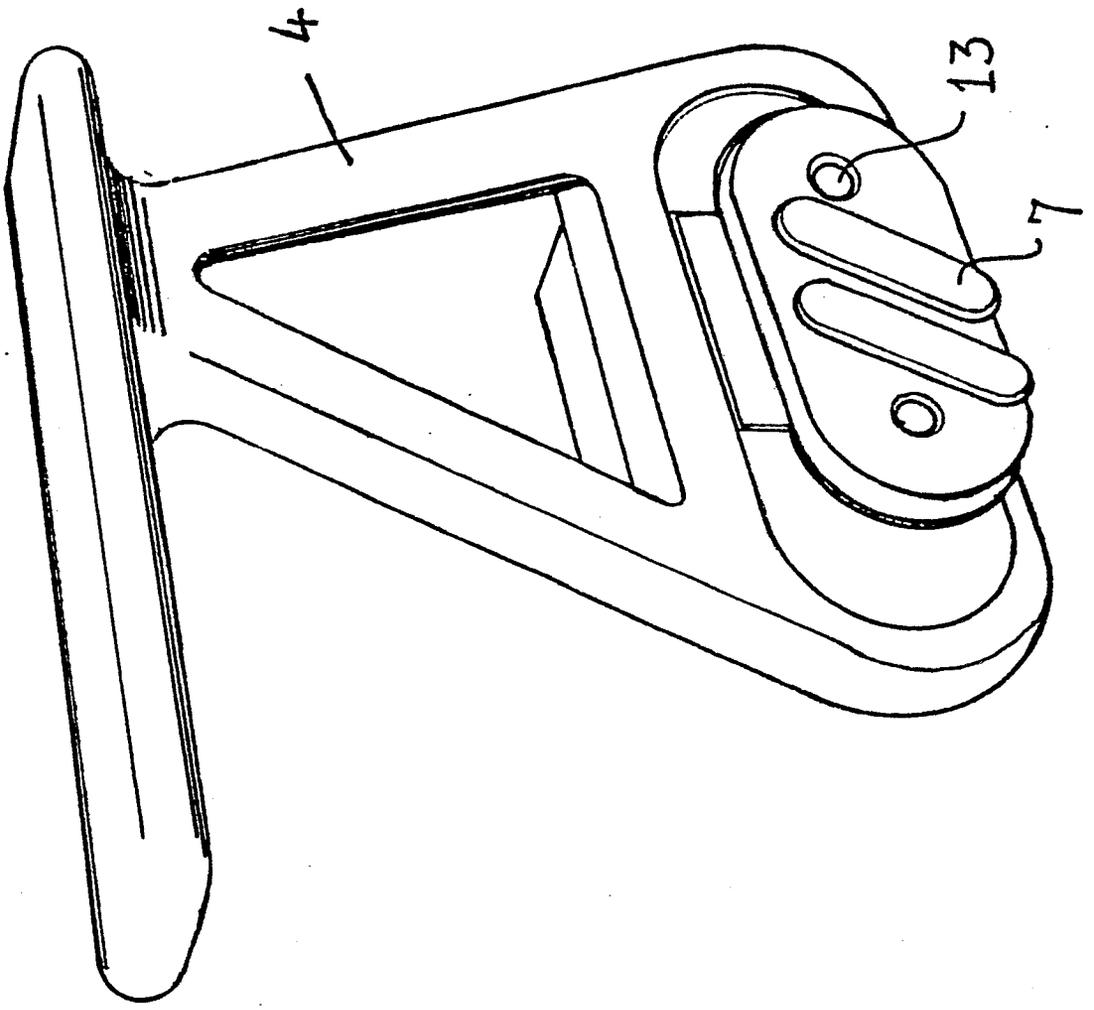


FIG. 9



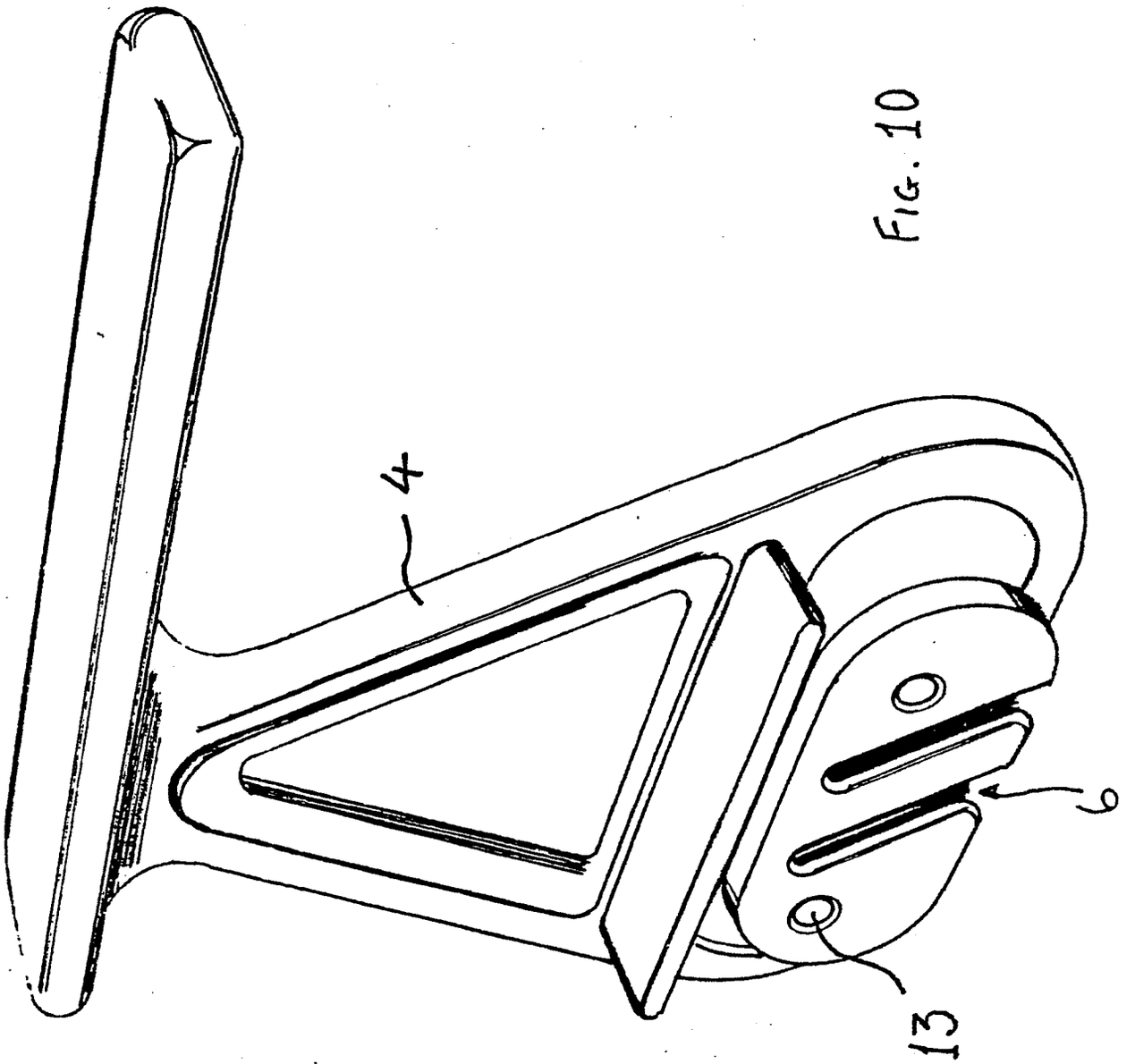


FIG. 10

FIG. 11

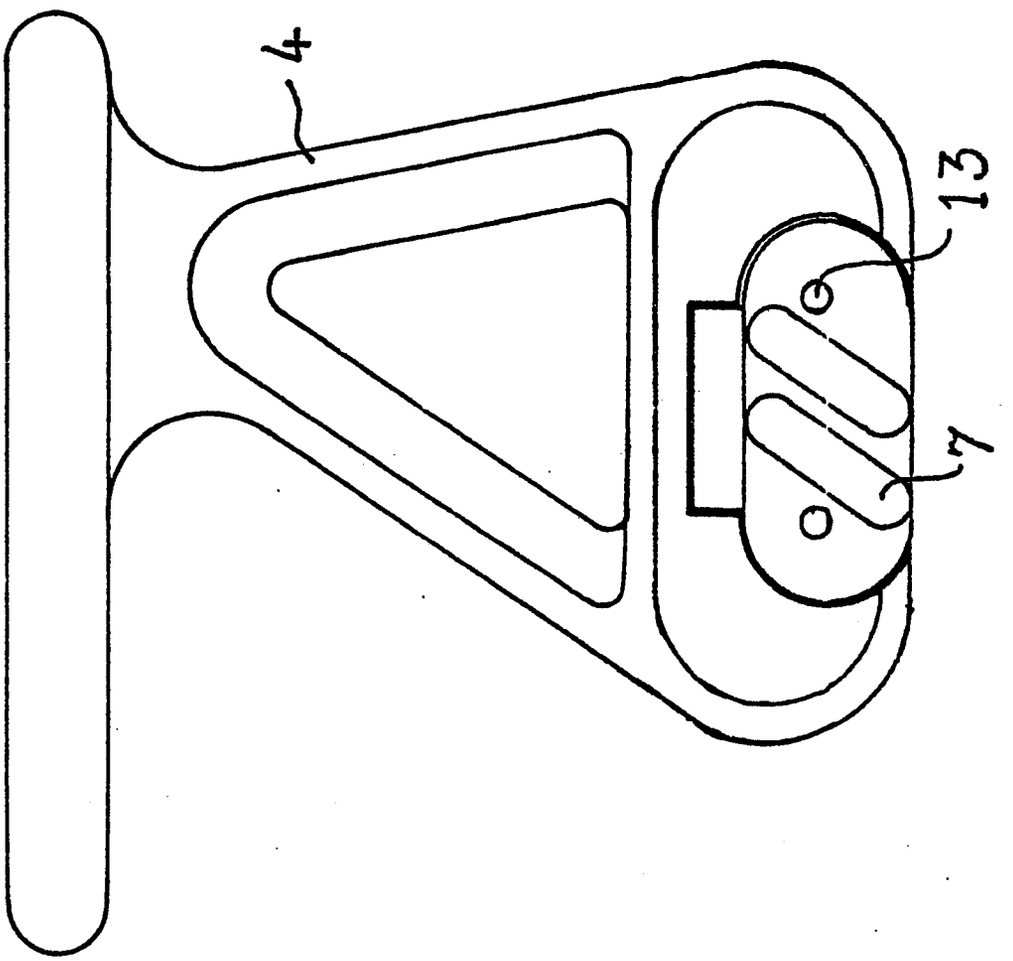
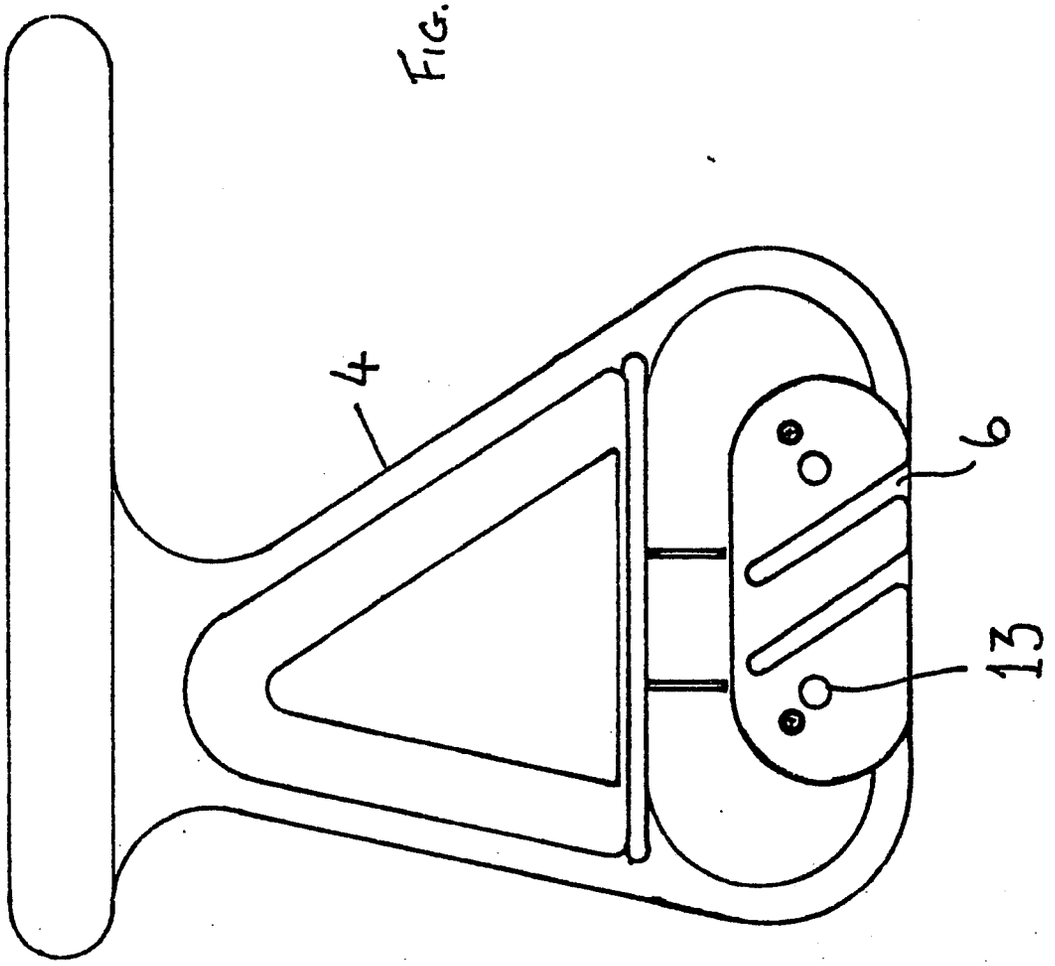


