

July 22, 1958

S. FRIEDMAN

2,844,257

CONVERTIBLE FURNITURE PIECE

Filed Oct. 25, 1954

3 Sheets-Sheet 1

FIG. 1.

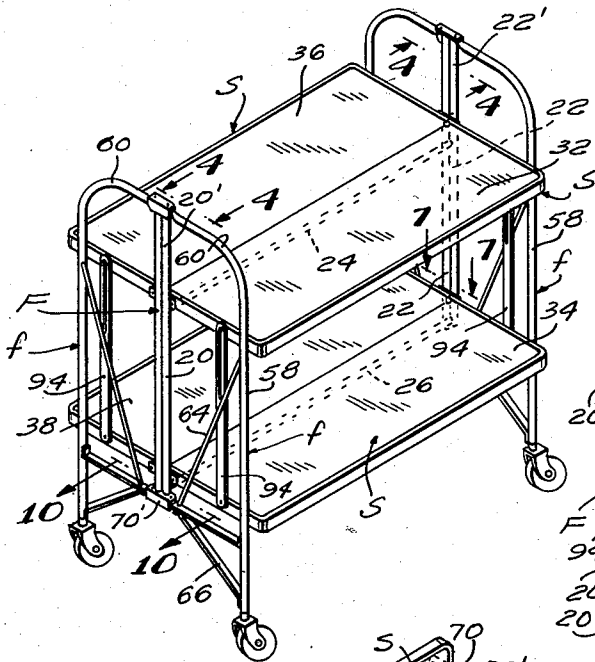


FIG. 3.

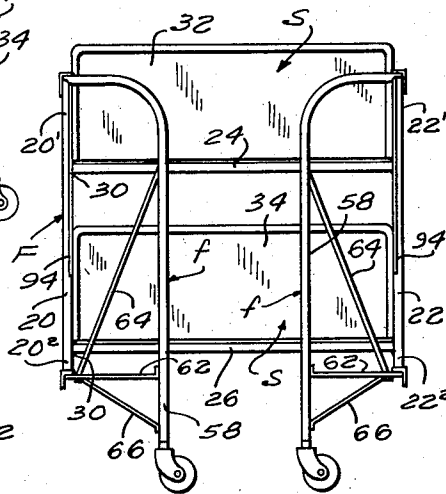
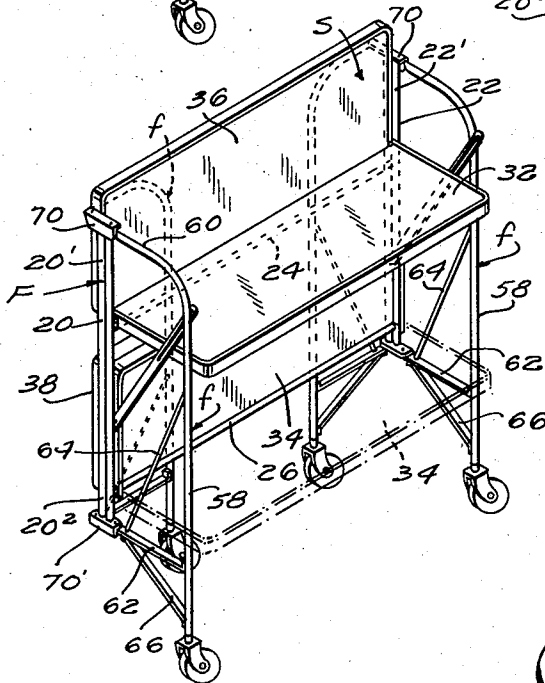


FIG. 2.



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FIG. 4.

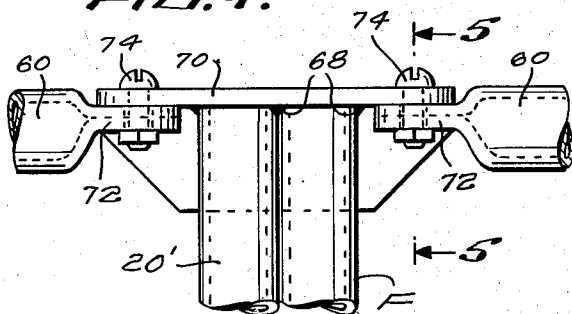
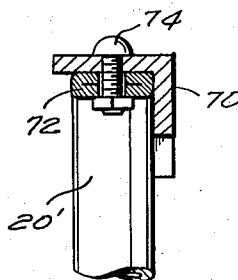


FIG. 5.

