March 23, 1954 V. GIUSEFFI 2,672,624

FOLDING BED

Filed March 18, 1949 2 Sheets-Sheet 1

FIG. 1.

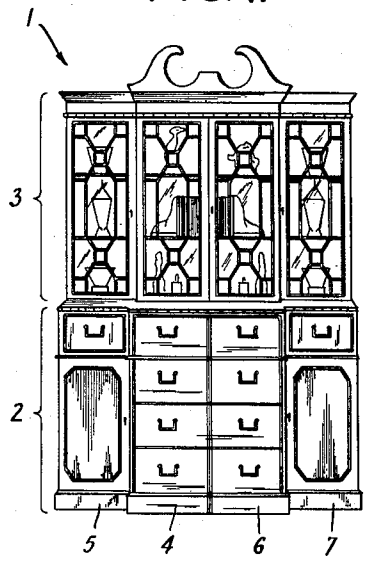


FIG. 2.

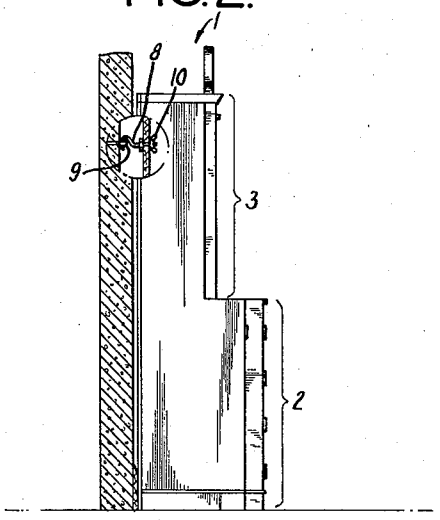
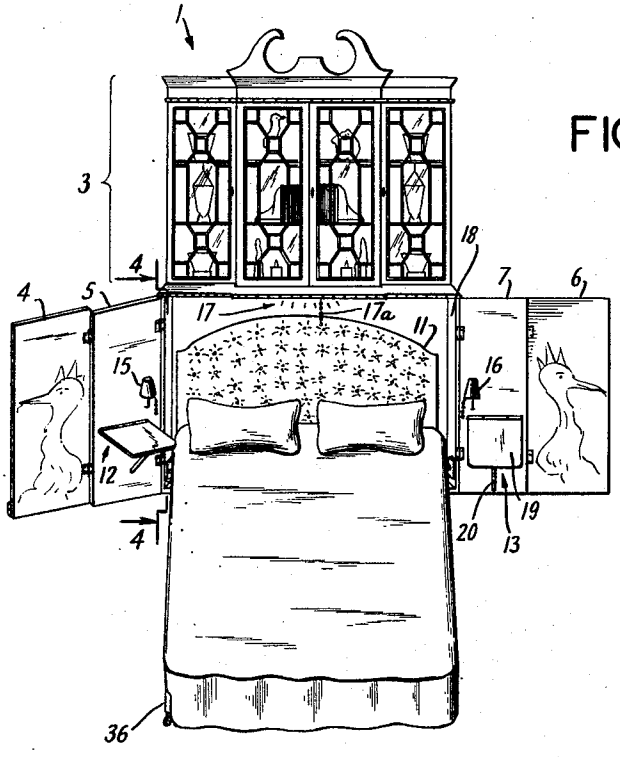


FIG. 3.



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March 23, 1954 V. GIUSEFFI 2,672,624

FOLDING BED

Filed March 18, 1949 2 Sheets-Sheet 2

FIG. 4.

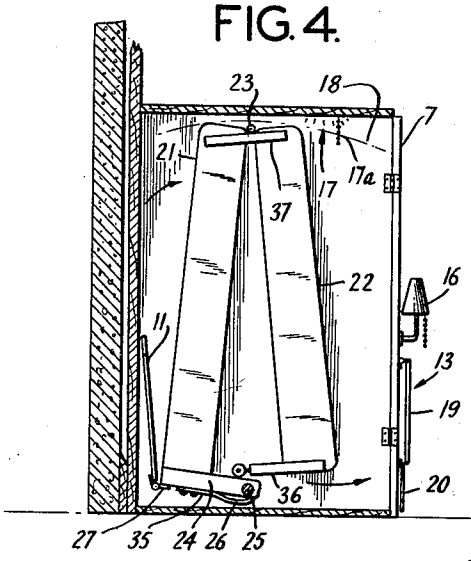
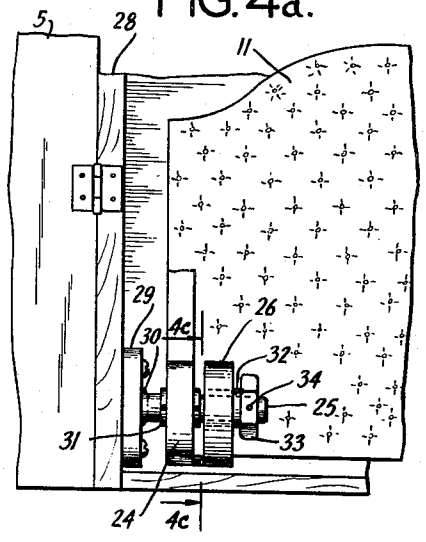


FIG. 4a.



