

[54] **DIVAN-BED**

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[58] Field of Search.....5/13, 14, 17, 18, 24-27, 5/37, 41-43

[56]

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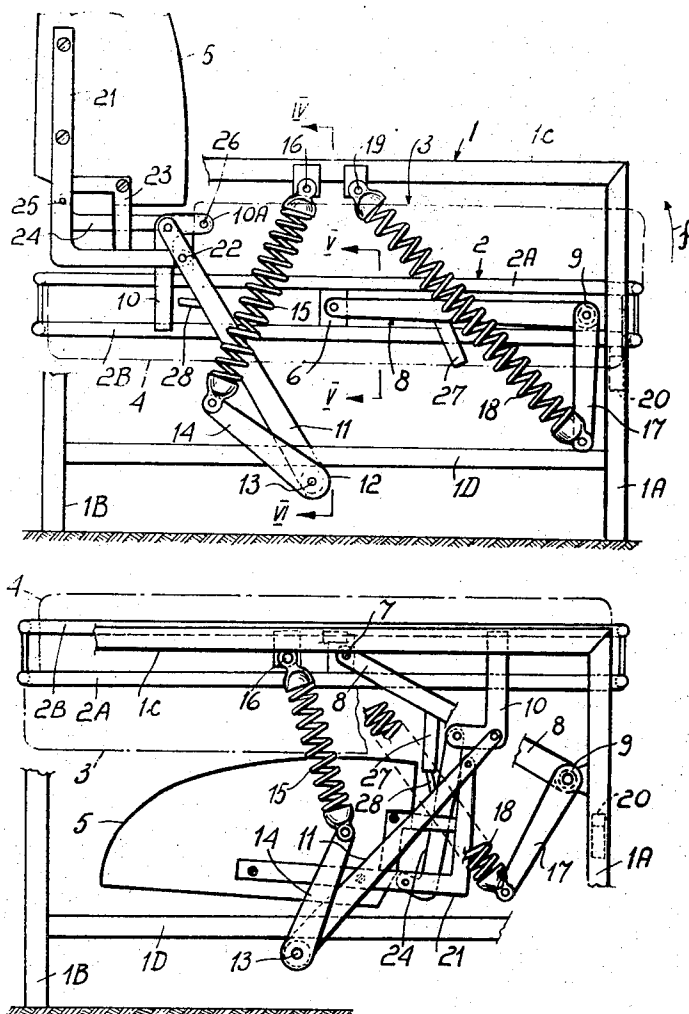
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[57]

ABSTRACT

A divan bed, including a fixed supporting structure, a frame tiltable in two positions displaying for use in one of the positions seat cushions and in the other a mattress. It further comprises a back that in the bed arrangement is admitted under the frame to sustain the cushions and is articulated to said frame.