Fig. 12



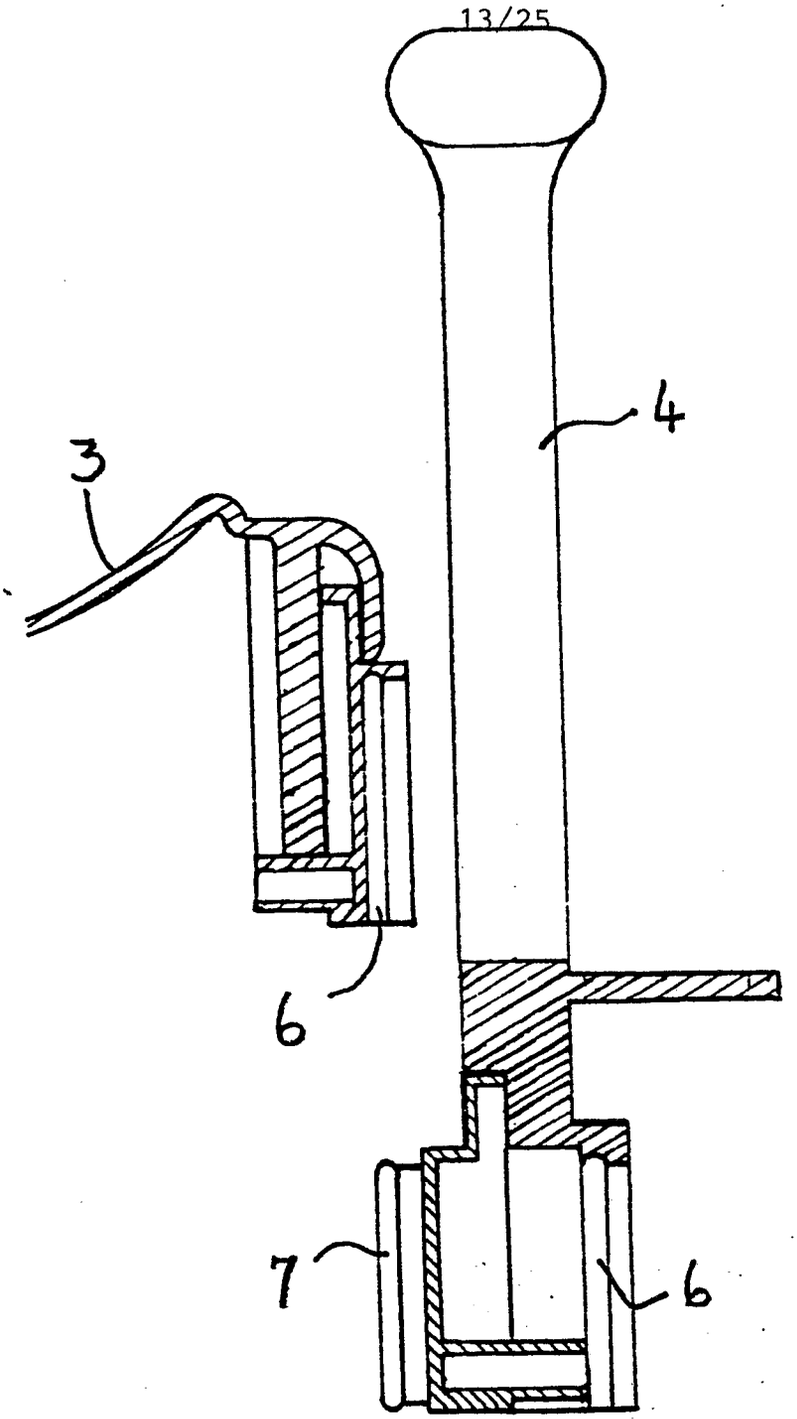
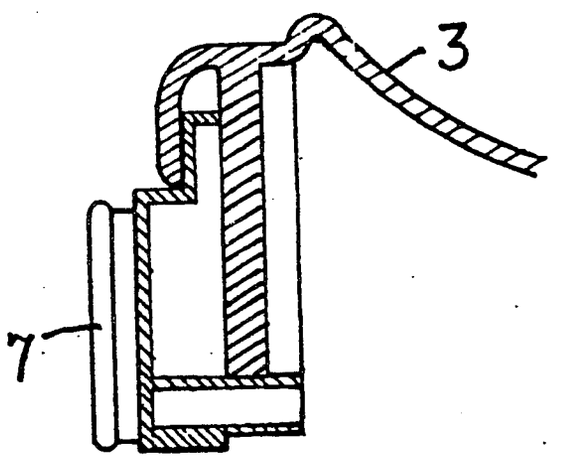


