Dec. 26, 1933. H. C. FLINT 1,940,853

MOUNTING FOR COIL SPRINGS

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Fig. 4.

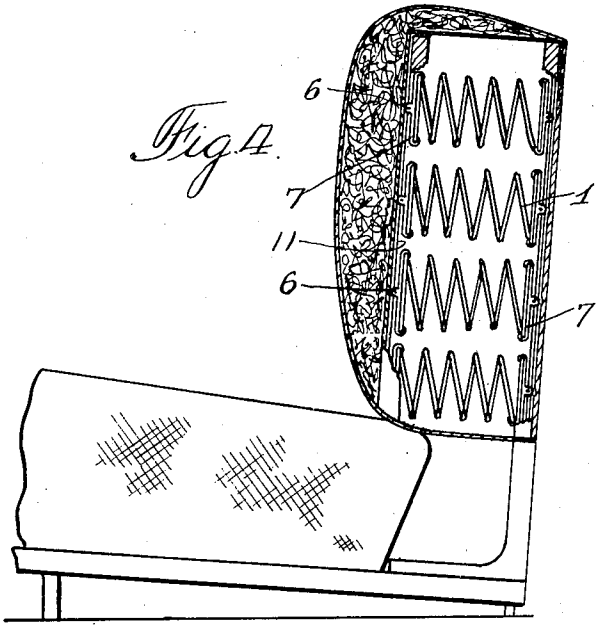


Fig. 1.

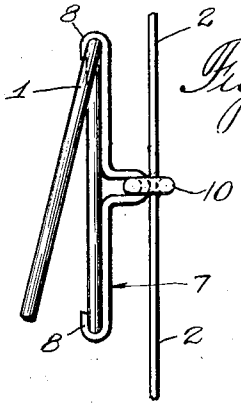


Fig. 3.

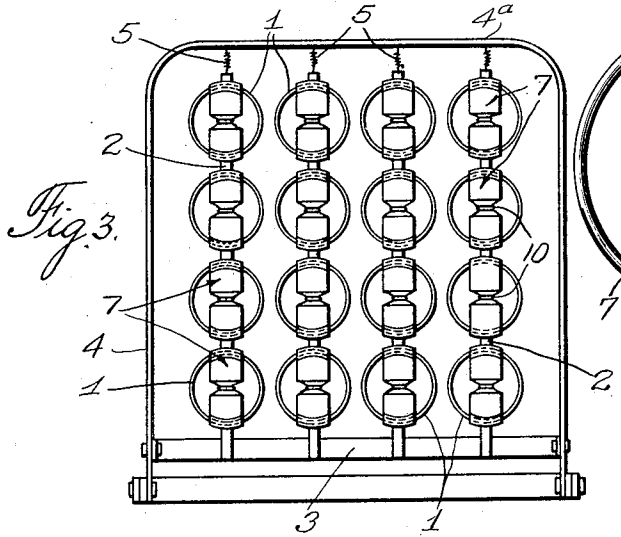
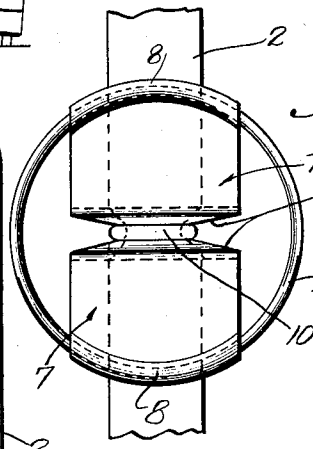


Fig. 2.



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Fig. 8.