4 Claims, 12 Drawing Figures



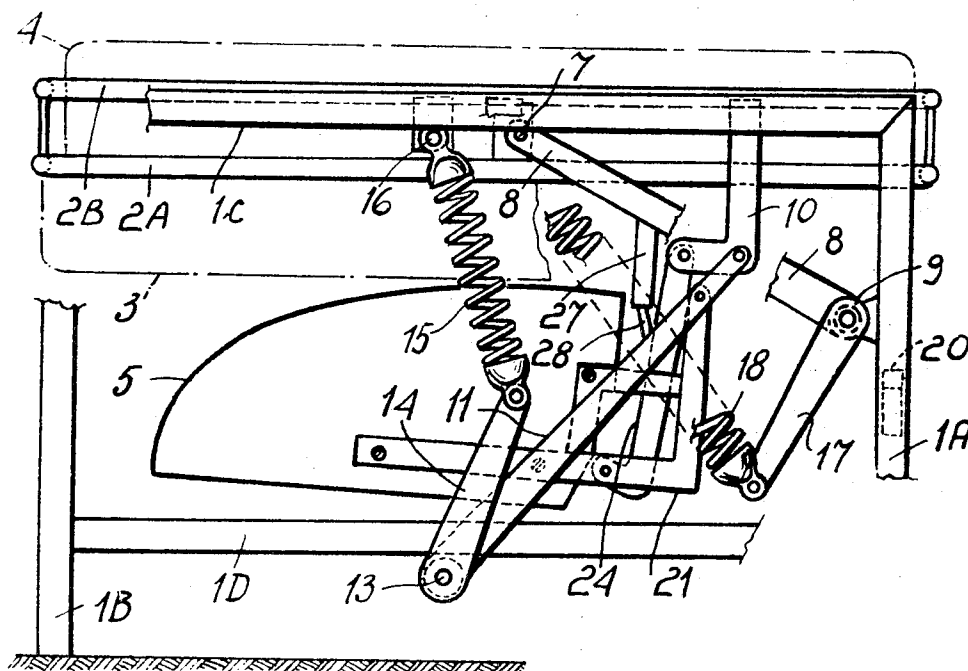
