M. F. BAYER.

EXTENSIBLE FURNITURE.

APPLICATION FILED FEB. 21, 1918.

1,359,658.

Patented Nov. 23, 1920.

2 SHEETS—SHEET 1.

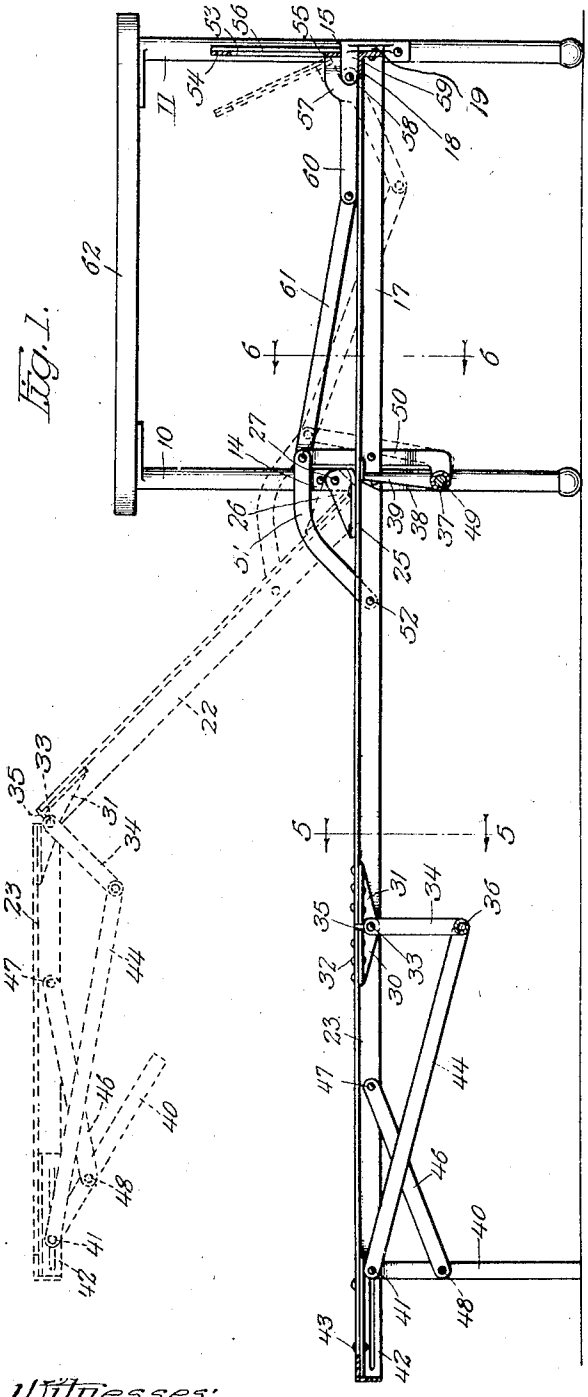


Fig. 1.

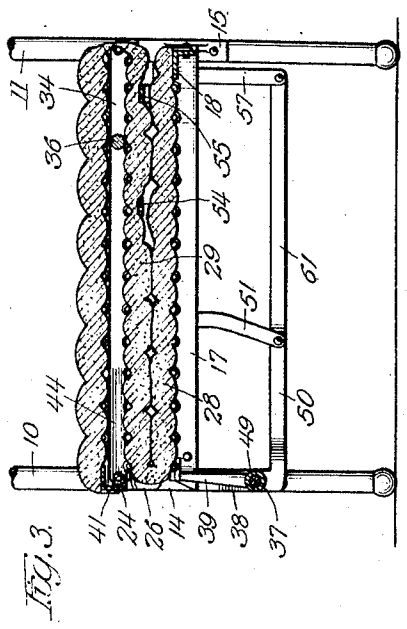


Fig. 3.

