Dec. 11, 1923. 1,476,981

W. J. KELLY

CONVERTIBLE FURNITURE

Filed Aug. 16, 1918 2 Sheets-Sheet 1

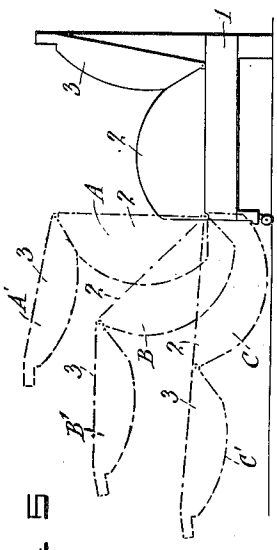


Fig. 5

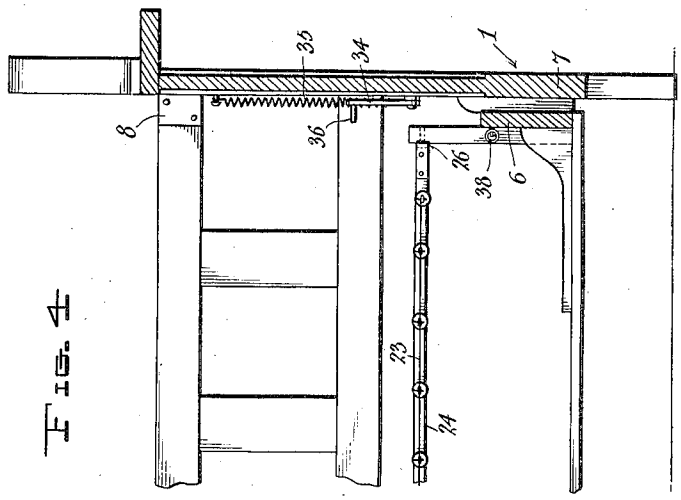


Fig. 4

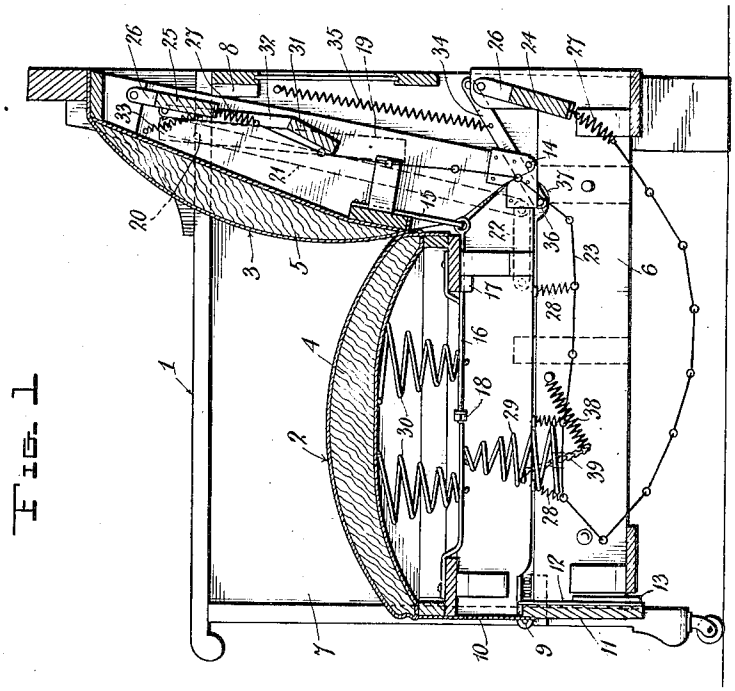


Fig. 1

Witnesses

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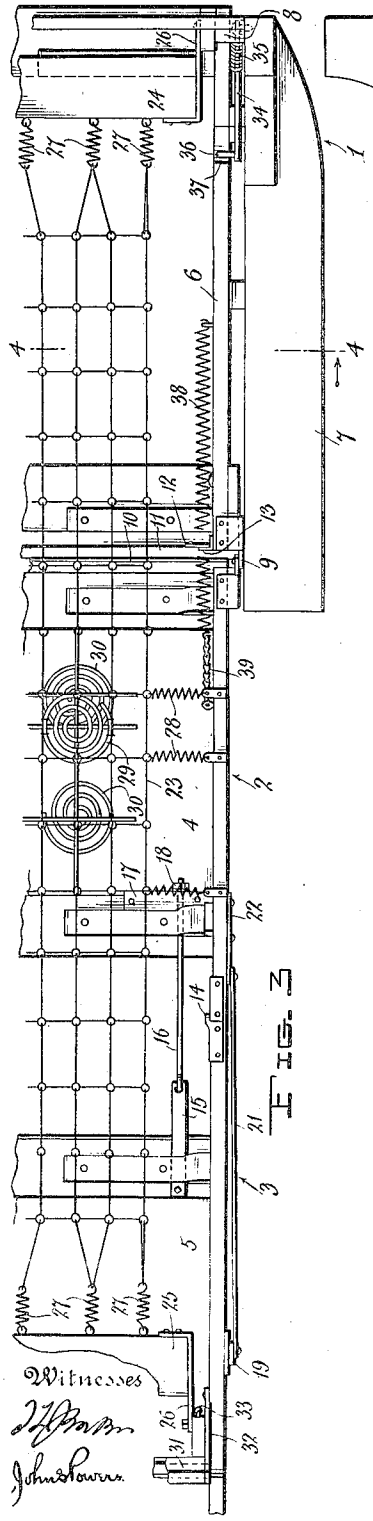


Fig. 3

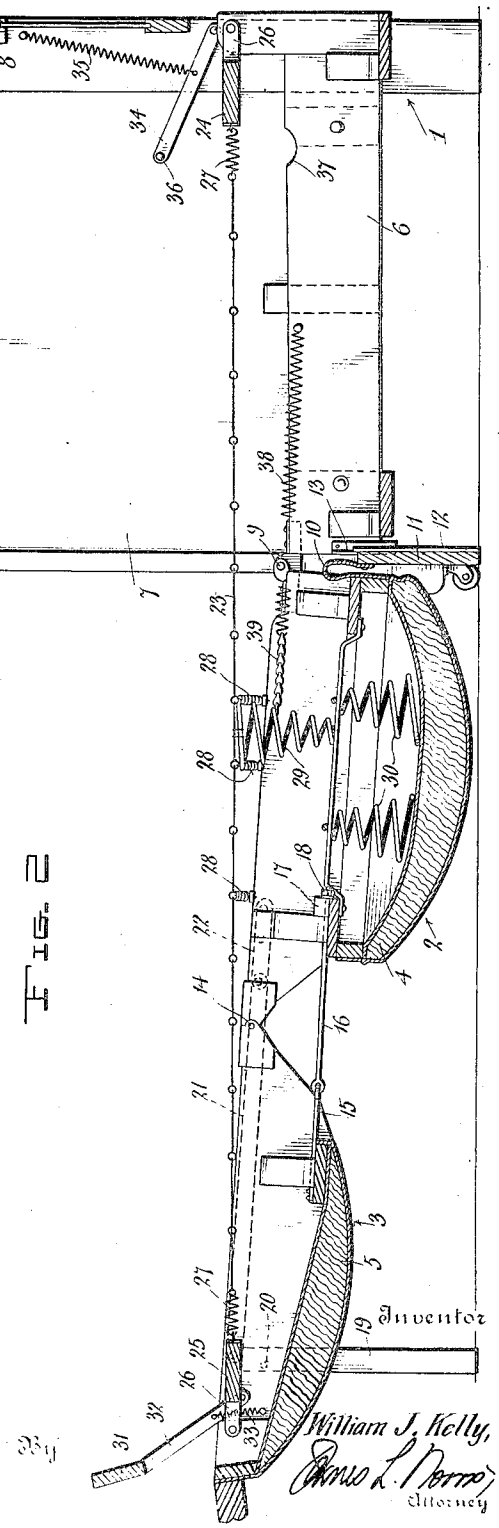


Fig. 2

Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM J. KELLY, OF CLINTON, IOWA, ASSIGNOR TO THE SENG COMPANY, OF CHICAGO, ILLINOIS.

CONVERTIBLE FURNITURE.

Application filed August 16, 1918. Serial No. 250,187.

To all whom it may concern:

Be it known that I, WILLIAM J. KELLY, a citizen of the United States, residing at Clinton, in the county of Clinton and State of Iowa, have invented new and useful Improvements in Convertible Furniture, of which the following is a specification.

This invention relates to improvements in convertible furniture, proposing an article of that type which may be used as a bed or as a davenport and which embodies hingedly connected sections having prescribed movements in consequence of which the article may be easily and quickly changed from one form to the other.

