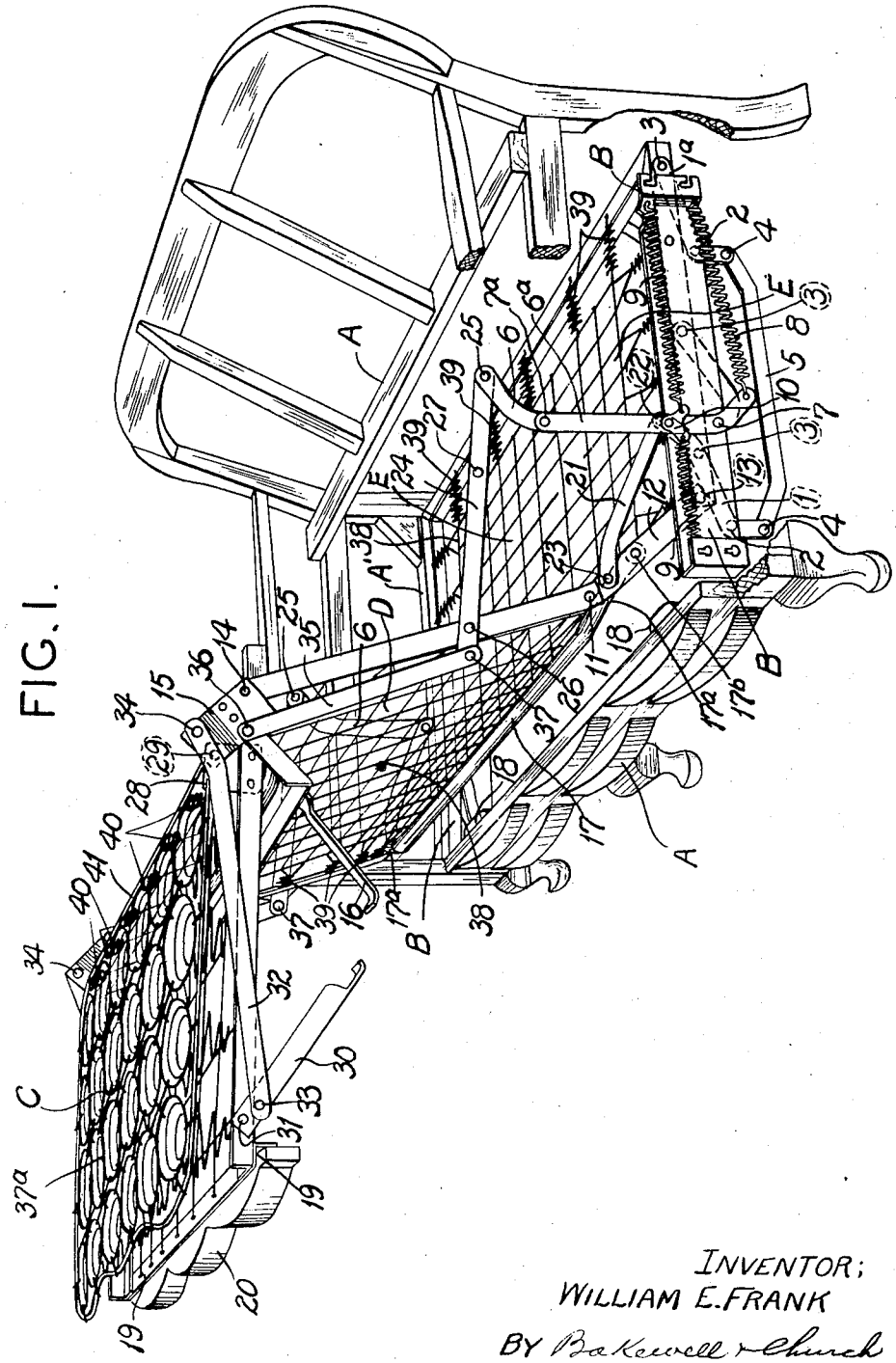
Jan. 30, 1934. W. E. FRANK 1,945,186

FOLDING COUCH OR DAVENPORT

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FIG. 1.



