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(54) Bed having a support surface comprising sections which can be reclined by means of a manually operated semiautomatic mechanism

(57) Bed (20) having transverse sections (27-32) reclinable between a horizontal bed position and a sinuous sitting position. A part of the transverse sections of the bed (20) is articulated to regulating means (34) which slide longitudinally in the frame (21) of the bed (20) against the action of elastic return means (35). Retaining means (50, 55, 56, 58) lock said regulating means (34) in positions corresponding to various inclinations of the transverse sections of the bed (20).

On manually deactivating the retaining means (50, 55, 56, 58), the regulating means (34) and the transverse sections connected thereto can be moved semiautomatically into any position by the resultant of the force system consisting of the elastic return means (35) and the load which the user may variably distribute over the transverse sections connected to said regulating means (34).

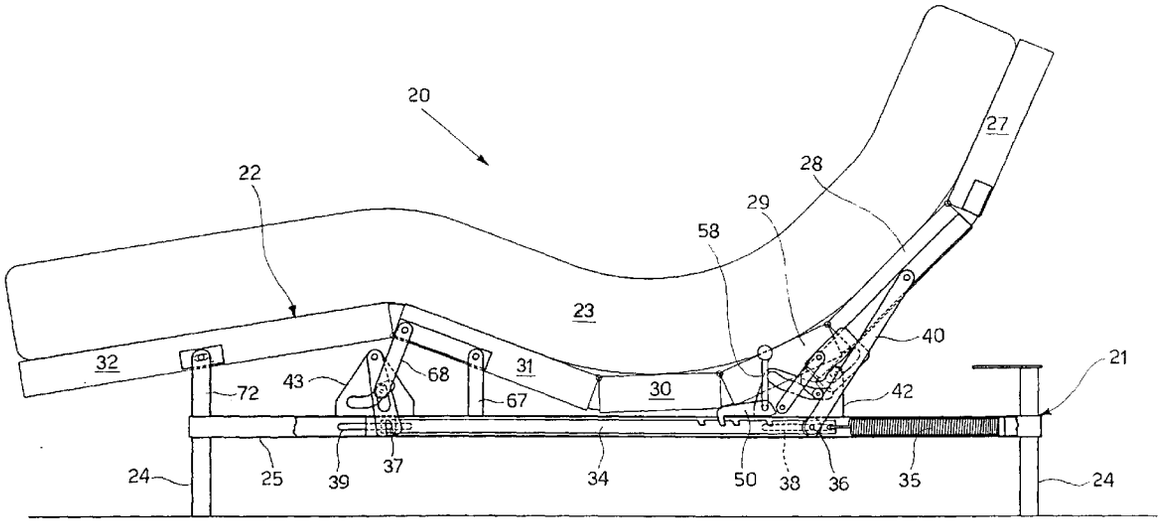

FIG. 3

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Description

The present invention relates to a bed in which the mattress support surface is composed of a plurality of transverse sections hinged to one another and reclinable to a plurality of positions, from the horizontal lying position to a sinuous sitting or chaise-longue position, by means of a manually operated semiautomatic mechanism.

It is known that there exist various types of beds which have a mattress support surface which can be articulated in three or more transverse sections.

These transverse sections can be variously reclined by means of manual or electrical mechanisms in order to ensure the maximum comfort of the occupant of the bed for sleeping and also for reading, writing or watching television.

In addition, beds composed of reclinable sections are also the most suitable for correctly solving positioning problems for persons confined to bed for health reasons.

The demand for ever increasing comfort has led to the provision of an increasingly large number of articulated sections, each of which has associated with it an electromechanical control device which can be actuated by means of a pushbutton connected to the structure of the bed, or by means of remote controls.

On the other hand, these electromechanical control devices can be used only in rooms provided with an electricity supply, and in any case they cannot be used if the electric power supply fails.

Moreover, the cost of manufacturing these electrically controlled beds is increased substantially by the fact that the number of electromechanical control devices provided corresponds to the number of articulated sections to be operated.

It should be pointed out that operating costs are also substantially increased by the periodic servicing operations which these electromechanical devices require and by the necessary repair of damage which can occur with all electrically operated appliances.

For the above reasons, the main object of the invention is that of providing a bed having a support surface composed of reclinable sections, which offers the same facilities as electrically controlled beds without requiring the use of electromechanical control means.

Another object of the invention is that of providing a bed of the type described which has characteristics such as to obviate the limitations and disadvantages of electrically controlled beds and to widen the utilizability of this type of bed comprising articulated sections, thus reducing both the cost of manufacture and operating costs.

These and other objects are achieved in accordance with the invention with a bed having a support surface composed of reclinable surfaces which has the characteristics claimed hereinbelow.

The objects, characteristics and advantages of the bed according to the invention will become clear from the following description given with reference to the accompanying diagrammatical drawings, in which

Figure 1 shows a side view of the bed according to the invention in the horizontal coplanar position;
Figure 2 shows the bed according to the invention in a slightly sinuous position;
Figure 3 is a side view of the bed in a moderately sinuous position;
Figure 4 shows, likewise in side view, the bed according to the invention in a sinuous sitting position;
Figures 5 and 6 show two enlarged details of Figure 1;
Figures 7 and 8 show two enlarged details of Figure 2;
Figures 9 and 10 show two enlarged details of Figure 3;
Figures 11 and 12 show two enlarged details of Figure 4.

Referring to Figures 1, 2, 3, and 4, the bed 20 is composed essentially of a frame 21 which carries the support surface 22 of the mattress 23.

The frame 21 is made of steel tubing having a hollow quadrangular section and comprises four vertical uprights or legs 24 connected by two longitudinal members 25, which extend along the sides of the bed 20, and two cross members 26 respectively positioned to correspond to the head and foot of the bed 20.

The frame 21 of the bed carries a support surface 22 for the mattress 23, said support surface consisting of a plurality of transverse sections articulated to one another and to the frame 21 in such a manner as to be reclinable to a plurality of positions included between a horizontal coplanar position (Figure 1) and a sinuous sitting position (Figure 4).

Starting from the head of the bed 20, there are provided a section supporting the head and cervical lordosis, which in the remainder of the description will be referred to as the cervical section 27, a dorsal section 28 to support dorsal cyphosis, a lumbar section 29 to support lumbar lordosis, a sacral section 30 to support the sacral part, a femoral section 31 to support the femoral portion of the lower joints, and finally a section 32 to support the legs and feet of the occupant's body.

In a manner known per se each section is composed essentially of two longitudinal sides made of steel tubing having a hollow quadrangular section and interconnected by crossbars (not shown in the drawings).

Each support section is hinged to the adjacent support section about horizontal axes of rotation extending transversely along the top edges of the support sections, with the exception of the section 32 for legs and feet and of the femoral section 31, which are hinged along their bottom edges.

The cervical section 27 and the dorsal section 28 are also interconnected by a device, known per se and

not described, capable of permitting various inclination positions of the cervical section 27 relative to the dorsal section 28.

Removably laid on the support surface 22 of the bed 20 is a mattress 23 constructed to follow the movements of the transverse sections on which it is supported.

A regulating bar 34 is slidably disposed inside each longitudinal member 25 of the frame 21 of the bed 20.

The head end of the regulating bar 34 is connected to the end of a tension spring 35, which is arranged coaxially in the longitudinal member 25. The other end of the tension spring 35 is anchored, by means of fastening systems known per se, to that end of the longitudinal member 25 which is connected to the vertical leg 24 at the head end of the frame 21. The front end, facing the head of the bed 20, and the rear end, facing the foot of the bed 20, of each regulating bar 34 are provided with respective pairs of cross pins 36 and 37, which project horizontally from the sides of the regulating bar 34. The pair of front pins 36 and the pair of rear pins 37 of the regulating bar 34 can slide in respective pairs of horizontal guide and stop slots 38 and 39 formed in the side walls of the longitudinal member 25.

As can be seen in Figures 5, 7, 9, 11, keyed around the front cross pins 36 of the regulating bar 34, in such a manner as to be free to rotate, are both the bottom end of a connecting rod 40 and the horizontal rotating shaft of a sliding roller 41, which is slidably arranged in the longitudinal member 25.

The top end of the connecting rod 40 is articulated to the dorsal support section 28 and cooperates, in a manner known per se, with the device permitting various inclined positions of the cervical section 27 relative to the dorsal section 28.

Fixed in the top side of each longitudinal member 25, so as to project vertically, are not only a trapezoidal bow 42 but also a triangular bow 43, which are respectively positioned to correspond to said front and rear guide and stop slots 38, 39 for the regulating bar 34 in the longitudinal member 25.

The trapezoidal bow 42 has a guide slot 44, which extends on a substantially arcuate path (Figures 5, 7, 9, 11), and two cross pins 45, 46 which are respectively keyed to a top lobe of the bow 42 and to the bottom side of the bow 42, for reasons which will be described further on below.

The triangular bow 43 has a guide slot 47, which extends on a substantially sinuous path on which a concave portion, facing the foot of the bed 20, is followed by a convex portion facing the head of the bed 20.

Hinged in the top vertex of the triangular bow 43, in such a manner as to be free to rotate about a horizontal axis, is a connecting arm 48 which has a substantially conical shape.

The middle portion of the connecting arm 48 has a rectilinear longitudinal slot 49.

Formed in the bottom end of the conical arm 48 is an open slot 73 in which is slidably engaged a rear cross pin 37 of the regulating bar 34, said pin also being at the same time slidably guided in a rear horizontal slot 39 of the longitudinal member 25.