The features of the invention are essentially applicable to a davenport bed having three hingedly connected sections adapted to be folded or extended in a single operation or motion, and to carry an internally arranged spring fabric of continuous character whose flexibility enables it to bend as the sections are folded or unfolded, thereby to adapt itself to the form of the article as a bed or davenport and to conform to the relation of the sections.

The principal objects of the invention are to provide a davenport bed of the type stated wherein, without increasing the elevation of the seat section and without the introduction of any mechanical complications, an internal arrangement of the spring fabric is provided for which admits of the storage of the bedding under the seat section and between the folds of said fabric and also of the provision under the seat section of springs for the support of the seat upholstery and for the support of the transverse central portion of the spring fabric; wherein the folding or unfolding of the seat sections may be easily and quickly effected with the least effort on the part of the operator, and provision is made, by devices of simple and efficient character, for positively limiting the outward movement of the sections, thereby insuring their certain and correct relation to one another to provide a bed, and for cushioning their folding movement, in its final stage, thereby eliminating any liability of jar and consequent injury, in case the sections are dropped or lowered too quickly into relation to provide a davenport as well as gradually relieving the operator of the weight of the sections; wherein the internal arrangement of the spring fabric in the rear of the outer section admits of the provision of a head rest which, when said outer section is positioned to provide the back of the davenport, may be conveniently and effectively folded against said fabric; and which shall be simple, inexpensive, and durable in its construction with its various parts readily accessible for all necessary purposes.

With the above objects in view the invention consists in certain features of structure and combination which will be set forth in detail as the description proceeds.

An embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figures 1 and 2 are sectional views showing the article as a davenport and as a bed, respectively.

Figure 3 is a partial plan view showing the article as a bed.

Figure 4 is a detail cross sectional view on the line 4—4 of Figure 2.

Figure 5 is a diagram illustrating the operations of extending and folding the sections of the article.

Similar characters of reference designate corresponding parts throughout the several views.

The three sections are a stationary inner section 1, an intermediate section 2 hingedly connected to the stationary section, and an outer section 3 hingedly connected to the intermediate section. The sections 2 and 3 may be referred to as seat and back sections since they carry the cushioned seat and back upholstery 4 and 5, respectively. The inner section 1 includes a suitably constructed rectangular frame 6 which is supported between members 7 forming the sides of the davenport and according in design with the general design of the davenport.

To constitute a davenport, the sections 2 and 3 are positioned between the members 7, the section 2 being folded over the frame 6 and, therefore, occupying a horizontal position in which it serves as a seat and the section 3 extending in upright or substantially upright relation from the rear or outer edge of the section 2 and serving as a back. As thus positioned, the section 2 rests upon and is supported by the frame 6 and the section 3 is supported by the section 2 and by cleats or blocks 8 secured to the members 7.

The frame of the section 2 is connected to the frame 6 by suitable leaf hinges 9 which are located at the adjacent corners of said frames. The parts arranged internally of the sections 1 and 2 are concealed, when the section 2 is folded upon the section 1, by a flexible valance strip 10 connected to the frame of the section 2 to a drop board 11, preferably mounted for vertical sliding movement. As shown the board 11 is provided on its rear side with vertical keeper strips 12 which engage slidably over vertical guides 13 secured to the frame 6. When the section 2 is extended the board 11 drops to its lower position as shown in Figure 2 and in such action prevents the valance strip 10 from being scored or worn in connection with repeated folding and unfolding movements of the section 2. When the section 2 is folded the drop board is raised as shown in Figure 1 and by its weight holds the valance strip taut.

The side bars of the sections 2 and 3 are connected by suitable hinges 14 and have their adjoining end faces beveled to enable the folding of said sections in substantially right angular relation in order that the section 2 may serve as the seat, and the section 3 as the back, of the davenport.

The adjacent cross bars of the sections 2 and 3 are connected by one or more devices which act to prevent the relative movement of said sections through an angle greater than 180°—in other words to arrest the relative movement of said sections when they have been brought into co-planar relation—and which, when the sections 2 and 3 are folded, take up the least possible space and are positioned remote from the spring fabric. Two of such connecting devices, one at each side of the sections, are preferably employed. Each connecting device comprises a stem 15 rigidly secured to and projecting outward from the cross bar of one of the sections, e. g. the section 3, and a stem 16 pivotally connected to the stem 15 for movement about an axis parallel to the axes of the hinges 14 and slidably connected to the cross bar of the adjacent section, e. g. the section 2. The stem 16 is slidably movable in a direction fore and aft of the section 2 through a suitable guide 17 and carries on its inner end a head 18 which, as the sections come into their fully extended relation, as shown in Figure 2, engages the guide 17 as an abutment to prevent further relatively outward movement of said sections. When the sections 2 and 3 are folded or extended the stems 15 and 16 participate in their relative pivotal movements and the stem 16 is actuated slidably by the stem 15, being pushed inward, as shown in Figure 1, when the sections are folded, and pulled outward, as shown in Figure 2, when they are extended.