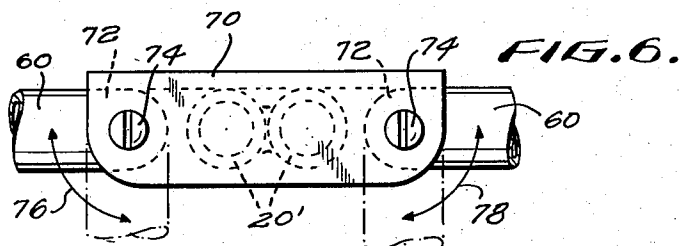
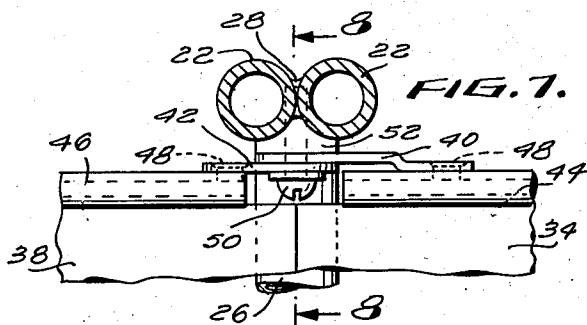
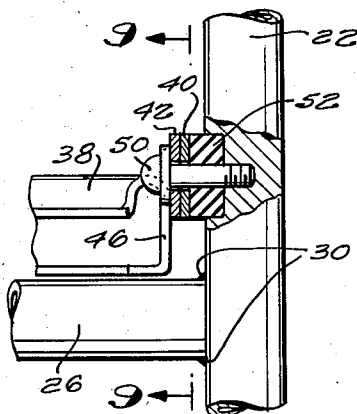
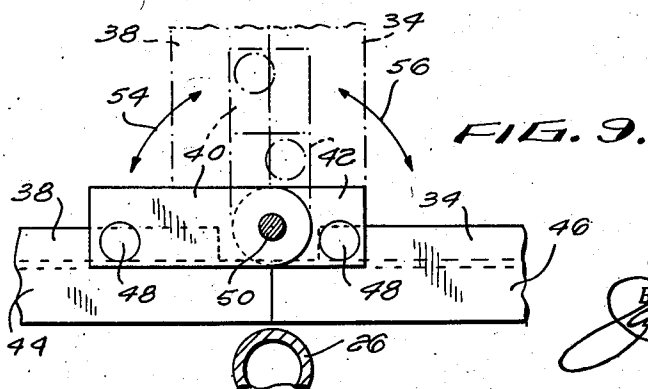


FIG. 8.