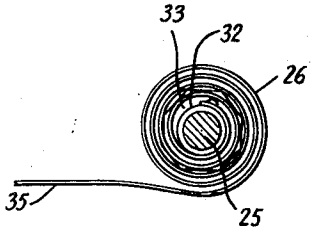


FIG. 4c.

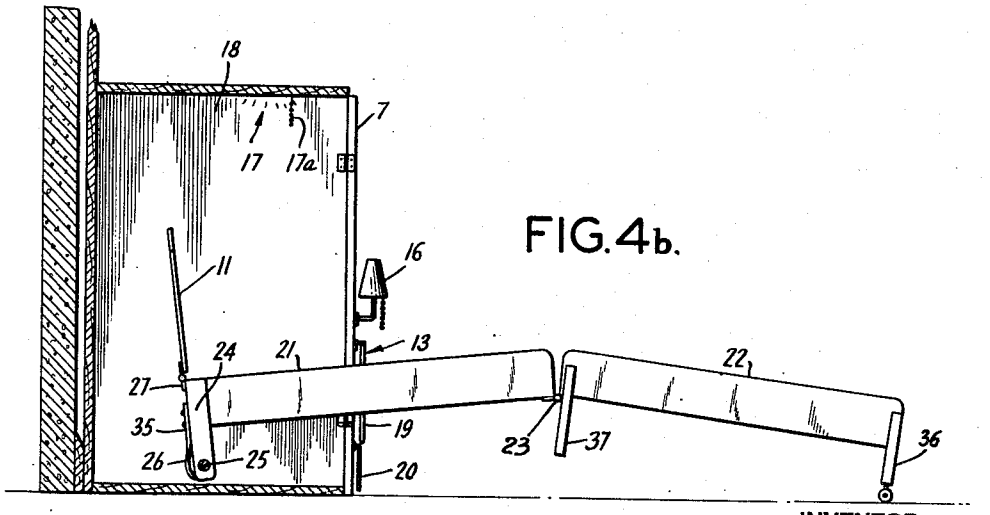


FIG. 4b.

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FOLDING BED

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4 Claims. (Cl. 5—2)

1

The present invention relates to improvements in folding beds. More particularly, it relates to such improvements whereby a folding bed has novel and increased utility in either its folded or unfolded condition.

Three types of folding beds have been well known and extensively used in the furnishings art: one, which is useful as an article of furniture only when it is unfolded and which is portable so that it may be stored in an out-of-the-way place when folded; another, which similarly is useful as an article of furniture only when it is unfolded but which ordinarily is not particularly portable since provision is made for storing it simply by folding it into a receptacle disguised behind a dummy door or within a dummy article of furniture; and a third, which is a sofa or couch when folded and a bed when unfolded. The first of these three types has the disadvantage that it requires a substantial storage space near to the sleeping room and that it must be carried back and forth between that space and that room every time that it is used. The second has the disadvantage of the obvious lack of utility of the dummy article of furniture other than its utility for concealing the bed. The third has the disadvantage that a couch which must be proportioned to meet the functional requirement of containing a folded bed cannot be freely designed to meet aesthetic requirements of style and appearance. And in addition all three types, at least in their most usual embodiments, have in common the disadvantages that when unfolded into beds they offer less comfort and poorer appearance than conventional beds.

It is an object of this invention to devise a novel article of furniture which in an unfolded condition is a comfortable bed and which in a folded condition is a credenza or break-front having other utility than merely that as a receptacle for folding portions on the bed such as its spring and mattress.

It is a further object of the invention to devise a novel article of furniture of the kind described above in which in the folded condition thereof, its said other utility is so apparent as to detract attention from its primary utility as a receptacle for the folding portions of the bed.

It is a further object of this invention to devise a novel article of furniture of the kind described above which, in addition to having the features set forth above, is so arranged that when it is unfolded to serve as a bed it in fact serves not only as a bed but as a uniquely serviceable combination of several articles of sleeping room furniture such as a very comfortable bed, a pair of appropriately positioned night tables, and a pair of utilitarian and decorative dressing screens.