The section 3 is provided at each of its sides and near its front end with supporting legs 19 pivotally mounted, as at 20, for movement in planes parallel to the planes of the side bars to which they are secured. The legs 19 are preferably operated automatically in their folding and unfolding movements and for this purpose may be connected at points inwardly of or above their pivots, by links 21 to brackets 22 rigidly and externally secured to the side bars of the section 2 near the front of said section. The links 21 serve to move the legs 19 into vertical operative position during the extension of the section 3, as shown in Figure 2, and to fold said legs alongside of the sides of the section 3 during the folding of said section, as shown in Figure 1. The legs 19 when thus folded lie in concealed relation between the sides of the section 3 and the members 7.

The sections 1, 2 and 3 conjointly support a continuous flexible spring fabric 23 of suitable and known construction, which participates in the folding and extending movements of the sections, its bending or flexing action in no wise impairing its efficiency or causing any appreciable wear. When the sections are extended the fabric 23 occupies a true plane, thus insuring the comfort of the occupant; and when the sections are folded the folds of the fabric under the seat of the davenport provide ample accommodation for the bedding which may thus be conveniently and accessibly stored.

For the support of the fabric 23 the sections 1 and 3 are provided with pivotally mounted cross bars 24 and 25 supported at their ends by pivoted arms 26 movable in vertical planes, said fabric being connected at its ends to said cross bars, preferably by extension springs 27 which keep said fabric tensioned when the sections are extended. The transverse central portion of the fabric may also be connected by similar extension springs 28 to the side bars of the section 2 and is preferably supplemented by helical supporting springs 29 arranged under the similar springs 30 provided for the support of the seat upholstery.

In the preferred construction a foldable head rest against which the bolster or pillows may be laid is carried by the section 3 and comprises a transverse rest bar 31 supported at its ends by pivotally mounted arms 32 movable in vertical planes and located at the outer sides of the adjacent arms 26. The arms 32 are acted upon by springs 33 which move said arms, when beyond their pivotal center, to either of their extreme positions. When folded the bar 31 lies against the fabric 23 as shown in Figure 1 and when extended said bar is located at a suitable distance above said fabric as shown in Figure 2, the arms 32 resting against the blocks

33 to which the adjacent arms 26 are pivoted.

When the sections are extended the bars 24 and 25 occupy the common plane of the fabric 23. When the sections are folded the bar 25 assumes a position, with reference to its pivotal center, wherein it permits the fabric 23 to yield in order that the rest bar 31 and its supporting arms 32 may be folded entirely within the frame of the section 3; and the bar 24 assumes a position with reference to its pivotal center wherein it permits the lower fold of the fabric 23 under the seat section to sag, thereby to serve as a hammock for the bedding, the upper fold of said fabric being prevented from sagging by the springs 28.

The extension and folding of the sections is clearly shown in Figure 5. In extending the sections to provide a bed, the then upper bar of the section 3 is grasped and the sections 2 and 3 are pulled forward, first as a unit, through an arc whose radius extends from the hinge joints 9. This unitary movement of the sections 2 and 3 is continued until the section 2 has an approximately vertical position and the section 3 an approximately horizontal position, as shown by the dotted lines A and A′; after which, and in consequence of the continued forward pull upon the section 3, said sections move pivotally relatively to one another, as shown by the dotted lines B and B′, each approaching its final position wherein it is co-planar with the other and with the section 1, as shown in the dotted lines C and C′. The operation of folding the sections to provide a davenport may be just the reverse of that described; or, if preferred, it may be performed by raising the sections 2 and 3 in their co-planar relation and as a unit through an arc whose radius is measured from the hinge joints 9 into vertical or substantially vertical positions, and thereafter by permitting said sections to move inward by gravity and fold relatively to one another, the section 3 being so held or manipulated that it will gradually approach its final position wherein it extends substantially upright from the section 2 and is supported by said section and the cleats 8.

