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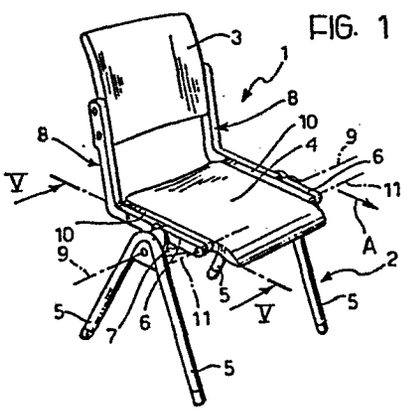
(54) Chair.

(57) A chair with a backrest (3) and seat (4) which are movable in relation to a fixed structure (2), consists of a backrest support (8) hinged to the fixed structure around a first transverse axis (9) perpendicular to the vertical plane of symmetry of the chair, the said axis being situated substantially at the seat level and being displaced forwards in relation to the rear edge of the seat. Stop means are provided to limit the rotation of the backrest support (8) relative to the fixed structure (2), the said means defining a forwardly rotated end position for the backrest support, corresponding to an upright position of the backrest, and a rearwardly rotated end position corresponding to a reclined position of the backrest. The chair is provided with resilient biassing means which bias the backrest support (8) to its forwardly rotated end position. A seat support (10) is hinged, substantially adjacent its front edge around a second transverse axis (11) on the fixed structure (2) parallel to and displaced forwardly relative to the first axis (9) the seat support (10) being also connected to the backrest support (8) in correspondence with the rear edge of the seat.

FIG. 1



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Chair

The present invention relates to a chair of the type having a fixed structure and a backrest and seat which are movable with respect to the said fixed structure.

In chairs of the above type (see for example U.S. Patent 4,084,850) the backrest is movable from an upright position to a backward reclining position so as to allow the seated person to assume either an erect working position or a resting, reclined position, achieving the greatest possible comfort in both positions.

A chair is already known (see U.S.A. Patent 4,084,850 ref--erred to above) in which, when the backrest is moved into its backward reclined position, the seat is also inclined backwards, so as to counteract a possible tendency of the seated person's body to slip forwards. In this known solution, however, the front edge of the seat moves perceptibly upwards during the said inclining movement, pressing underneath the legs of the seated person at knee height and consequently preventing achievement of an optimal position from the point of view of comfort.

Experimental studies carried out by the Applicant have moreover shown that during backward reclining movement of the backrest it is necessary, in order to achieve a correct posture and optimal comfort of the body of the seated person, for the backrest to rotate around an articulation axis situated substantially at the seat level and displaced forwardly in relation to the rear edge of the seat so that it coincides

substantially with the articulation axis between the thighs and the pelvis of the seated person.

Finally it is necessary, again with a view to achieving the maximum possible comfort, for the chair seat to incline backwards at an angle less than the inclination angle of the backrest.

The object of the present invention is to provide a chair of the type specified at the beginning of the present description, which will on the one hand make it possible to satisfy all the requirements described above and which will at the same time afford a relatively simple and economical construction.

With a view to achieving the said object, the invention provides a chair having a fixed structure and a backrest and a seat movable relative to the said fixed structure, characterised in that it comprises:

- a backrest support hinged to the fixed structure around a first transverse axis perpendicular to the vertical plane of symmetry of the chair, the said axis being situated substantially at the seat level and being displaced forwardly in relation to the rear edge of the seat,
- stop means to limit rotation of the backrest support relative to the fixed structure of the seat, the said means defining, for the seat support, a forwardly rotated end position, corresponding to an upright position of the backrest, and a backwardly rotated end position, corresponding to a reclined position of the backrest,
- resilient biassing means which tend to urge the backrest support towards its forwardly rotated end position, and

- a seat support articulated, substantially adjacent its front edge, to the fixed structure around a second transverse axis, parallel to the said first transverse axis and displaced forwardly relative to the latter, the said seat support being moreover connected to the backrest support substantially in correspondence with the rear edge of the seat.

The special kinematic connection described above between the fixed structure of the chair, the seat support and the backrest support affords a number of advantages: firstly, when the backrest is reclined backwards it rotates around an articulation axis which is positioned substantially at seat level and which is displaced forwardly in relation to the rear edge of the seat, so as to ensure correct posture and maximum comfort of the body of the seated person. Secondly, when the backrest is moved into its reclined position, the seat is also inclined backwards, counteracting a possible tendency of the body of the seated person to slip forwards; however, the angle of inclination of the seat is less than that of the backrest, which ensures, in this case as well, maximum comfort. Finally, the seat, in its backward inclining movement, rotates around an axis positioned in proximity to the front edge of the said seat, which avoids the abovementioned disadvantage due to excessive raising of the said front edge.

Preferably, the chair according to the invention is further characterised in that the fixed structure includes a crosspiece and two support bars projecting

cantilever-fashion forwardly from the two ends of the crosspiece, in that the backrest support includes two substantially L-shaped support arms, each joined at one end to a respective side of the backrest and articulated at the opposite end around the said transverse axis to a respective end of the crosspiece, and in that the seat support consists of two lateral support members joined to the two sides of the seat, and having their front ends articulated around the said second transverse axis to the two front ends of the said support bars and their rear ends connected to the two said L-shaped support arms rearwardly of the said first transverse axis.

Further characteristics and advantages of the present invention will emerge from the following description referring to the accompanying drawings, supplied purely by way of non-limiting example, in which:

Figure 1 is a perspective view of a first embodiment of the chair according to the invention;

Figures 2, 3 show on an enlarged scale a detail of Figure 1 in two different operative positions,

Figure 4 is an exploded perspective view, on an enlarged scale, of a detail of Figure 1,

Figure 5 is a sectional view along the line V-V of Figure 1,

Figure 6 is a sectional view along the line VI-VI of Figure 5,

Figure 7 is a sectional view along the line VII-VII of Figure 5,

Figures 8, 9 are two variants of Figures 4, 5 which show a second embodiment of the chair according to the invention,

Figures 10, 11 show a third embodiment of the chair according to the invention,

Figures 12 to 14 show a fourth embodiment of the chair according to the invention,

Figures 15 to 17 show a fifth embodiment of the chair according to the invention, and

Figures 18, 19 show a sixth embodiment of the chair according to the invention.

Figure 1 shows a chair 1 comprising a backrest 3 and a seat 4 movable relative to a fixed base structure 2.

In the example illustrated the fixed based structure 2 comprises two pairs of lateral legs 5, each pair being formed by a tubular element bent into a V and disposed with the apex of the V upwards. It will be evident, however, that this particular type of base structure is shown in the accompanying drawings solely by way of example. It could be replaced by any other type of base structure, such,for example,as a pedestal including one single central support column or the like.

As shown also in greater detail in the Figures 2, 3, the fixed structure 2 includes two support bars 6 projecting cantilever fashion forwardly from the ends of a crosspiece 7 which joins together the two pairs of lateral legs 5. (In the case of a base structure consisting of a pedestal having a single central support column, the crosspiece 7 would be joined at its

centre to the upper end of the said support column).

In the present description and in the claims which follow, the terms "forwards" and "front" refer to the direction indicated by the arrow A in Figure 1, that is, the direction in which a person seated on the chair faces. The terms "backwards" and "rear", refer to the opposite direction. Moreover, the terms "transverse" and "transversely" refer here to a direction perpendicular to the vertical plane of symmetry of the chair.

The backrest 3 is carried by a backrest support consisting of two substantially L-shaped support arms 8, each of which is connected at its upper end to a respective side of the backrest 3. The front end of each support arm 8, on the other hand, is articulated to the fixed structure 2 of the seat around a transverse axis 9.

The chair is provided with stop means (which will be described in detail below) to limit rotation of the arms 8 around the articulation axis 9, in such manner that the said arms 8 can be moved from an extreme forwardly rotated position (shown in Figures 1, 2), corresponding to an upright condition of the backrest 3 and an extreme backwardly rotated position (shown in Figure 3) corresponding to a reclined position of the backrest 3.

There are also provided resilient means (which will also be described in detail below) which bias the support arms 8 of the backrest 3 towards their forwardly rotated extreme positions (see Figures 1, 2).

The seat 4 is carried by a seat support consisting

of two lateral support members 10 connected respectively to the two sides of the seat 4. The two support members 10 have their front ends articulated, around a transverse axis 11, to the two front ends of the fixed support bars 6. The articulation axis 11 is disposed adjacent the front edge of the seat 4.

The rear ends of the two lateral support members 10 are pivotally connected to the two L-shaped arms 8, substantially in proximity to the elbow thereof. As will be apparent, the connection of the rear ends of the support members 10 to the support arms 8 is effected by the engagement of a pin in a slot so as to allow correct movement of the elements described above.

Referring to Figures 2, 3, when the seated person presses his back against the backrest 3, the latter moves into its backwardly reclined position (see Figure 3) against the action of the resilient means which tend to keep it in the upright position. Upon movement of the arms 8, the zone of articulation of the support members 10 to the arms 8 moves downwards, inducing a backward inclination of the seat 4.

As is evident from the foregoing description and from the accompanying drawings, the axis 9 of articulation of the backrest support to the fixed structure of the chair is displaced forwardly in relation to the rear edge of the seat 4, thereby allowing a correct body posture for the seated person when the chair is put into the rest position with the backrest 3 reclined backwards. At the same time, the special kinematic connection described above, which joins together the backrest

support, the seat support and the fixed structure of the chair, causes a backward inclination of the seat, which prevents the body of the seated person from sliding forwards when the backrest is tilted backwards, the inclination of the seat 4 being, however, less than the inclination of the backrest 3. Finally, since the seat 4 is articulated to the fixed structure of the chair substantially adjacent its front edge, the said edge does not move upwards when the seat is inclined backwards, which allows maximum comfort for the seated person.

