June 15, 1943. W. E. HUTTON 2,321,817

SPRING FRAME ASSEMBLY

Filed Nov. 16, 1942

Fig. 1.

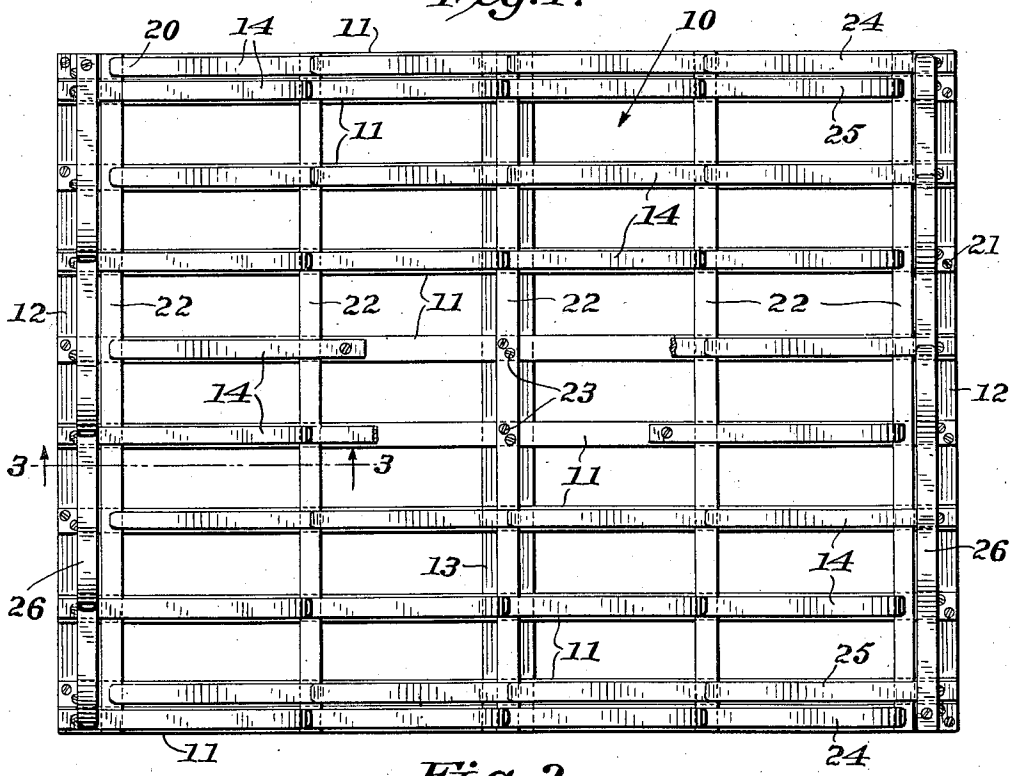


Fig. 2.

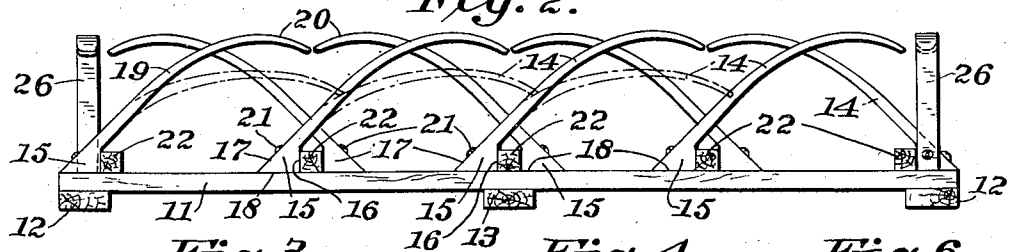


Fig. 3.

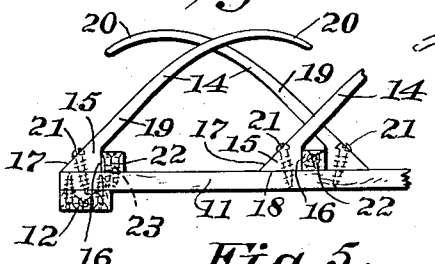


Fig. 4.

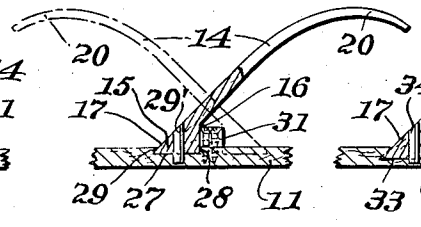


Fig. 6.