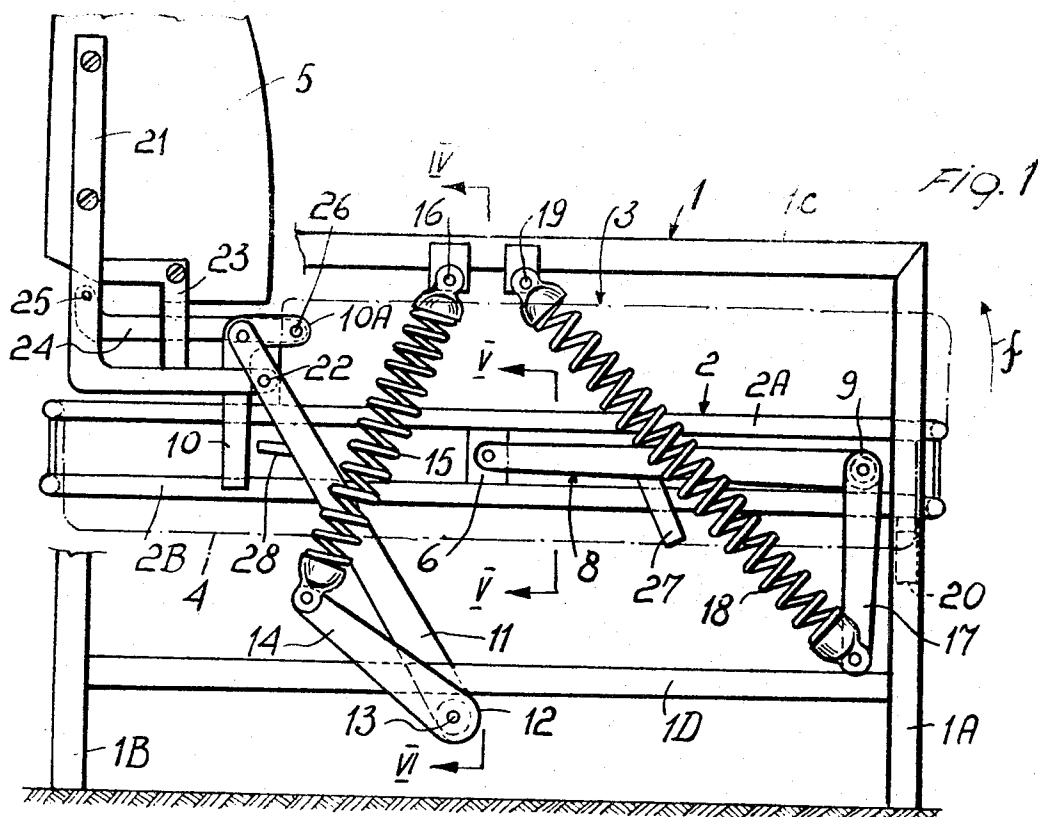
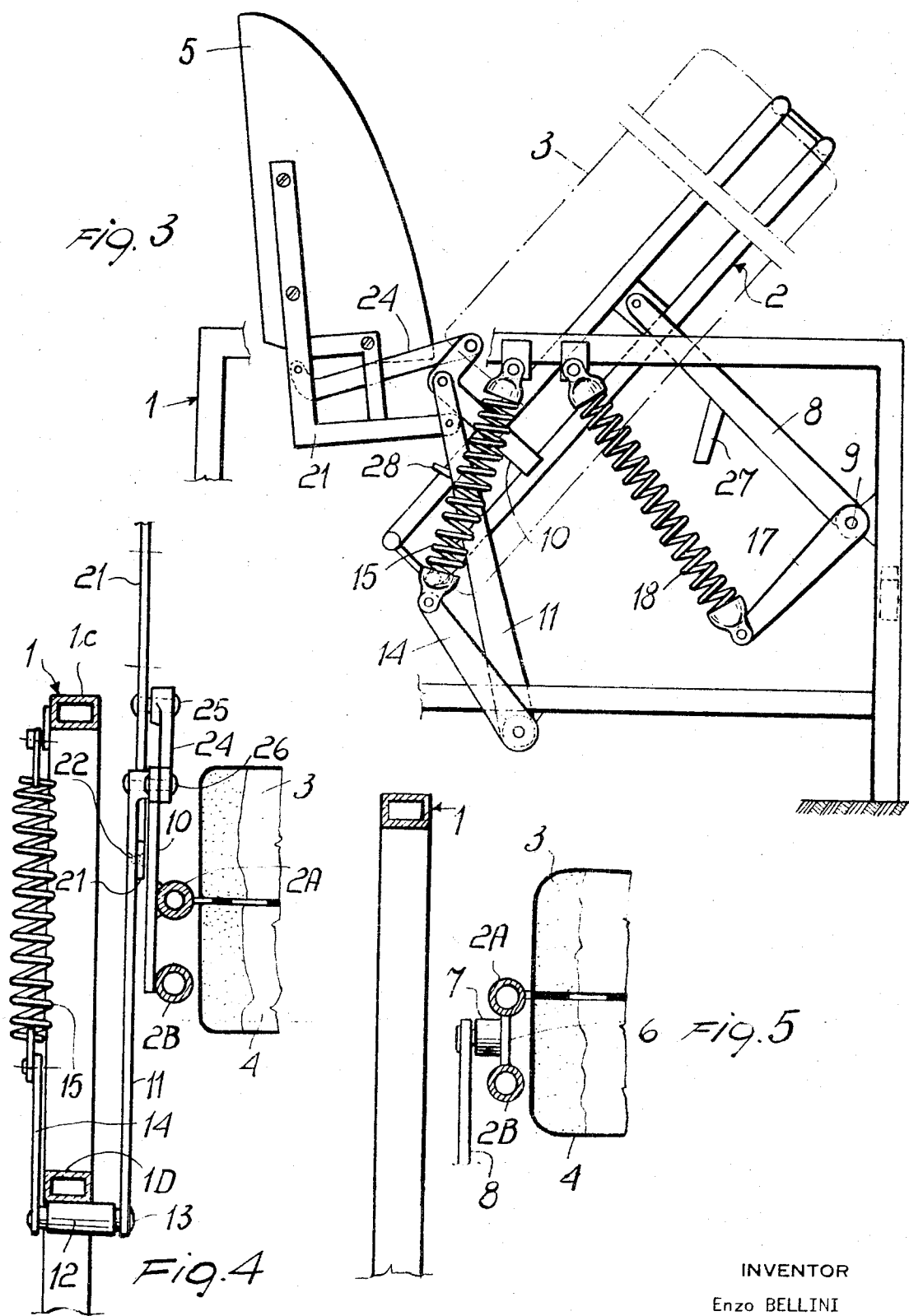