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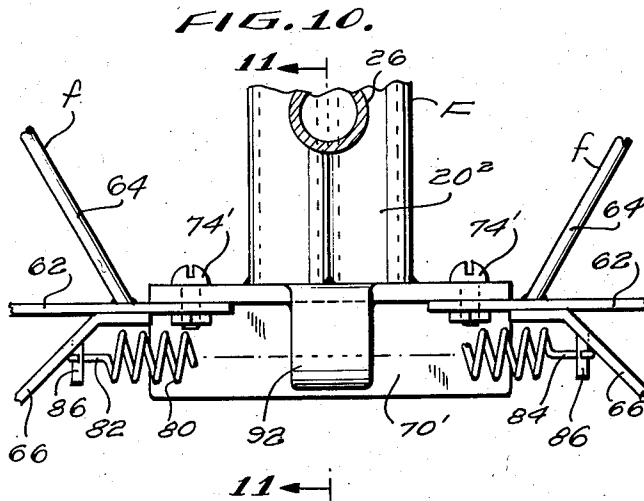
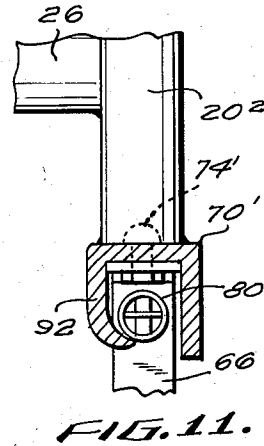
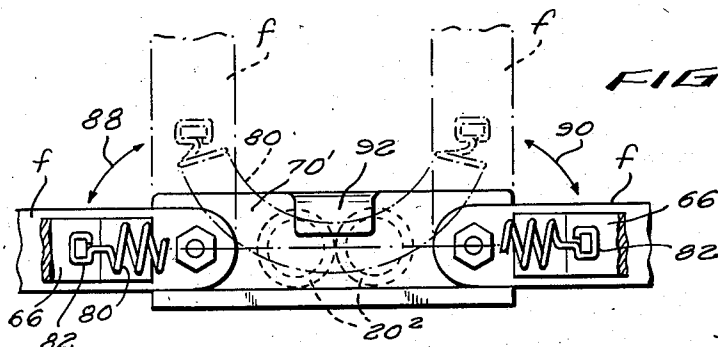
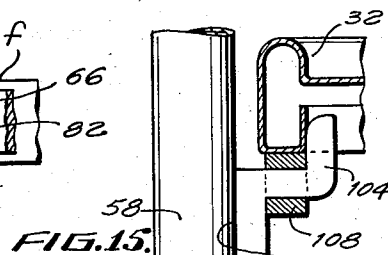
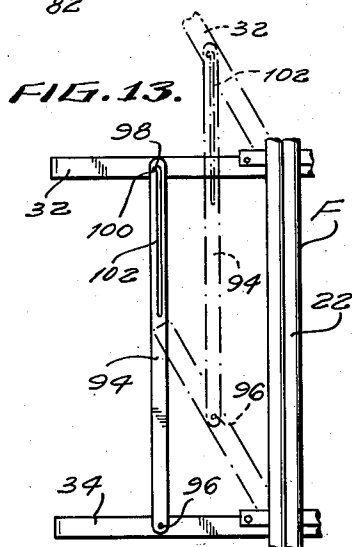
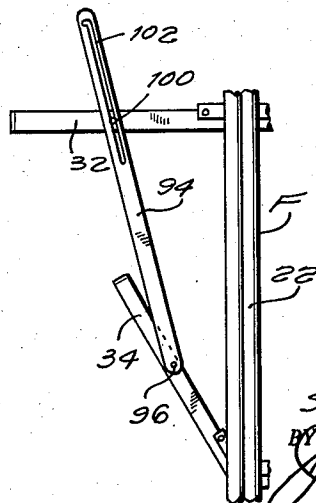
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CONVERTIBLE FURNITURE PIECE

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Application October 25, 1954, Serial No. 464,389

3 Claims. (Cl. 211-2)

This invention relates to a convertible furniture piece.

The prime object of the invention centers about the provision of an improved home furniture piece which is convertible by folding and unfolding operations into the following furniture uses and assemblies:

(1) In its fully unfolded or open condition the furniture piece is functionable as a hostess or serving table with top and bottom tiers for serving-table use. In this fully unfolded condition, the bottom tiers may be folded up to convert the furniture piece to a writing table;

(2) In its half unfolded (or half folded) condition, it is functionable as a bookrack, wall serving table or end serving table; and

(3) In its folded-up condition, the furniture piece is collapsed to a compacted condition ready and convenient for closet storage.

In carrying out this prime object of the present invention, the convertible furniture piece is designed and constructed, in addition to yielding a relatively simple yet sturdy and durable structure, to produce a convertible multi-function furniture piece (a) in which the parts are capable of being changed or converted from one use to another with exceeding simplicity and ease and (b) in which the parts when unfolded or folded to any of its multi-functional positions are securely held to or retained in such positions and by simple structural devices which operate automatically, in the folding-up and unfolding steps or operations.

To the accomplishment of the foregoing objects, and such other objects as may hereinafter appear, my invention relates to the convertible furniture piece as sought to be defined in the appended claims taken together with the following specification and the accompanying drawings, in which:

Fig. 1 is a perspective view of the convertible furniture piece shown in its fully unfolded or open condition functionable as a hostess or serving table;

Fig. 2 is a perspective view thereof showing the same in its half unfolded (or half folded) condition wherein the same is functionable as a bookrack, wall serving table or end serving table;

Fig. 3 is an elevational view thereof showing the same in its folded-up condition for storage use;

Fig. 4 is a view of a section thereof taken from a plane indicated by the lines 4-4 of Fig. 1;

Fig. 5 is a view of Fig. 4 taken in cross-section in the plane of the line 5-5 of Fig. 4;

Fig. 6 is a top plan view of the part shown in Fig. 4;

Fig. 7 is a view of a part of the furniture piece taken in the plane of the line 7-7 of Fig. 1;

Fig. 8 is a view of Fig. 7 taken in cross-section in the plane of the line 8-8 of Fig. 7;

Fig. 9 is a view of Fig. 8 taken in cross-section in the plane of the line 9-9 of Fig. 8;