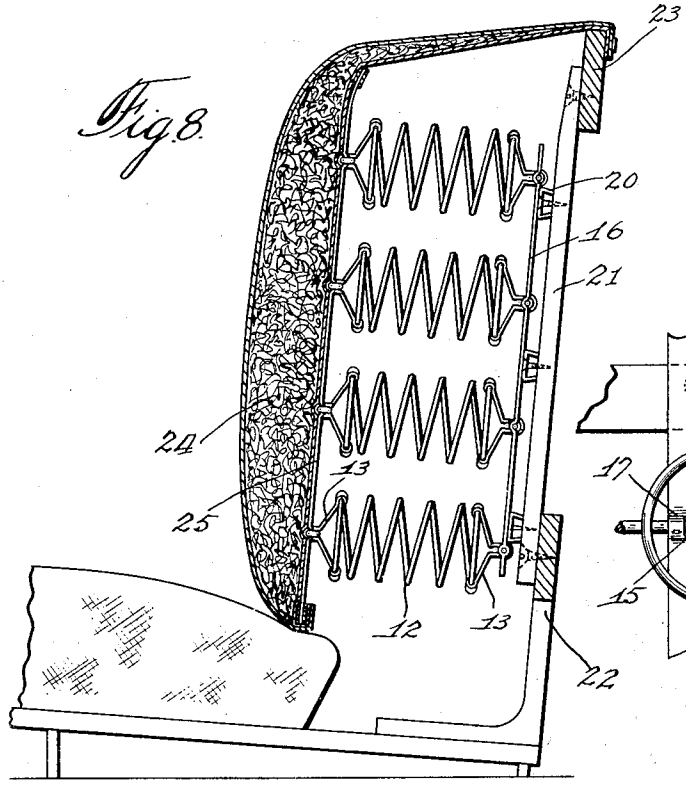


Fig. 5.

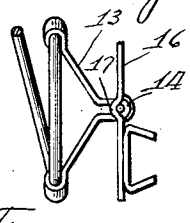


Fig. 6.

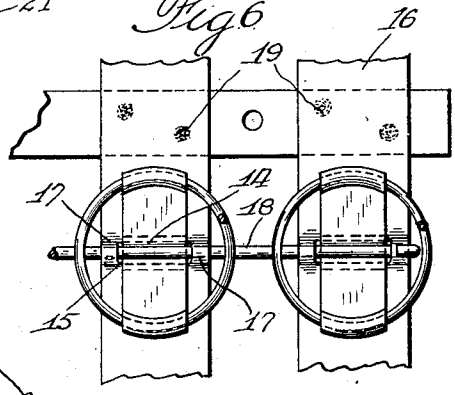


Fig. 9.

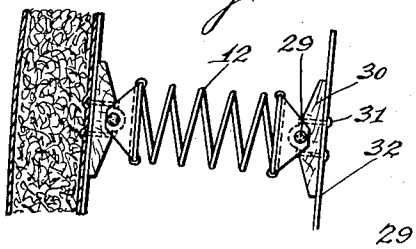


Fig. 7.

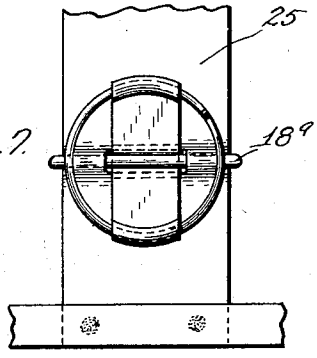


Fig. 10.

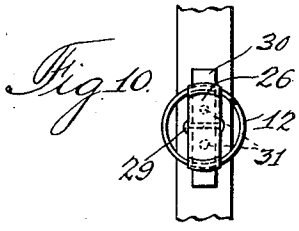




Fig. 11.

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UNITED STATES PATENT OFFICE

1,940,853

MOUNTING FOR COIL SPRINGS

Hyland C. Flint, Chicago, Ill.

Application November 21, 1932
Serial No. 643,655

7 Claims. (Cl. 155—179)

My invention relates to improvements in the mounting of coil springs, and it has special reference to their easy and ready incorporation into the upholstering of seats for moving vehicles.

This application is a continuation, in part, of my copending application Serial No. 577,585, filed on November 27, 1931, and entitled "Mounting coil springs."

The general object of my invention is to provide an upholstered seat for the purpose of eliminating, as much as possible, the sudden jerks and shocks, sustained by the occupant of the seat of a rapidly moving vehicle, such as an automobile, motor bus, or railroad coach. These repeated sudden shocks to which an occupant is subjected through the back of the seat, when continued for a considerable period of time in the course of travel, result in fatigue and lameness in the back of the occupant. Therefore, my invention has for its purpose the construction of a seat of the character indicated whereby such fatigue may be relieved greatly, giving more ease and comfort to the occupant.

The former method of mounting coil springs in the backs of seats of automobiles, railroad coaches, and the like, consists in rigidly attaching the ends of the coil springs to a tape or wire webbing stretched and held taut in a frame. This webbing serves as a foundation for the springs. In seats wherein such mounting of the coil springs is employed, the vertical movement of the upholstering touching the occupant's back tends to be too sudden and jerky, due mainly to this rigid mounting of the coils. This rigidity does not allow of sufficient freedom of up-and-down movement of the coil springs supporting the upholstering against which the back of the occupant rests as the occupant partakes of the up-and-down movement of the seat.