2

It is a further object of this invention to devise a novel article of furniture of the kind described above which includes novel mechanical features for facilitating folding and unfolding.

Other objects, features, and advantages will be apparent to those skilled in the art from the following detailed description of an illustrative embodiment of the invention and from the drawing in which:

Figs. 1 and 2 represent front and side elevations of an embodiment of the invention in its folded condition;

Fig. 3 represents a front view of the same embodiment in its unfolded condition;

Figs. 4 and 4*b* are sectional views of the lower portion of the article of furniture shown in Figs. 1–3, the section being taken along the line **4—4** shown in Fig. 3, which views respectively illustrate different positions which the spring and mattress sections and the headboard pass through in the folding or unfolding of the bed;

Fig. 4*a* is a fragmentary front view of the lower left hand portion of the article of furniture to show details of an arrangement including a pivot for supporting one side of the upper end of the bed and for permitting it to be folded; and

Fig. 4*c* shows a portion of the arrangement shown in Fig. 4*a*.

Fig. 1 shows a break-front **1** having a lower portion **2** which, according to the present invention, provides a receptacle for components which unfold to form a bed, and an upper portion **3** which has both utilitarian value in affording shelf space and psychological value in drawing attention away from the lower portion when it is closed to conceal the folded bed. Shelves which vertically subdivide the interior space of upper portion **3** may be used to carry books or, as shown in Fig. 1, figurines, small vases, and other bric-a-brac having marked aesthetic value and therefore, commanding more attention than the relatively plain and undecorated lower portion. The front area of lower portion **2** actually comprises, as is more clearly shown in Fig. 3, four simple vertical panels **4**, **5**, **6** and **7**. However, when the bed is folded and the panels are moved to their closed positions as shown in Fig. 1, they expose to view on their respective outer surfaces, wooden and hardware embellishments such as moldings, handles, and false key holes arranged to impart the external appearance of a perfectly conventional break-front or credenza. In the example

shown in Fig. 1 the arrangement of these embellishments for the lower portion 2 is such that it appears to contain two centrally located vertical stacks of four drawers each and on each side thereof a closet-like compartment, accessible through a hinged door, with a single drawer above it. Actually, the interior of the entire lower portion 2 is one unbroken hollow space suitable for providing a receptacle of the folding portions of the bed.

Fig. 2 shows in a circular inset and on an enlarged scale a suitable means for anchoring the upper portion of the credenza to and against a wall so that it will not be free to tilt forward or tip over in a forward direction during folding or unfolding of the bed. This means includes a hook 8 and an eye 9. The eye may be of any conventional known kind comprising a screw for fastening the eye into the wall and a loop for receiving the hook. For the purpose here intended, it is preferable that the size of the loop be small with respect to the diameter of the engaging finger of the hook so that there will be very little free play. The hook includes a shank portion which may be passed through a hole in the back panel of upper portion 3 and is externally threaded to receive a wing nut 10. Obviously two or three of these anchoring means may be employed. Moreover, the particular anchoring means represented herein by hook 8 and eye 9 is shown solely by way of example and obviously any other convenient known means may be employed. In fact, if the break-front be made of heavy wood and made to stand squarely on the floor there will be many instances in which this element will not be required.

When the panels 4, 5, 6, and 7 are opened to permit unfolding of the bed they may be positioned in swung-back positions in which, in addition to being out of the way, they have the added usefulness of serving as components contributing to form a pair of screens located on opposite sides of the bed. Thus two persons occupying a small congested apartment may disrobe with a measure of modesty behind the respective screens afforded by the panels 4 and 5 in combination with the left side of the break-front and 6 and 7 in combination with the right side. As illustrated in Figure 3, the inner surfaces of the panels 4, 5, 6, and 7 may be appropriately decorated in a manner consistent with this usefulness as screens which they attain when swung back.

For example, they may be embellished in lacquer according to certain well known practices with colorful figures of Chinese or Japanese motif or they may be otherwise decorated with flowers, birds, or the like. In embodiments where this is done the aspect of the room as a bed chamber will be thereby emphasized when the bed is unfolded, whereas its aspect as a living room may be emphasized by the external appearance of the break-front as described above due to the ornamentation on the outside surfaces of the panels.