FIG. 2

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Fig. 6

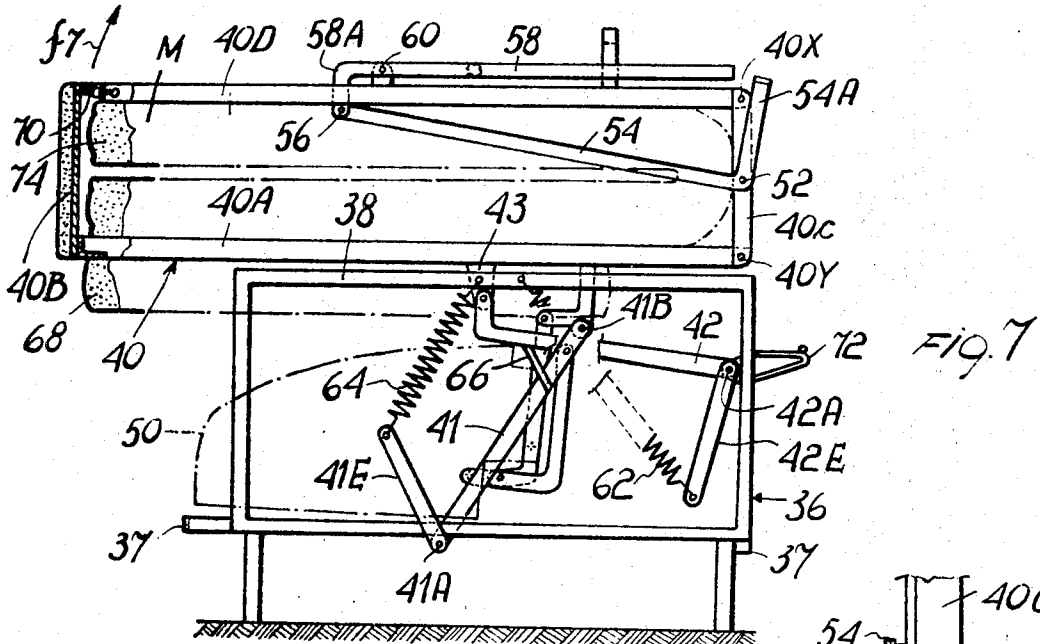
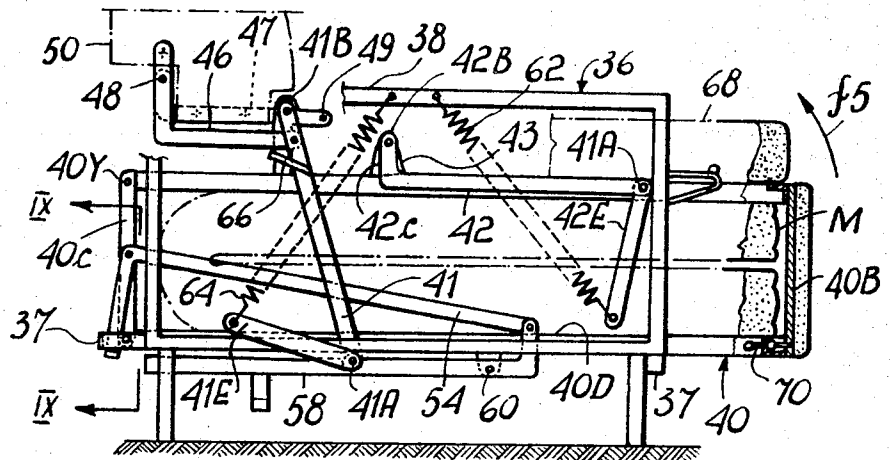