Provided on the top side of each longitudinal member 25, next to said trapezoidal bow 42, is a retaining device for the regulating bar 34 housed in the longitudinal member 25 disposed therebeneath.

The retaining device comprises essentially a pawl 50 which is positioned on each longitudinal member 25 to correspond to indentations 51, 52, 53, 54 formed in the surface of the regulating bar 34. One end of the pawl 50 is pivoted about a rotating shaft 55, which firmly connects the pawls 50 provided on the longitudinal members 25.

The free end of each pawl 50 is provided with a hook 56 which, passing through an opening 57 formed in the top side of the longitudinal member 25, can engage in the indentations 51, 52, 53, 54 of the regulating bar 34.

The pawls 50 are continuously urged to turn into the position of engagement with the indentations 51, 52, 53, 54 of the regulating bar 34 by appropriate torsion springs (not shown in the drawings).

A vertical lever 58 is connected to the rotating shaft 55 of the pawls 50 to enable the user to disconnect the pawls 50 manually from the indentations 51, 52, 53, 54 of the regulating bar 34, against the action of the torsion springs.

In Figures 5, 7, 9, 11 it can be seen that on the inside of the longitudinal sides of the dorsal section 28 there are also fixed two longitudinal sectional members 59 which extend in cantilever fashion towards the lumbar section 29.

Anchored to each cantilever portion of said longitudinal sectional members 59 is a rectangular guide bow 60 provided with a guide slot 61 following an undulating path in which a long curved portion follows a shorter curved portion.

Slidably engaged in the undulating slot 61 is said cross pin 45 keyed to the top lobe of the trapezoidal bow 42.

Also articulated to each cantilever portion of said longitudinal sectional members 59, for rotation about a horizontal axis, is the top end of a rectilinear connecting arm 62.

The bottom end of the connecting arm 62 is articulated, for rotation about a horizontal axis, to said cross pin 46 keyed in the bottom part of the trapezoidal bow 42.

Slidably connected to the dorsal section 28 is also an elbow bow 63, whose curved end 64 protends longitudinally towards the lumbar section 29.

The curved end 64 of the elbow bow 63 is provided with a pin 65 which is slidably engaged in the arcuate slot 44 of the trapezoidal bow 42 in order to cooperate with the articulation device of the cervical section 27 relative to the dorsal section 28.

In a manner known per se the elbow bow 63 is connected by appropriate lever mechanisms (not shown) to

the articulation device of the cervical section 27 for the purpose of varying the inclination of the latter on variation of the inclination of the dorsal section 28.

Fixed to the longitudinal sides of the femoral section 31 are two longitudinal plates 66, which extend over approximately half the longitudinal length of the femoral section 31 from the edge adjacent to the leg and foot section 32.

Articulated at the respective ends of each of the plates 66, for rotation about a horizontal axis, are the top end of an upright 67, which rises vertically from the longitudinal member 25, and the top end of a rectilinear connecting arm 68.

The foot of the upright 67 is fixed to the longitudinal member 25, while the bottom end of the connecting arm 68 is provided with a pivot pin 69 which is slidably engaged both in the sinuous slot 47 of the triangular bow 43 and in the rectilinear slot 49 of the conical connecting arm 48.

On the inside of each longitudinal side 33 of the leg and foot section 32 is fixed a longitudinal plate 70 which is provided with a longitudinal rectilinear slot 71.

Slidably pivoted in said slot 71 is the top end of an upright 72, which extends vertically from the longitudinal member 25 in a position corresponding to the foot of the bed 20.

In the horizontal position of the bed 20 (Figure 1) the support sections 27, 28, 29, 30, 31, 32 are coplanar.

The retaining pawl 50 (Figure 5) engages in the first indentation 51 of the regulating bar 34 and holds the latter in the position of maximum displacement towards the foot of the bed 20, neutralizing the return action of the tension spring 35.

The pairs of front and rear cross pins 36, 37 of the regulating bars 34 are located at the stroke-limiting ends of the respective front and rear guide and stop slots 38,39.

The cervical section 27 is held in the horizontal position by the elbow bow 63, whose slidable pin 65 is situated at one stroke-limiting end of the arcuate slot 44 in the trapezoidal bow 42.

The dorsal section 28 is locked in the horizontal position by the rod 40 connecting it to the regulating bar 34 and by the cross pin 45 of the trapezoidal bow 42, which is now in a position corresponding to one stroke-limiting end of the undulating slot 61 of the rectangular bow 60.

The femoral section 31 (Figure 6) is locked in the horizontal position both by the fixed pin of the upright 67 and by the pin 69 of the connecting arm 68, which is now in a position corresponding to one end of the sinuous slot 47 in the triangular bow 43.

The pin 69 is held in this position by the longitudinal slot 49 of the conical arm 48, which in turn is locked in position by the rear cross pins 37 of the regulating bar 34, which are engaged in the open slot 73.

The leg and foot section 32 is locked in the horizontal position by the pin of the upright 72, lying at one stroke-limiting end of the longitudinal slot 71 in the plate 70.

Starting from the horizontal position illustrated in Figures 1, 5 and 6, the user can recline the bed 20 into a slightly sinuous position (Figures 2, 7 and 8) by carrying out the following operations:

Firstly, the user operates the lever 58 to disengage the pawl 50 from the first indentation 51 of the regulating bar 34.

After this, the user moves the upper part of his body towards the sacral section 30, of exerts pressure on the sacral section 30, and releases his hold on the lever 58.

The regulating bar 34, released from the pawl 50, moves towards the head of the bed 20, both through the return action of the tension spring 35 and through the load which the user has transferred towards the sacral section 30.

At the same time, the lever 58 is shifted by its torsion spring to a position in which its hook 56 comes into contact with the surface of the regulating bar 34 until it engages in the second indentation 52 and blocks the movement of the bar 34 (Figure 7).

During the movement of the regulating bar 34, the connecting rod 40 follows the bar 34 and brings about the displacement of the dorsal section 28. The latter moves to a slightly reclined position in which the pin 45 keyed in the top lobe of the trapezoidal bow 42 has been moved into an indentation interposed between two curved parts of the undulating slot 61 in the rectangular bow 60 (Figure 7).

The elbow bow 63 follows the displacement of the dorsal section 28 and is pushed towards the interior of the dorsal section 28 through the sliding of the pin 65 in the arcuate slot 44.

By means of lever mechanisms known per se the movement of the elbow bow 63 brings about the displacement of the cervical section 27 to a position slightly inclined relative to the dorsal section 28 (Figure 2).

The lumbar section 29 is moved downwards, following the lowering of the sacral section 30 and turning towards the head of the bed 20 the top end of the connecting arm 62 to which it is pivoted.

The sacral section 30 is moved downwards by the thrust exerted by the user.

The femoral section 31 swings about the fixed pin of the upright 67 to a slightly inclined position (Figure 8).

The movement of the femoral section 31 is due to the rotation which the conical arm 48 has made about its top pin because of the thrust applied by the rear cross pin 37 in its open slot 73 during the movement of the regulating bar 34.

The rotation of the conical arm 48 has brought the pivot pin 69 of the connecting arm 68 to a position between the concave portion and the convex portion in the sinuous slot 47 of the triangular bow 43.

The leg and foot section 32 is swung about the pin of the upright 72 in order to follow the swinging of the edge of the femoral section 31 to which it is pivoted.

The position of the pin of the upright 72 in the longituinal slot 71 of the plate 70 remains substantially unchanged.

Starting from the slightly sinuous position shown in Figure 2, the user can recline the sections of the bed 20 to obtain the moderately sinuous position shown in Figures 3, 9 and 10 by operating the lever 58 and releasing the pawl 50 from the second indentation 52 of the bar 34.

After this, the user moves the upper part of his body further towards the sacral section 30, or exerts further pressure on the sacral section 30 and releases his hold on the lever 58.

The return action of the tension spring 35 and the load applied by the user to the sacral section 30 bring about a movement of the regulating bar 34 towards the head of the bed 20.

The pawl 50 of the lever 58, on which in the meantime the user has released his hold, comes into engagement with the third indentation 53 of the regulating bar 34 and blocks the movement of the latter (Figure 9).

During the movement of the regulating bar 34 the connecting rod 40 has brought about a further enlargement of the angle of inclination of the dorsal section 28.

The pin 45 keyed in the top lobe of the trapezoidal bow 42 has moved into the shorter curve of the undulating slot 61 of the rectangular bow 60.

The pin 65 of the elbow bow 63 has moved in the arcuate slot 44 of the trapezoidal bow 42 to a position which leaves the position of the elbow bow 63 substantially unchanged, so that the inclination of the cervical section 27 relative to the dorsal section 28 consequently also remains unchanged.

The lumbar section 29 has been further lowered to follow the downward displacement of the sacral section 30 and has turned the top end of the connecting arm 62, to which it is pivoted, further towards the head of the bed 20.

The femoral section 31 swings further about the pin of the upright 67 to assume a moderately reclined position (Figure 10).

The swinging of the femoral section 31 is brought about by the further rotation of the conical arm 48, which in turn is caused to rotate by the rear cross pin 37 of the regulating bar 34, said pin being engaged in its open slot 73.

The rotation of the conical arm 48 has moved the pivot pin 69 of the connecting arm 68 into the convex portion of the sinuous slot 47 of the triangular bow 43. The leg and foot section 32 has swung about the pin of the upright 72 to bring about the swinging of the edge of the femoral section 31 to which it is pivoted.