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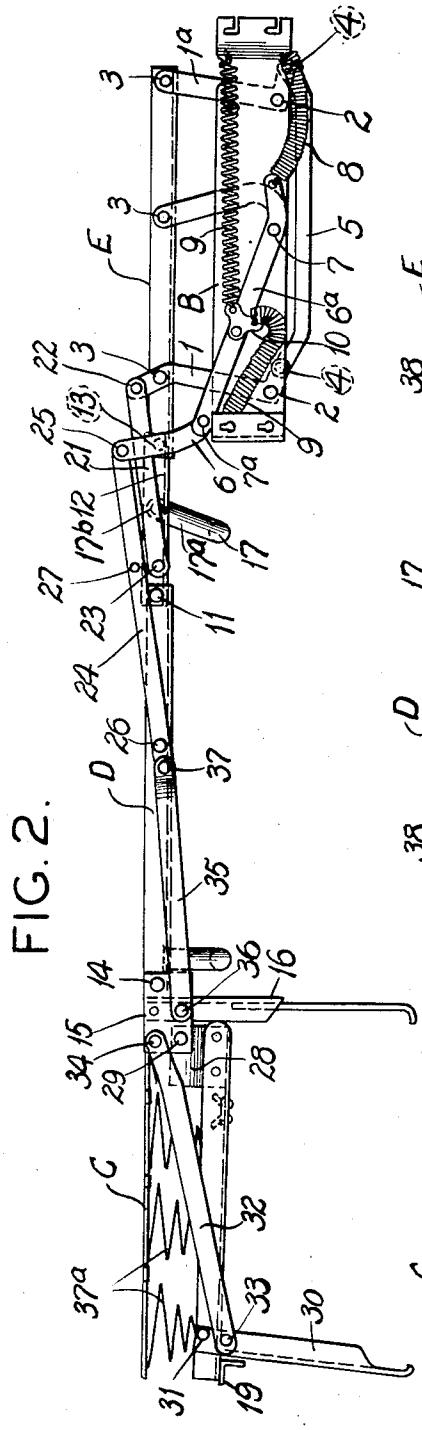


FIG. 2.