Fig. 8

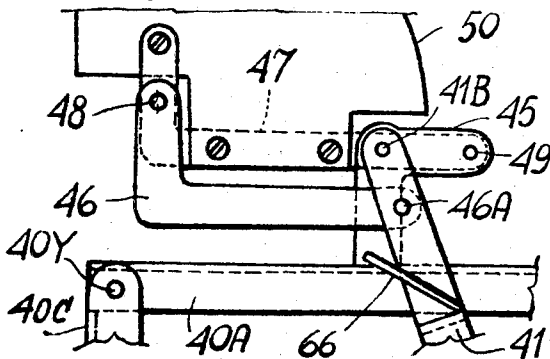
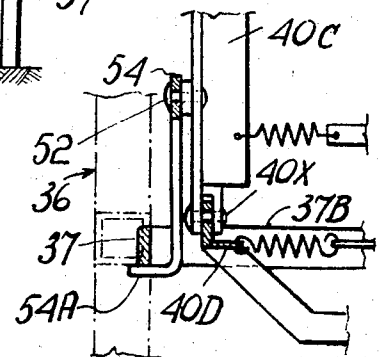


Fig. 9



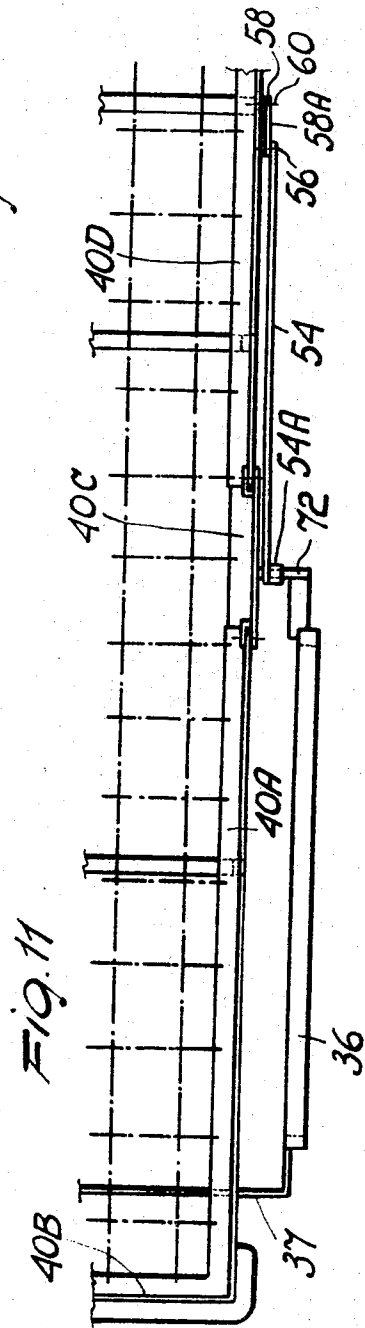
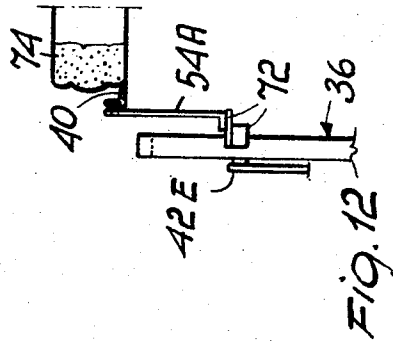
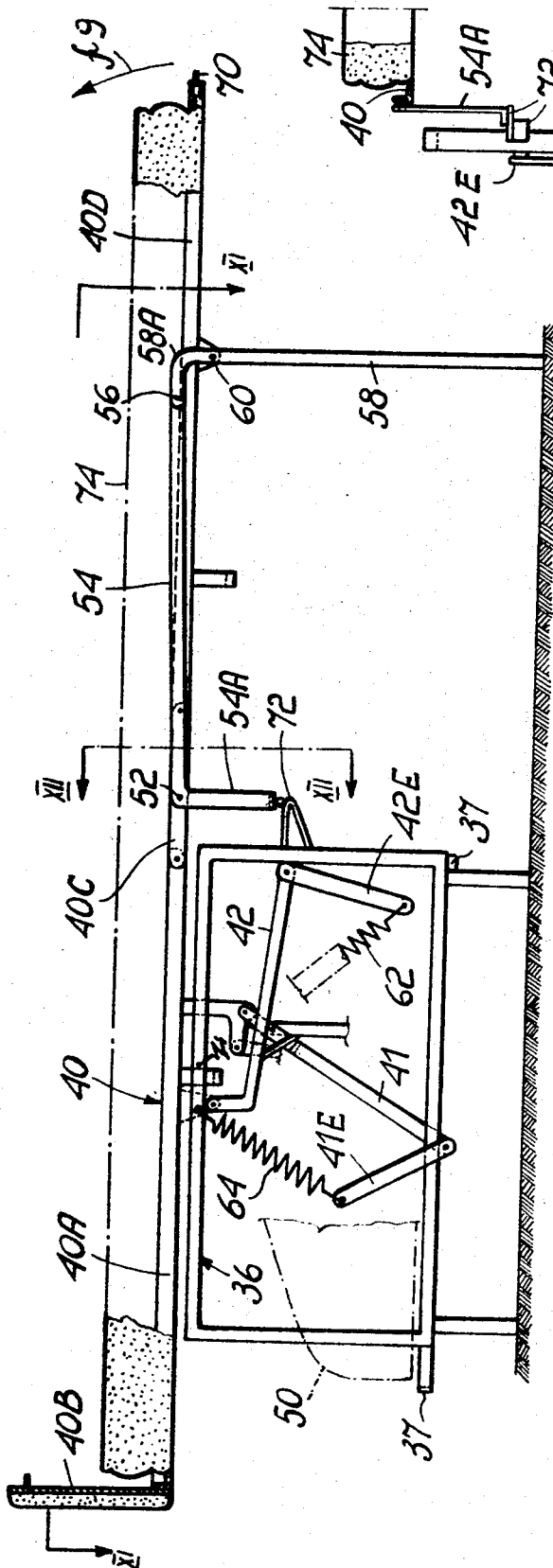
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DIVAN-BED

BACKGROUND OF THE INVENTION

This invention relates to a divan transformable into a bed. Divans transformable into beds by overturning the seat assembly thereof are already known in the art. The divan arrangements suggested by the prior art, however, suffer a number of inconveniences such as high manufacturing cost, indesirably noisy operation, difficult maneuvering, and the like. One object of this invention is substantially to eliminate the inconveniences mentioned above.

SUMMARY OF THE INVENTION

The divan-bed according to the invention comprises a fixed supporting structure, a frame overturnable in two positions. In one position it displays seat cushions and alternatively, in the other position, a mattress. It comprises further a back that, in the arrangement as a bed, is admitted under the frame to bear the cushions. This back is articulated to said overturnable frame. The divan-bed according to the invention offers particular simplicity and agility of maneuver. It can be produced for a single bed parallel to the back, and as a double bed orthogonal to the extension of the back.

According to the invention, the drop frame is on everyone of the two opposite sides bound to the structure by two levers susceptible of limited movement about the articulation provided on the structure, the levers remaining orientated the one approximately horizontal or a little raised from the front side towards the back in the position of use, the other towards the top in positions approximately symmetrical about a vertical position; every lever is rigid with an angled arm, in respect to the lever, and on which respective traction springs are anchored, reacting on the fixed structure to facilitate the beginning of the movement and to restrain it at the end.

The two levers in the bed arrangement can be positioned the first lightly inclined towards the top and rearwardly and the other inclined towards the top and forwardly beneath the first, and in a way to lean the one on the other through two heels.

One of the two levers is articulated forwardly and orientated rearwardly being articulated approximately to the center of the overturnable or drop frame, and the other of the levers is articulated at the bottom and orientated towards the top, being articulated to a bracket rigid with the frame and projecting from the seat side. Bound to the second lever and to the bracket providing articulation to the drop frame, are articulated quadrilateral elements, that aid to bear and move the back. In practice the brackets are square developed, and the articulated quadrilateral elements are accomplished in a way to fix the initial inclination of the seat with its cushions towards the back in the transformation from divan to bed, so as to assure the support of the said cushions with the continuation of the dropping or overturning operation, during which the seat and the back practically lean the one against the other.