The pin of the upright 72 is positioned approximately halfway along its path of movement in the longitudinal slot 71 of the plate 70.

Starting from the moderately sinuous position shown in Figure 3, the user can recline the sections of the bed 20 to the sinuous sitting position shown in Figures 4, 11 and 12 by operating the lever 58 and releasing the pawl 50 from the third indentation 53 of the bar 34.

After this, the user concentrates the weight of his upper body on the sacral section 30, or exerts equivalent pressure on the sacral section 30, and releases his hold on the lever 58.

The action of the tension spring 35 and the pressure exerted by the user on the sacral section 30 bring about the displacement of the regulating bar 34 towards the head of the bed 20 until the pawl 50 of the lever 58, on which in the meantime the user has released his hold, engages in the fourth indentation 54 of the regulating bar 34 and locks the movement of the latter (Figure 11).

The front cross pins 36 of the regulating bar 34 have reached the other stroke-limiting end of the front guide and stop slots 38.

During the movement of the regulating bar 34, the connecting rod 40 has brought the dorsal section 38 into the position of maximum inclination shown in Figure 11.

The pin 45 keyed in the top lobe of the trapezoidal bow 42 has been brought to the other stroke-limiting end of the undulating slot 61 in the rectangular bow 60.

The pin 65 of the elbow bow 63 has been moved to the other stroke-limiting end of the arcuate slot 44 of the trapezoidal bow 42, leaving unchanged both the position of the elbow bow 63 and the inclination of the cervical section 27 relative to the dorsal section.

The lumbar section 29 and the sacral section 30 have been moved further downwards, leaving substantially unchanged the position of the connecting arm 62 to which the lumbar section 29 is pivoted.

The femoral section 31 swings further about the pin of the upright 67 until it reaches its position of maximum inclination illustrated in Figure 12.

The swinging of the femoral section 31 is brought about by the rotation of the conical arm 48, which in turn is caused to rotate by the rear pin 37 of the regulating bar 34, which has now reached the other stroke-limiting end in the respective guide and stop slot 39. The rotation of the conical arm 48 has brought the pivot pin 69 of the connecting arm 68 to the other stroke-limiting end of the sinuous slot 47 in the triangular bow 43.

The leg and foot section 32 has followed the swinging movement of the edge of the femoral section 31 to which it is pivoted for rotation about the pin of the upright 72 until it reaches its position of maximum inclination (Figures 4 and 12).

The pin of the upright 72 is positioned at the other stroke-limiting end of the longitudinal slot 71 in the plate 70.

From the sinuous sitting position shown in Figure 4 the user can bring the sections of the bed 20 back to any other of the resting positions previously described.

After operating the lever 58 and thereby releasing the pawl 50 from the fourth indentation 54 in the regulating bar 34, the user exerts an appropriate thrust on the cervical section 27, the dorsal section 28 and the lumbar section 29 to bring about a rotation in the direction of the head of the bed 20. The connecting rod 40

moves the regulating bar 34 towards the foot of the bed 20, overcoming the resistance of the tension spring 35.

The pins 45 and 65 slide respectively in the undulating slot 61 of the rectangular bow 60 and in the arcuate slot 44 of the trapezoidal bow 42 in order to guide the turning of the cervical, dorsal and lumbar sections 27, 28, 29.

The rear cross pins 37 of the regulating bar 34 bring about the rotation of the conical arm 48 and the movement of the pin 69 in the sinuous slot 47 of the triangular bow 43.

The connecting rod 68 swings towards the foot of the bed 20 and moves the femoral section 31 and the leg and foot section 32 in the downward direction.

Once the desired position of the bed 20 has been reached, the user releases his hold on the lever 58.

The lever 58 and the appertaining pawl 50 are turned by the torsion spring to the position of engagement with the regulating bar 34 to enable the hook 56 of the pawl 50 to engage in that indentation in the regulating bar 34 which corresponds to the position desired by the user.

From the description given it is clear that the bed 20 according to the invention achieves the main object of providing the facilities of traditional electrically controlled beds without requiring the use of electromechanical control devices.

In addition, the bed 20 according to the invention makes it possible to reduce substantially the manufacturing and operating costs of this type of reclinable bed, eliminating the use of expensive electrical equipment and minimizing servicing and possible repair work, such as is frequently required for electrically operated beds.

Modifications and variations can obviously be made to the bed 20 according to the invention without thereby departing from the scope of the principal characteristics claimed hereinbelow.

For example, instead of the regulating bar 34, the appertaining tension springs 35 and the retaining means (50-58) it is possible to provide manually operated gear units consisting of a worm and a gear.

It is also obvious that the bed 20 can be adapted in a simple and economical manner for use by users who are disabled or immobilized for health reasons.

In such cases it is sufficient to connect the above-described gear units to a single electric geared motor device enabling the user to change the resting position without varying the distribution of body weight on the support surface 22 of the mattress 23.

Claims

1. Bed (20) comprising a support frame (21) composed of uprights (24) connected by tubular longitudinal members (25) and cross members (26), a support surface (22) for the mattress (23), which support surface is composed of a plurality of transverse sections (27, 28, 29, 30, 31, 32) articulated to one another and to the support frame (21) in such a manner as to be reclinable to a plurality of positions included between two limit positions corresponding to a horizontal coplanar position and a sinuous sitting position, characterized by the fact that position regulating means (34) are provided which are slidably housed in said tubular longitudinal members (25) of the frame (21) and are movable, against the action of elastic return means (35), into a plurality of positions included between two limit positions defined by first guide and stop means (36, 37, 38, 39) and corresponding respectively to the horizontal coplanar position and to the sinuous sitting position of the transverse sections (27, 28, 29, 30, 31, 32) of the support surface (22), in that retaining means (50, 55, 56, 58) are provided which are continuously urged by elastic means, which can be deactivated manually by the user, to engage in stop seats (51, 52, 53, 54) provided on said regulating means (34) and to block the sliding of the latter both in said limit positions and in a plurality of positions which are intermediate relative thereto, in that at least the transverse sections (27, 28, 31) of the support surface (22), which respectively support the cervical, dorsal and femoral parts of the body of the user, are articulated to said regulating means (34) with the aid of swinging connecting means (40, 43, 47, 48, 49, 68, 73) which are movable into a plurality of positions included between two limit positions and corresponding respectively to the coplanar position and to the sinuous sitting position of the transverse sections (27, 28, 29, 30, 31, 32) of the support surface (22), in that the transverse sections (27, 28, 29, 31, 32) of the support surface (22), which respectively support the cervical, dorsal, lumbar, femoral and leg-and-foot sections of the user's body, are articulated to the support frame (21) with the aid of swinging guide and stop means (42, 43, 60, 63, 67, 68, 72) which are movable into a plurality of positions included between two limit positions defined by second guide and stop means (45, 61, 44, 65, 47, 69) and corresponding respectively to the horizontal coplanar position and to the sinuous sitting position of the transverse sections (27, 28, 29, 30, 31, 32) of the support surface (22), in that that transverse section (30) of the support surface (22) which supports the sacral part of the user's body is suspended relative to the support frame (21) of the bed (20) at transversely axes of articulating the adjacent transverse sections (29, 31) for lumbar and femoral support, in that on manually deactivating said retaining means (50, 55, 56, 58) the regulating means (34) and the cervical transverse section (27), dorsal transverse section (28) and femoral transverse section (31) which are connected thereto are movable into a plurality of positions included between their limit position by the resultant of the

force system consisting of the action of the elastic return means (35) of the regulating means (34) and the load which the user can variably distribute over the transverse sections (27, 28, 31) of the support surface (22) which are articulated to said regulating means (34).

2. Bed (20) according to Claim 1, characterized by the fact that said regulating means are composed of bars (34) slidably housed in the tubular longitudinal members (25) of the frame (21), and in that said elastic return means are composed of tension springs (35) of which one end is connected to the head end of the bars (34) and the other end is anchored to an upright (24) of the frame (21), in that said first guide and stop means are composed of pairs of cross pins (36, 37) provided respectively on the front and rear ends of each bar (34) and slidable respectively in pairs of horizontal guide and stop slots (38, 39) formed in the side walls of each tubular longitudinal member (25) of the frame (21).

3. Bed (20) according to Claims 1 and 2, characterized by the fact that said retaining means are composed of two pawls (50) which are positioned respectively on each tubular longitudinal member (25) of the frame (21), are connected to a transverse rotating shaft (55) for rotation therewith, and are provided with a hook (56) which, via an aperture (57) formed in the top side of the tubular longitudinal member (25) of the frame (21), is able to engage in stop indentations (51, 52, 53, 54) formed in the top side of the regulating bar (34), said pawls (50) being continuously urged to rotate to the position of engagement with said indentations (51, 52, 53, 54) in the bar (34) by respective torsion springs and being releasable from said indentations (51, 52, 53, 54) of the bars (34) by manual actuation of a lever (58) connected transversely to the rotating shaft (55) of the pawls (50).

4. Bed (20) according to the preceding claims, characterized by the fact that said swinging connecting means comprise a rod (40) whose top end is articulated to the dorsal support section (28) and whose bottom end is articulated on said front cross pins (36) of the bar (34) coaxially to a roller (41) slidable in the tubular longitudinal member (25) of the support frame (21), a triangular bow (43) provided with a sinuous slot (47) and fastened to the frame (21) at the rear horizontal guide and stop slots (39) for the rear cross pins (37) of the bar (34), a conical arm (48) having its top end pivoted at the top vertex of the triangular bow (43) and its bottom end articulated to the rear cross pins (37) of the bar (34) by means of an open slot (73), a rectilinear connecting arm (68) having its top end pivoted on the femoral section (31) and its bottom end provided with a pivot pin (69) slidably engaged both in the sinuous slot (47) of the triangular bow (43) and in a rectilinear longitudinal slot (49) formed in the middle portion of the conical connecting arm (48).

