Jan. 20, 1925. 1,523,746

G. C. BOLISTON

SPRING SEAT

Filed Sept. 15, 1924 2 Sheets-Sheet 1

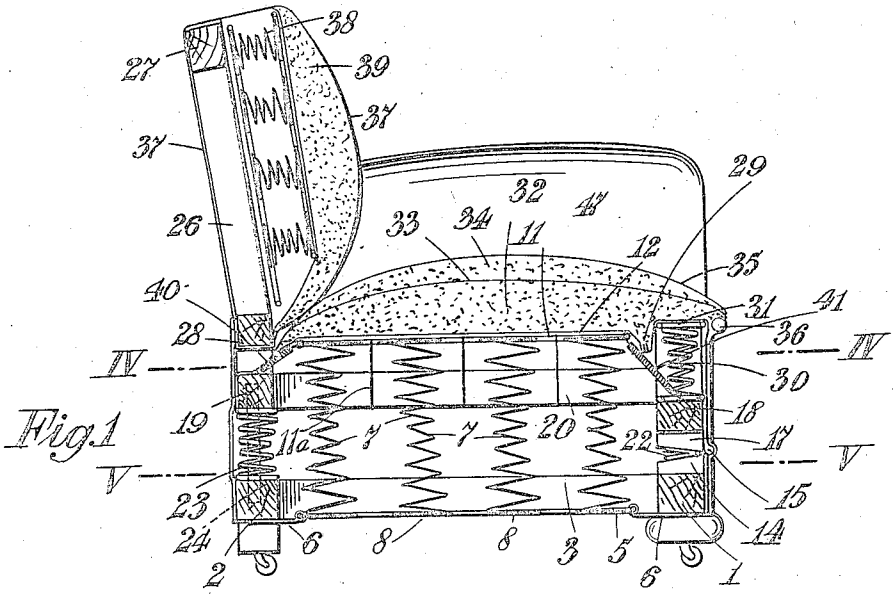


Fig.1

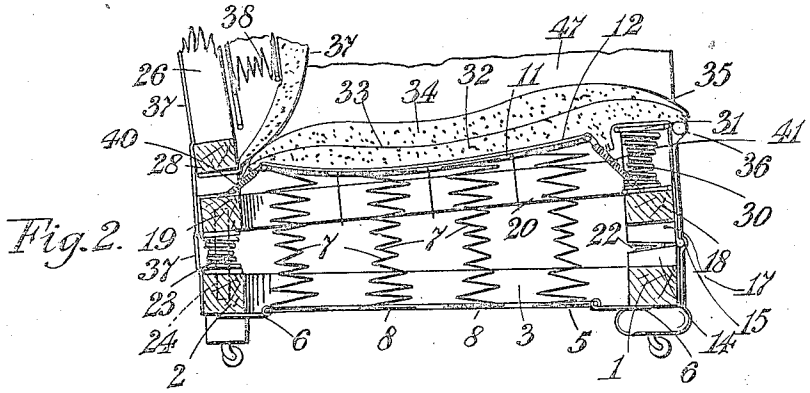


Fig.2.

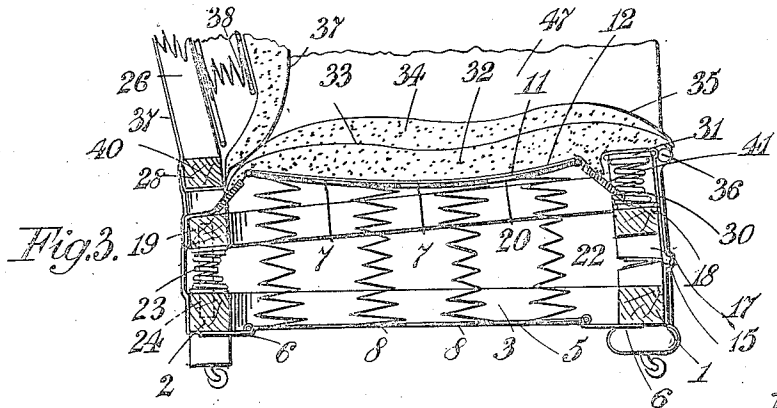


Fig.3.