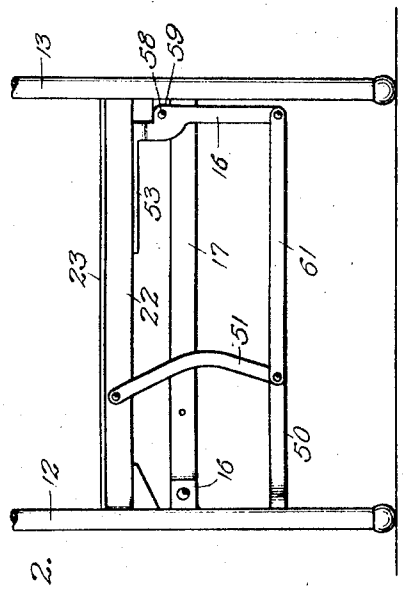


Fig. 2.

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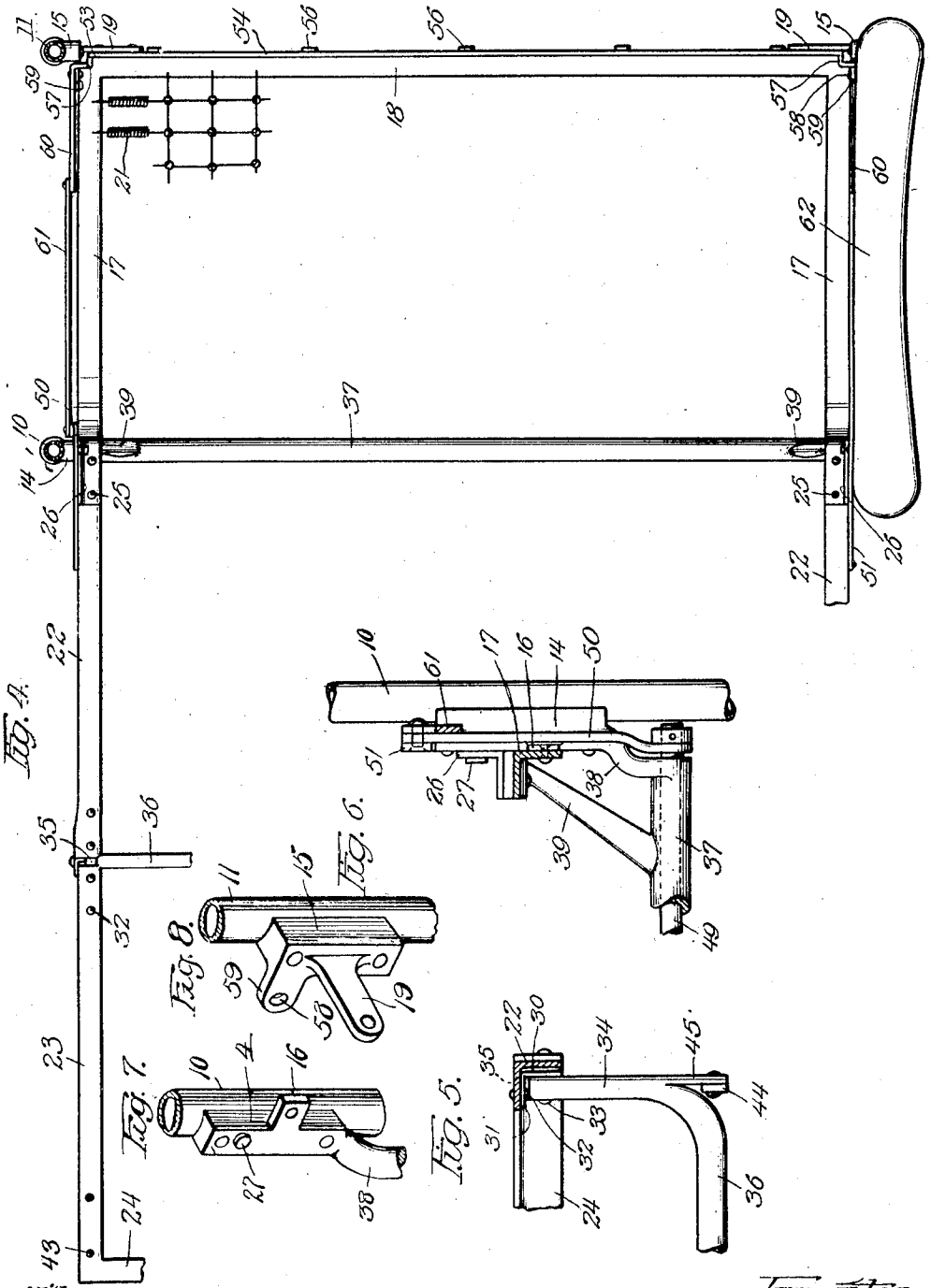