5. Bed (20) according to the preceding claims, characterized by the fact that said swinging guide and stop means comprise a trapezoidal bow (42) fixed to the frame (21) of the bed (20) at the front horizontal guide and stop slots (38) for the front cross pins (36) of the regulating bar (34) and provided with an arcuate slot (44) and with two cross pins (45, 46) respectively keyed in the top and bottom parts of the bow (42), a rectangular bow (60) anchored on the side of the dorsal section (28) in such a manner as to project in cantilever fashion towards the adjacent lumbar section (29), and provided with an undulating slot (61) in which the top cross pin (45) of the trapezoidal bow (42) slides, an elbow bow (63) slidably connected to the dorsal section (28) and having a curved end (64) protending towards the lumbar section (29), and a pin (65) slidable in the arcuate slot (44) of the trapezoidal bow (42) and able to cooperate with known articulation devices of the cervical section (27) relative to the dorsal section (28), said rectilinear connecting arm (68) having its top end pivoted on the femoral section (31) and its bottom end provided with a pivot pin (69) slidably engaged both in the sinuous slot (47) of the triangular bow (43) and in a rectilinear longitudinal slot (49) formed in the middle part of said conical connecting arm (48), an upright (67) whose bottom end is fixed to the tubular longitudinal member (25) of the frame (21) and whose top end is pivoted on the side of the femoral section (31), an upright (72) whose bottom end is fixed to the tubular longitudinal member (25) of the frame (21) at the foot of the bed (20) and whose top end is pivoted on the side of the leg and foot section (32) in a rectilinear longitudinal slot (71) formed in a longitudinal plate (70) fixed on the side of the leg and foot section (32).

6. Bed (20) according to the preceding claims, characterized by the fact that said guide and stop means comprise said top pin (45) of the trapezoidal bow (42), said pin (65) of the curved end (64) of the elbow bow (63) and said pin (69) of the bottom end of the rectilinear connecting arm (68), which are slidable respectively in said undulating slot (61) of the rectangular bow (60), in said arcuate slot (44) of the trapezoidal bow (42), and in said sinuous slot (47) of the triangular bow (43).

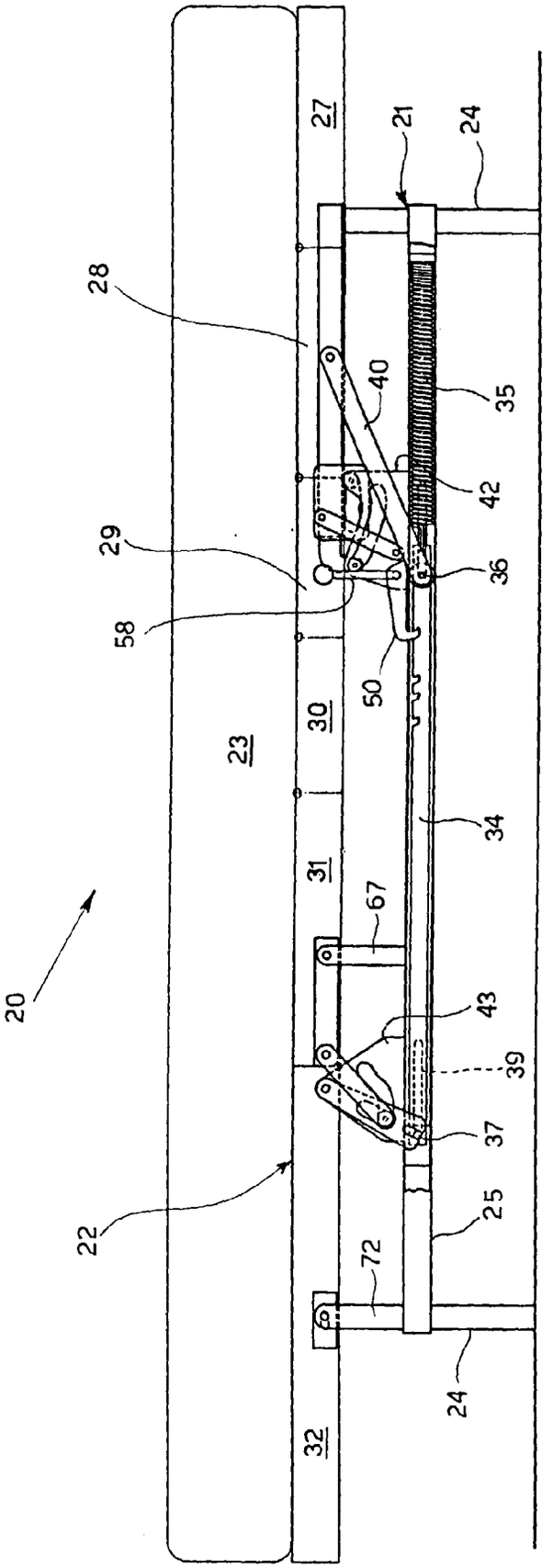

FIG. 1

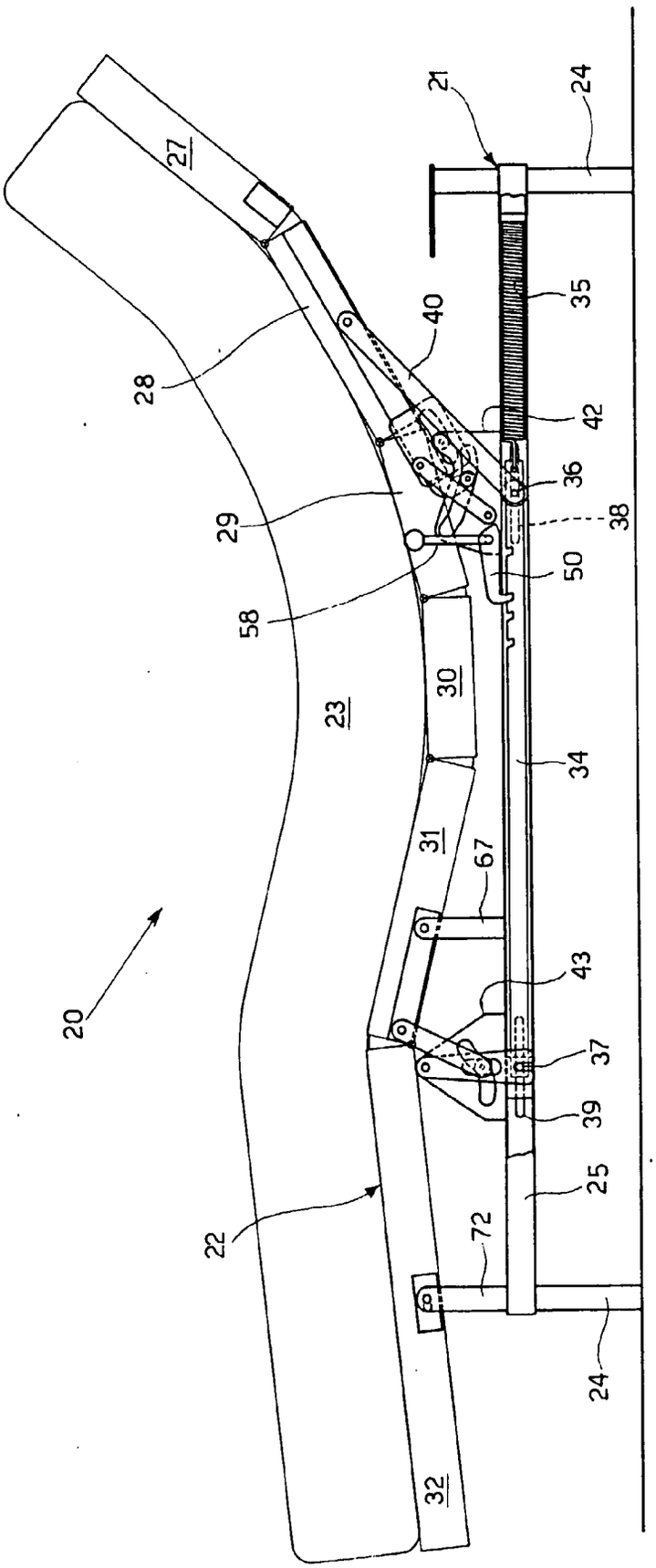
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FIG. 2