The various embodiments of the chair according to the invention which are shown in Figures 4 to 19 differ from one another mainly in the realisation of the resilient means which bias the backrest 3 to its upright position.

Referring to Figures 4 to 7, the crosspiece 7 consists of a channel section element having a vertical lug 12 at each of its ends.

As shown in Figure 6, each lug 12 is traversed by a cylindrical pivot pin 13 affixed to the said lug. That portion of the pin 13 which projects outwards from the lug 12 of the crosspiece 7 is fitted into a hole 14 in a fillet 15, substantially triangular in shape, welded to the V-shaped tubular element which constitutes the two corresponding lateral legs 5, at the apex of the V. To the lug 12 there is moreover affixed a dowel 16 which engages in a hole 17 in the fillet 15. The fillet 15 is fixed removably to the pin 13 by a screw 18 which engages in a threaded hole made in the outer end of the pin 13.

An annular element 19 is interposed between the head of the screw 18 and the fillet 15.

Each support bar 6 has a box section which includes two lateral walls 20 and an upper wall 21. The lateral wall 20 which faces the outside of the chair is joined at its rear end (see Figure 4) to the lug 12 of the crosspiece 7.

Also, each of the two support arms 8 has a box section including two lateral walls 23 and an upper wall 24.

A bush 25 is interposed between the two lateral walls 23 of each support arm 8 at the front end of the arm, and is welded to the said walls 23. The bush 25 is rotatably mounted on that part of the pin 13 which projects from the lug 12 towards the inside of the chair, with the interposition of an auxiliary bush 26. This auxiliary bush has at one end an annular flange in contact with the lug 12, and its opposite end abuts a disc 27 fixed to the corresponding end of the pin 13 by a screw 28. The two walls 23 of each support arm 8 have two holes, 29, 30 respectively which accommodate the auxiliary bush 26 and the disc 27. The bush 25 has a flat lateral surface 25a (see Figure 5).

Within each support bar 6, in correspondence with the articulation axis 11 of the seat 4, there is fixed a transverse pin 31. More precisely, one end of the pin 31 is clamped by a grub screw 32 within a bush 33 welded to the inside of the bar 6 (see Figure 7). The pin 31 passes through a hole 34 in the wall 20 opposite the bush 33 and projects cantilever-

fashion towards the inside of the chair so as to act as a pivot pin for the support member 10 of the seat.

In the embodiment shown, each support member 10 (see Figures 6, 7) consists of a channel section element within which there is fixed, by screws 35, an insert element 36 which has appendages 37a, 37b located in corresponding holes in the wall of the support member 10. The said insert element 36 has at its front end a hole 38 for its articulated assembly on the end of the pin 31 projecting cantilever-fashion from the support bar 6. The element 36 is locked on the pin 31 by an annular disc 39 fixed to the pin 31 by a screw 40.

Adjacent the rear end of each support member 10 the insert element 36 has a slot 41 within which there is slidably mounted a transverse pin 42 projecting towards the inside of the chair from the support arm 8. The pin 42 passes through the wall 23 of the support arm 8 which faces towards the inside of the chair and has an enlarged head 43 welded to the said wall 23 on the inside of the support arm 8. The insert element 36 is locked to the transverse pin 42 by a disc 44 fixed on the free end of the pin 42 by a screw 45.

Within each support bar 6 there is disposed a helical spring 46 having one end hooked to the pin 31 and its opposite end rigidly connected to a body 47 (see Figure 5) having a threaded axial hole. A threaded bolt 48, acting as a tie bar,engages in the threaded hole of the body 47, the head 49 of the bolt 48 being joined to the corresponding support arm 8

in the manner described below. The bolt 48 is guided in a downwardly-open notch 50, made in a vertical wall forming part of a bracket 51 welded within the fixed support bar 6.

The head 49 of the bolt 48 bears against a cylindrical element 52 which has a transverse hole for the passage of the bolt 48 and which is in contact with a wall 53 which forms part of a gusset element 54 welded to the inside of the support arm 8. The wall 53 has a hole 55 through which the bolt 48 passes. In order to allow assembly of the bolt 48, the element 54 has an opening 56 in an inner vertical wall 57. Assembly of the different parts described above is moreover facilitated by the fact that the box-section elements which constitute the support bars 6 and the support arms 8 are open downwardly.

Referring to Figures 4, 5, the upper wall 24 of each support arm 8 has, at the front end of the said arm, a downwardly-inclined portion 24a having a notch 24b open downwards, in which the respective bolt 48 engages.

The helical springs 46 constitute the resilient means described above which bias the backrest support towards its forwardly rotated end position, corresponding with the upright position of the backrest 3. Each helical spring 46 tends in fact to keep the head 49 of each bolt 48 pressed against the cylindrical element 52 which rests on the inner wall 53 of the respective support arm 8. Consequently the latter is thrust towards its forwardly rotated end position, which is defined by contact between the front portion

24a of the wall 24 and the two rear edges, indicated 20a in Figures 5, of the two lateral walls 20 of each support bar 6.

When the seated person presses his back against the backrest 3 so as to thrust it into its backward inclined position, the support arms 8 rotate about the articulation aixs 9 relative to the lugs 12 at the ends of the crosspiece 7. The centre of the cylindrical element 52 therefore describes a circumferential arc about the axis 9 and consequently causes an increase in the distance between the head 49 of the bolt 48 and the pin 31, thus bringing about an extension of the corresponding helical spring 46. The backwardly rotated extreme position of the support arms 8 is defined by the limit stop position of the pin 42 in the slot 41. The flat surface 25a of the bush 25 serves to allow the bolt 48 to move without the latter interfering with the bush 25.

Following the rotational movement of the support arm 8 about the articulation axis 9, the pin 42 to which the rear end of the seat support member 10 is joined moves downwardly, effecting a rotation of the support member 10 about the pin 31 carried by the support bar 6.

The embodiment of the chair according to the invention which is shown in Figures 8, 9 differs from that of Figures 4 to 7 in that the resilient means biassing the backrest towards the upright position consist of two springs 58 each of which is disposed within the front end of the respective support arm 8 and is

helically wound around the pivot pin by which the support arm 8 is articulated to the lug 12 of the crosspiece 7. Each spring 58 has,moreover,one end 59 bearing against the lower surface of the wall 24 of the respective support arm 8 and one end 60 bearing against the inner surface of one of the two vertical walls of the channel-section crosspiece 7. A screw 61 is screwed into this wall, the free end of the screw 61 being in contact with the end 60 of the spring 58, so that the loading of the said spring can be adjusted by the screw 61.

Referring to Figures 10, 11 the embodiment shown in these drawings differs from the previously described embodiments in that the resilient biassing means urging the backrest towards its upright position consist of two helical springs 62, each of which is disposed, with its axis horizontal and parallel to the vertical plane of symmetry of the chair, within a widened end 7a of the channel-section crosspiece 7. One end of each spring 62 is in contact with an annular shoulder on a bush 63 engaged by a screw 64 which is located in a vertical wall 7b of the crosspiece 7 and which affords adjustment of the loading of the spring 62. The opposite end of the spring 62 reacts against the bottom wall of a fork-shaped element 65 the wings of which are pivotally connected by a pin 66 (see also Figure 10) to one end of a lever 67 which is fixed to the respective support arm 8 and which is itself articulated about the axis 9 to the fixed structure of the chair. Referring to Figure 11, when

the backrest is moved into its backward reclined position, the lever 67 rotates anticlockwise, causing compression of the associated helical spring 62.

Referring to Figures 12 to 14, these drawings show an embodiment of the chair according to the invention which can be realised only when the fixed structure of the chair includes two pairs of lateral legs consisting of tubular elements. In this embodiment the resilient means for biassing the backrest to its upright position consist of two helical springs 68, each of which is disposed within a respective lateral leg 5. The lower end of each spring 68 is connected to a body 69 slidably mounted within the leg 5 and having an axial threaded hole 70. The said leg 5 and the body 69 have a non-circular cross-section (see Figure 13) so as to prevent rotation of the body 69 within the leg 5. A screw 71, engaged in the hole 70 of the body 69, passes at its lower end through a ferrule 73 and engages a nut 72 welded to the latter. By adjusting the screw 71 the body 69 is adjusted in position within the leg 5, causing a consequent variation of the loading of the helical spring 68. The upper end of the spring 68 is hooked to a transverse pin 74 the ends of which are fixed to the two lateral walls 23 of the respective support arm 8.

In this embodiment, moreover, two discs 75 are welded to the opposite sides of each tubular element of inverted V-shape forming each pair of lateral legs 5, at the apex of the V. Two aligned holes 76 are formed in the

discs 75, their common axis coinciding with the articulation axis 9. On to the two discs 75 there is welded a tubular element 77 the ends of which are inserted into the holes 76. The tubular element 77 pivotally supports, through the interposition of two bushes 78, a pin 79 to which the two lateral walls 23 of the corresponding backrest support arm 8 are fixed. The pin 79 has a head 80 which bears, through an interposed washer 81, against one wall 23 and is locked in position by a disc 82 which is fixed to the opposite end of the pin 79 by a screw 83 and which bears against the other wall 23 through a further washer 81. The two discs 75 have slots 84 (one of which can be seen in Figure 13) into which the transverse pin 74 fits slidably and to which is hooked the upper end of the associated helical spring 68. Obviously, the leg 5 also has an opening through which the pin 74 passes. Each support bar 6 is provided internally with a bracket 6e, welded to it and connected to a bracket 6f welded to the legs 5. This facilitates fixing of the bar 6 to the legs 5.

Referring to Figures 15 to 17, the embodiment of the chair according to the invention shown in these drawings differs from those previously described in that the resilient means for biassing the backrest to its upright position consist of a torsion bar 84 disposed within the crosspiece 7 and anchored at the centre to the central portion of the said crosspiece.