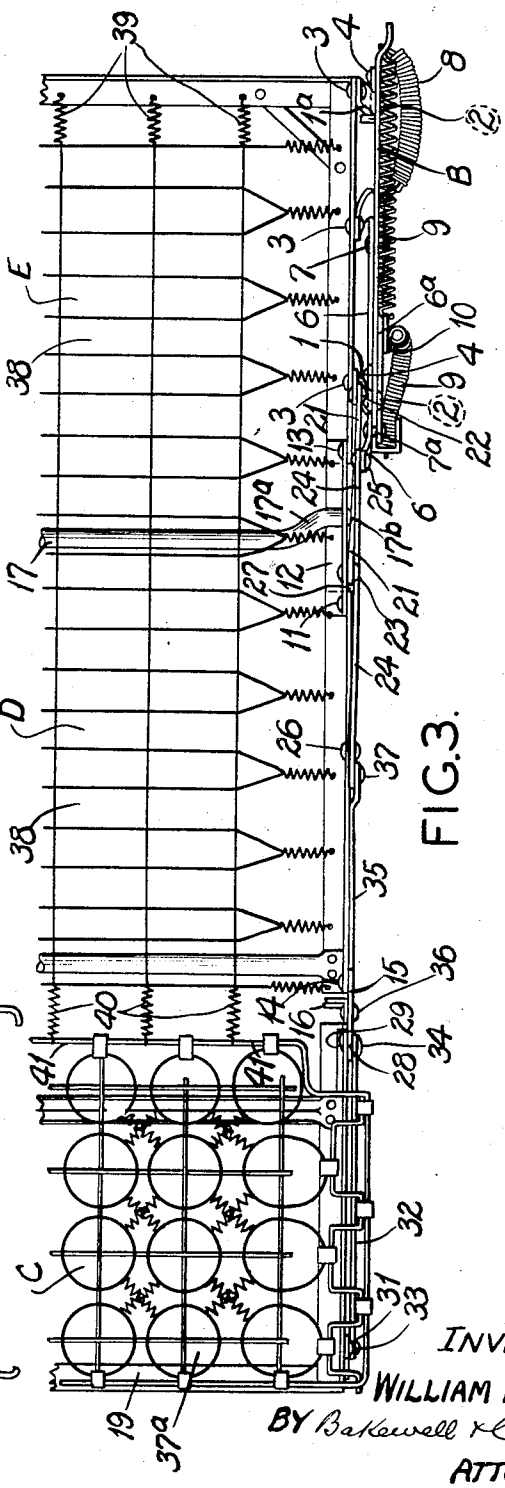


FIG. 3.

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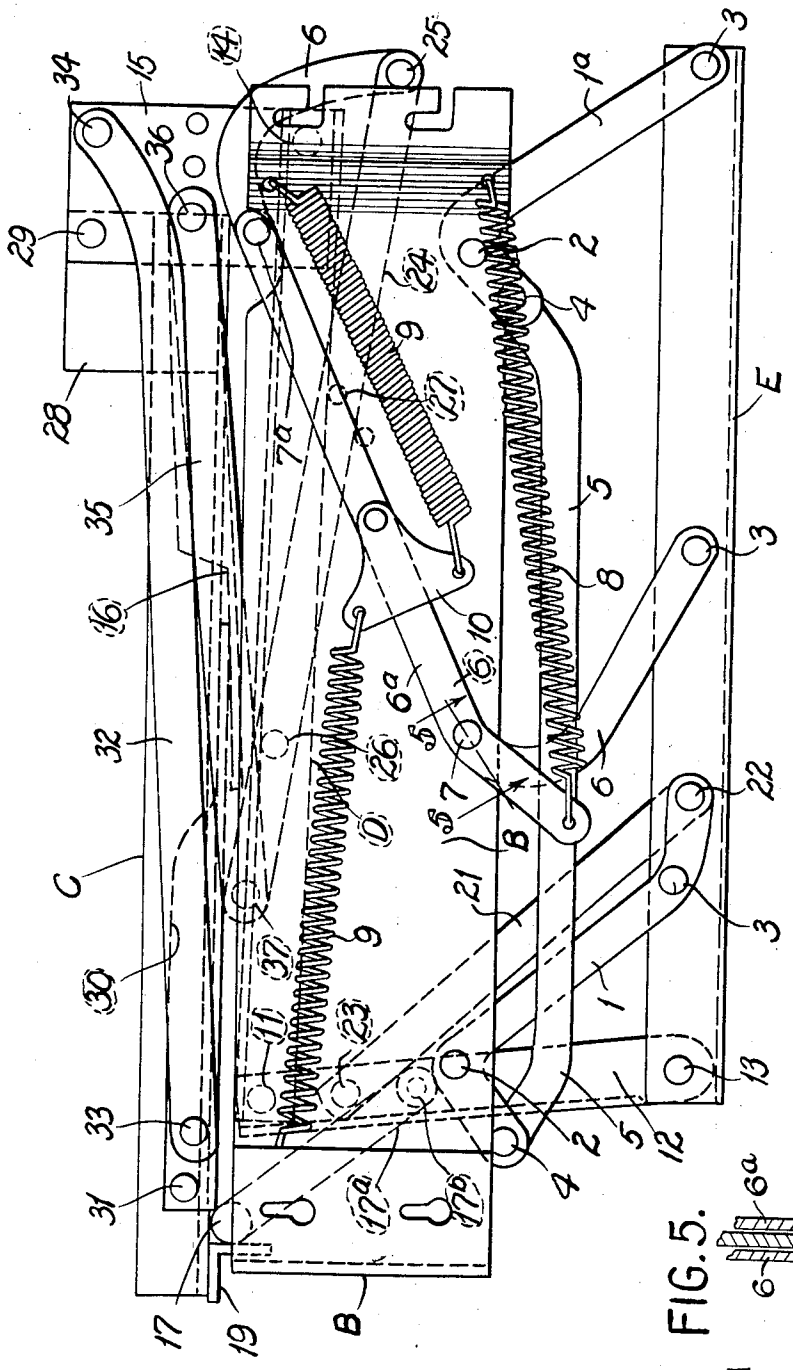