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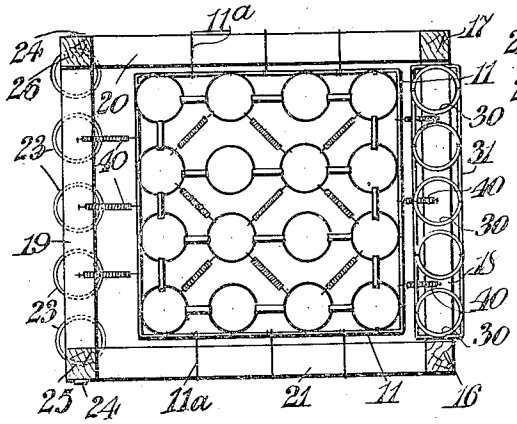


Fig. 4

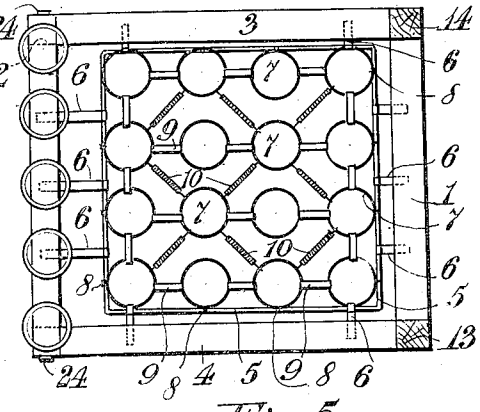


Fig. 5.

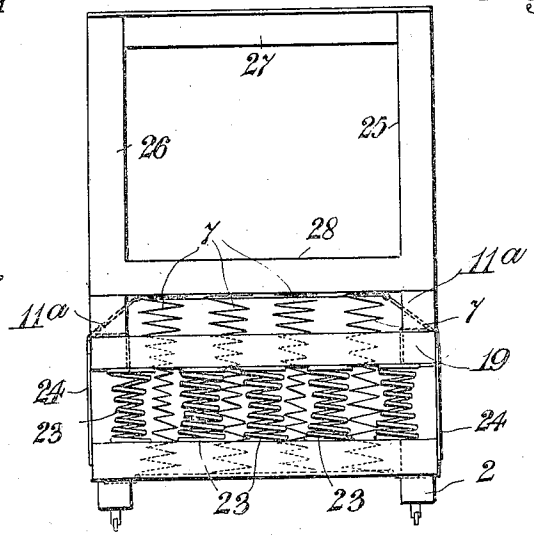


Fig. 6.

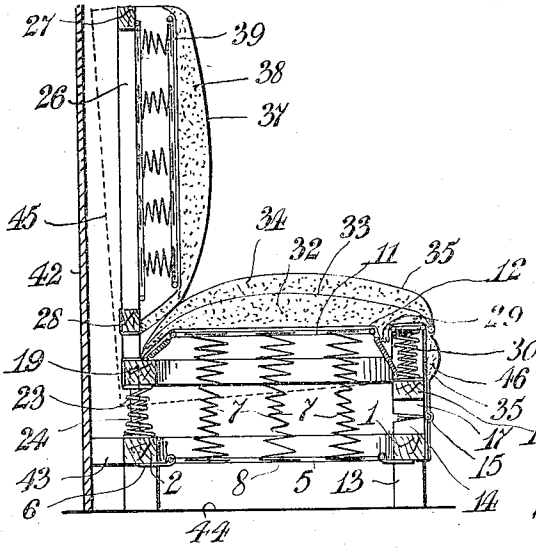


Fig. 7.

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Patented Jan. 20, 1925. 1,523,746

UNITED STATES PATENT OFFICE.

GEORGE CHARLES BOLISTON, OF WESTCLIFF-ON-SEA, ENGLAND.

SPRING SEAT.

Application filed September 15, 1924. Serial No. 737,901.

To all whom it may concern:

Be it known that I, GEORGE CHARLES BOLISTON, a subject of the King of Great Britain and Ireland, residing at Westcliff-on-Sea, England, have invented certain new and useful Improvement in Spring Seats, of which the following is a specification.

This invention relates to spring upholstered seats, chairs, lounges and like furniture of the kind in which the seat frame is hinged at the front to an underframe and supported on springs secured to the underframe and seat frame; the back frame and the arm frames (if any) being rigidly mounted on the seat frame.

Objects of the invention are, to construct spring upholstered seats and furniture so as to obtain automatic adjustment in the relative positions of the back and the seat, according to the variations in the position of the user; to equalize and distribute the load evenly between the seat and the backframes, the underframe and the seat and its supporting springs, and thus greatly increase the comfort of the seat; to considerably increase the durability and wearing qualities, and to simplify and reduce the cost of construction thereof.