As shown in Figure 15, the torsion bar 84 has a U-shaped centre portion 85 which is located in a notch 86 in an

anchoring member 87 which has a threaded hole 88. A screw 89 engages in the said hole 88 and is housed within a central box-like portion 90 of the crosspiece 7. The screw 89 has a shank which projects externally of the portion 90 and is connected by a diametral pin 91 to an adjusting knob 92. By operating the knob 92 it is possible to vary the loading of the torsion bar 84.

Those portions of the torsion bar 84 which branch off from the centre portion 85 (indicated by the reference number 93) are rotatably supported on the bottom of the channel-section crosspiece 7, each by means of two bearing members 94 screwed to the crosspiece 7. The free ends 95 of the torsion bar 84 are, however, disposed inside the respective support arms 8 of the backrest and bear against the inner surfaces of the upper walls 24 of the support arms 8.

Referring to Figures 18, 19, in the embodiment of the chair according to the invention shown in these drawings, the resilient means for biassing the backrest to the upright position consist, on each side of the chair, of a series of leaf springs 96, substantially C-shaped, which bear, at their ends, against two counterposed walls 97, 98 fixed respectively to the support arm 8 and to the corresponding end of the crosspiece 7. The latter end is moreover provided with an internal cross pin 99 which engages in a slot 100 made in the support arm 8.

The chair according to the invention, in its various illustrated embodiments, is designed more particularly as a chair for community use, for example, in meeting

halls, theatrical halls and the like. It is plain that the chair according to the invention can therefore be fitted, as generally occurs in the case of chairs of the type indicated above, with means (of a kind known per se) designed to allow them to be joined together side-by-side with other chairs, and with means for connecting to the said chair, easily and quickly, accessories such as arm rests and the like. Moreover, the chair can be made, also as known per se, with a shape such as to allow it to be superimposed on other chairs of the same kind to form a vertical stack of minimal size.

Naturally, with the principle of the invention remaining the same, details of construction and practical embodiments can be widely varied relative to what has been described and illustrated purely by way of example, without nevertheless going beyond the scope of the present invention.

CLAIMS

1. A chair having a fixed structure (2) and a backrest (3) and seat (4) which are movable relative to the said fixed structure,

characterised in that the chair includes:

- a backrest support (8) articulated to the fixed structure (2) around a first transverse axis (9), perpendicular to the vertical plane of symmetry of the chair, the said axis (9) being situated substantially level with the seat (4) and being displaced forwardly relative to the rear edge of the seat (4),
- stop means (24a, 20a, 42, 41) for limiting rotation of the backrest support (8) relative to the fixed structure (2) of the chair, the said means defining for the backrest support (8) a forwardly rotated end position corresponding to an upright position of the backrest (3) and a backwardly rotated end position corresponding to a reclined position of the backrest (3),
- resilient biassing means (46) which tend to urge the backrest support (8) into its forwardly rotated end position, and
- a seat support (10) articulated substantially adjacent its front edge to the fixed structure (2) around a second transverse axis (11) parallel to and displaced forwardly relative to the said first transverse axis (9), the said seat support (10) being moreover connected to the backrest support (8) substantially in correspondence with the rear edge of the seat (4).

2. Chair according to Claim 1, characterised in that the fixed structure (2) of the chair includes a crosspiece (7) and two support bars (6) projecting cantilever-fashion forwardly from the two ends of the crosspiece (7), in that the backrest support includes two substantially L-shaped support arms (8) each connected at one end to a respective side of the backrest (3) and articulated at its opposite end around the said first transverse axis (9) to a respective end of the crosspiece (7), and in that the seat support

comprises two lateral support members (10) connected to the two sides of the seat (4), and having their front ends articulated around the said second transverse axis (11) to the two front ends of the said support bars (6) and having their rear ends connected to the said L-shaped support arms (8) rearwardly of the said first transverse axis (9).

3. Chair according to Claim 2, characterised in that each of the said support bars (6) has a box-like body and that the said resilient biassing means include at least one helical spring (46) disposed within the box-like body of one of the said support bars (6), the said helical spring (46) having one end connected to the front end of the said support bar (6) and the other end connected to one end of a tie-bolt (48) the opposite end of which is connected to a respective backrest support arm (8) in a zone which does not coincide with the said first transverse articulation axis (9).

4. Chair according to Claim 2, in which each backrest support arm (8) is articulated to the respective end of the crosspiece (7) through the interposition of a pivot pin (13), characterised in that the said resilient biassing means consist of a spring (58) wound spirally around the said pivot pin (13) and having its two ends (59,60) bearing respectively against the respective backrest support arm (8) and the respective end of the crosspiece (7).

5. Chair according to Claim 2, characterised in that the said crosspiece (7) has a box-like body and in that the said resilient biassing means consist of at least one helical spring (62) disposed within one end (7a) of the crosspiece (7) and having one end connected to the crosspiece (7) and its opposite end connected to one end of a lever (67)

articulated around the said first transverse axis (9) and fixed to a respective backrest support arm (8), the said lever (67) being designed to compress the said helical spring (62) when the backrest support (8) is rotated backwards.

6. Chair according to Claim 2, in which the fixed structure includes two pairs of lateral legs (5) each consisting of a tubular element, characterised in that the said resilient biassing means consist of a helical spring (68) disposed within one of the lateral legs of the chair, the said helical spring having its lower end connected to an anchoring element (69) located within the leg (5) and its upper end connected to a respective backrest support arm (8).

7. Chair according to Claim 6, characterised in that means (69 to 72) are provided for adjusting the position of the said anchoring element (69) within the said leg (5).

8. Chair according to Claim 6, characterised in that the upper end of the said helical spring (68) is hooked to a transverse pin (74) which forms part of the said backrest support arm (8) and which projects into the inside of the said leg (5) through a guide slot (84) in said leg.

9. Chair according to Claim 2, characterised in that the said crosspiece (7) has a box-like body and that the said resilient biassing means consist of a torsion bar (84) disposed along the crosspiece (7) and anchored at the centre to the central zone of the crosspiece (7), the ends of the torsion bar (84) being connected to the two backrest support arms (8).

10. Seat according to Claim 9, characterised in that the crosspiece (7) is provided with means (87) for anchoring the centre portion (85) of the torsion bar (84), the said anchoring means (87) being adjustable in position in order to allow adjustment of the loading of the torsion bar (84).

11. Chair according to Claim 2, characterised in that each end of the crosspiece (7) and the corresponding ding backrest support arm (8) has two contraposed surfaces (97, 98) and in that the said resilient means biassing the backrest towards its upright position consist of at least one substantially C-shaped leaf spring (96) the ends of which bear against the said contraposed surfaces (97, 98).