FIG. 4.

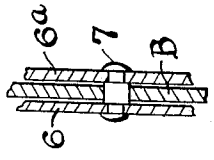


FIG. 5.

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1,945,186

FOLDING COUCH OR DAVENPORT

William E. Frank, St. Louis, Mo., assignor to Foster Bros. Manufacturing Company, St. Louis, Mo., a corporation of Missouri

Application August 29, 1932. Serial No. 630,781

5 Claims. (Cl. 5—36)

This invention relates to folding couches, davenports, and day beds of the so-called "short" couch type, in which the seat of the article is of substantially the same length as the width of the conventional double bed.

One object of my invention is to provide a short folding couch that is inexpensive to build, easy to open and close and of sufficiently rugged construction to eliminate the possibility of the relatively movable parts of same swaying or springing out of shape, and thus causing the operating mechanism to become jammed in the operation of opening or closing the article.

Another object is to provide a short folding couch that has a relatively shallow seat and an articulated or collapsible mattress supporting structure whose front section or top section can be moved into and out of its extended position without reversing or turning upside down.

Another object is to provide a short folding couch in which the means that sustains the mattress or pad when the couch is open, instead of being formed solely by a link fabric, or by a plurality of independent sets of coil springs or spiral springs, as has heretofore been the practice, is formed by a link fabric that is attached at one end by helical springs to a set of coil springs or spiral springs on which the upholstered seat of the article rests when the couch is in its closed condition.

Other objects of my invention are, to provide a folding couch having a novel leg operating mechanism that is reliable and of simple design; to provide a means of simple design for eliminating side swaying of the operating levers for the rear section or bottom section of the mattress supporting structure; and to provide means for making it practicable to arrange the springs forming part of the operating mechanism, at points on the outside of the two supporting plates that carry the collapsible mattress supporting structure.

Figure 1 of the drawings is a perspective view, partly broken away, of a folding couch embodying my invention, showing the mattress supporting structure in its partially open or extended position.

Figure 2 is an end view, showing the mattress supporting structure open or in its fully extended position.

Figure 3 is a fragmentary top plan view of Figure 2.

Figure 4 is an end view, showing the mattress supporting structure in its closed position; and

Figure 5 is a sectional view, taken on the line 5—5 of Figure 4, illustrating how the operating levers 6 are constructed so as to prevent said levers from swaying in either direction.