The accompanying drawings forming part of this specification illustrate preferred constructions according to the present invention.

Fig. 1 is a central vertical section of an easy chair.

Fig. 2 is a similar view to Fig. 1 (part of the back being broken away) showing the relative position of the parts when a person is leaning back in the chair.

Fig. 3 is a view similar to Fig. 2 showing the positon of the parts when a person is sitting forward in the chair.

Fig. 4 is a sectional plan on the line IV—IV of Fig. 1, showing the seat frame and its supporting springs, and also the arrangement of the main supporting springs for the seat.

Fig. 5 is a sectional plan on the line V—V of Fig. 1, showing the underframe and the resilient supports of the main seat springs.

Fig. 6 is a back view of the frame of the chair shown in Fig. 1.

Fig. 7 is a central vertical section of a modified form of chair according to the present invention, particularly constructed for use in railway cars.

Referring first to Figs. 1 to 6:

The underframe comprises front and back rails 1 and 2, and side rails 3 and 4, in which underframe an inner wire frame 5 is suspended by strips 6 firmly secured to the front, back and side rails, so as to form a resilient support for rows of coil springs 7, the bottoms of which springs are secured by ties 8 to the wire frame 5; the springs being also connected together by light metal strips 9 and by diagonally arranged springs 10, as indicated.

Such coil springs 7 constitute the main springs for the seat, and are connected at their top by another wire frame 11 (see Fig. 4) similar to the frame 5 above referred to, over which frame 11 the seat canvas or the like 12 is stretched, as hereafter explained.

The front of the underframe preferably comprises at each side two short uprising legs 13 and 14, each provided with a hinge 15 which form a connection between these legs and legs 16 and 17 of a seat frame, thereby constituting a connection between the underframe and the seat frame in the form of articulated legs.

The seat frame includes a front rail 18 which connects the legs 16 and 17, a rear rail 19 and side rails 20 and 21, the latter being connected to the legs 16 and 17 above the rail 18 (see Figs. 1–3).

The pairs of legs 13, 16 and 14, 17 have their adjacent faces cut away or bevelled; such faces being covered by packing 22 (Figs. 1–3) to prevent noise.

The hinges form the front support of the seat frame, the rear part being carried on a battery of springs 23 (Figs. 4 and 5) arranged between the rear rail of the underframe and the rear rail 19 of the seat frame. Webbing strips 24 are fixed to each rear rail to limit the normal tension of the springs, and to reinforce the outer covering of the chair, such webbing strips 24 being arranged so that normally the seat frame is held in a horizontal position.

The seat frame also includes side posts 25 and 26 at the rear, which are connected together by cross rails 27 and 28 to form a back frame rigid with the seat frame. The posts are bent backwards to give a restful shape to the back of the chair.

The foundation canvas 12 of the seat is stretched over the spring supported frame 11, and also over a second frame 31 carried

by an additional set of springs 30 mounted on the front rail 18 of the seat frame (see Figs. 1 to 4) so as to resiliently support the front of the seat.

The canvas 12 is secured as usual to the rails of the seat frame and stretched by guttering the same, as indicated at 29, between the frames 11 and 31 with webbing or the like; the ends of which are secured to the side rails 20 and 21 of the seat frame, so as to allow the front springs 30 to work independently of the main seat springs 7.

The canvas 12 carries suitable stuffing 32, which is packed so as to form an even seating for the springs; such stuffing being covered by canvas 33 secured to the rails of the seat frame.

A second layer of stuffing 34 is arranged on the canvas 33, and covered in by the outer cover 35 of the seat; such outer covering is also secured in any convenient manner to the rails of the seat frame, and is preferably piped or reinforced along its front edge, as indicated at 36.

The back of the chair is upholstered with springs 38 and stuffing 39 in known manner; the stuffing being held in place by the covering 37, which is stretched thereover and fastened as usual to the back frame.

To prevent distortion of the main springs as a person moves in the chair, back to front or vice versa, the light frame 11 connected to the top of the springs is also connected by coil springs 40 and 41 to the back rail 19 and front rail 18 respectively of the seat frame, and may also be connected by ties 11^a to the side rails 20 and 21 (see particularly Fig. 4).