FIG. 1

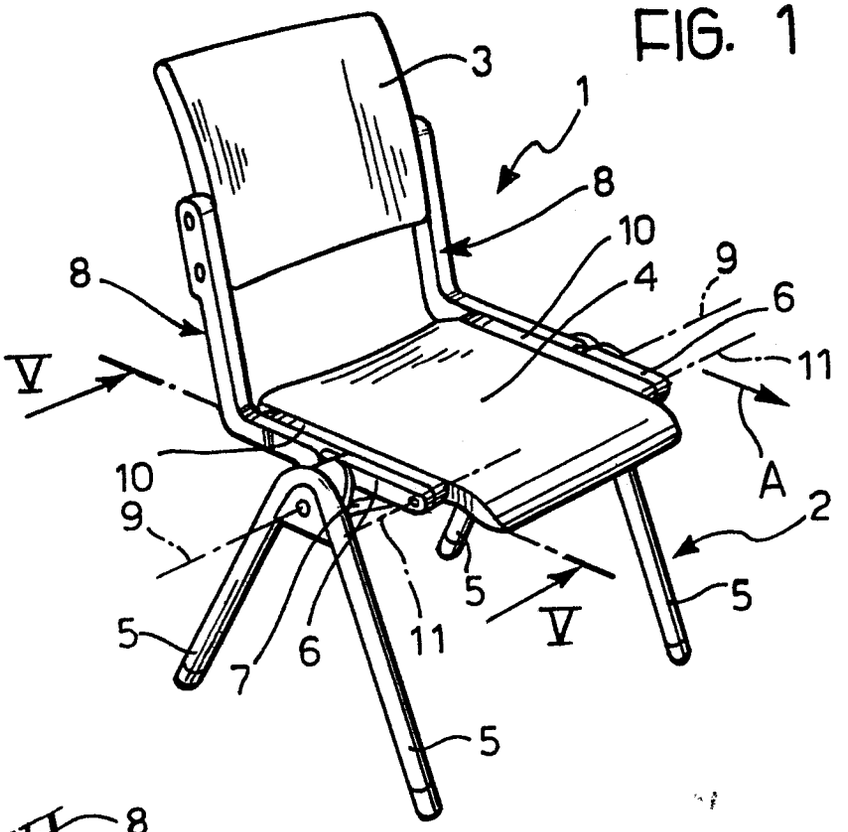


FIG. 2

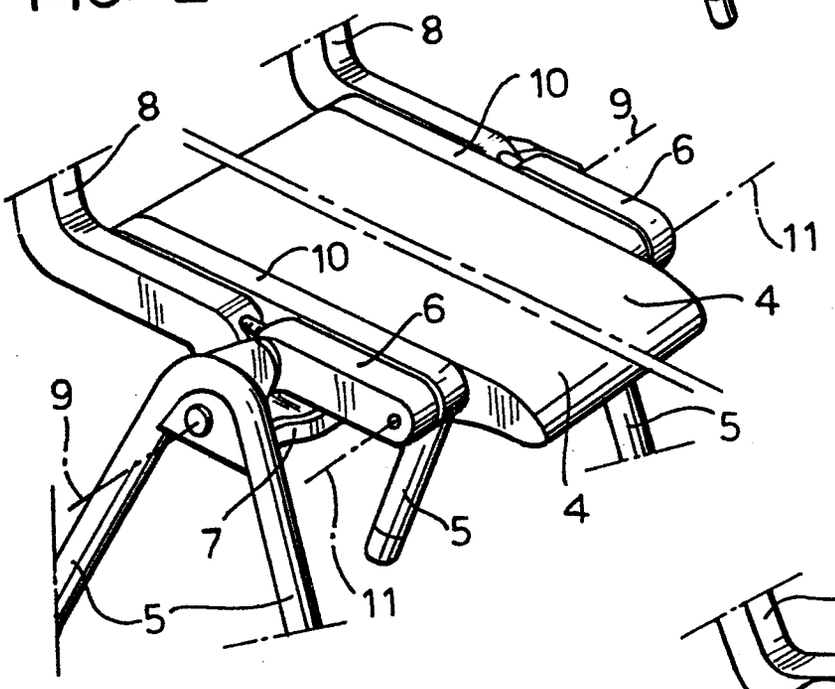
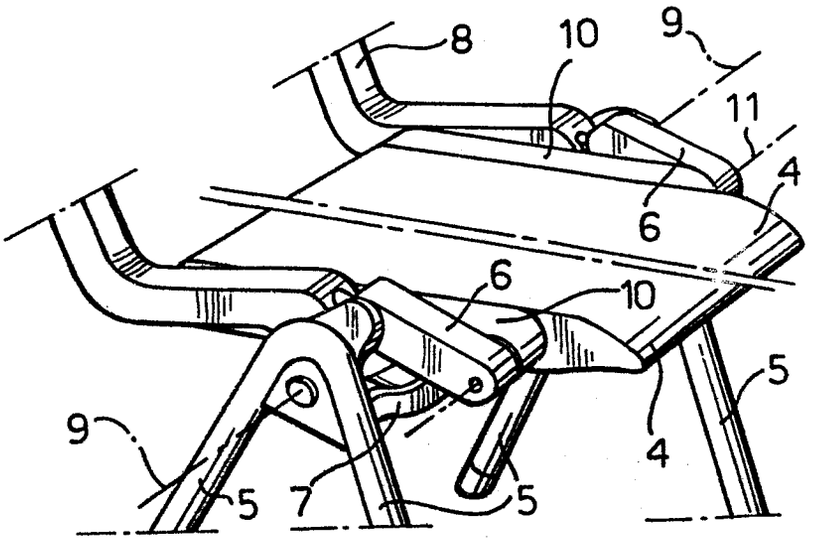


FIG. 3



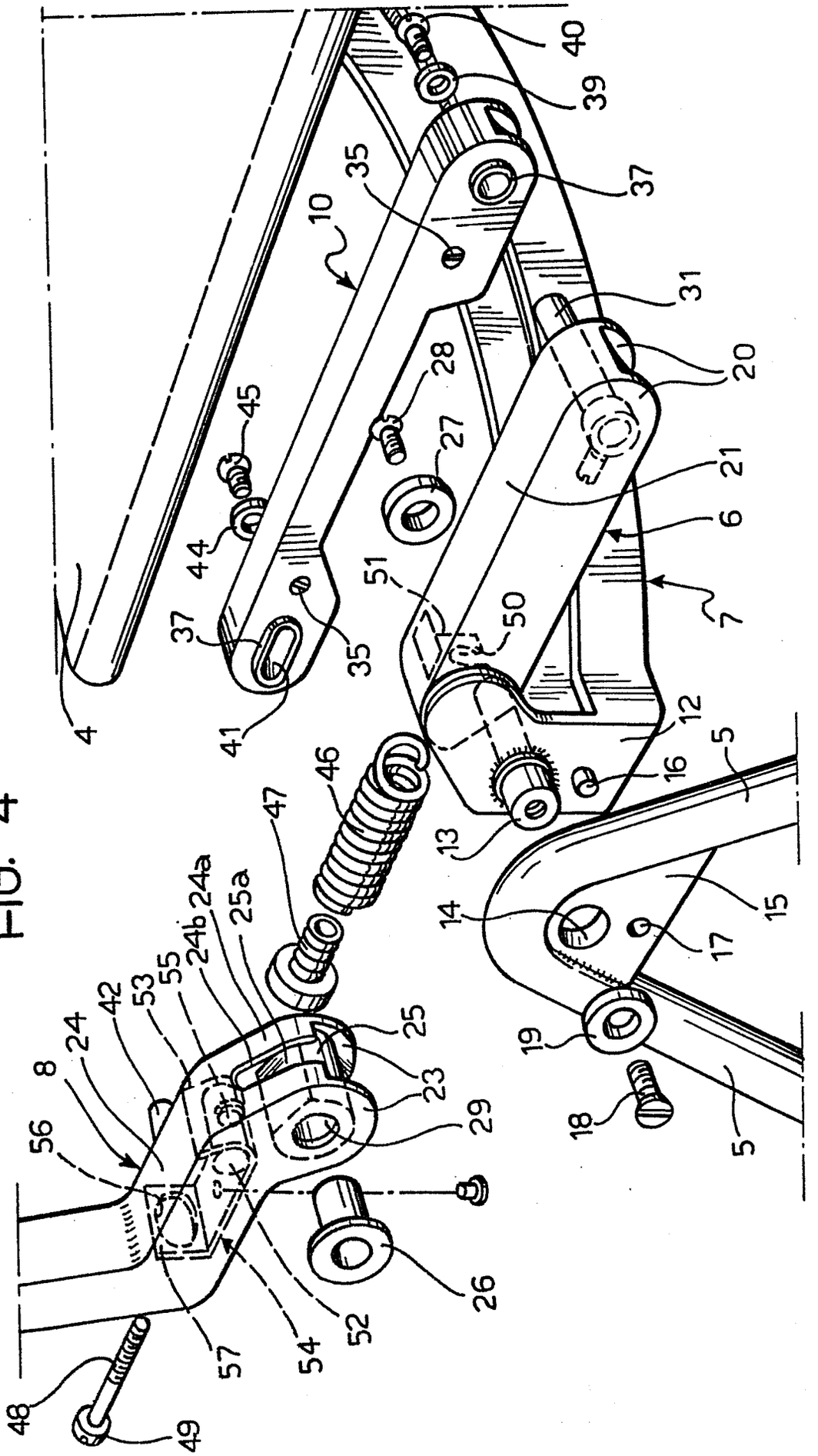

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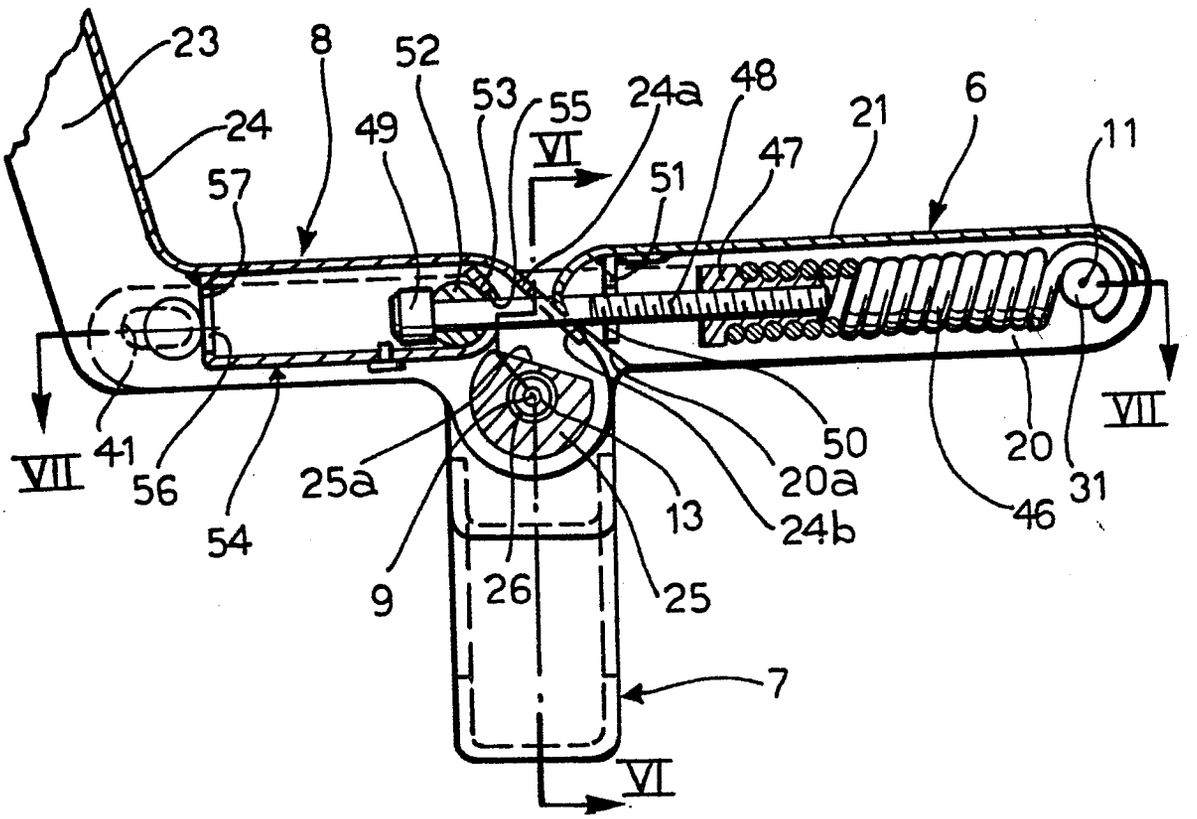
FIG. 4