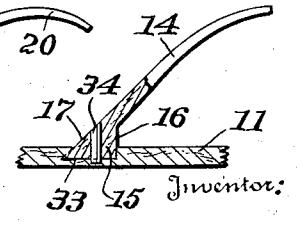
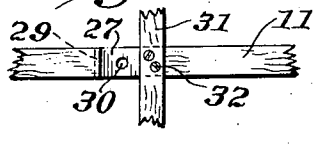


Fig. 5.



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SPRING FRAME ASSEMBLY

William E. Hutton, Dickson, Tenn.

Application November 16, 1942, Serial No. 465,740

11 Claims. (Cl. 5—247)

The present invention relates to supports for articles of furniture, such as bed bottoms, chairs, and the like, and more particularly to an improved spring frame assembly in which the springs are arranged in longitudinal and transverse rows extending completely over the area of the frame, so that the weight to be sustained is received by the springs in such a manner as to provide a comfortable and elastic support.

An important object of the invention consists in providing a frame with bowed springs so arranged that the upper free end portions of each spring overlaps the spring in front of it in order that when a spring is depressed, it will engage the adjacent front spring to limit its downward movement and will, upon release of the pressure, return to its normal overlapped position, due to the inherent resiliency of the spring.

A further object consists in providing the frame assembly with a double row of bowed springs along the sides to give proper shape to a bed mattress or the like. Additionally, a single row of transverse springs may be arranged at the ends of the frame and extend substantially at right angles to the longitudinal rows of springs in order to insure the mattress being maintained in proper shape at the ends of the frame. Thus, simple, efficient, and inexpensive means are provided to obtain complete resiliency of the entire supporting surface of the frame assembly and in which the parts are constructed and arranged so that the supporting surface may be subjected to constant usage without losing its resiliency or impairing its efficiency.

Another object comprehends the provision of a bowed spring having a substantially triangular base provided with means for coacting with complementary means on a supporting structure to insure the spring being maintained firmly in a fixed position.

Other objects and advantages of the invention will become apparent from the following description, when taken in conjunction with the accompanying claims and drawing.

Referring to the drawing, in which are shown several preferred embodiments of the invention:

Figure 1 is a plan view of the frame assembly.

Figure 2 is a side view of Figure 1, showing the springs depressed in dotted lines;

Figure 3 is a sectional view taken along the line 3—3 of Figure 1;

Figure 4 is a detail side view of a modified form of the invention with parts in section;

Figure 5 is a plan view of Figure 4, with the springs removed, and

Figure 6 is a detail side view of a further modification, with parts in section.

The improved resilient support comprises a frame 10 of any suitable size and shape. This frame may be formed of spaced longitudinal members 11 connected at their ends to transverse members 12 and between their ends to one or more transverse members 13 so as to provide a rigid and durable construction. In order that the frame may yieldably and comfortably support a bed mattress, seat, or the like (not shown), bowed springs 14 made of wood, metal, or plastic material, are suitably secured to the frame and are preferably arranged in longitudinal and transverse spaced rows extending alternately in opposite directions throughout the entire area of the frame. As shown, the springs 14 are formed of any suitable hard, light, and flexible wood, such as hickory, and are of the same length and shape. Each spring is preferably provided at its lower end with a substantially triangular base 15 (Figure 2) having a vertical straight side 16, an inclined side 17, and a flat bottom 18. The inclined side 17 has extending upwardly therefrom a flexible arm or integral portion 19 which terminates in a bowed or curved upper free end 20 on which a bed mattress or the like may rest. The arm 19 inclines upwardly from the base 15 and is preferably of reduced thickness or taper so as to provide proper elasticity to permit the free end of the arm to be flexed when subjected to pressure and return to its normal position when the pressure is released. The base 15 of each spring may be secured to the frame in any suitable manner, and as shown in Figures 2 and 3, this is effected by the screws 21. Spaced cross beams 22 may be secured to the upper surfaces of the longitudinal members or bars 11 by the screws 23 so as to abut the straight sides 16 of the bases 15 to further insure the springs being held in proper position. As the longitudinal rows of springs 14 extend alternately in opposite directions, the intermediate cross beams 22 will abut the vertical opposed sides of alternate rows of springs to prevent longitudinal movement thereof.

In order to firmly and uniformly support a bed mattress or the like, the frame 10 may be provided along its front and rear sides with a double row of springs 24 and 25 (Figure 1) similar in size and shape to the springs 14 and which extend in opposite directions throughout the length of the frame. Additionally, a single row of bowed springs 26 may be located at each end of the frame so as to extend transversely across the

same substantially at right angles to the longitudinal rows of springs 14 to insure the mattress or seat being yieldably maintained in proper position at the ends thereof.