FIG. 13



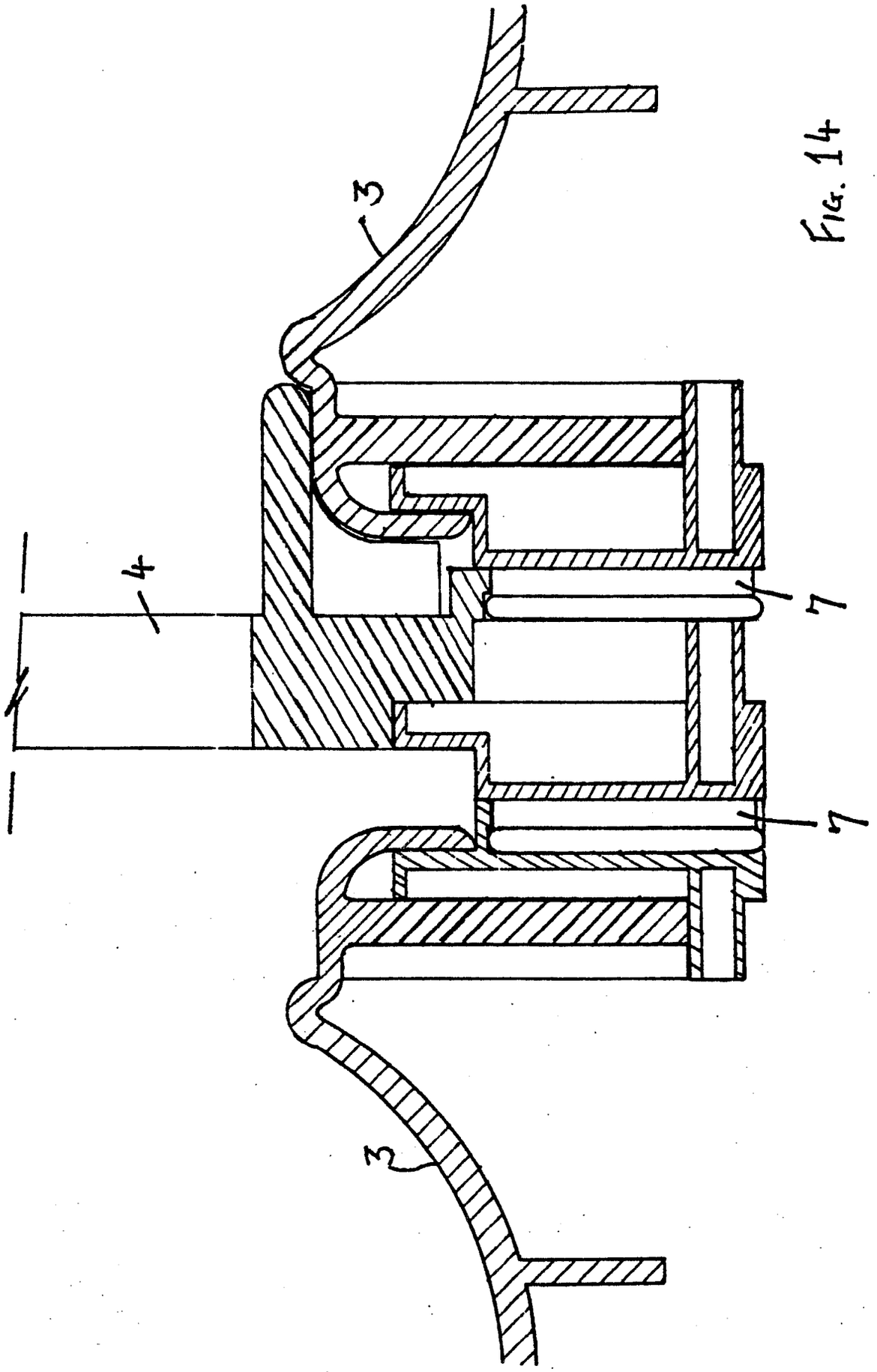


Fig. 14

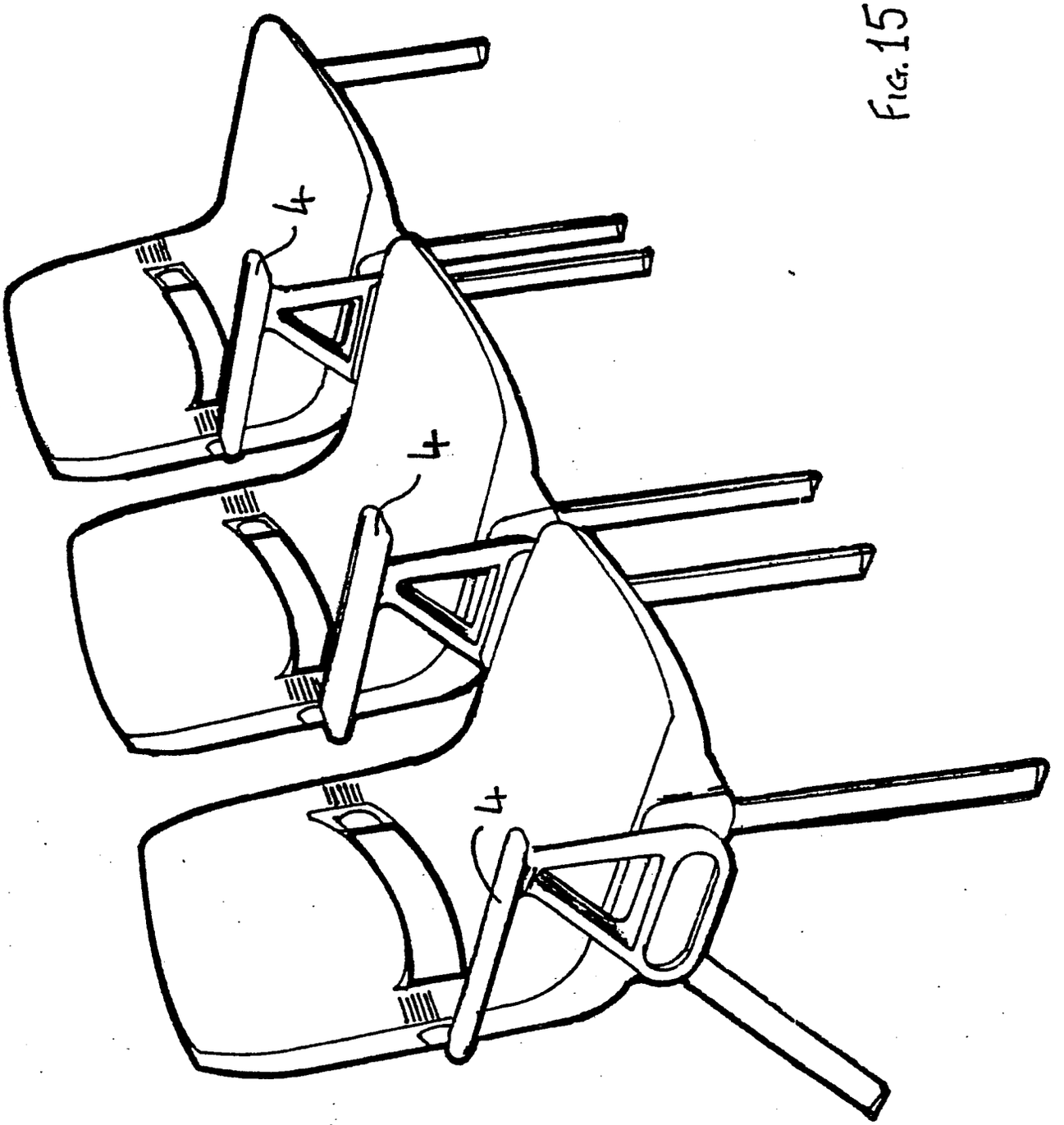