Fig. 4.

Fig. 6.

Fig. 8.

Fig. 7.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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EXTENSIBLE FURNITURE.

1,359,658. Specification of Letters Patent. Patented Nov. 23, 1920.

Application filed February 21, 1918. Serial No. 218,425.

To all whom it may concern:

Be it known that I, MATTHEW F. BAYER, a citizen of the United States, residing at Kenosha, in the county of Kenosha and State of Wisconsin, have invented certain new and useful Improvements in Extensible Furniture, of which the following is a specification.

My invention relates to improvements in extensible furniture, and is of particular service when used in connection with pieces of furniture such as couches or bedsteads which, when not actually in use as couches or beds, must be folded or condensed to occupy a minimum amount of floor space. The invention also has special advantages when applied to bed or couch constructions employing flexible or resilient fabric by which the mattress or pad is supported.

The principal objects of the invention are to provide a plural-section piece of furniture of the class described in which the sections may be folded together in superposed relation when it is desired to economize floor space; to provide a piece of furniture of the class described which may be opened out for sleeping purposes and collapsed or condensed into smaller compass while still serving the purpose of a piece of furniture of another type, such as a seat or lounge; to provide in a construction of the class described means for preventing the weight of the occupant from straining the parts; to provide improved means for causing uniform actuation of the various parts of the device and thereby minimizing racking stresses; to provide an improved folding head-stop; to provide improved means for automatically adjusting the legs employed for supporting the extended portion of the bed or couch; to provide an improved construction which shall be simple in design, economical to manufacture, and efficient in operation; and, in general, to provide a neat, comfortable, and practical article of extensible furniture of the character referred to.

In the drawings, which describe one embodiment of my invention as applied to a full-sized bed or couch designed to fold up into the form of a seat when not required for sleeping purposes,—

Figure 1 is a section taken through the center of the bed when fully extended, the mattress having been removed in order better to disclose the mechanical construction;

Fig. 2 is an end elevation, similar to Fig. 1, but not in section, and showing the device when closed up or folded;

Fig. 3 is a view similar to Fig. 2, but shown in section with the mattress in place;

Fig. 4 is a fragmentary plan view showing the device fully extended;

Fig. 5 is a section taken on the line 5—5 of Fig. 1;

Fig. 6 is a section taken on the line 6—6 of Fig. 1;

Fig. 7 is an enlarged fragmentary view, in perspective, of the bracket 14 and portion of the post to which it is attached; and

Fig. 8 is a perspective view of the bracket 15 and portion of the post to which it is attached.

Referring to the drawings, 10, 11, 12, and 13 represent posts which constitute the four principal legs of the main frame or supporting structure of the device. Secured to the legs 10 and 12 are a pair of blocks 14, as shown best in Fig. 6, and to the legs 11 and 13 there are rigidly secured a pair of blocks 15. Each of the blocks 14 has an integral lug 16 to which is riveted one end of an angle iron 17, the other end of each of said angle irons 17 being integrally connected to the opposite ends of another angle bar 18. Each end of the said angle bar 18 is riveted to a small lug, for instance as shown at 19 in Fig. 1, which constitutes an integral part of the block 15. The rectangle inclosed by the angle bar 18 at the back and the two angle bars 17 at the side, constitutes one section of the skeleton frame across which is stretched the flexible link fabric 20. Preferably, the edges of said fabric 20 are connected to the surrounding frame by means of a series of helicals, for instance as shown at 21 in Fig. 4. The skeleton spring frame in the present instance is composed of three sections, the other sections being hinged together and hinged to the stationary section so as to enable them to be folded flat in three-ply superposed relation. To this end, the angle bars 22 constitute marginal frames for the intermediate spring section, and the angle bars 23 constitute the marginal side frames for the ter-