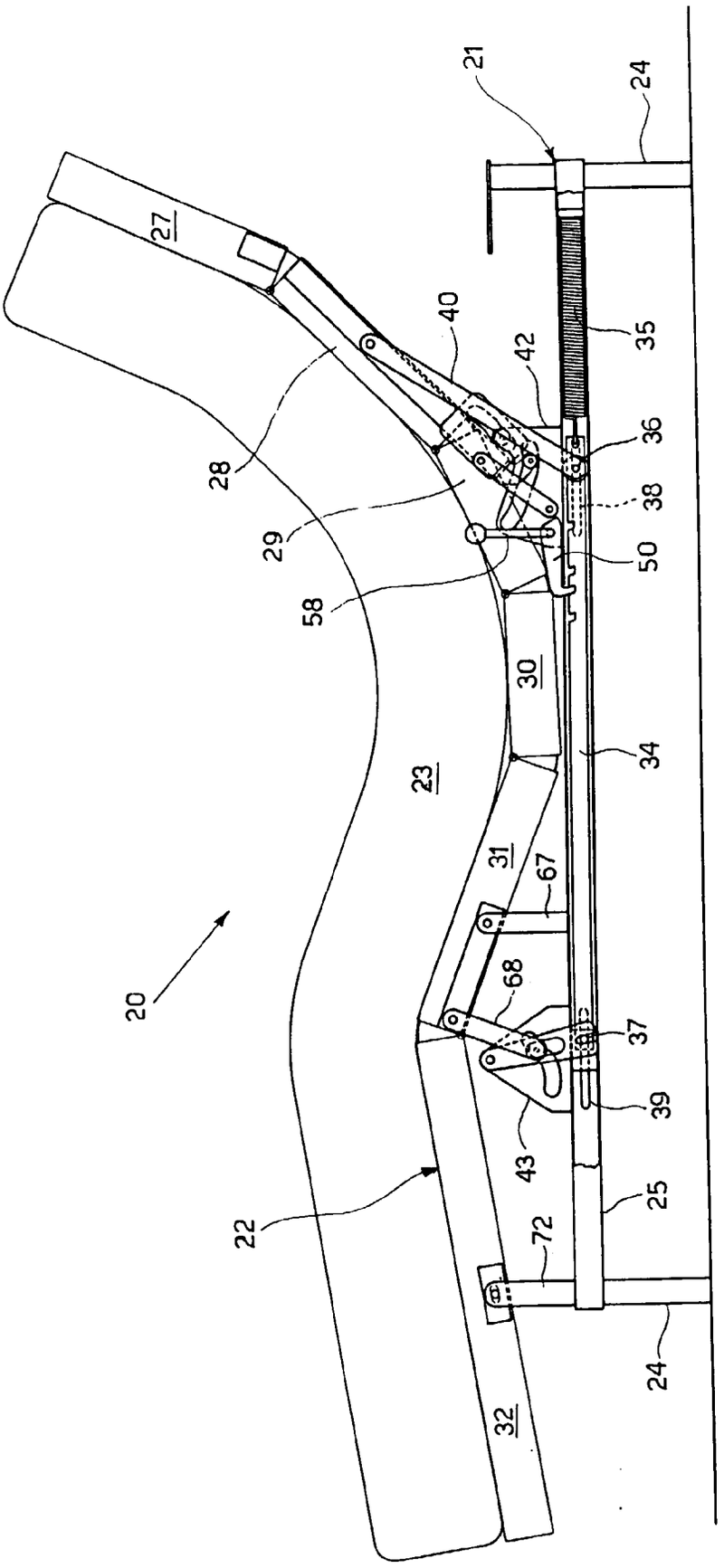
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FIG. 3

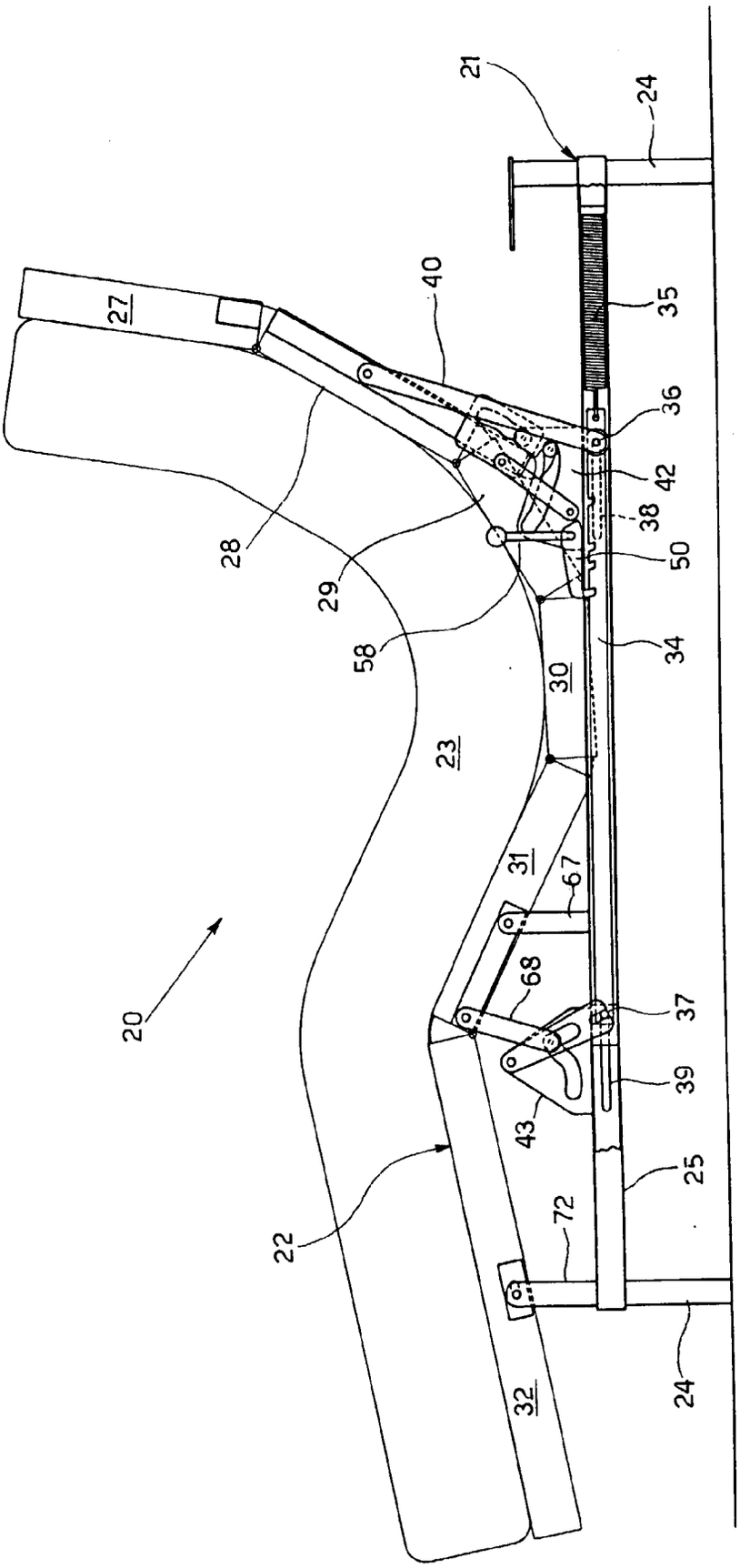
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FIG. 4

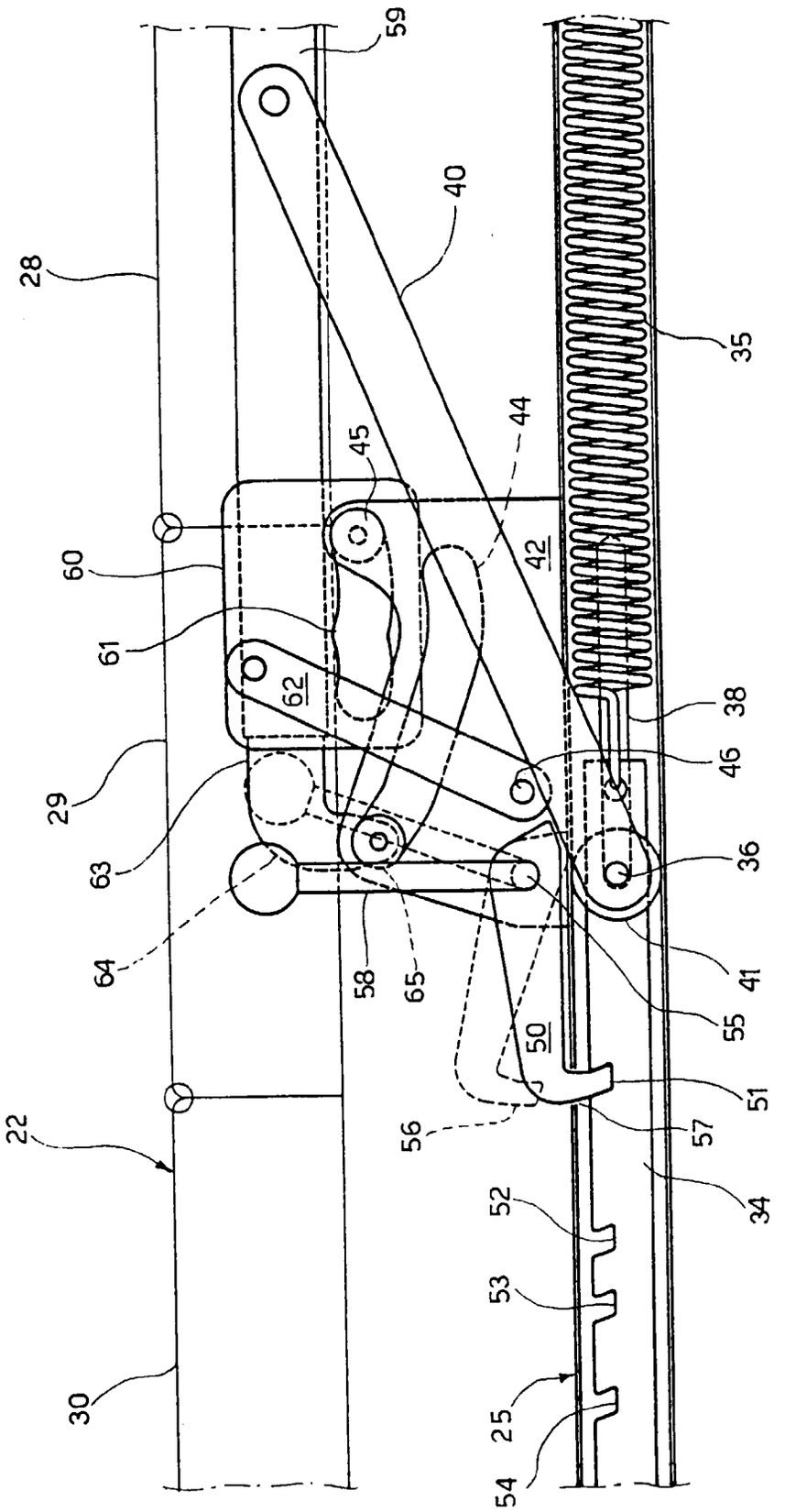
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FIG. 5