Fig. 15

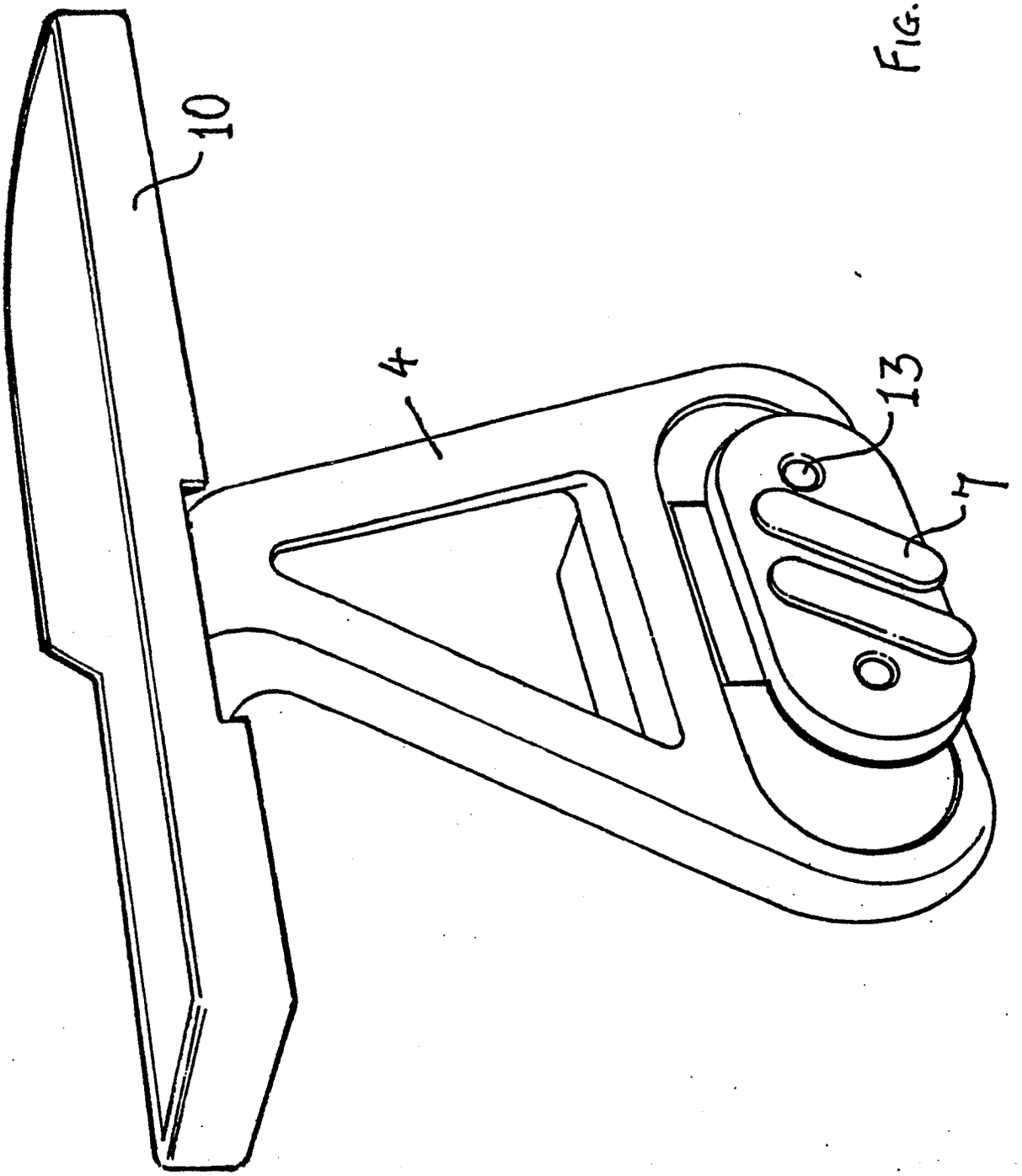


FIG. 16

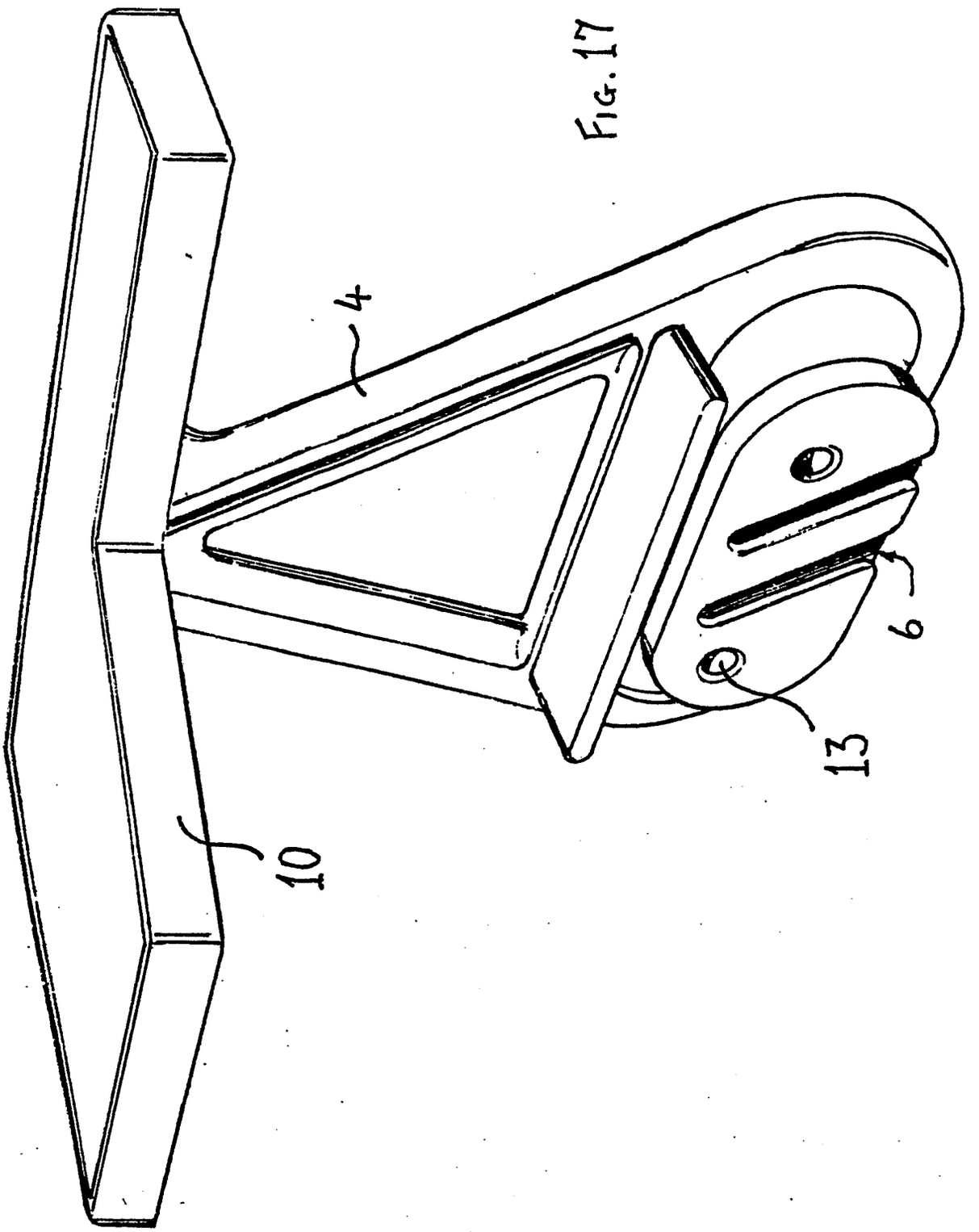