minal spring section, the ends of said angle bars 23 being suitably united to an angle iron 24 which extends across the foot end of the bed.

To the inner ends of the frame members 22 there are suitably fastened, for instance by rivets 25, a pair of small oblique lugs 26, the upper ends of which are perforated to rotate upon a pair of pivot pins 27 secured in the upper ends of the mounting blocks 14. The position of the pins 27 is higher than the top of the stationary frame angle 17, so that the frame members 22, when folded over upon the frame member 17, as shown in Fig. 2, are spaced apart some distance therefrom so as to permit the inclusion of the two folds 28 and 29 of a mattress normally covering the top of the fabric. For convenience, the edges of the mattress are preferably securely fastened to the sides of the skeleton spring frame by means of snaps or other detachable devices.

The outer ends of the frame members 22 and the inner ends of the frame members 23 are pivotally connected together through pairs of oblique stiffening lugs 30 and 31 united to the respective ends of the said bars by rivets 32. The adjacent overlapping ends of the parts 30 and 31 are hinged together by means of pins 33 upon which also there is loosely swiveled an arm 34. As shown best in Fig. 1, the upper ends of the arms 34 are each formed with an integral tooth or projection 35 extending upwardly substantially to the top of the angle bars 22 and 23. As shown best in Fig. 4, the angle bars 22 and 23 are each cut back a short distance so as to just inclose the upper end of the finger 35 when the parts are in completely extended relation, as shown in Fig. 1. The purpose of the said finger 35 is to cause the arms 34 to assume a depending vertical position when the bed is opened out.

The spaced apart arms 34 constitute in effect the bent ends of a stretcher bar 36 which prevents the tension of the fabric from collapsing the sides of the skeleton frame when the bed is occupied. The same effect is obtained by a tubular member 37 which maintains the proper spacing of the legs 10 and 12, said stiffening tube 37 having its ends rigidly connected to the lower extremities of a pair of offset lugs 38 depending from and constituting integral parts of the lower ends of the mounting blocks 14. The said stiffening bars 37 and the structure as a whole are mutually strengthened against transverse strains by means of a pair of oblique braces 39 connecting the ends of the angle bars 17 with the stiffening tubes 37.

The object of locating the frame tube 37 below the top of the fabric is to permit the latter to sag under the weight of the occupant. Likewise, the same reason applies for the locating of the stretcher bar 36 below the level of the bed fabric.

When the spring frame is completely opened out in extended position, as shown in Fig. 1, the outer or foot end is supported by a pair of folding legs 40. The upper ends of the said legs 40 are equipped with pins 41, the outer ends of which are headed to slide within the space between the angle bars 23 and the slotted plates 42. Said slotted plates 42 are secured to the under sides of the angles 23 by means of suitable rivets 43, as shown in Fig. 1. The pins 41 also constitute pivots for the outer ends of a pair of oblique links 44, the rear ends of which are pivotally connected to a pair of short lugs 45 (see Fig. 5) rigidly connected to and constituting parts of the arms 34. The outer ends of oblique links 46 pivoted to the angles 23, as shown at 47, constitute fulcra or pivots for intermediate points 48 on the folding legs 40, whereby, when the spring frames are folded flat in superposed relation, the legs 40 are caused to assume a position parallel to and within the confines of the frame angles 23. The dotted lines in Fig. 1 illustrate the position of the parts when the bed is in partially folded condition, and illustrates the manner in which the links 44 and 46 control the folding of the legs 40.