Fig. 10 is a view of a part of the furniture piece taken in the plane of the line 10-10 of Fig. 1;

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Fig. 11 is a view of the parts shown in Fig. 10 taken in cross-section along the line 11-11 of Fig. 10;

Fig. 12 is a plan view of the parts shown in Fig. 10 depicting the movement of the side frames of the structure between their unfolded and folded-up positions;

Fig. 13 is a fragmentary and diagrammatic view of parts of the convertible furniture piece showing the manner in which the top and bottom shelf tiers are movable in unison;

Fig. 14 is a view similar to Fig. 13 depicting the manner in which one of the shelf tiers may be folded up independently of the folding up of the other shelf tier whereby the piece may be converted from a serving-table use to a writing table use; and

Fig. 15 is a view of a detail.

Referring now more in detail to the drawings, and having reference first to Figs. 1 to 3 thereof, the convertible furniture piece of the present invention comprises in its generic form a main medially arranged vertical frame F, a plurality of shelves generally designated as S hingedly mounted on the frame F and movable between dropped, unfolded positions lying normal to the vertical plane of the frame F as depicted fully in Fig. 1 and partially in Fig. 2 of the drawings and folded-up vertical positions lying parallel to the vertical plane of said frame F as fully depicted in Fig. 3 and partially in Fig. 2 of the drawings, and vertical side frames f, f hingedly affixed to said main frame F, said side frames being each movable between an unfolded position lying normal to the vertical plane of the frame F as shown fully in Fig. 1 and partially in Fig. 2 of the drawings and a folded-up position lying parallel to said vertical plane of the frame F and in folded-over relation to said folded-up shelves S, as shown fully in Fig. 3 and again partially in Fig. 2 of the drawings.

The frame F comprises an open frame having the vertical components 20 and 22 spaced by transverse components 24 and 26, the said component parts when made of metal being suitably made of tubular metal, the vertical parts 20, 22 each being preferably made of two tubular pieces suitably joined together as by brazing or welding, as at 28 (see Fig. 7), the transverse parts or components 24 and 26 being suitably attached to the vertical components as by being brazed or welded thereto as at 30 (see particularly Fig. 8). The vertical components or parts 20, 22 of the frame F are formed with upper and lower extensions designated by similar, but primed, reference characters for mounting the side frames f, f, as will be described hereinafter. The frame F of the furniture piece defines a medially arranged frame about which the shelves S and side frames f, f are movable between their folded and their unfolded positions.

The shelves S, S comprise a first pair of vertically spaced shelves 32, 34, hinged to said frame F and a second pair of vertical and similarly spaced shelves 36, 38 hinged to said frame F on the other side of the medial plane of said frame, the shelves of each pair being movable, and the shelves of one pair being preferably movable independently of the shelves of the other pair, between the dropped, unfolded position normal to said medial plane, as best shown in Fig. 1, and folded-up vertical positions lying parallel to said frame as best shown in Fig. 3 of the drawings. The hinged mounting of these shelves is such that in their open or unfolded positions two tiers of shelves are formed, the shelves 32 and 36 of the upper tier lying co-planar and forming a continuous surface so that both shelves assemble themselves to form or define a table surface, and the shelves 34 and 38 of the lower tier also lying co-planar and forming a continuous surface so that both of these shelves also

assemble themselves to form or define a table surface, the result being the convertibility of the unit into a serving or hostess table.

The preferred manner in which the shelves are hinged to the frame F is best depicted in Figs. 7 to 9 of the drawings, these figures exemplifying the hinge structure at each end of both shelf tiers. For example, the shelves 34 and 38 (illustrated in these Figures 7 to 9) are provided with pivot plates 40 and 42 secured to the side walls such as 44 and 46 of the shelves by means of bolts 48, the pivot plates being shaped so that they move to inter-nesting condition when the shelves are moved to their folded-up position, as best shown in dash-dot lines in Fig. 9 of the drawings, the hinged shaft of the hinge structure comprising a bolt 50 which threads through registering apertures in the hinged plates 40, 42 and which is secured through a filler washer 52 to the vertical frame component 22, as best portrayed in Figs. 7 and 8 of the drawings. Both shelves of each tier of shelves are thus mounted for coaxial hinged motion, the inner edge walls of the shelves of each tier being movable to the contiguous relationship such as to cause the shelves of each tier to form a continuous table surface when the shelves are in open or unfolded positions. Fig. 9 best illustrates the movement of the shelves of each tier between the open unfolded horizontal shelf position, shown in full lines in these figures, to the folded, closed and vertical positions shown in dash-dot lines in these figures, the movement taking place as indicated by the arrows 54 and 56.