FIG. 5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55
24a
48
21
6
11
24
49
VI
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57
51
VII
VII
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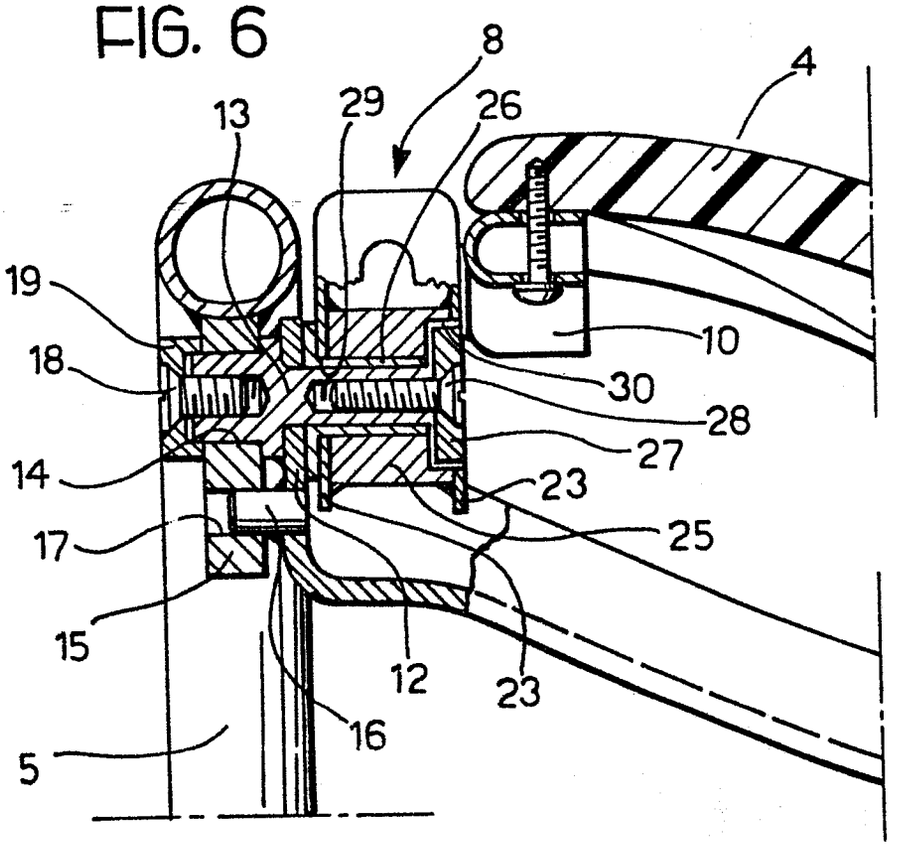
54
25a
50
20
20a
24b
46
31
13
9
26
25
7
VI

FIG. 6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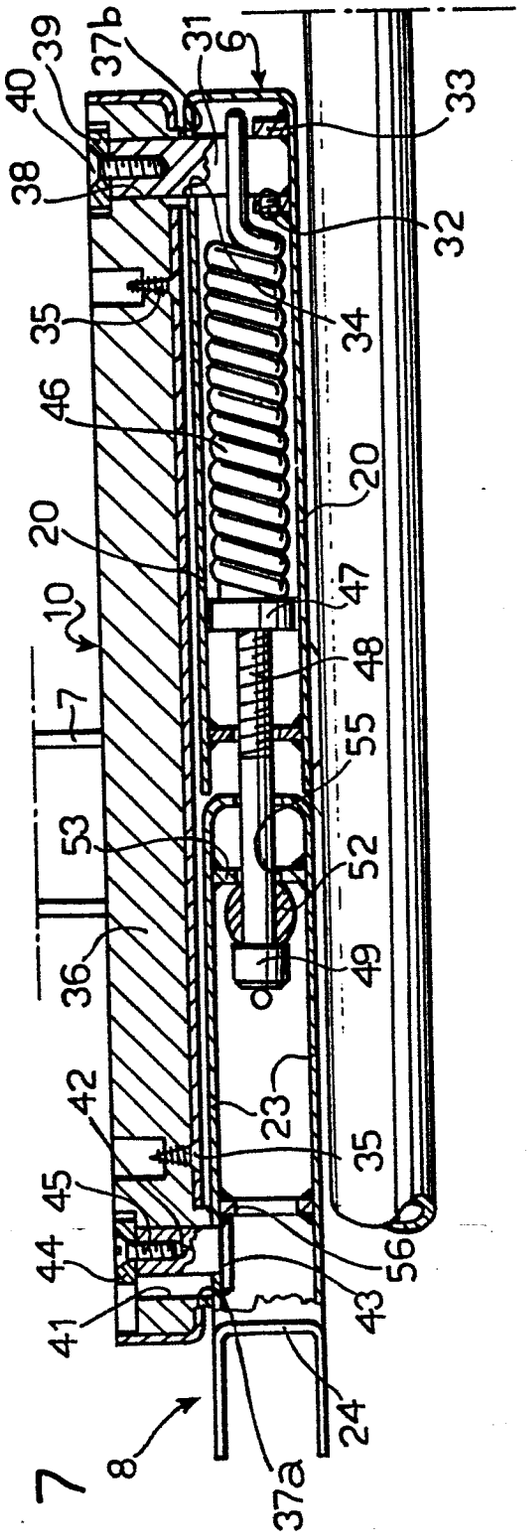
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34
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20
20
47
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42
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35
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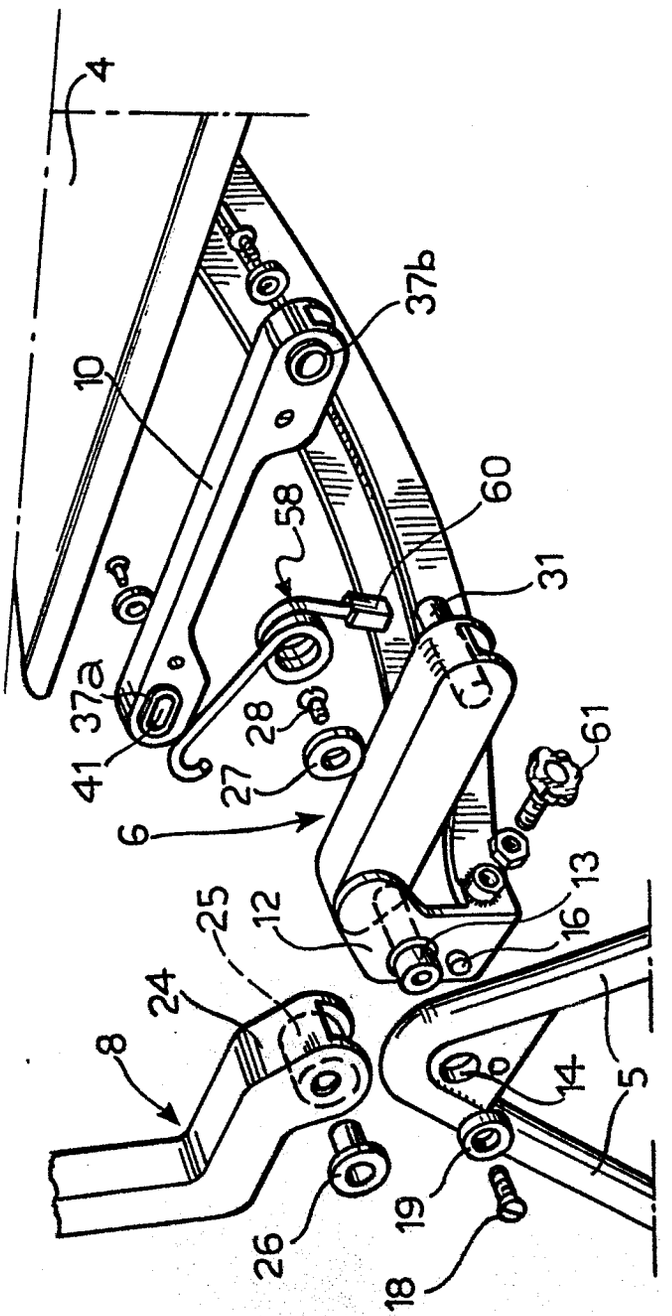
44
56
41
43
24
8
37a

FIG. 7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37a
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61
6
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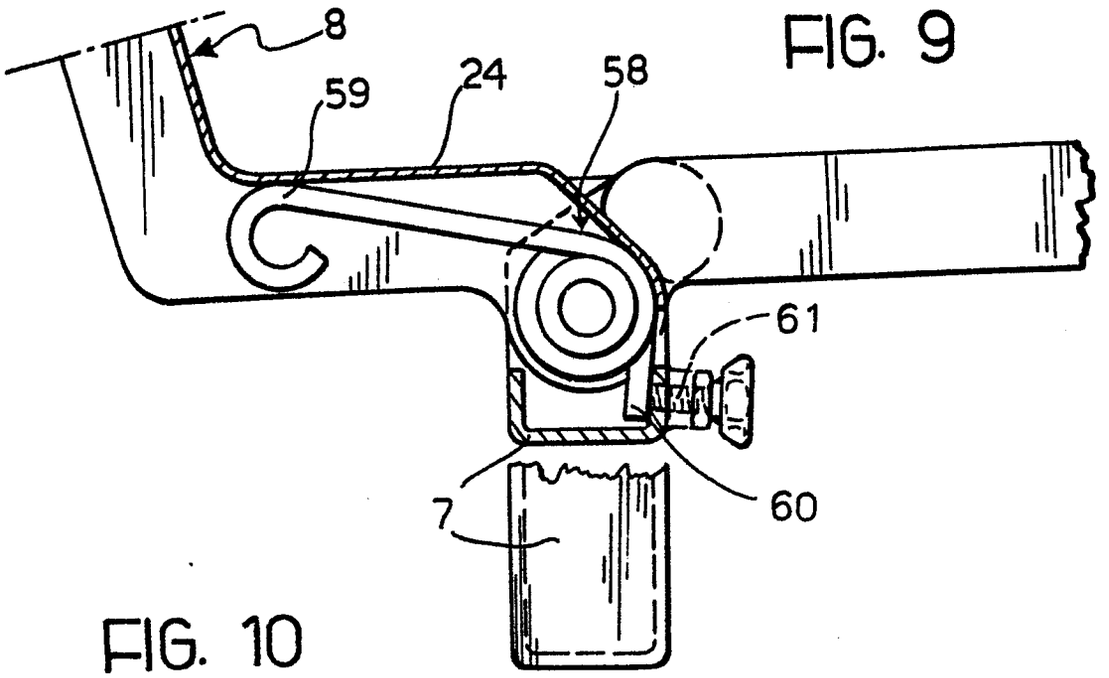
16
25
24
8
14
5
19
26
18