Each spring is positioned so that its upper bowed free end 20 normally overlaps the spring in front of it so that when a spring is depressed, it engages the front spring in the manner as shown in dotted lines in Figure 2 to limit the downward movement of the bowed portion thereof. Due to the inherent resiliency of the springs, when the pressure is released, they will return to their normal overlapped position. Thus, simple and efficient means are provided for insuring the continued use of the resilient supporting structure without weakening the resiliency of the springs or distorting them beyond their elastic limits.

Various means may be provided for maintaining the springs 14 in a fixed position on the frame. As shown in Figures 4 and 5, this means comprises forming the upper surface of each of the longitudinal members 11 with rabbeted grooves or recesses 27 having a vertical wall 28 for receiving the complementary vertical wall 16 of the triangular base 15 and an inclined notched wall 29 which receives the complementary inclined side 17 of the base, so that the bottom 18 of the spring may securely fit within the groove 27. Dowel pins 29' may extend into suitable aligned openings 30 (Figure 5) formed in the base and the member 11 to assist in securing the springs 14 to the frame. A suitable adhesive may also be applied to the walls of the groove 27 for further assisting in maintaining the springs in a fixed position. Cross beams 31 secured to the upper surface of the members 11 by screws 32 may be arranged to bear against the vertical side 16 of the base 15 so as to constitute a stop or abutment for maintaining the springs 14 and their associated parts in a fixed position on the frame.

The modification shown in Figure 6 is substantially the same as that shown in Figure 4 with the exception that the cross beam 31 is omitted and the groove 33 is slightly deeper than the groove 27 so that the vertical wall 16 of the triangular base 15 and the inclined wall 17 firmly engage and abut the corresponding shaped sides of the walls of the groove 33 to maintain the bowed spring 14 securely in position on the member 11. A dowel pin 34 may also be arranged to extend through suitable aligned openings in the base 15 and the member 11 to hold the spring in place.

Thus, it will be seen that a spring frame assembly is provided for supporting bed mattresses, seats, and the like, and which insures the mattress being yieldably maintained at all times in proper position, and which constitutes a comfortable support that will not lose its resiliency when subjected to constant usage.

It will be understood that the forms of the invention shown are merely illustrative of preferred embodiments and that such changes may be made without departing from the spirit of the invention as come within the scope of the following claims.

I claim:

1. In a spring structure, a supporting frame, springs on the frame arranged in spaced rows, each spring having a base at its lower end provided with an upwardly extending resilient arm terminating in a bowed free end, the free end of each spring normally overlapping the spring in front of it and arranged to engage the same when depressed to limit the downward movement thereof, the resiliency of the depressed spring returning the same to its overlapped position when the pressure is released, and means securing the base of each spring to the frame.

2. In a spring structure, a supporting frame including longitudinal and transverse members, springs extending upwardly from said longitudinal members and arranged in spaced rows extending alternately in opposite directions, each spring having a substantially triangular base at its lower end provided with an inclined side, said inclined side having a flexible arm extending upwardly therefrom and terminating in a bowed free end, the free end of each spring normally overlapping the spring in front of it and arranged to engage the same when depressed so as to limit the downward movement thereof, the resiliency of the depressed spring returning the same to its normal overlapped position when the pressure is released, and means securing the base of each spring to its adjacent longitudinal member.

3. In a spring structure, a supporting frame including longitudinal and transverse members, springs extending upwardly from said longitudinal members and arranged in spaced rows extending alternately in opposite directions, spaced cross beams on said longitudinal members, each spring having a substantially triangular base at its lower end provided with a vertical side and an inclined side, said vertical side abutting a contiguous cross beam, said inclined side having a flexible arm extending upwardly therefrom and terminating in a bowed free end, the free end of each spring normally overlapping the spring in front of it and arranged to engage the same when depressed so as to limit the downward movement thereof, the resiliency of the depressed spring returning the same to its normal overlapped position when the pressure is released, and means securing the base of each spring to its adjacent longitudinal member.

4. In a spring structure, a supporting frame including longitudinal and transverse members, springs extending upwardly from said longitudinal members and arranged in spaced rows extending alternately in opposite directions, each spring having a substantially triangular base at its lower end provided with an inclined side, said inclined side having a flexible arm extending upwardly therefrom and terminating in a bowed free end, the free end of each spring normally overlapping the spring in front of it and arranged to engage the same when depressed so as to limit the downward movement thereof, the resiliency of the depressed spring returning the same to its normal overlapped position when the pressure is released, the front and rear sides of the frame being provided with a double row of springs extending alternately in opposite directions, and means securing the base of each spring to its adjacent longitudinal member.