FIG. 17

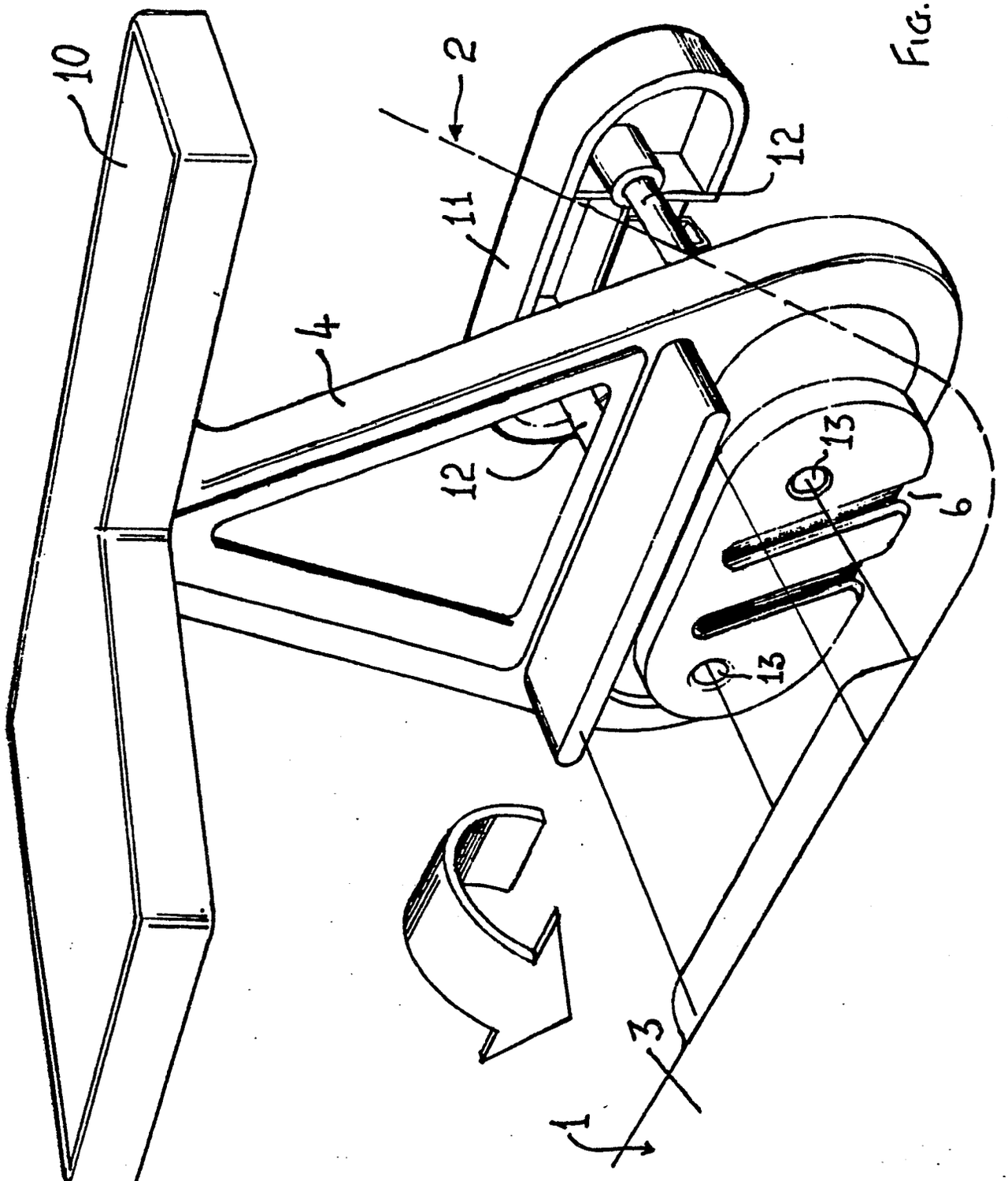
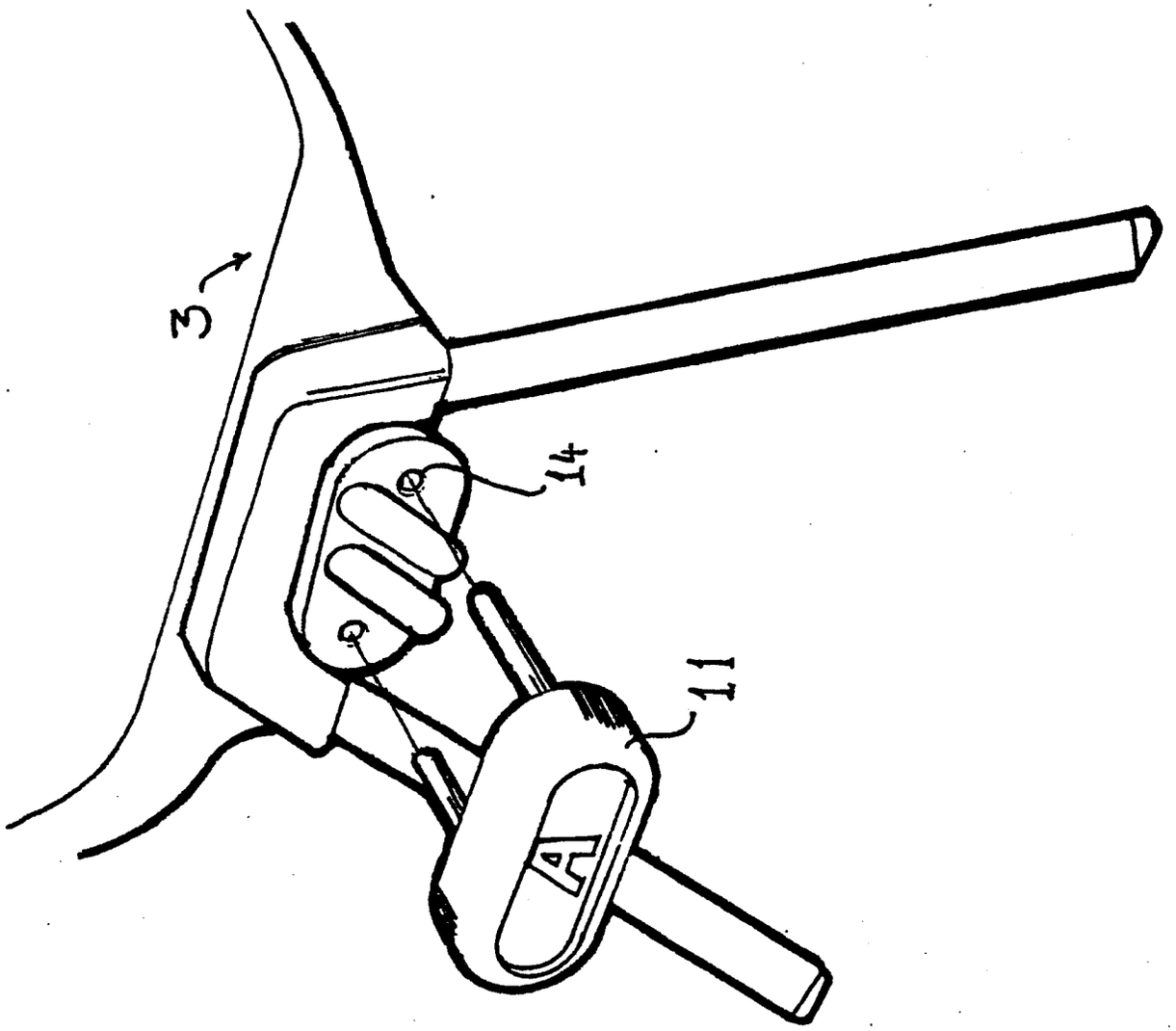