Special means are provided for effecting corresponding uniform pivotal movement of the opposite sides of the skeleton frame when the bed is being folded or opened up. Said means comprises, in the present instance, a transverse shaft 49 which, for convenience, is journaled within the stiffening tube 37, the outer ends of the said shaft being rigidly united to the lower ends of a pair of offset arms 50. The upper ends of said arms 50 are respectively connected to a pair of curved links 51, the other ends of said curved links 51 being pivotally secured to the angle bars 22, as shown at 52. Upon inspecting the figures, it will be manifest that if an attempt be made to effect pivotal movement of one only of the angle bars 22 by applying force to one side of the bed only, the other angle bar 22 on the other side of the bed will be compelled to move a corresponding amount by reason of the integral connection between the arms 50 which are thus compelled to move in unison and effect corresponding movement of the angle bars 22 to which they are pivotally connected by the curved links 51.

In many cases it is desirable to have some means, such as a head-stop, to prevent displacement of the pillows or other bedding. In the present instance, such means preferably comprise a folding head-stop 53 composed of an upper bar 54 and a lower bar 55, said bars being connected at intervals by vertical straps 56. To each end of the

lower bar 55 of the head-stop there is rigidly united a strap member 57 constituting in effect a lever which is pivotally supported upon a pin 58 carried by a small lug 59 projecting from the mounting block 15. The front end 60 of said levers 57 are pivotally connected to the outer ends of the synchronizing arms 50 by means of links 61, the arrangement being such that when the arms 50 move down into the position shown in Fig. 3, the links 61 effect a pivotal movement of the lever 75 into the position shown in Fig. 3, thereby causing the head-stop 53 to fold down flat over the fold 28 of the mattress. Similarly, when the bed is unfolded or opened up, the links 61 cause the head-stop to assume a vertical position, as shown in full lines in Fig. 1.

When the device is opened out it constitutes a neat and comfortable full sized bed, the upper surface of which is flat, unobstructed. and having the desired degree of resiliency; and when it is folded, it has the appearance of an ordinary seat or settee. It should be noted that when the bed is equipped with a suitable mattress permanently secured in position, as shown, the folding of the bed into the form of a settee furnishes a seat which is very resilient and comfortable, due to the presence of the resilient bed fabric and three folds of mattress, instead of having to rely upon a single thickness of mattress and a single section of spring, as in some other types of construction which have been brought to my attention. It must of course be understood that the shape of the permanent arms 62 at the ends of the settee may be as plain or as ornamental as desired, depending upon individual taste.

The scope of the invention should be determined by the appended claims, the described details of construction and operation being merely illustrative of a single application of my invention.

I claim—

1. In an article of furniture, the combination of a main frame and a pivoted main frame extension, both supporting a resiliently depressible bed bottom, and a shaft journaled in a fixed position at a distance below the bed bottom and connected with portions of the main frame extension at opposite sides of the bed bottom to effect corresponding and simultaneous pivotal movement of said portions.

2. In an article of furniture, the combination of a main frame, a main frame extension comprising spaced rails pivoted on a fixed axis above the main frame to fold at an altitude thereover, a resiliently depressible bed bottom supported by the main frame and extension, a shaft journaled in a fixed position at a distance below and extending from side to side of the bed bottom, a lever at each end of the shaft, and links connecting the levers with said rails to effect corresponding and simultaneous pivotal movement of said rails by rotating said shaft.

3. In an article of furniture, the combination of the main frame having a rail and a pair of supporting posts at each end, an auxiliary frame comprising a pair of end rails pivotally supported to swing to and from a position in line with the end rails of the main frame; shaft bearings on corresponding posts at each end of the main frame spaced below the pivotal axis of the auxiliary frame; a shaft journaled in said bearings; an arm at each end of the shaft; and a link connecting each arm with one of the rails of the auxiliary frame so as to rotate the shaft and effect simultaneous and corresponding movement of said rails.

MATTHEW F. BAYER.