In order to increase the usefulness of this article of furniture whenever it is unfolded, as well as further to emphasize the aspect of the room as a bed chamber at such times, there are further provided a tufted covering for the headboard 11, a pair of folding night tables 12 and 13, night-table lamps 15 and 16, and a reading lamp 17 which does not appear in Fig. 3 although its position is indicated by the location of the reference numeral 17, and its presence is suggested by a group of radial lines intended to represent light rays as well as by a chain 17a representing the switch controlling mechanism for turning the reading lamp on and off.

The panels 4 and 5 as well as the panels 6 and 7, have their adjacent edges connected together either by hinges as shown in Fig. 3 or by any other suitable means and each of the two articulating pairs of panels thus formed is similarly hung to the forward edge of a respective one of the upright sides of the lower portion 2 of the credenza.

Fig. 4 is a cross-section of Fig. 3 along the line 4—4. In it panel 7 is in the background swung back so far that only its edge which is hinged to the right upright side 18 can be seen. The top 19 of night table 13 is shown hanging down against the inner surface of panel 7 suspended from a hinge which connects its upper edge to that surface. Also shown in this figure is a strut 20 similarly hanging down from the inner surface of panel 7 from a hinge which connects it thereto. In using the night table 13 its top 19 is raised to a horizontal position and strut 20 is raised to a point where its free end engages a notch in the underside of top 19 and thereby supports it. The wiring for lamp 16 is not shown as it may be of any conventional type. Of course provision must be made for the wiring to be flexible at the point where panel 7 is hinged to upright side 18 so as to permit opening and shutting of the lower right front doors of the break-front. Obviously the arrangement of night table 12 and the wiring of lamp 15 may be of the same kind.

In addition to headboard 11 the folding portions include upper bed half 21 and lower bed half 22 which are hinged together as shown in Fig. 4. Each of the bed halves 21, 22 consists of a rigid structural unit comprising a half box-spring-mattress. The components of the presently disclosed article which bear the reference numerals 21 and 22 in the accompanying drawing are herein referred to respectively as the "upper bed half" and the "lower bed half" inasmuch as they are the parts of the bed upon which the generally upper and lower portions of a sleeper's body will rest when he is occupying the bed. The upper and lower bed halves are foldably connected together by suitable hinges 23 of which only the one in the foreground appears in the drawing and which are appropriately fastened between the respective frames thereof whether those frames be integral parts of the half box-spring mattress or separate structures for supporting them. At the headboard end of the upper bed half there is a first pair of legs 24 of which only the one in the foreground appears in Figures 4, 4a, and 4b. Each of these legs is fastened to an opposite corner of the upper bed half 21 at its headboard end and is rotatably fastened to the lower portion 2 of the breakfront 1 by a respective one of a pair of pivots 25 one of which appears in the foreground portion of Fig. 4. As is apparent from Figs. 4 and 4b when the bed is unfolded, the upper bed half 21 is tilted forward from a vertical position to a horizontal one while at the same time its headboard end is raised and its opposite end is lowered. Since this is so it is obvious that the height at which the pivots 25 are fastened to the respective upright sides of the lower portion 2 of the breakfront 1 and the length of the first pair of legs 24 will be the most important factors to determine the height of the top surface of the bed when it is unfolded. A spiral spring 26 is fitted over each of the pivots 25; it is wound up to load it with energy; its inner end is anchored to the pin 25; and its outer end is fastened to the associated bed leg 24 to urge it in a counterclockwise direction (as Fig.

4 is viewed looking down on the paper) for assisting in folding. The details of the arrangement of the spring 26 are more clearly shown in Figs. 4a and 4c.

The headboard 11 is attached to the top ends of the first pair of legs 24 by spring loaded hinges 27 which tend to swing the headboard in a counter-clockwise direction (as Fig. 4 is viewed looking down on the paper). The hinges 27 are of the kind which, even though they are spring loaded, can only open to a point where the two sides of the hinge enclose an angle of 180 degrees and therefore lie in the same plane. In this way the headboard will assume the position shown in Fig. 4b when the bed has been unfolded even though the top edge of the headboard is no longer bearing against the back wall of the lower half of the break-front as shown in Fig. 4.