Fig. 18

Fig. 19



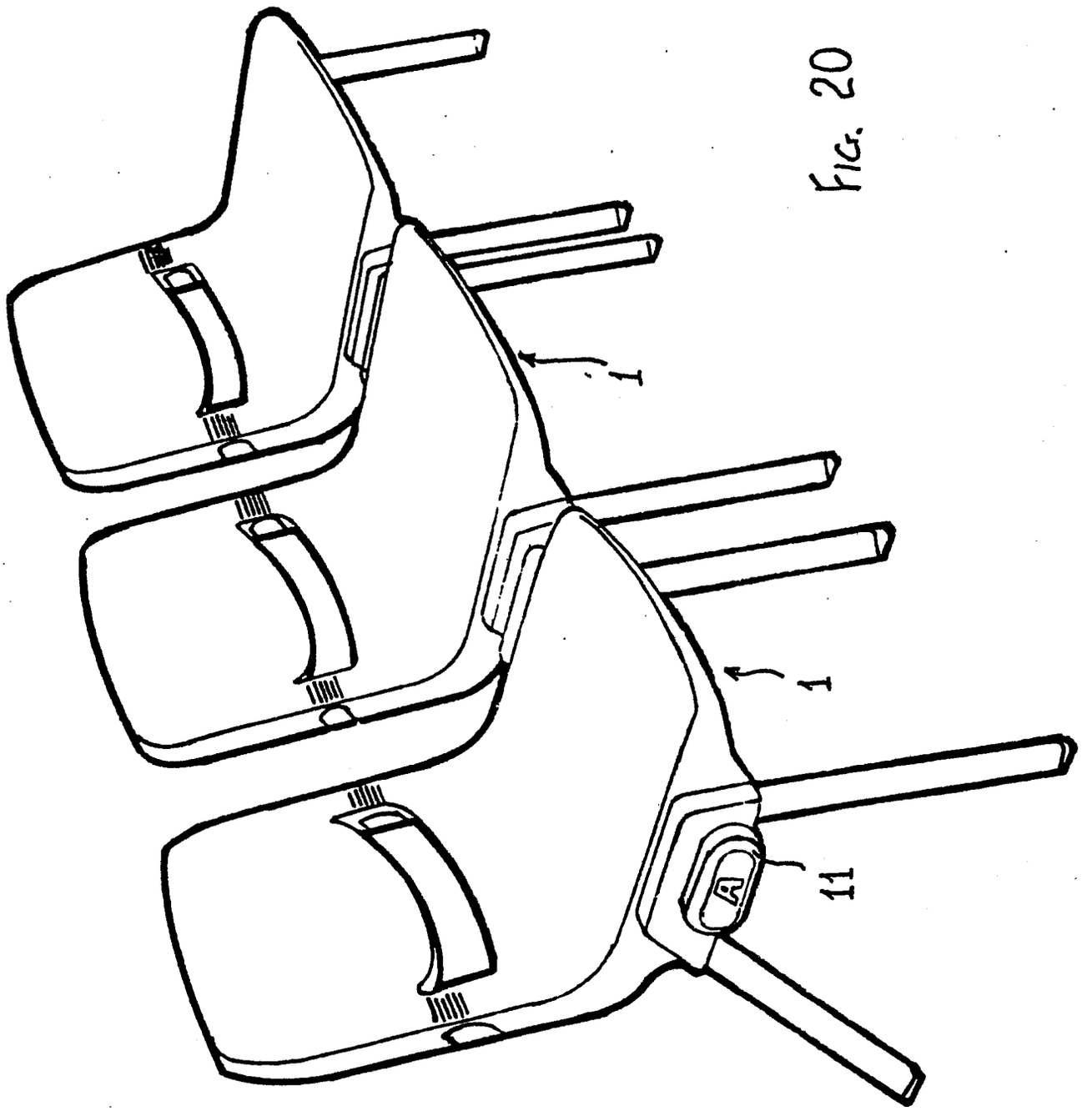


FIG. 20

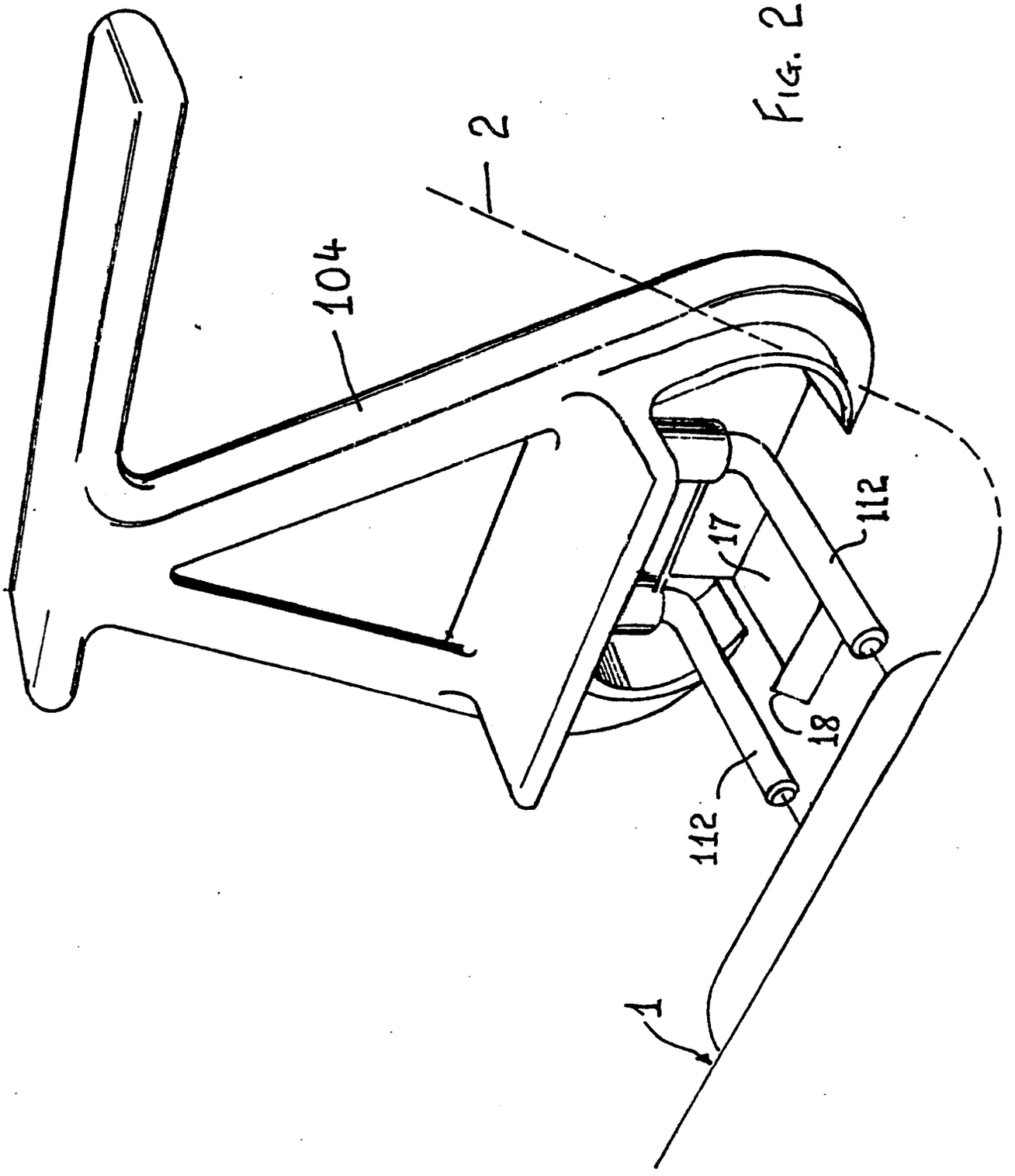