FIG. 8

FIG. 9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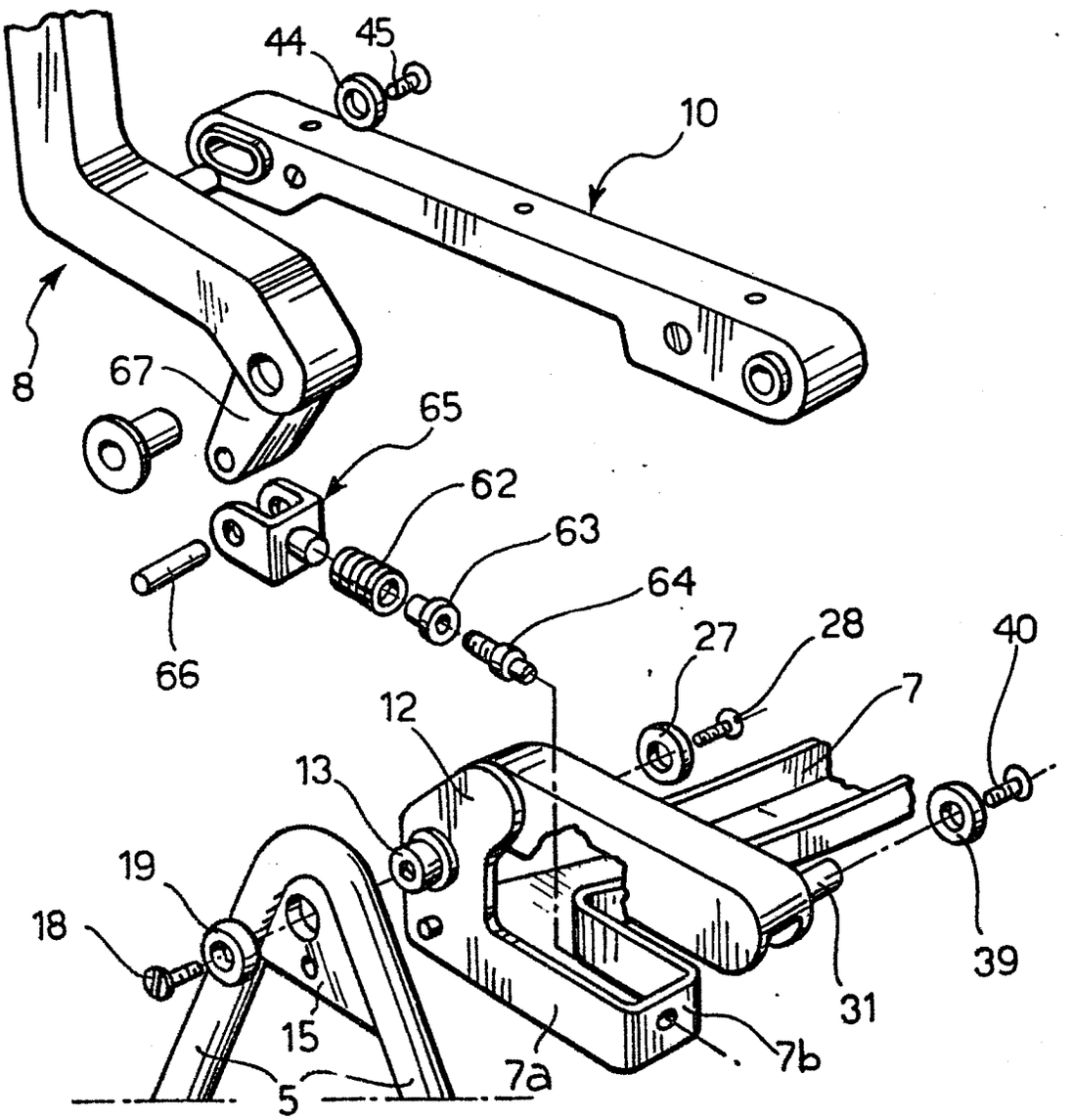
61
7
60

FIG. 10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27
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15
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7a
7b
31
39