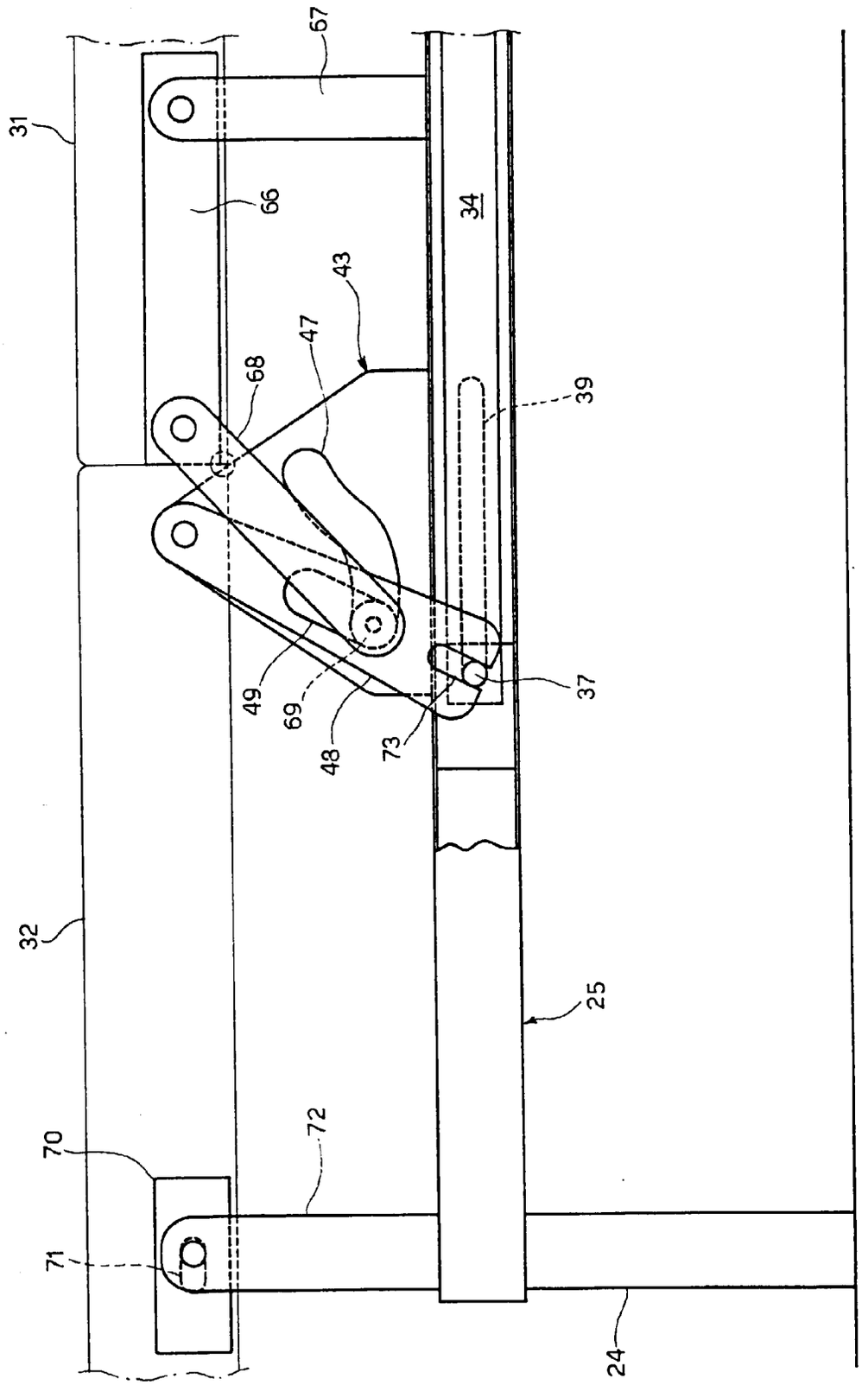

FIG. 6

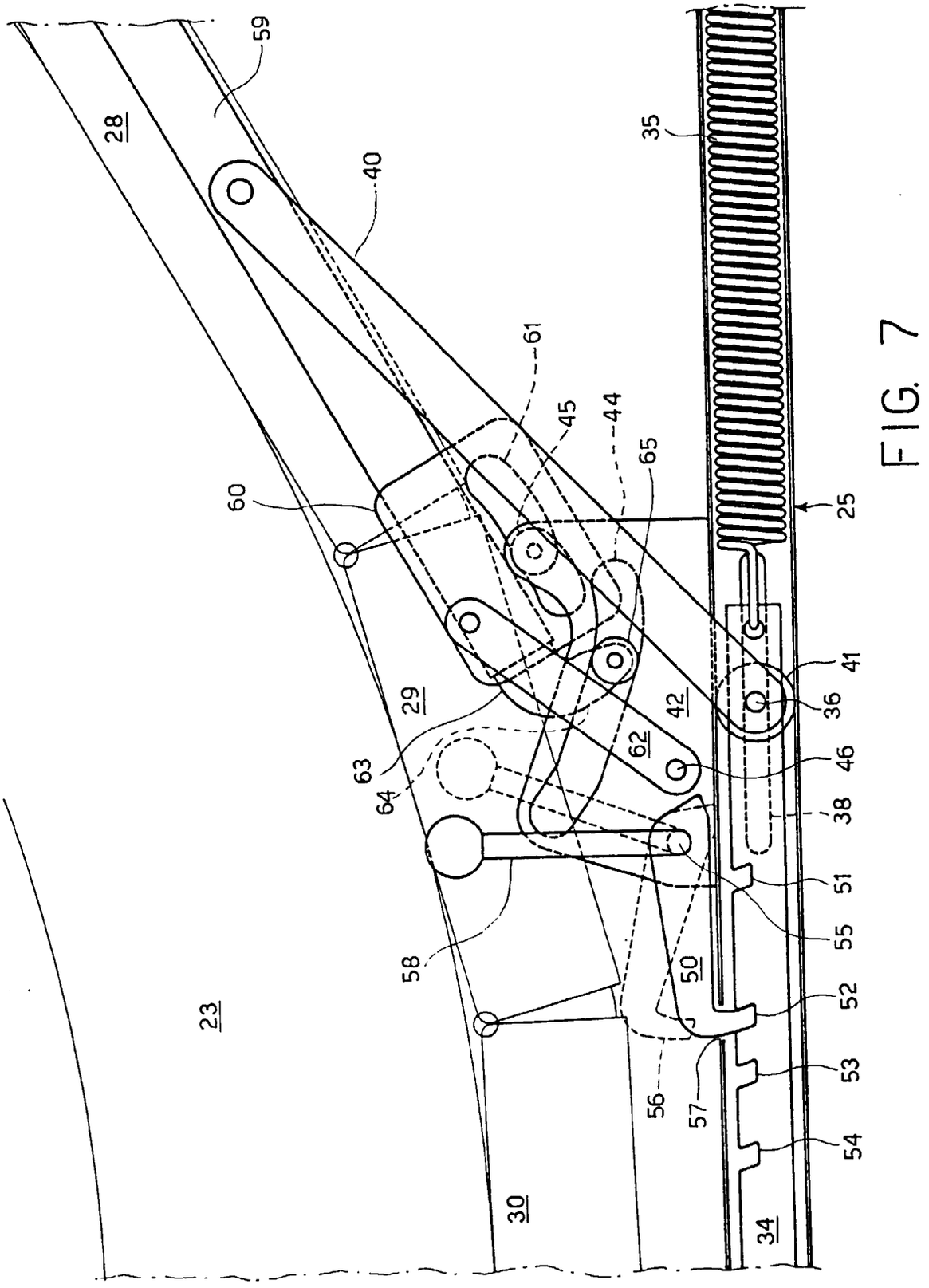
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FIG. 7