As shown in Figure 1 of the drawings, my improved couch is composed of a rigid frame of any preferred design or construction, designated as an entirety by the reference character A, and a collapsible or extensible mattress supporting structure mounted in said frame A and carried by two relatively deep, vertically-disposed supporting plates B that are attached in any suitable way to the end pieces A' of the frame A. Said mattress supporting structure is made up of three sections, C, D and E pivotally joined together in such a way that when the couch is closed said sections will be arranged in superimposed relation with the section D positioned between the top section C and the bottom section E, as shown in Figure 4, and when the couch is open, said sections will lie in the same horizontal plane with the intermediate section D in front of the bottom section E and the top section C in advance of said intermediate section, as shown in Figure 2. To open the couch the user first removes the upholstered seat, not shown, which rests upon and is supported by the top section C, and then grasps said top section and moves it upwardly and forwardly, which operation causes the intermediate section D to rock forwardly in such a way that the top section C can move into its fully extended position without reversing or turning upside down. To close the couch the user grasps the top section or front section C and moves it upwardly and rearwardly, thus causing the intermediate section D to rock rearwardly into such a position that the top section C will be carried or moved rearwardly into the vertical plane in which the bottom section E lies. The mattress or pad, not shown, that is sustained by the sections C, D and E when the couch is open, is adapted to be folded and stored between the bottom section E and the intermediate section D when the couch is closed. As is usual in folding couches, the bottom section E is mounted in such a manner that it will lie in a horizontal plane considerably higher than the supporting plates B when the couch is open, as shown in Figure 2, and will be depressed or moved downwardly into a lower horizontal plane, as shown in Figure 4, during the operation of closing the couch.

The bottom section or rear section E is provided with a rigid, yoke-shaped frame preferably constructed of angle iron and composed of two end members arranged parallel to the supporting plates B and having their rear ends joined to-

gether by a transverse frame member. Said bottom section E is sustained by two pairs of supporting levers 1 and 1a arranged at the opposite ends of said section and pivotally connected at 2 to the supporting plates B. Said levers 1 and 1a are herein illustrated as being constructed in the form of bell cranks, and each pair of said levers have their long arms pivotally connected at 3 to the end members of said bottom section E, and their short arms pivotally connected at 4 to a link 5 which maintains said levers in parallel relation and causes them to move in unison. Operating levers 6, of substantially bell crank shape, that are pivotally connected at 7 to the supporting plates B, are used to move the bottom section E upwardly from the position shown in Figure 4 into the position shown in Figure 2 during the operation of opening the couch, and thereafter restore or depress said bottom section when the couch is being closed.

In order to prevent the operating levers 6 from swaying sidewise, each of said levers is constructed in such a manner that it comprises a bifurcated portion or double portion that straddles the supporting plate B on which it is mounted and which provides sufficient bearing area on said plate to maintain said lever in the vertical plane in which it is intended to operate. This highly desirable result can be obtained easily and at a low cost by mounting the lever 6 on the inner side of the supporting plate B and rigidly attaching to said lever a strap piece 6a that is positioned on the outside of the supporting plate B, as shown in Figure 5. The pivot 7 that joins the lever 6 to the supporting plate projects outwardly through the strap piece 6a and is upset or headed, and the upper end portion of the strap piece 6a is attached to the lever 6 at a point above the top edge of the plate B by a rivet 7a, thereby causing the strap piece 6a to co-act with the supporting plate B to effectively resist or take up any side strains on the lever 6 tending to move it laterally.

In folding couches and davenports it is standard practice to equip the operating mechanism with springs arranged so as to assist the manual effort of the user in the operation of opening and closing the couch and to check the movement of the operating mechanism at approximately the time the co-acting sections of the mattress supporting structure move into their fully closed position. In prior folding couches the springs just referred to have usually been arranged on the inside of the supporting plates that carry the collapsible mattress supporting structure. In my improved couch the said springs are arranged wholly on the outside of the supporting plates B, which characteristic is made possible by the strap pieces 6a, previously described, that are attached to the operating levers 6 for the bottom section E. As shown in Figures 1 and 2, the lower ends of the strap pieces 6a have actuating springs 8 attached to same. Similar actuating springs 9 are attached to the strap pieces 6a at points above the pivots 7 of the levers 6, preferably by means of triangular-shaped plates 10 that are fastened to the outside faces of the strap pieces 6a. By constructing the couch in this manner I overcome the possibility of the springs 8 and 9 interfering with any of the moving parts of the collapsible mattress supporting structure, due, of course, to the fact that said springs are arranged on the outside of the supporting plates B, between said plates and the end pieces of the stationary frame A of the couch.