FIG. 11

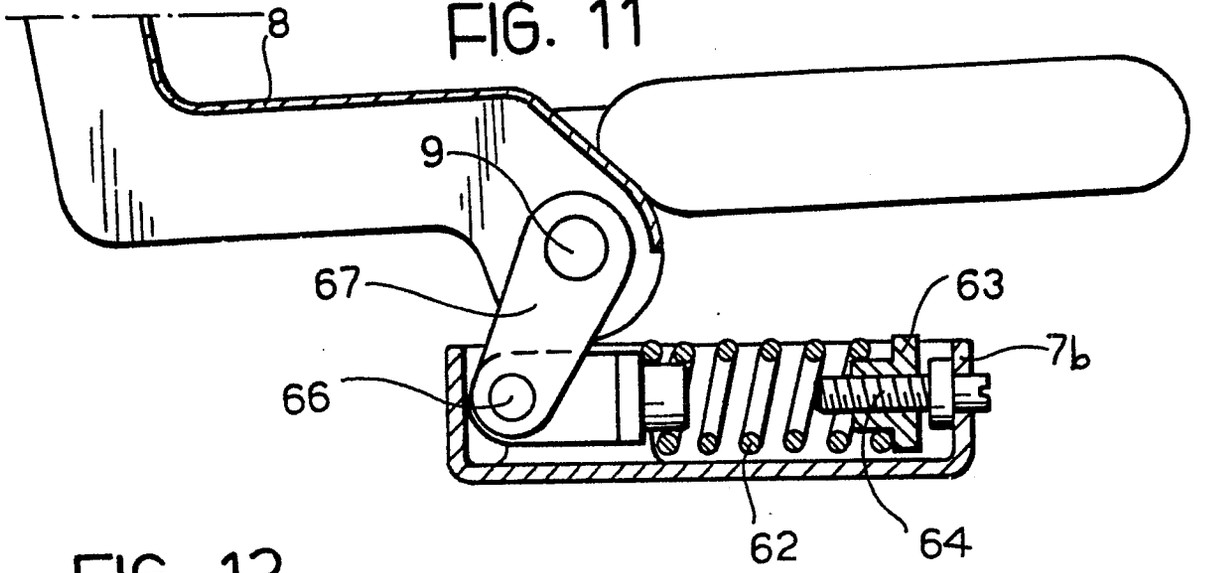


FIG. 12

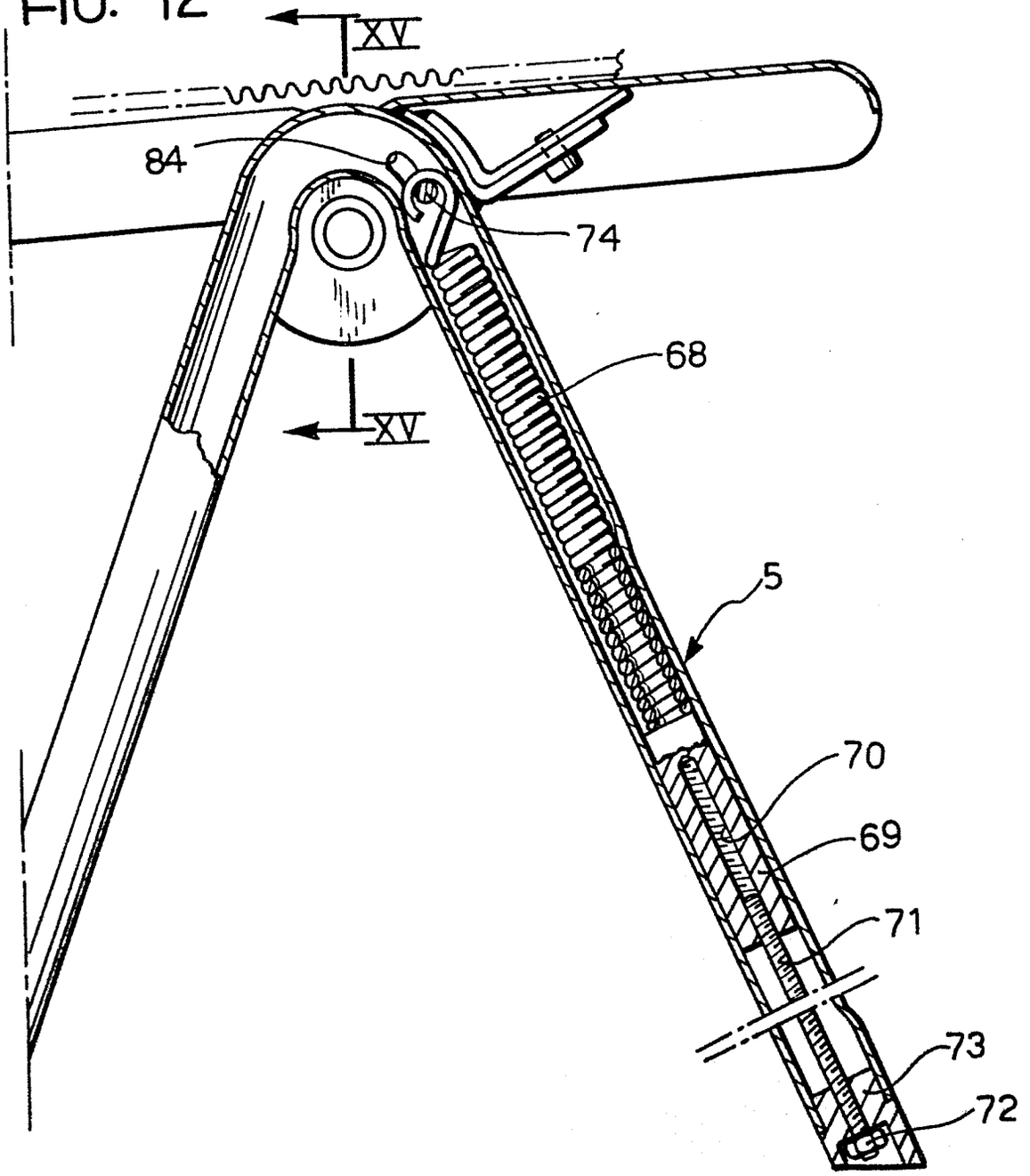
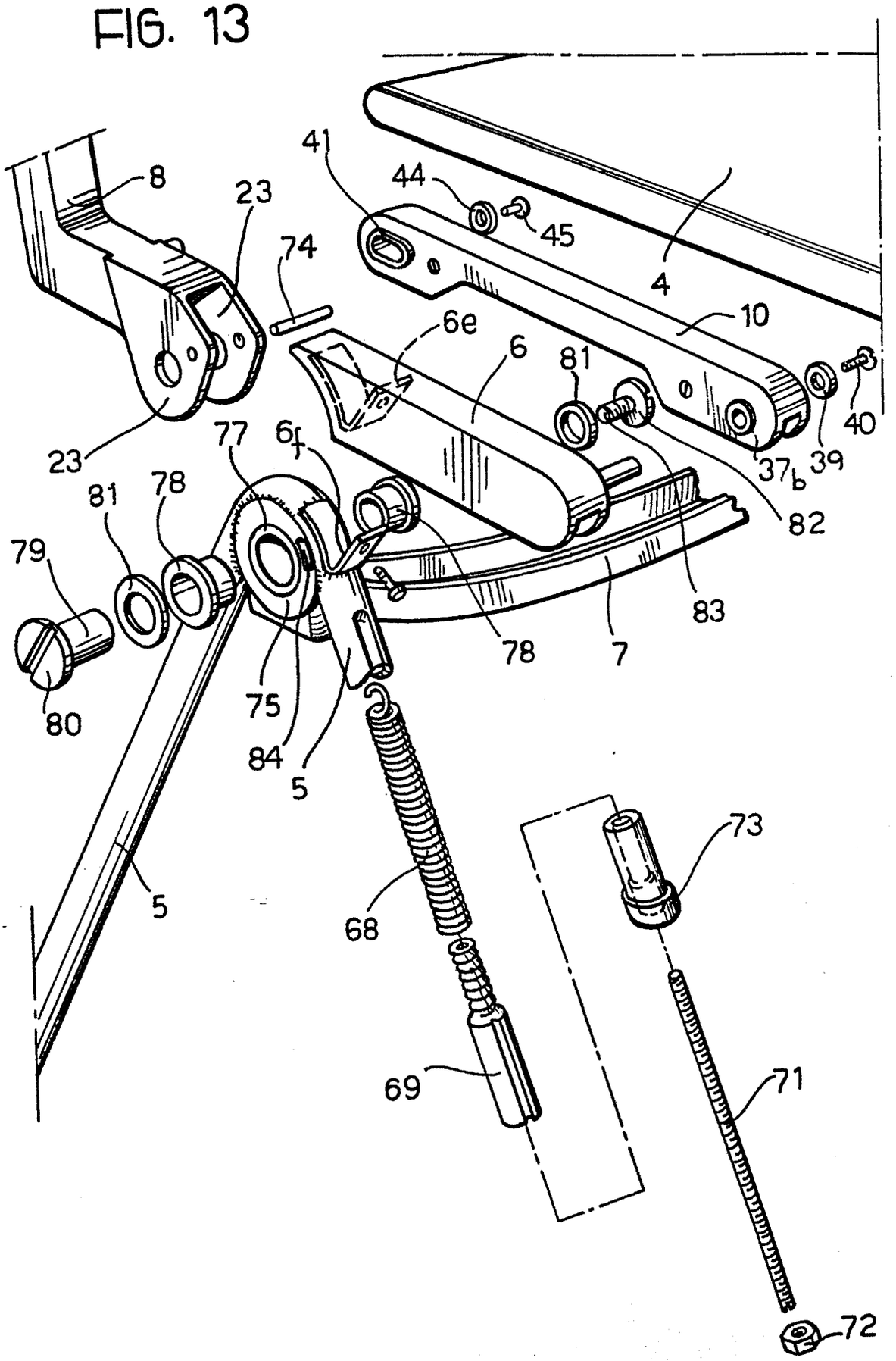


FIG. 13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39
37b
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6f
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FIG. 14

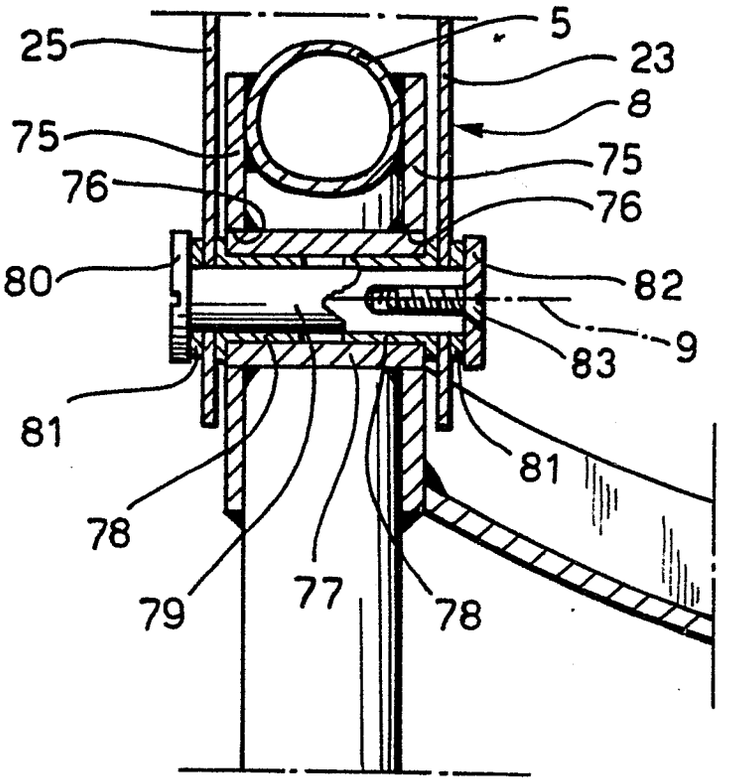
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FIG. 15

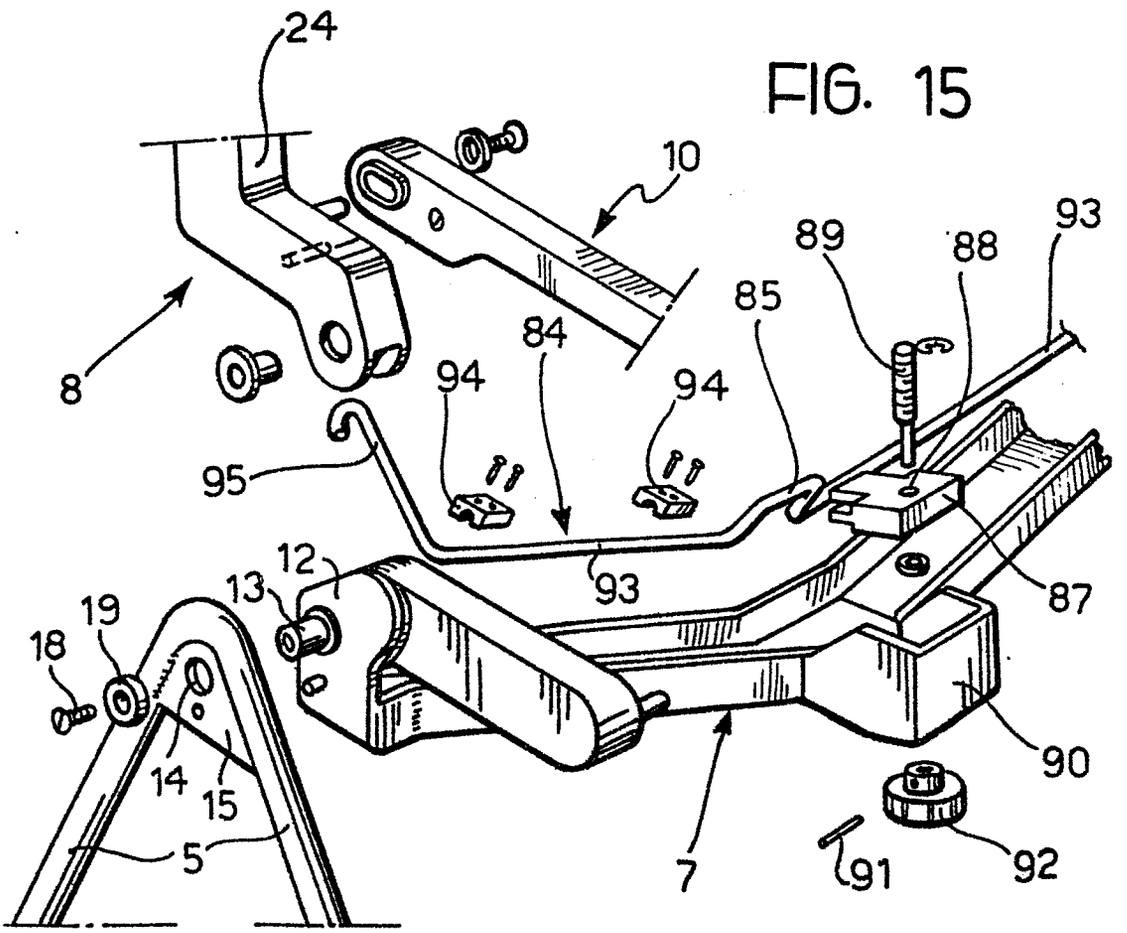
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FIG. 16