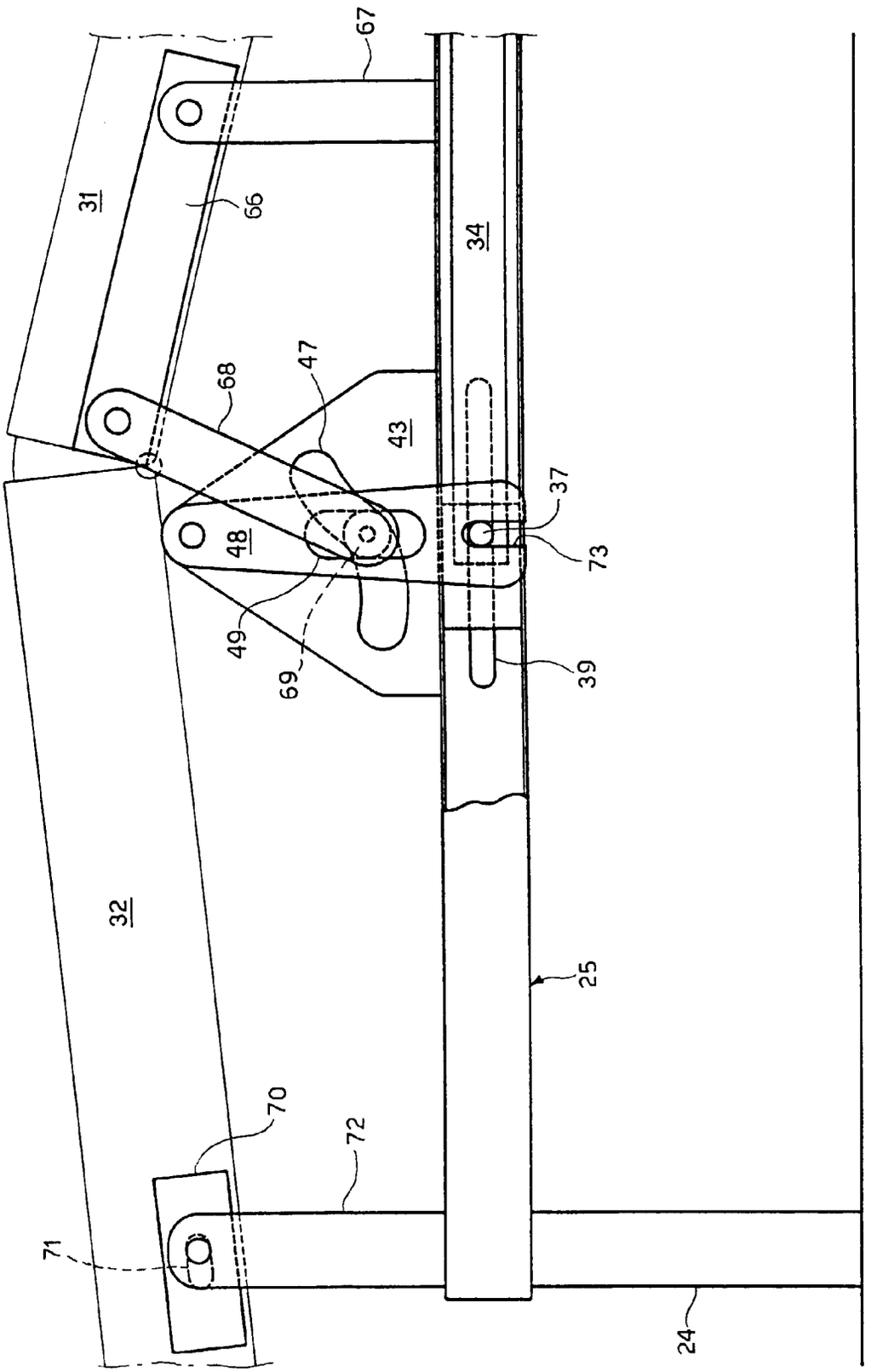

FIG. 8

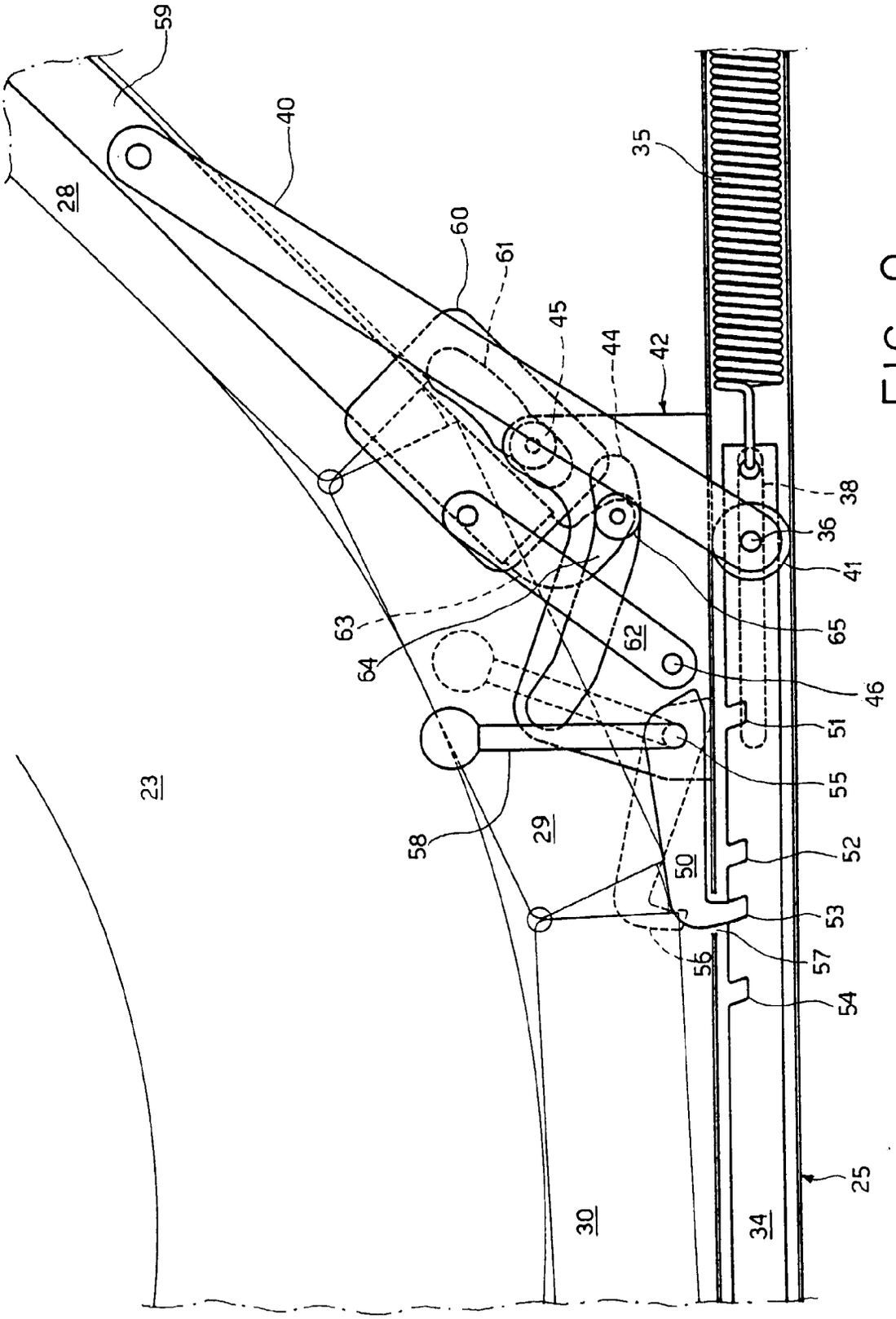
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FIG. 9