The invention will be better understood from the following description and accompanying drawings, which show not limited examples of the invention.

In the drawings:

FIG. 1 shows a side view of a flank of a divan-bed of single bed-type, according to the present invention, in the divan arrangement or position;

FIG. 2 analogous to FIG. 1, shows the arrangement of the divan in the bed arrangement;

FIG. 3 analogous to the preceding, shows the divan in an intermediate arrangement;

FIGS. 4 and 5 show two transverse sections respectively according to the lines IV—IV and V—V of FIG. 1;

FIG. 6 shows a modified embodiment of a divan-bed of double bed-type, in the divan arrangement;

FIG. 7 analogous to FIG. 6, shows the divan in an intermediate transformation position;

FIG. 8 shows an enlargement of a detail of FIG. 6;

FIG. 9 shows a section according to IX—IX of FIG. 6 in an enlarged scale;

FIG. 10, analogous to FIG. 6 shows the above said divan in the bed arrangement;

FIG. 11 shows a partial plane view according to XI—XI of FIG. 10, and

FIG. 12 shows a section according to XII—XII of a detail of FIG. 10, in an enlarged scale.

With reference to FIGS. 1 to 5, a metallic structure of one of the sides of the divan is indicated at 1. The sides consist essentially of two uprights 1A, 1B, forming respectively the front and rear leg of the same side. The legs are joined to each other by an upper transverse piece 1C and by a lower transverse piece 1D. The two side structures of the divan are joined to each other by longitudinal beams and bands (not illustrated for drawing convenience) to give the fixed structure of the divan. At 2 is indicated the dropable or overturnable main framework that in the position of FIG. 1, receives upperly the seat cushions 3 (which can also be mobile) and has lowerly a mattress 4, anchored by known means, that forms the couch when the divan is positioned to constitute a bed. At 5 the back frame is generally indicated.

Every side of the dropable framework 2 has a bridge 6 that joins two tubular structures 2A, 2B constituting the framework itself. An arm 8 of a first crank-like lever is articulated to a pivot 7 of said bridge, and is hinged to the other end within a tube 9 connected with the front leg 1A.

Every side of the framework 2 has, towards the rearward part, a first bracket 10 projecting upperly and developing into a square (see FIG. 1). In the intermediate stretch, at the angle of said square, is fulcrumed an arm 11 of a second crank-like lever articulated to a tube 12 occurring at the lower transverse piece 1D. Said arm at the tube 12 is connected with a lever arm 14 by means of a pivot 13. A spring 15 is tensioned between a fixed point 16 and the end of said lever arm 14. The arm 8, analogous to the arm 11, is connected through the articulation on the tube 9, to a corresponding lever arm 17 to which anchors a second spring 18, anchored to the other end at 19. The two arms 8, 11 are dimensioned in such a way so as to allow the drop structure 2 in the arrangement illustrated in FIG. 1 to assume a horizontal position. Engagement pieces 20 fixed to the front leg 1A, towards the inside of the divan, make rests for the structure 2 in the divan arrangement, while the springs 15 and 18, operating within a suitable space obtained in the lining of the sides of the divan, are suitable to facilitate the tilting maneuver of the framework 2, counter-balancing the weight of the same.

From the upper part of every arm 11, one per side, there passes towards the rearward part of the framework 2, a square bracket 21, articulated at 22. Between the two brackets 21, one for every side of the divan, is fixed the structure of the back 5.

The corner of said square can be reinforced by connections 23, they also developing as squares, and which are suitable to increase the surface of junction of the back itself.

A strut 24 is articulated at its two ends at 25 and 26 respectively between every square 21 and at the end of the horizontal extension 10A of the square 10. Said strut assuring the position of the back to be approximately vertical in the daytime arrangement, and controls the rotation of the back itself to arrange itself in a horizontal way, during the transformation from divan to bed.

For such a transformation it is sufficient to act on the framework 2 in the direction of the arrow f (see FIG. 1) turning over the framework itself by 180° in order that the mattress 4 appears upperly. Such a maneuver causes the recovery of the back 5 under the framework 2, in such an arrangement, to efficiently bear the seat cushions 3.

Considering FIG. 3 it is noticeable how the connecting piece 24 in the first stretch of the drop or tilting operation allows the back 5 a displacement in a position slightly inclined with respect to the vertical, for which the cushions 3 are efficiently sustained from the base of the front of the back, before

that said cushions tend to come away from the back 2 in the drop process, towards the bed arrangement. Also in the inverse operation it achieves, on the part of the back, an effective support of the cushions 3. The proportion between the various elements favors a well balanced drop and makes the operations smooth.