FIG. 21

FIG. 22

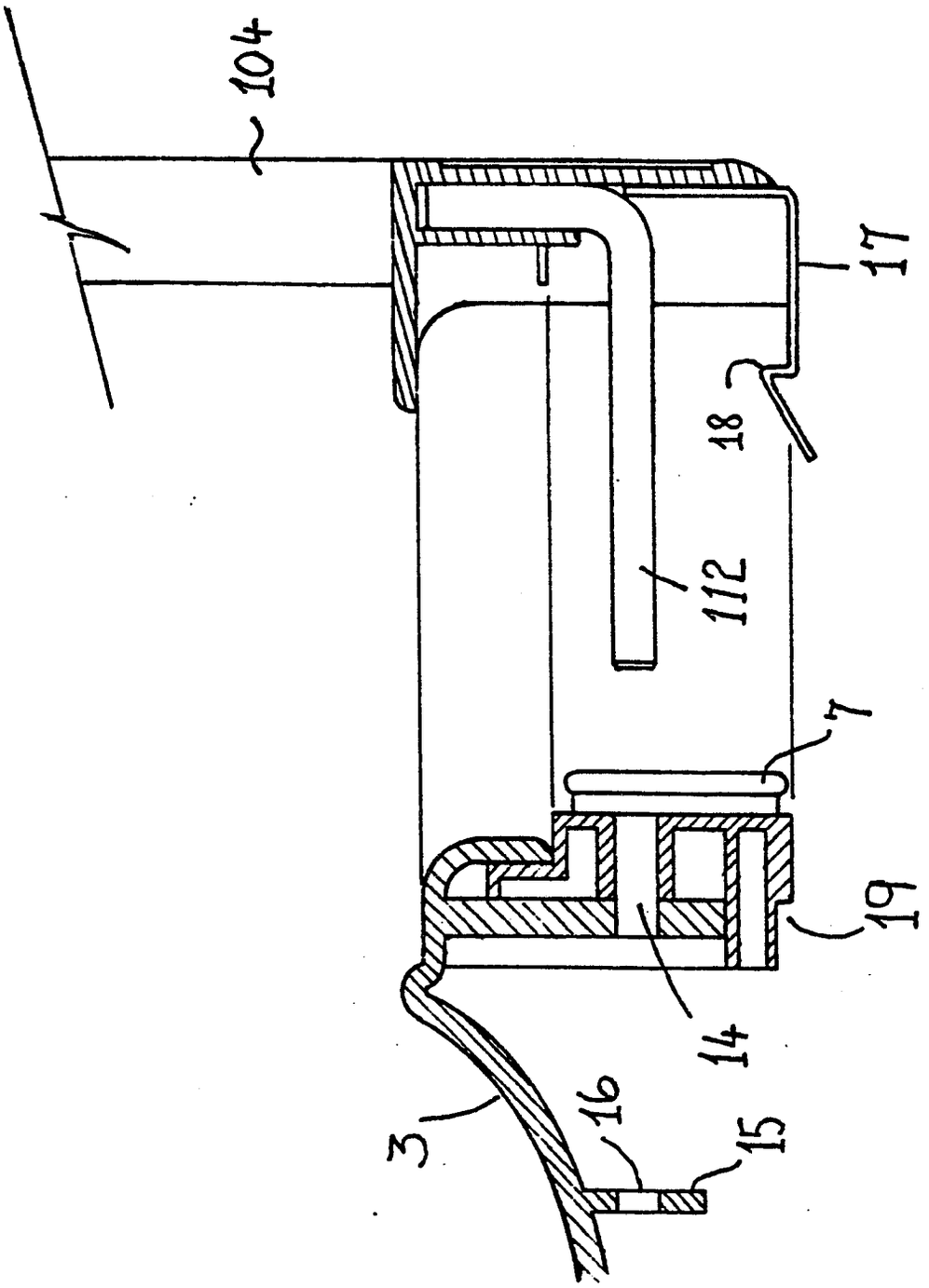
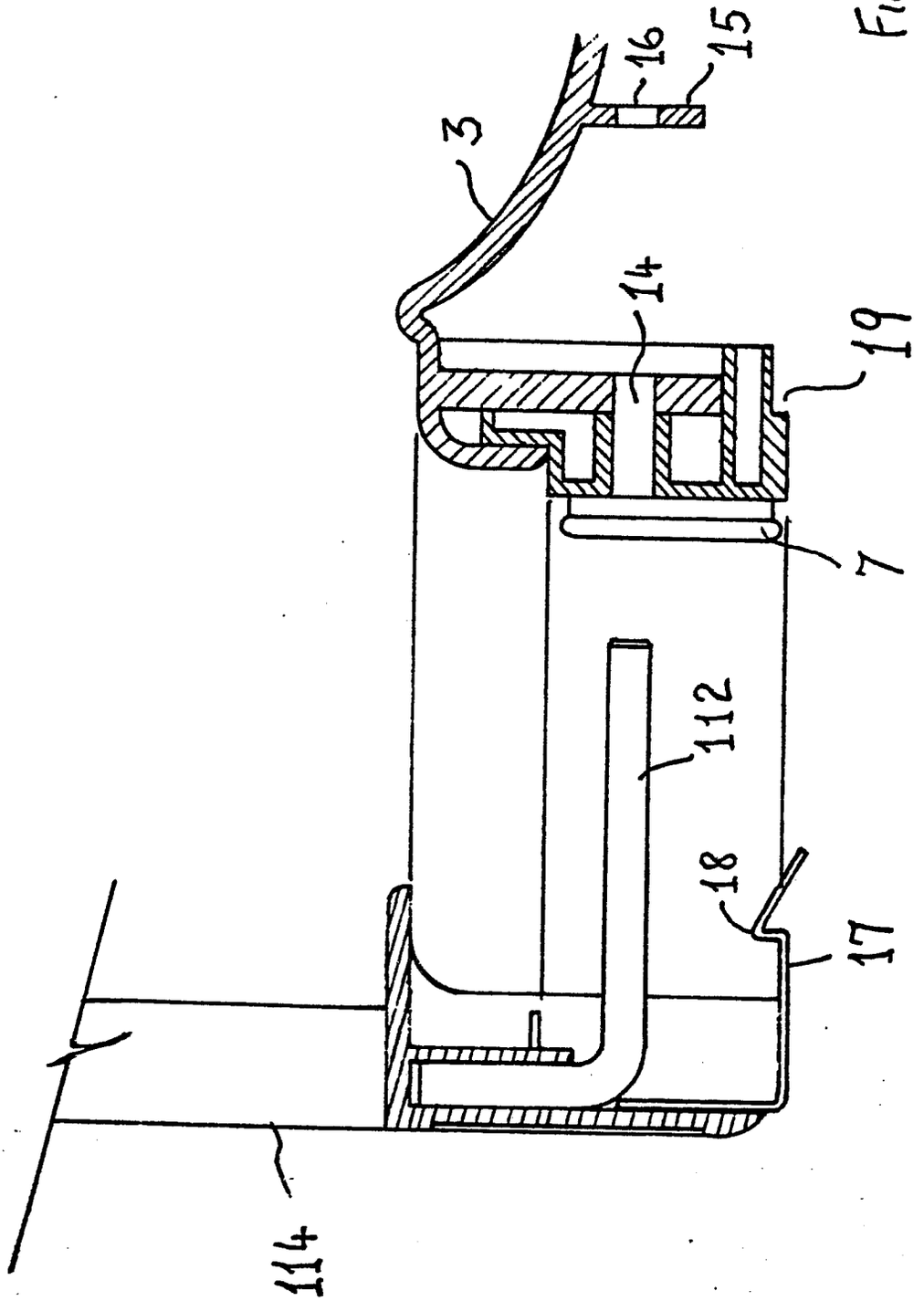