It will be noted that the light frame 11 is above the seat frame, and that therefore the seat is a floating member above the seat frame.

When the seat is in use the weight is mainly taken by the springs 7 and 23, more or less on 23, depending on whether or not the person is leaning on the arms 47, so as to directly distribute part of the load to the seat frame; a part of the weight being also carried by the springs 30 owing to the occupant's legs resting on them.

If the occupant leans back, more weight is taken by the back and seat frames, hence the springs 23 are compressed to a greater extent, while the springs 30 are somewhat relieved (see Fig. 2); on the other hand, if the occupant leans forward the back springs are relieved, and the forward springs take more of the weight (see Fig. 3).

It will be noted therefore that though the seat and back frames are rigid with each other, yet there is relative movement between the seat and back, corresponding to the weight and disposition of the occupant in the chair.

As to the relative strength of the springs: the rear springs 23 are preferably of heavier gauge than the front springs 30, which in turn may be of slightly heavier gauge than the main springs 7, so that when the chair is not in use the load of the frame is taken chiefly by the springs 23; the springs 7 merely supporting the seat upholstery.

Referring now to Fig. 7:

This shows a chair modified for use in a railway car. The back frame is straight so that the chair can be disposed near to a partition 42 of the car, the underframe being secured to the flooring 44, its position relatively to the partition 42 being conveniently determined by a distance-piece 43 on the back of the underframe, so as to afford sufficient clearance for angular displacement of the back of the seat, as indicated by the dotted line 45.

Other parts of the structure are similar to those described with reference to Figs. 1–6, and are identified by the same reference numerals; further description being therefore unnecessary, except that instead of piping the front of the seat, as previously described, stuffing 46 is placed between the canvas 12 and cover 35 in front of the springs 30.

In either construction heretofore described arm rests may be provided by including frames therefor formed rigid with the seat frame. In Figs. 1–3 one arm is indicated by the reference 47.

What I claim as my invention, and desire to secure to Letters Patent, is:—

1. The combination with a support, of a seat, main springs mounted on said support and carrying the seat as a floating member, a seat frame independent of the seat and having a movement independent thereof, a back frame rigidly fixed to said seat frame, a hinge connection between the front of the seat frame and said support, rear compression springs between the rear of the seat frame and said support, and front compression springs mounted on the seat frame to support the front of the seat: said front and rear compression springs being tensioned with relation to each other and the main springs, so that normally the load is taken by all three sets of springs, and when the load is thrown backward the back frame and seat frame move downwards, and when the load is forward the front of the seat depresses and the back and seat frames rise.

2. The combination with an open underframe, of a seat, main springs mounted on the underframe and carrying the seat as a floating member, a seat frame independent of the seat and having a movement independent thereof, a back frame rigidly fixed to said seat frame, articulated legs connecting the front of the seat frame to said under-

frame, rear compression springs between the rear of the seat frame and said underframe, and front compression springs mounted on the seat frame to support the front of the seat; said front and rear compression springs being tensioned with relation to each other and the main springs, so that normally the load is taken by all three sets of springs and distributed through them to the underframe, and when the load is thrown backward the back frame and seat frame move downwards, and when the load is forward the front of the seat depresses and the back and seat frames rise.

3. The combination with a seat, of main springs carrying the seat as a floating member, a resilient support for said main springs including an open underframe, a frame suspended in said underframe, and connected to said main springs, a seat frame independent of the seat and having a movement independent thereof, a back frame rigidly connected to said seat frame, articulated legs connecting the front of the seat frame to said underframe, rear compression springs between the rear of the seat frame and said open underframe, and front compression springs mounted in the seat frame to support the front of the seat; the front and rear compression springs being tensioned with relation to each other and the main springs, so that normally the load is taken by all three sets of springs and distributed through them to the underframe, and when the load is thrown backward the back frame and seat frame move downwards, and when the load is forward the front of the seat depresses and the back and seat frames rise.

4. A piece of furniture comprising the combination with a seat frame and back frame rigid therewith, of an underframe, a hinged connection between the front of the seat frame and the underframe, helical springs connecting the underframe to the back of the hinged frame, a seat, helical springs carried by the underframe supporting the seat as a floating member independent of the movement of the seat and back frames, and springs carried by the seat frame supporting the front of the seat, whereby the load on the furniture is distributed through all the springs to the underframe.

In testimony whereof I affix my signature.

GEORGE CHARLES BOLISTON.