Fig. 4a shows in detail one suitable arrangement for the left one of the pivots 25, its associated spiral spring 26, and the left one of the first pair of bed legs 24. In this arrangement one left pivot 25 is fastened to the inside surface of the left upright side 28 (of the lower portion 2 of the break-front 1) by a metallic plate 29 to which this pivot is firmly fastened, for example by being welded thereto at 30. As shown in the example in Fig. 4a a bushing 31 may be inserted through the lower end of the bed leg 24 and fitted over pivot 25 to provide smooth and enduring operation. However, if desired the bed leg may be made of hard wood and the bushing may be eliminated. A spring-adjusting sleeve 32 which has a nut head 33 formed on the outer periphery of its right end is also fitted over the left pivot 25 where it is free to rotate about the pivot unless it is anchored by a cotter pin which may be inserted through a hole 34 and a corresponding hole in pivot 25 with which it may be aligned. As shown in Fig. 4c the inner winding of the left spiral spring 26 is anchored to the left spring-adjusting sleeve 32 as to counter-clockwise rotation (as viewed in Figures 4 and 4c) of this sleeve with respect to this spring. Thus, in practice after the parts are assembled a wrench is placed over the nut head 33 and rotated in a clockwise direction (as seen facing the nut head end of sleeve 32) until the spring is loaded. As shown in Fig. 4c there is a straight extension of the outer winding of the spiral spring 26 which affords an anchoring arm 35, and as is apparent from Fig. 4a this arm is bent leftward from the plane of the spiral spring in order that its end portion will be in alignment with the left bed leg 24 so that it may be fastened thereto by any appropriate means such as screws.

The lower bed half has a second pair of legs 36, of which only the one in the foreground appears in Fig. 4b, which are fastened to its foot end and each of which is equipped with a wheel mounted on its end which is nearest the floor when the bed is unfolded. The bed is folded by applying an upwardly directed force near to the point where the upper and lower bed halves are hinged together. When this is done the upper and lower bed halves will start to jackknife together, the latter portion rolling along the floor supported by the legs 36 and their respective wheels; and finally a point will be reached where the wheels will be lifted clear of the floor and the jackknifing of upper and lower bed halves will approach completion. Since each of the legs 36 is fastened to one of the outer edges of the lower bed half it will not collide with the upper bed half but will pass along one of its sides thereby permitting complete folding of the bed.

A third pair of bed legs 37 is provided as shown in Figs. 4 and 4b to avoid placing too great a strain on the articulation between the upper and lower bed halves.

What I claim is:

1. An article of furniture comprising a folding bed including upper and lower bed halves hinged together to be foldable for storage and unfoldable for use, the lower being shorter than the upper bed half as measured in a direction corresponding to the length of the unfolded bed; the far ends of said unfolded halves respectively constituting the head-board end of the bed and its foot end; a receptacle for receiving the folding bed, the receptacle including a back wall and two upright sides; pivot means supported in said upright sides to afford an axis of rotation for the upper bed half near its head-board end, said axis extending crosswise between the upright sides in a plane which is spaced substantially away from that of the bottom of the unfolded bed and is intermediate it and a surface on which the article of furniture is resting; means for supporting the head-board end of the upper bed half on said pivot means so as to permit it to rotate about said axis for folding into the receptacle, said means including a pair of legs each attached at one of its ends to an opposite corner of said head-board end and extending at right angles therefrom in a direction which is downward for the unfolded condition of the bed and each rotatably supported at it other end on said pivot means near a respective upright side, whereby said head-board end is both lowered and moved toward said back wall as it is folded into the receptacle and it is both raised and moved away from said back wall as it is unfolded out of the receptacle; a head-board; means articulating the bottom of the head-board to said head-board end and yieldably urging the top of the head-board against said back wall so as to maintain it in a vertical position as the bed is unfolded and in nearly vertical positions as and after the bed is folded; and a pair of legs each attached at one of its ends to an opposite corner of the foot end of the lower bed half and extending at right angles thereto in a direction which is downward for the unfolded condition of the bed and each rotatably carrying a wheel at its other end to have the function, during folding of the bed, of carrying the weight of said foot end along a surface on which the article is resting until a point is reached whereat the entire lower bed half will be lifted away from said surface and all of its weight carried by the upper bed half.

2. An article as in claim 1 which further comprises a spring-loadable means for rotationally urging said upper bed half about said pivot means toward said back wall and means for anchoring said back wall to a stationary structure, such as a wall of a room in which the article is being used, to prevent the spring-loadable means from having an undesired effect of tilting the receptacle forward while it is acting to fold the bed.

3. An article as in claim 1 in which said legs are spaced at least as far apart as the width of the head-board end of the upper bed half.

4. An article as in claim 1 in which said receptacle further includes two pairs of vertically hinged-together vertical panels each pair having the free vertical edge of one of its panels hinged to the front edge of a respective upright side so

that the pairs of panels are adapted to act alone as doors for closing the front of the receptacle and to serve in conjunction with the upright sides as dressing screens when the receptacle is open, the surfaces of said panels which are outside of the receptacle when it is closed carrying hardware and other embellishments characterizing the article as one of living room furniture and their other surfaces carrying useful bedroom accessories characterizing it as an article of bedroom furniture.

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