5. In a spring structure, a supporting frame including longitudinal and transverse members, springs extending upwardly from said longitudinal members and arranged in spaced rows extending alternately in opposite directions, each spring having a substantially triangular base at its lower end provided with an inclined side, said inclined side having a flexible arm extending upwardly therefrom and terminating in a bowed free end, the free end of each spring normally overlapping the spring in front of it and

arranged to engage the same when depressed so as to limit the downward movement thereof, the resiliency of the depressed spring returning the same to its normal overlapped position when the pressure is released, a transverse row of bowed springs extending across each end of the frame, and means securing the base of each spring to its adjacent member.

6. In a spring structure, a supporting frame including longitudinal and transverse members, springs extending upwardly from said longitudinal members and arranged in spaced rows extending alternately in opposite directions, each spring having a substantially triangular base at its lower end provided with an inclined side, said inclined side having a flexible arm extending upwardly therefrom and terminating in a bowed free end, the free end of each spring normally overlapping the spring in front of it and arranged to engage the same when depressed so as to limit the downward movement thereof, the resiliency of the depressed spring returning the same to its normal overlapped position when the pressure is released, the front and rear sides of the frame being provided with a double row of springs extending alternately in opposite directions, a transverse row of bowed springs extending across each end of the frame at right angles to the longitudinal rows of springs, and means securing the base of each spring to its adjacent member.

7. In combination, a spring structure including longitudinal members and transverse end members, said longitudinal members being provided with a series of transversely aligned grooves in their upper surfaces, springs extending upwardly from said longitudinal members and arranged in spaced rows extending alternately in opposite directions, each spring having a substantially triangular base at its lower end fitting in an adjacent groove, the inclined side of said base having a flexible arm extending upwardly therefrom and terminating in a bowed free end, the free end of each spring normally overlapping the spring in front of it and arranged to engage the same when depressed to limit its downward movement, the resiliency of the depressed spring returning the same to its normal overlapped position when the pressure is released, and means for securing the base of each spring in its complementary groove.

8. In combination, a spring structure including longitudinal members and transverse end members, said longitudinal members being provided with a series of transversely aligned grooves in their upper surfaces, each groove having a straight side and an opposite inclined side, springs extending upwardly from said longitudinal members and arranged in spaced rows extending alternately in opposite directions, each spring having a substantially triangular base at its lower end provided with a vertical side and an inclined side engaging the complementary formed sides in the adjacent groove, the inclined side of said base having a flexible arm extending upwardly therefrom and terminating in a bowed free end, the free end of each spring normally overlapping the spring in front of it and arranged to engage the same when depressed to limit its downward movement, the resiliency of the depressed spring returning the same to its normal overlapped position when the pressure is released, and means for securing the base of each spring in its complementary groove.

9. In combination, a spring frame structure including longitudinal members and transverse end members, said longitudinal members being provided with a series of transversely aligned grooves in their upper surfaces, each groove having a straight side and an opposite inclined side, springs extending upwardly from said longitudinal members and arranged in spaced rows extending alternately in opposite directions, each spring having a substantially triangular base at its lower end provided with a vertical side and an inclined side engaging the complementary formed sides in the adjacent groove, the inclined side of said base having a flexible arm extending upwardly therefrom and terminating in a bowed free end, the free end of each spring normally overlapping the spring in front of it and arranged to engage the same when depressed to limit its downward movement, the resiliency of the depressed spring returning the same to its normal overlapped position when the pressure is released, spaced cross beams on said frame abutting the vertical sides of the spring bases, and means for securing the base of each spring in its complementary groove.

10. In combination, a spring frame structure including longitudinal and transverse members, springs extending upwardly from said longitudnal members and arranged in spaced rows extending alternately in opposite directions, each spring having a substantially triangular base at its lower end provided with an inclined side, said inclined side having a resilient arm extending upwardly therefrom and terminating in a bowed free end, and bowed springs connected to the ends of the longitudinal members and extending transversely of the frame for providing an elastic support throughout the area of the frame.

11. In combination, a spring frame structure including longitudinal and transverse members, springs extending upwardly from said longitudinal members and arranged in spaced rows extending alternately in opposite directions, each spring having a substantially triangular base at its lower end provided with an inclined side, said inclined side having a resilient arm extending upwardly therefrom and terminating in a bowed free end, the front and rear sides of the frame having a double row of springs extending alternately in opposite directions, and bowed springs connected to the ends of the longitudinal members and extending transversely of the frame for providing an elastic support throughout the area of the frame.

WILLIAM E. HUTTON.