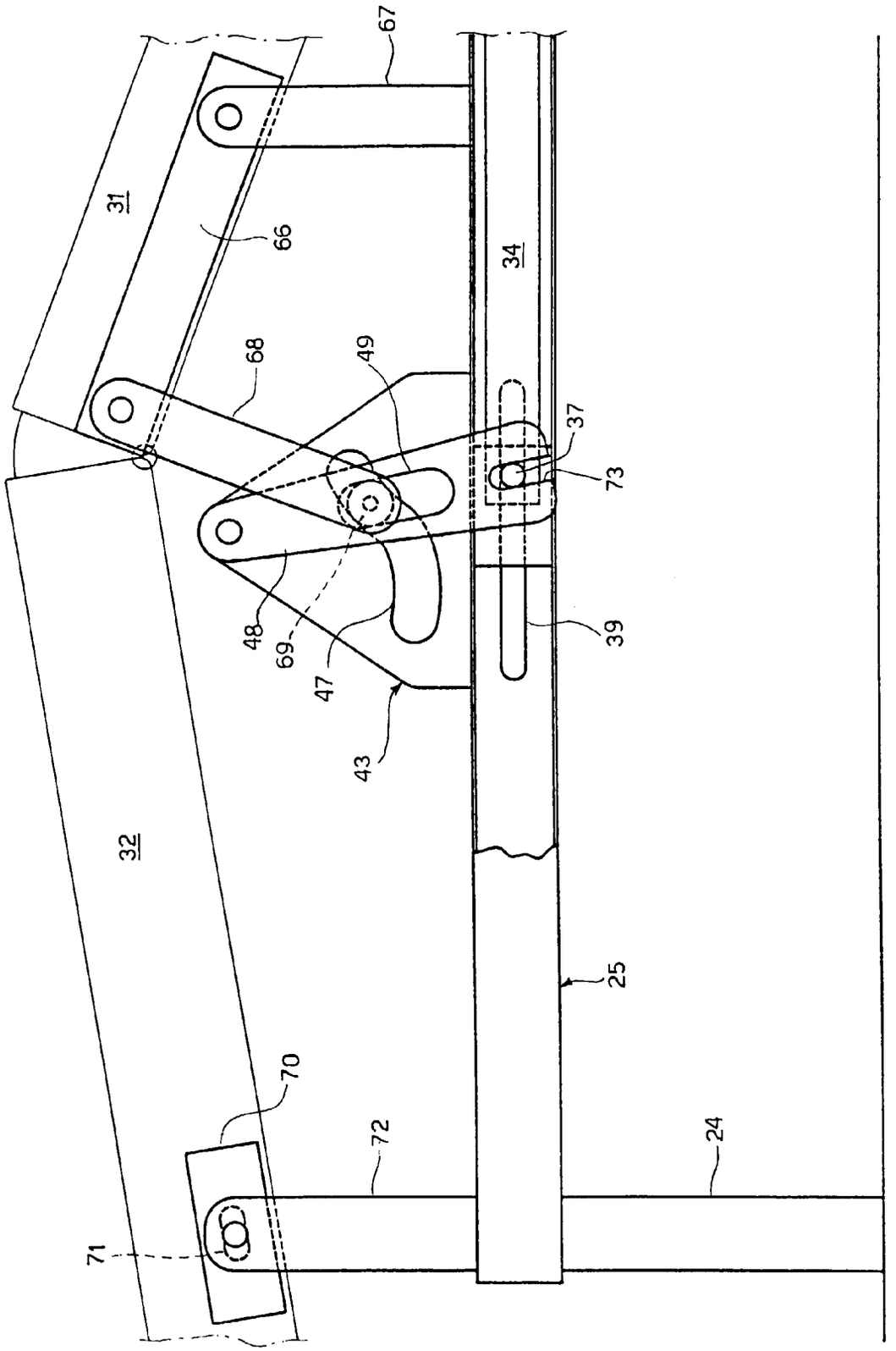

FIG. 10

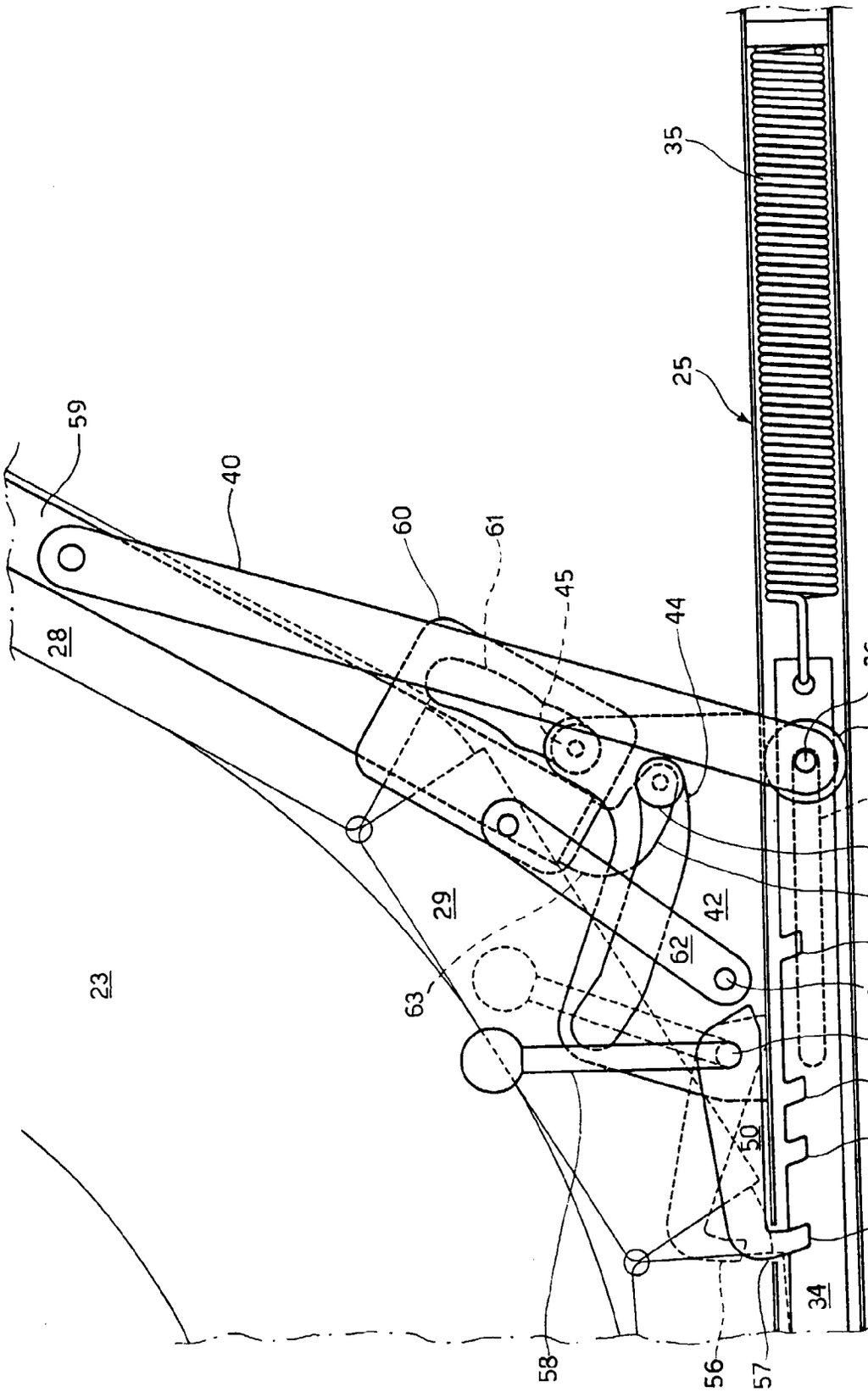
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FIG. 11

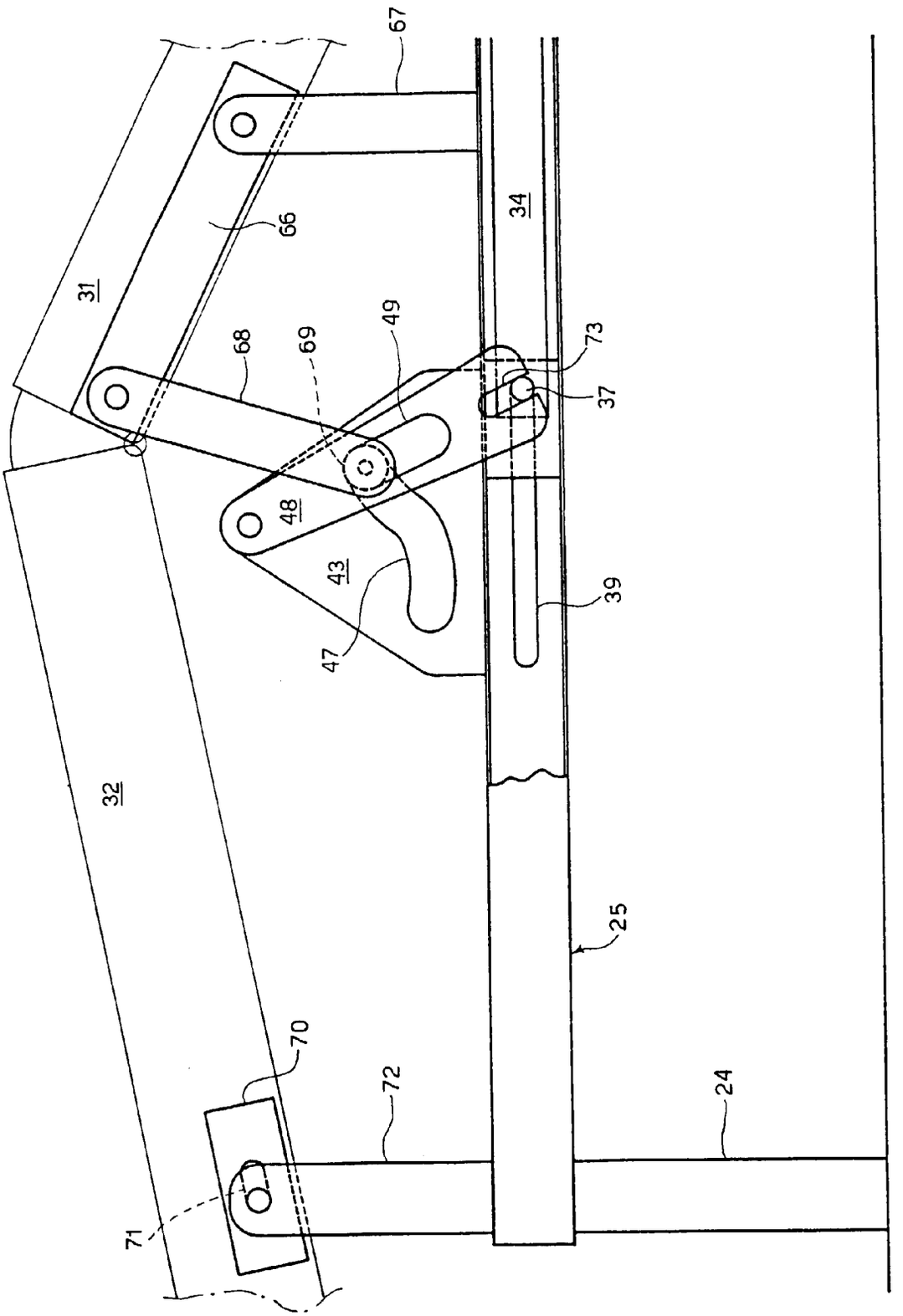

FIG. 12

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 20 3685

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	GB 409 463 A (VAUGHAN) * figures * -----	1,2	A47C20/08

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A47C
A61G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	24 March 1997	VandeVondele, J

CATEGORY OF CITED DOCUMENTS

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