The intermediate section D of the mattress supporting structure comprises end members which are pivotally connected at one end by pivots 11 to strut pieces 12, which, in turn, are pivotally connected at 13 to the end members of the bottom section E, adjacent the front edge of said bottom section, as shown more clearly in Figure 1. The other ends of the end members of the intermediate section D are pivotally connected at 14 to connecting plates 15 which are provided with rigid legs 16. The strut pieces 12 at the opposite ends of the couch are joined together by a tie member 17 of substantially yoke shape form, whose side arms 17a are pivotally attached at 17b to the strut pieces 12. When the couch is open, as shown in Figure 2, the tie member 17 lies at a point far enough below the link fabric on which the mattress rests to eliminate the possibility of its being struck or engaged by the mattress, and thus causing discomfiture to the user of the article. In the operation of closing the couch the tie member 17 comes into engagement with a part or blocks 18 mounted on the front piece of the stationary frame A of the couch, the said part or blocks 18 being disposed so as to cause said tie member 17 to swing relatively to the strut pieces 12 and assume such a position that said tie member 17 will not form an obstruction that prevents the top section C of the mattress supporting structure from bearing squarely or evenly upon the intermediate section D. Stated more specifically, the top section C is provided at its front edge with a transversely-disposed angle 19, see Figure 2, that is used to carry a tacking piece 20 to which is attached the covering for the coil springs of the section C. It is necessary that the tie members 17 lie behind said angle 19 when the couch is closed, and to this end I pivotally connect the tie member 17 to the strut pieces 12 and provide the stationary frame A of the couch with a means 18 that will positively fold or move the tie member 17 into the position shown in Figure 4 during the operation of closing the couch.

In the operation of closing the couch the strut pieces 12 swing upwardly, as shown in Figure 1, and eventually come to rest in a substantially upright position, see Figure 4, wherein they hold the intermediate section D spaced far enough above the bottom section E to provide a space of ample size to receive the mattress or pad. The above described movement of the strut pieces 12 and also the movement of said strut pieces in the opposite direction, is governed or controlled by links 21 pivotally connected at one end by pivots 22 to extensions on the upper ends of the bell crank levers 1 associated with the bottom section E, the opposite ends of said links 21 being joined by pivots 23 to the strut pieces 12. The rocking movement of the intermediate section D, both forwardly and rearwardly, is controlled by links 24 joined at one end by pivots 25 to angularly-disposed extensions on the upper ends of the operating levers 6 for the bottom section E, and connected adjacent their opposite ends by pivots 26 to the end members of the intermediate section D. When the couch is closed stop pins 27 that project laterally from the links 24 co-act with the supporting plates B to maintain the intermediate section D in substantially parallel relation with the bottom E and sustain the load imposed on the seat of the couch. The links 24 are also used to control the movement of the front section C and the collapsible legs of the couch, as hereinfater described.

The top section or front section C is provided with a substantially yoke-shaped frame made up

of end members joined together at their front ends by the transverse angle 19, previously mentioned. Said end members have plates 28 rigidly attached to the rear ends of same, and said plates 28 are pivotally connected by means of pivots 29 to the plates 15, previously mentioned, that carry the legs 16, the plates 28 and 15 co-acting with each other to virtually form hinges that join the top section C to the intermediate section D. Collapsible front legs 30 that are pivotally connected at 31 to the end members of the front or top section C are provided for supporting the extreme front end of the mattress supporting structure when the couch is open. The legs 16, previously mentioned, are used to support the intermediate portion of the mattrees supporting structure when the couch is open. In the operation of closing the couch both sets of legs 16 and 30 are folded in such a way that they will lie between and substantially parallel to the sections C and D, as shown in Figure 4. The front legs 30 are collapsed and opened by links 32 connected at their front ends by pivots 33 to the legs 30 and connected at their rear ends by pivots 34 to the plates 15, as shown more clearly in Figure 1. The intermediate legs 16 are collapsed and opened by means of links 35 pivotally connected at one end by pivots 36 to the legs 16 and pivotally connected at their opposite ends by pivots 37 to the front ends of the links 24, previously described. A leg controlling and operating mechanism of the construction just described is inexpensive to construct and it insures the collapsible legs of the couch assuming their correct positions when the couch is being opened and when it is being closed, due to the fact that both sets of legs 30 and 16 are positively actuated and at all times are joined by rigid controlling links to co-acting parts of the structure.