In any case, the user is required to perform but a single operation or motion and the working leverages are so selected and distributed that the extension of folding of the sections 2 and 3 may be practiced with very slight physical effort.

The operation of folding or extending the sections is greatly facilitated by the provision of cushioning bumpers which coact with the section 3 and in their preferred form comprise arms 34 pivoted to the members 7 for movement in vertical planes and projecting forward from their pivots and springs 35 connected to said arms for holding them in an elevated position, the arms being provided at their free ends with lateral projections 36 which, when the arms are lowered, are accommodated in recesses 37 formed in the upper edges of the side bars of the frame 6. The arms 34 are located in planes beyond the side bars of the sections 2 and 3 and in the folding of said sections their projections 36 are engaged by the side bars of the section 2, the arms thus being forced downward against the gradually increasing resistance of the springs 35 which, through said arms, are effective to cushion the final movement of the sections 2 and 3, gradually relieving the operator of the weight of said sections and, in case the sections should be dropped or lowered too suddenly, greatly minimizing the jar or shock. On the other hand, power being stored in the springs 35 when the arms 34 are lowered, said springs are effective, through said arms, in facilitating the initial stage of the extending movements of the sections 2 and 3 and materially lighten the effort required for the movement of said sections from their folded positions to the positions A, A′, as shown in Figure 5.

In order to further facilitate the folding and extension of the sections 2 and 3, an elastic connection, preferably consisting of a retractile spring 38 and a chain 39, may be provided between each side bar of the section 2 and the adjacent side bar of the frame 6, the spring resisting or retarding the outward movement of the section 2, i. e. its movement from position B to position C, as shown in Figure 5, and assisting or accelerating its inward or return movement.

Having fully described my invention, I claim:—

1. In a bed davenport, an inner stationary section having side boards with recesses adjacent their rear ends, an outer and an intermediate section hinged together, the latter hinged to the front of the side boards, a pair of spring supported arms each having a pin projecting therefrom adapted to be engaged by the intermediate section when it is moved to closed position, and the pins being seated in the recesses in this position.

2. In a bed davenport, a frame, an inner stationary section comprising side boards each having a recess adjacent the rear end thereof, foldable sections mounted at the front of the frame and supported on the side boards, an arm pivoted at the rear of the frame having a projecting pin adapted to be engaged by the folding sections, and a spring tending to hold the arm in raised position with the pin out of the recess, the spring tending to assist in raising the folding sections from the frame when the sections are extended to form a bed.

3. In a bed davenport, a frame, an inner stationary section comprising side boards, foldable sections mounted at the front of

the frame and supported in folded position upon the side boards, an arm pivoted at the rear of the frame having a projection adapted to be engaged by the folding sections, and a spring tending to hold the arm in raised position to cushion the return and to assist in raising the folding sections when the sections are extended to form a bed.

4. In a bed davenport, an inner stationary section, a seat section and a back section hinged together and pivoted at the outer end of the stationary section, means at the outer end of the back section for supporting the back and seat sections, in extended position with the edges of the sections inclined upwardly from the pivoting point of the stationary section and a bed fabric extended and drawn taut by the unfolding of the back and seat sections and having swinging means for connecting the extremities of the fabric to the outermost end of the back section and the innermost end of the stationary section, so that the fabric will be supported substantially above the inclined side edges of the seat and back sections.

5. In a bed davenport, a frame; a seat section and a back section pivoted together, and the seat section pivoted at the front side of the frame, means for limiting the pivoted movement of the back and seat sections in both directions; a support for the back section only which inclines the seat and back sections upwardly from the pivotal connection with the frame; a foldable bed fabric; and means for swingingly mounting the ends of the fabric within the frame and at the outer end of the back section so that when the sections and the fabric are extended the fabric will be drawn taut in a plane above the pivotal mounting and above the side edges of the back and seat sections.

6. In a bed davenport, a frame; a seat section and a back section pivoted together and the seat section pivoted at the front of the frame, means for limiting the pivotal movement of the back and seat in overturning; foldable legs on the back section which hold the upper edges of the back and seat sections inclined upwardly from the pivotal connection with the frame; a continuous bed fabric swingingly supported at its outer end to the upper edge of the back section and at its inner end at the back of the frame, so that the bed fabric will be drawn taut in a plane above the side edges of the back and seat sections; and additional spring supports for the intermediate portion of the bed fabric extending from the underside of the seat section.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM J. KELLY.

Witnesses:
ALICE GAFFNEY,
CAROLINE KAMER,