Moreover the bed position is stabilized by the effect of the engagement of the support appendix 27, carried from the arms 8, with engagement pieces 28, rigid with the arms 11.

The springs 15 and 18 intervene, in the transformation from one to the other arrangement, to facilitate the beginning of the movement and to restrain it at the end.

The two arrangements are stabilized by the cooperation between the two lever arms 8 and 11 that work as struts or connection pieces in the various arrangements or positions, depending on the position according to which the load urges on the frame 2, in the two situation arrangements or positions.

FIGS. 6 to 12 illustrate an embodiment of a divan transformable into a double bed.

In this embodiment at 36 is indicated one of the two fixed sides, that are joined between them by longitudinal beams 37 and form together the principle skeleton resting through feet on the floor. A transverse piece 38, aids to form the arm. At 40 is indicated a tiltable or drop framework made up of three sections articulated to each other, and formed from three frames 40A, 40C, 40D with spring members forming together the sprung surface functioning as elastic-like nets. As is visible in the side view of FIGS. 6 and 7, the structure 40 can assume a rectangular position. The element 40A (which is above in the divan arrangement) of said framework forms upperly the supporting surface for the seat cushions 38 in the divan arrangement. To the said element a frontal piece 40B is fixed, which in the bed arrangement, will form the headpiece of the bed itself. The intermediate element 40C joins with the articulations 40x and 40y the upper element 40A with the lower element 40D; a bar 70 allows binding, with the possibility to control the release for the transformation into the bed arrangement, the frontal piece 40B at the end of the element 40D to close the framework 40 itself, which contains in the space so formed a double mattress M folded on itself.

At each side are provided two lever arms 41 and 42 articulated at 41A and 42A at the corresponding side 36. The arm 42 is articulated at 42B to an appendix piece 43 formed from the element 40A, arranged above the supporting surface of the cushions 68 in the divan arrangement, the end of the arm being folded into a square 42c towards the top, so as to make possible the disengagement of the arm 42 itself laterally to the framework 40, under the element 40A in the divan arrangement. A lever arm 42E is connected to the arm 42. A traction spring 62 is coupled to the said lever 42E and to the transverse piece 38 of the side 36. The lower part (in the divan arrangement) of each side of the element 40A has a square bracket 45, in which, at the corner, is articulated at 41B the end of the arm 41. To the said arm 41 a lever arm 41E is connected. A traction spring 64 is coupled to the said lever 41E and to the transverse piece 38. Near the articulation 41B of the upper end of said arm 41 is articulated at 46A a second square 46, that extends towards the rear part of the divan; a shaped connecting piece 47 is articulated at the point 48 to said square 46 and at the point 49 to the horizontal extension 45A of the bracket 45. The structure of the back 50 is anchored to two connecting pieces 47, one for every side.

At each side, the intermediate element 40C carries in an intermediate position an articulation 52 for a rod 54, which to its free end is articulated at 56 to the square end 58A of a support foot 58, said foot being bound to the frame 40D through an articulation 60; the feet 58 of the two sides can be joined between them. The rod 54 has an arm 54A developed to a square with respect to the rod itself and bearing the articulation 52. The elements 54, 54A, 58 aid for the automatic positioning of the foot 58 in the support arrangement of the frame 40D in an intermediate position, and for strengthening the whole structure.

For the transformation of the divan to a double bed, in the first place by means of the articulated ties formed by the arms 41 and 42, the overturning of the assembly 40 is carried out from the arrangements of FIG. 6 to that of FIG. 7, passing through inclined intermediate positions, the movement occurring in the direction of the arrow f5 of FIG. 6. This drop, both for the initial maneuver and for the last part of such a maneuver, is facilitated by the tensions springs 62 and 64, that are anchored at one side to the upper transverse piece 38 forming the frame arm 36 of the side, and at the other side to the levers 42E and 41E respectively, of the arms 41 and 42. At the termination of the overturning from the arrangements of FIG. 6 to that of FIG. 7, the arms 41 and 42 reach a position, illustrated in FIG. 7, in which they lean one against the other, and in which the arm 42 particularly leans against a support heel 66 carried by the arm 41. It is noticeable that in the abovesaid drop operation, the arm 42 rises limitedly rotating about the hinge 42A afterwards to lower, while the arm 41 moves angularly from the arrangement of FIG. 6 into the arrangement of FIG. 7 about the hinge 41A with a short initial counterclockwise movement and afterwards with a clockwise movement until reaching the position of FIG. 7, in which it has a support heel 66 in a position below the arm 42, that supports thereabove. In the initial drop operation from the arrangement of FIG. 6 towards the arrangement of FIG. 7, there is an initial relative movement between the back 50 and the seat cushions 68, such for which, the seat cushions, and eventually those of the back, sustain each other and remain engaged between the back 50, that is admitted to the underneath of the framework 40, and the frame 40A on which it supports the cushions 68.