The side frames *f, f* are each hingedly mounted in a similar manner to the frame F at the opposite sides and the opposite ends of said frame, and a description of the hinged mounting of one of said frames will serve for a description of each and all of them.

Each side frame *f* comprising a leg piece 58 having an upper horizontal branch 60 and a lower horizontal branch 62 and reinforced by the struts 64 and 66 is hingedly mounted to the upper and lower extensions of the frame F, as, for example, to the upper extension 20' and the lower extension 20² of the frame F, as viewed in Fig. 2 of the drawings. A description of the hinged mounting of the side frames *f, f* to the upper end 20' of the medial frame by reference to the detail views shown in Figs. 4 to 6 of the drawings will suffice for a description of the hinged mounting of all of the side frames *f, f* at all hinged points thereof. To the top of the frame extension 20' is attached, as by brazing or welding 68 an angle piece 70 to the opposite sides of which are hingedly mounted the ends 72, 72 of the side frame upper branches 60, 60 by means of the hinge bolts 74, 74. The side frames *f, f* are movable about the hinges between the unfolded and folded positions, as shown in Fig. 6, the movement being indicated by the arrows 76 and 78 in this figure.

As heretofore set forth, the convertible furniture piece is designed and constructed so that the parts thereof are movable from one to another of its functional uses with exceeding simplicity and ease, and in such a manner that the parts when unfolded or folded to any of its different positions are securely held to or retained in such positions, and by means of simple structural devices which operate automatically in the folding up and unfolding steps or operations. To contribute to the obtaining of these results the side frames *f, f* in their hinged mounting on the medial frame F are spring-biased by the simple mechanism depicted in Figs. 10 to 12 of the drawings so that the side frames *f, f* at each end of the structure are resiliently placed in the plane of the hinge axes of the side frames in their unfolded positions and are resiliently biased about their hinge axes to their folded up positions as soon as the side frames are moved out of their dead center unfolded positions. The structure employed for this purpose is best depicted in Figs. 10 to 12 of the

drawings. The bottom branches 62, 62 of the frame F are hingedly mounted by means of the hinge bolts 74', 74' to the angle piece 70' secured as by being brazed to the bottom extension 20² of the main frame F. The side frames *f, f* of the pair of frames disposed at one end of the main frame F are connected together by means of a tensioned spring 80, the said spring being preferably an expansion spring, the ends 82 and 84 of which are anchored to said side frames *f, f* as, for example, to a pressed-out part 86 of the strut 66 thereof, the anchoring points of the said tensioned spring 80 being arranged preferably on the opposite sides of and more particularly in the plane of the hinge axes through bolts 74', 74' of the side frames in their unfolded positions, this being best shown in full lines in Figs. 10 and 12 of the drawings. When the side frames *f, f* are moved out of their unfolded positions, as between the full line and the dot-dash line positions shown in Fig. 12 of the drawings, the movement being in the direction of the arrows 88 and 90, the tension spring 80 is foreshortened (producing a lessening tension therein as this described movement occurs).

The angle plate 70' is formed with a retaining finger 92 for anchoring the central portion of said spring (see Figs. 11 and 12). The results are that when the side frames *f, f* are moved to their unfolded positions they are retained in these positions by the dead-center positioning of the spring and when the side frames are moved from their unfolded positions towards their folded positions the springs act to resiliently bias the side frames to their folded and collapsed positions, doing so, however, with decreasing tension and hence with a dampening effect.

In Figs. 13 and 14 of the drawings I show the linkage means for interconnecting the pair of shelves such as the shelves 32 and 34 on either (or both) sides of the frame F. The linkage means fixedly interconnects the shelves such as 32 and 34 for movement of the shelves in unison, such linkage means being also movably connected to one of said shelves whereby said shelves may be also moved one independently of the other. This is accomplished by the provision of a link 94 fixedly pivoted at 96 to the bottom shelf 34 and bayonet-joint pivoted at 98 to the top shelf, the bayonet-joint including a pin 100 on the shelf 32 and a bayonet slot 102 in the link 94. With this construction both shelves 32 and 34 may be folded up in unison as by hand moving the upper shelf 32 (as depicted by the full line and dash-dot positions shown in Fig. 13) and the bottom shelf 34 may be folded up independently of the folding up of the top shelf 32, as by hand moving the bottom shelf 34, this being as depicted in Fig. 14 of the drawings.