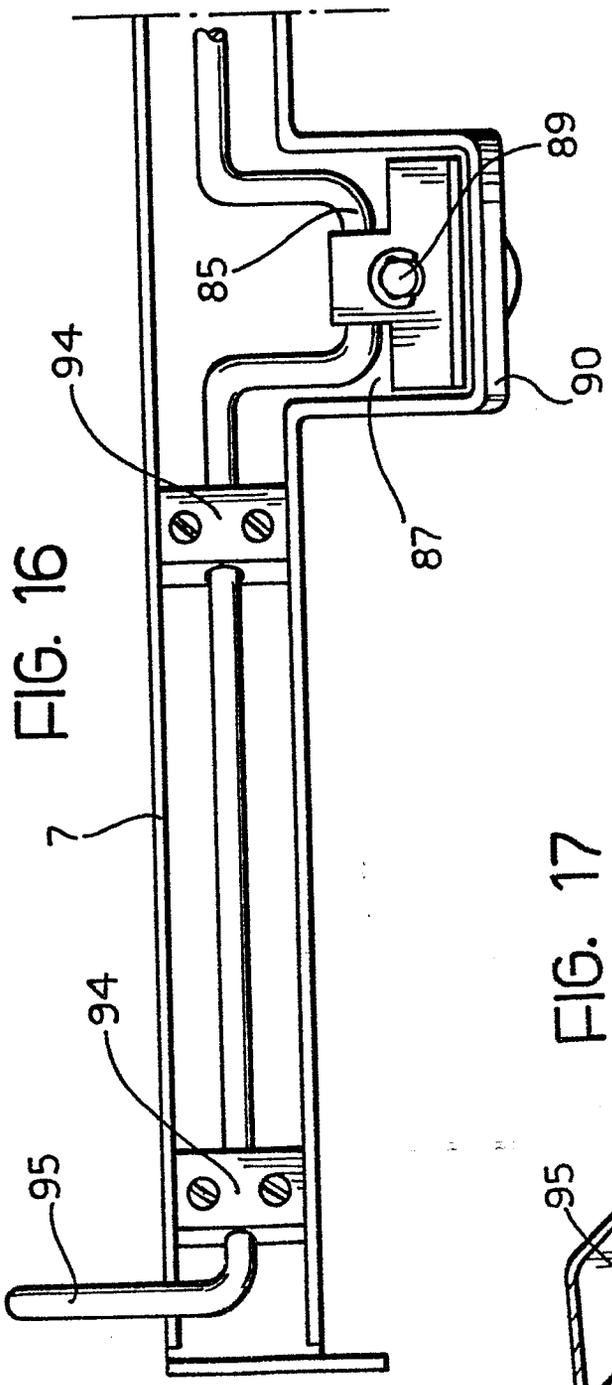

FIG. 17

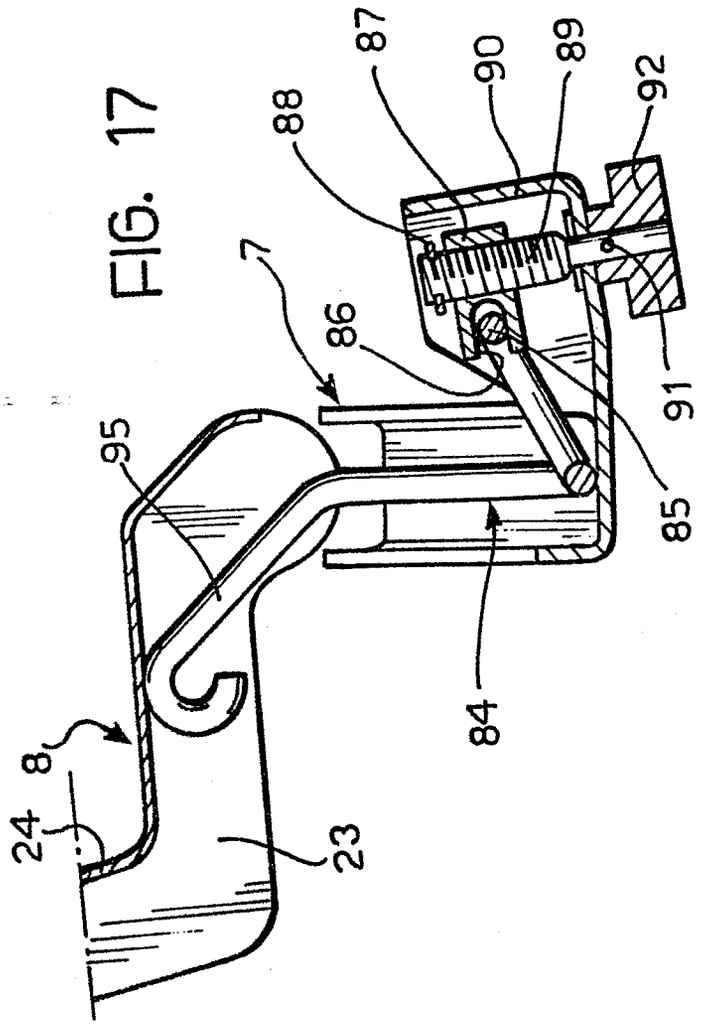

FIG. 18

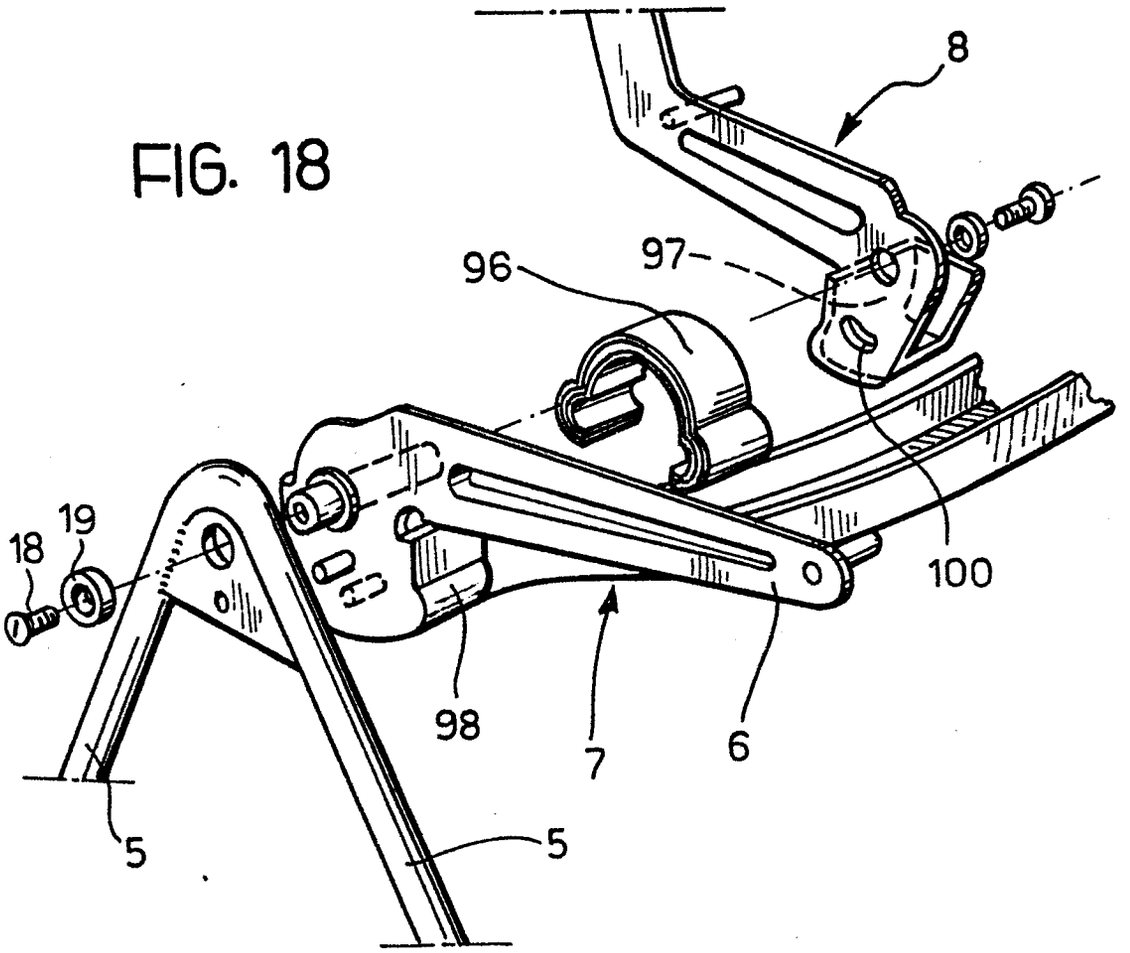

FIG. 19