After having reached the arrangement shown in FIG. 7, the frame 40D is disengaged from the part 40B forming the back of the bed, by acting on the clamping bar 70. When this is carried out, the rising of the frame element 40D takes place about the articulation 40x in the direction of the arrow f7 of FIG. 7, and from the part of the frame 40C around the articulation 40y, until carrying the parts of the frame 40C and 40D in an aligned condition with the part of the frame 40A, as is shown in FIG. 10. During this maneuver, due to the action of the rod 54 on the square end 58A of the foot 58, the latter moves from the arrangement in contact with a part of the frame 40D, progressively away with the increase of the angle between parts 40C and 40D, until reaching an orthogonal position with respect to a part of the frame 40D. At the same time the arm 54A of the rod 54 moves with the rod itself, and in the arrangement of FIG. 10 reaches a support condition on a support bracket 72 provided on the frame 36. After all, a positioning of the three frame parts 40A, 40C and 40D aligned between them is obtained to form the couch of the double bed, which is sustained both by the rods 41, 42 (for the part of the frame 40A) and by the articulations 54A, 54 and by the feet 58 (with regard to the frame parts 40C and 40D). The mattress 74, which is found folded up between the frame parts 40A and 40D in the arrangement of FIGS. 6 and 7, distends automatically on the couch, enabling it to be adequately bound to the corresponding frame parts.

It is noticeable that the level reached by the couch is above the level of the arms carried or formed from the transverse part 38 of the side frame 36, so that the bed is free laterally, besides to expose the head formed by the part 40B.

For the reverse transformation (from bed to divan), the parts 40D and 40C go back from the arrangement of FIG. 10 into that of FIG. 7 for lifting in the direction of the arrow f9 of FIG. 10, until to bring again the assembly 40 into the arrangement of FIG. 7. Hence, with the previous clamping of the parts 40D and 40B with the bar 70, the assembly 40 is tilted in the direction of the arrow f7 from the arrangements of FIG. 7 into that of FIG. 6, with the consequent angular movement of the arms 41 and 42 and with the consequent intervention of the springs 62 and 64. In this transformation the seat and back cushions sustain each other as first said and are finally found in their regular condition, by virtue of articulations 46 and 47 which impede a fall of cushions, even if free.

It is understood that the embodiments described and illustrated are given as indicative and non limiting examples and that many modifications of the inventions are possible within the scopes defined by the following claims.

I claim:

1. A divan-bed including a fixed supporting structure having two side frames rigidly connected with one another, a main frame mounted on the said supporting structure between the said side frames tiltable in two positions for displaying in one of said positions seat cushions and in the other of said positions a mattress, a lever system mounted on each of said side frames and operatively connected to the said main frame, a back frame articulated to the said lever system, wherein according to the improvement the said lever system comprises a first crank-like lever element fulcrumed on the said side frame and pivoted at one free end thereof to the said main frame, a first spring means tensioned between the other free end of said first crank lever element and a fixed point in said side frame, a second crank-like lever element fulcrumed on the said side frame in spaced relationship with the said first crank lever element and pivoted at an intermediate portion thereof to the said back frame, a first bracket element pivoted both to one free end of the said second crank lever element and the said main frame a second spring means tensioned between the other free end of the said second crank lever element and a fixed point in said side frame, wherein the lifting of the said main frame from the said one of said positions an approaching

pivotal movement of the said back frame to the said main frame and an overturning movement are caused to occur thus reaching the said other of said positions where a mattress is displayed and the said back frame is located under the said main frame.

2. A divan-bed as claimed in claim 1, wherein the said back frame comprises at each of the said side frames a square bracket element articulated to an intermediate portion of the said second crank-like lever element, a reinforcing connection element rigid with the said square bracket, and a strut member articulated at the free ends thereof between the said square bracket element and the said first bracket element.

3. A divan-bed as claimed in claim 1, wherein the said main frame further comprises a first, a second and an intermediate frame sections articulated to one another which in a folded rectangular position thereof define a seat assembly and in an extended spread out position thereof define a supporting frame work for mattresses for a double bed.

4. A divan-bed as claimed in claim 3, wherein to the said intermediate frame section in an intermediate position thereof a rod-like member is articulated and a support foot member is pivoted to the said second frame section, a square rigid element being articulated both to the said rod-like member and the said support foot member, thereby providing an automatic positioning of the said foot member when the said main frame is arranged in an extended spread out position.

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