As previously stated, in prior folding couches the mattress or pad was usually sustained either by a link fabric stretched from the front end to the rear end of the mattress supporting structure, or by a plurality of independent sets of coil springs or spiral springs. In my improved couch the means used to sustain the mattress or form a surface on which the mattress rests when the couch is open, is composed of a set of coil springs or spiral springs 37^a permanently combined with the front or top section C of the mattress supporting structure, and a link fabric 38 attached at its rear end by helical springs 39 to the transverse frame member of the bottom section E and attached at its front end by helical springs 40 to a transversely-disposed member 41 that forms part of the set of coil springs 37 carried by the front section C. Such a mattress supporting means is inexpensive to build; it is reliable in operation and is not liable to get out of order when it is folded and unfolded; and it provides a highly resilient support for the upholstered removable seat of the couch, due, of course, to the fact that the part on which the upholstered seat rests is made up of coil springs or spiral springs 37^a.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A folding couch or davenport provided with a mattress supporting structure that comprises a movable bottom section or rear section, relatively deep stationary supporting plates, operating levers for raising and lowering said bottom section, pivotally mounted on said supporting plates and arranged in sliding relationship with one side of said plates, and strap pieces rigidly attached to said levers and arranged in sliding relationship with the other side of said plates, whereby said levers are effectively held against side swaying in either direction.

2. A folding couch or davenport provided with a collapsible mattress supporting structure that comprises a bottom section that is adapted to be raised and lowered, stationary supporting plates, swinging members on said supporting plates that sustain said bottom section, operating levers for raising and lowering said bottom section, pivotally mounted on said supporting plates and arranged on the inside of same, strap pieces attached to said levers and arranged so as to bear on the outer sides of said supporting plates, and springs forming part of the operating mechanism of the couch attached to said strap pieces.

3. A folding couch or davenport provided with a collapsible mattress supporting structure comprising a top section, a bottom section and an intermediate section, an operating mechanism for raising and lowering said bottom section, strut pieces pivotally attached to the bottom section and to the intermediate section for joining said parts together, connecting plates pivotally attached to the front section and to the intermediate sections for joining said sections together, rigid legs on said connecting plates, front legs pivotally mounted on said top section, controlling links connected to said operating mechanism and to said strut pieces for actuating said strut pieces, controlling links connected to said operating mechanism and to said connecting plates for actuating said plates, and controlling links connected to said front legs and to said connecting plates.

4. A folding couch or davenport provided with a collapsible mattress supporting structure, comprising a front section and a co-acting section, rigid plates attached to said front section adjacent the point where it joins said co-acting section, connecting plates pivotally attached to said rigid plates and to said co-acting section for hinging said sections together, intermediate legs rigidly fastened to said connecting plates, front legs pivotally attached to said front section, controlling links for said front legs pivotally fastened to same and to said connecting plates, controlling links for said intermediate legs pivotally fastened to said connecting plates, and an operating means connected to said last mentioned links and to said co-acting section.

5. A folding couch or davenport provided with a collapsible mattress supporting structure comprising a bottom section, a top section and an intermediate section, an operating mechanism for raising and lowering said bottom section, strut pieces pivotally attached to said bottom section and to the intermediate section for joining said sections together, connecting plates pivotally attached to said top section and intermediate section for joining said sections together, collapsible front legs carried by the top section, intermediate legs carried by said connecting plates, and a control means for said connecting plates and said strut pieces directly connected with said operating mechanism.

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