FIG. 23



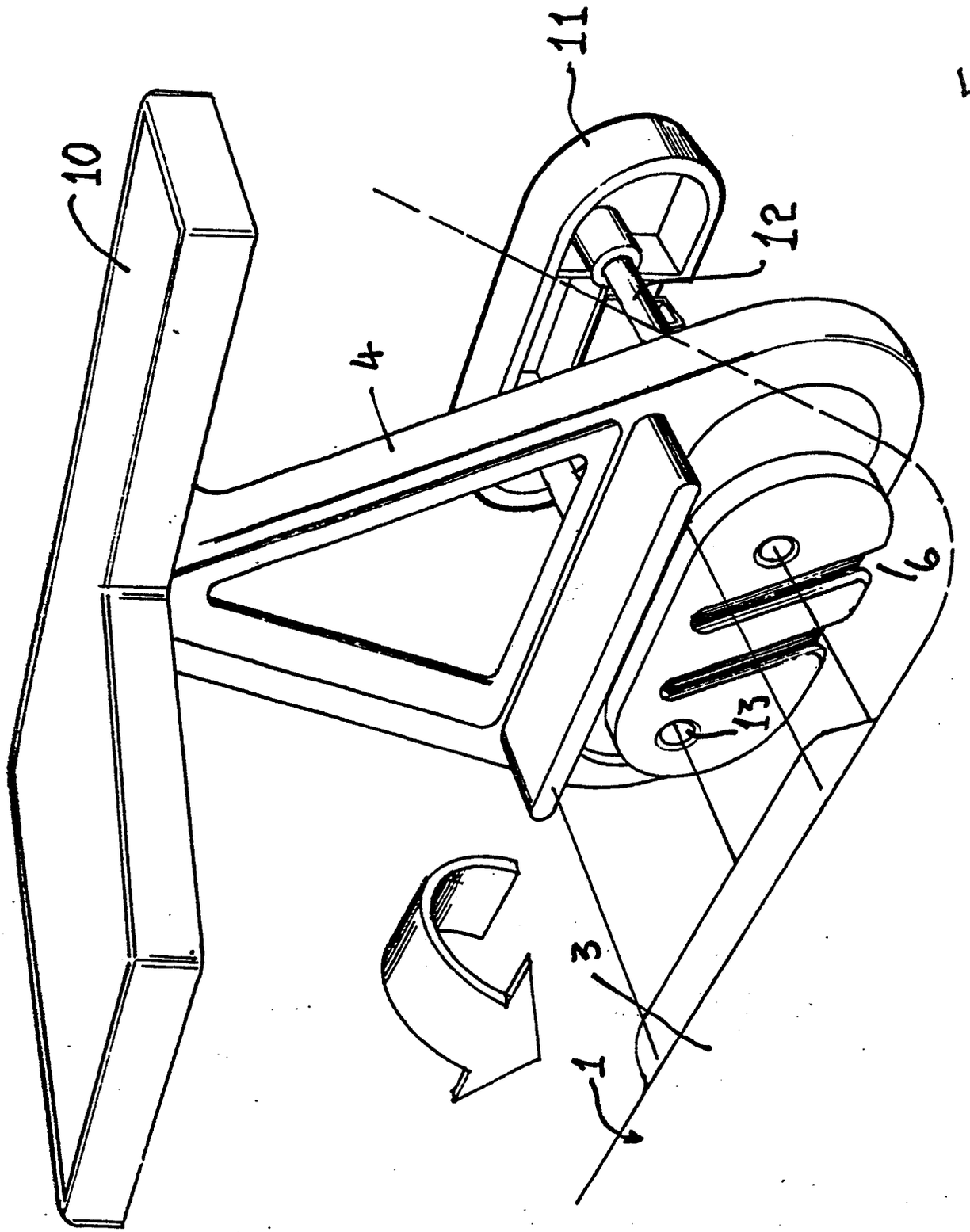


Fig. 24

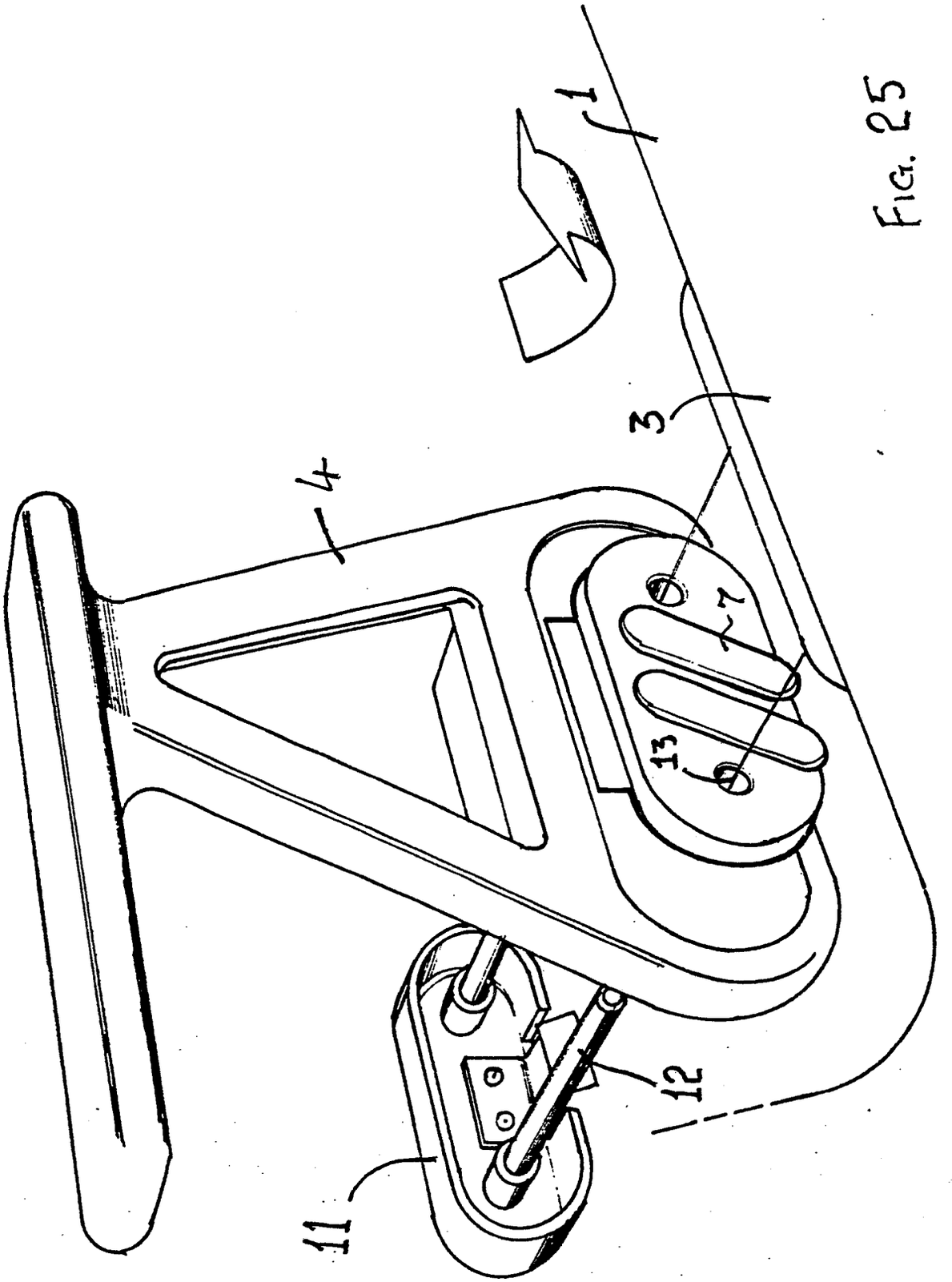


Fig. 25