Fig. 15 shows a detail omitted from Figs. 1 to 3 for reasons of retaining greater clarity for these figures. Each leg piece 58 of each of the side frames *f* is provided with vertically spaced stops, one for each shelf, on which the shelf rests in its open or unfolded position. Fig. 15 shows such a stop for one side of the shelf 32, the same comprising an angle bracket 104, welded at 106 to the leg piece 58, a rubber bumper 108 being provided on the stop to dampen the impact of the shelf unfolding operation.

The use and operation of the convertible furniture piece of the present invention will, in the main, be fully apparent from the above-detailed description thereof. It will be seen that the parts may be readily unfolded to the condition shown in Fig. 1, the unit being then functional as a hostess or serving table with top and bottom tiers for serving-table use. In this fully unfolded condition the bottom tier may be folded up, as depicted in Fig. 14 of the drawings (and partly in Fig. 2) to convert the unit to a writing table. In its half-unfolded condition, as shown in Fig. 2, the unit is functionable as a bookrack, wall serving table and end serving table. In

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this condition the bottom tier is also separately up-folded to convert the unit to a side wall writing table, the user's knees being permitted to go under the table. In the condition shown in Fig. 2, the lower tier may be unfolded merely by pulling upwardly the projecting links 94. In its completely folded-up condition, as shown in Fig. 3, the unit is collapsed to a compacted condition ready and convenient for closet storage. These operations are accomplished with the described ease and with the use of exceedingly simple devices.

It will be further apparent that many changes may be made in the structure described without departing from the spirit of the invention defined in the following claims.

I claim:

1. A convertible furniture piece comprising an open frame disposed in a medial plane, a first shelf hinged to said frame on one side and a second shelf hinged to said frame on the other side of said medial plane, said shelves being movable between dropped unfolded horizontal positions lying normal to said medial plane and folded-up vertical positions lying parallel to said medial plane of said open frame, a pair of vertical side frames hinged to said open frame on each side of the medial plane thereof, the side frames of each pair being disposed one at one end and the other at the other end of the open frame, the said side frames being each movable about its hinged axis between an unfolded position lying normal and a folded-up position lying parallel to the medial plane of said open frame and in folded-over relation to said folded-up shelves, and a tensioned spring for the side frames at each end of the open frame anchored at its opposite ends to such side frames, the anchoring points of said tensioned spring being arranged on opposite sides of and in the plane of the hinged axes of such side frames, whereby when such side frames are moved to their unfolded positions they are retained in such positions by the positioning of the spring in the plane of the side frames and when such side frames are moved from their unfolded positions toward their folded positions, the spring acts to resiliently bias the side frames to their folded positions.

2. A convertible furniture piece comprising an open frame vertically disposed in a medial plane, a first pair of vertically spaced shelves hinged to said frame on one side and a second pair of vertically and similarly

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spaced shelves hinged to said frame on the other side of said medial plane of the frame, the shelves of each pair being movable between dropped unfolded horizontal positions lying normal to said medial plane and folded-up vertical positions lying parallel to said medial plane, and a pair of side frames hinged to said open frame on each side of the medial plane thereof, the side frames of each pair being disposed vertically one at one end and the other at the other end of the open frame, and said side frames being each movable about its hinged axis between unfolded positions lying normal to said medial plane and folded-up positions lying parallel to said medial plane and in folded-over relation to said folded-up shelves, and a tensioned spring for the side frames at each end of the open frame anchored at its opposite ends to such side frames, the anchoring points of said tensioned spring being arranged on opposite sides of and in the plane of the hinged axes of such side frames, whereby when such side frames are moved to their unfolded positions they are retained in such positions by the positioning of the spring in the plane of the side frames and when such side frames are moved from their unfolded positions toward their folded positions, the spring acts to resiliently bias the side frames to their folded positions.

3. In the convertible furniture piece of claim 2, linkage means interconnecting the shelves of at least one of the pairs thereof, said linkage means comprising a pair of links arranged one on one side and the other on the other side of said shelves, each link being fixedly pivoted to the bottom shelf and being movably connected by pin and slot means to the top shelf, whereby both shelves may be folded up in unison by hand moving the upper shelf and the bottom shelf may be folded up independently of the folding up of the top shelf by hand moving the bottom shelf.

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