By means of my present invention I am able to free the coil springs mounted in the seat back from a large amount of their otherwise vertical rigidity. I do this by securely mounting the end convolutions of the spring on flexibly mounted rocker bridges, as hereinafter described. Instead of the end convolution of the coil spring being held rigidly on the webbing as in the past, I firmly attach both end convolutions of each spring to these bridges which serve as flexibly mounted rocker members. These bridges are thus free to partake of a limited rocking movement without allowing the coil to buckle or its convolutions to become displaced to any marked degree from their common axis when the vehicle jolts. This rocking of the end convolutions of the springs allows the springs to utilize to their full extent their inherent spring action and thus to absorb and eliminate, to a large degree, the sudden shocks occasioned by the jolts of the moving vehicle, with the result that the occupant experiences more of the sensation of floating and more comfort and less of the sensation of jar and jolt with the consequent fatigue.

My method of mounting coil springs is illustrated in the accompanying drawings in which:

Figure 1 is a side view showing in detail a form of mounting that I may employ for coil springs;

Fig. 2 is a front view of the mechanism illustrated in Fig. 1;

Fig. 3 is a front view showing a series of coil springs mounted in accordance with my invention to form the lazy back of a vehicle seat;

Fig. 4 is a side view of the lazy back assembly of Fig. 3;

Fig. 5 is a side view showing in detail a modified form of my mounting;

Fig. 6 is a front view of the mounting shown in Fig. 5 but adapted particularly to the construction employed for the back portion of a lazy back seat;

Fig. 7 is a front view of the mounting shown in Fig. 5 but adapted particularly for the construction employed for the front portion of a lazy back seat;

Fig. 8 is a side view of a lazy back assembly embodying the construction of Figs. 5, 6, and 7;

Fig. 9 is a modified form of my invention;

Fig. 10 is a detailed front view showing a portion of the structure illustrated in Fig. 9; and

Fig. 11 is a perspective view of the mounting member that is illustrated in Figs. 9 and 10.

Referring to Figs. 1 to 4, inclusive, the lazy back comprises a plurality of rows of helically coiled springs 1 of the usual form, that are spaced from one another sufficient distances to prevent physical contact between adjacent springs. The springs 1 contained in each vertical row are held in alignment by being attached to a flexible metal strip 2. Each strip is secured at its bottom portion to a transverse metal strip 3 that is secured at its ends to a frame 4 of the lazy back. The upper ends of the metal strips 2 may be connected through coiled springs 5 to the upper portion 4a of this frame. The springs, when assembled, are then covered with a padding 6 of the usual form to which the upholstery of the lazy back is applied.

As shown particularly in Figs. 1 and 2, the end convolution of each spring 1 is held firmly in a

rocker bridge 7 preferably made of a stamped metal piece of sufficient strength to resist change of shape when in use. This rocker bridge 7 is shown for the purpose of illustration as possessing a substantial width and in excess of that of the metal strip 2. The rocker bridge 7 engages the end convolution of the spring at diametrically opposed points and is firmly attached on each side to a substantial portion of the periphery of the spring convolution. This is accomplished by ears 8, formed integrally with the bridge 7, that are bent over in order to firmly grasp and clinch the end convolution of the spring so that movements imparted to the end convolution will be those only allowed by the rocker bridge 7. In this manner the plane of the end convolution is held firmly to coincide with the plane of the rocker bridge. The rocker bridge 7, at its central portion is notched or recessed, and this recessed portion is formed to provide a loop portion 9. The portion of the metal strip 2 adjacent to the loop portion 9 is also notched or recessed, and a tie member or eyelet 10 is threaded through the loop 9 and around the notched portion of the metal web 2. In this manner the cradle platform 7 is flexibly attached to the metal web member 2 and is prevented from sliding out of the notch formed in this web member.

In the construction shown, the rocker platform 7 is allowed to rock in a vertical plane about the pivot provided by the eyelet 10, but is restrained from rocking in a horizontal plane. Consequently, the end convolution of the spring gripped by the rocker bridge 7 is precluded from freely oscillating but is confined to those movements in a vertical plane that the rocker bridge 7 is allowed to partake of. Both end convolutions of each of the coil springs 1 are secured as herein described, the end convolution immediately adjacent to the back of an occupant of the seat being similarly secured to metal webs 11 that are embedded in the upholstery 6 applied to the lazy back.

In Figs. 5, 6, 7, and 8 a modified form of my invention is shown, wherein the coiled springs 12 of a lazy back are arranged in a manner similar to that shown in Figs. 3 and 4. In this modification each end convolution of each spring 12 is held in a rocker bridge 13 that in cross-section is of substantially conical form, as shown in Fig. 5. This allows the rocker bridge 13 to pivot through a wider angle than the rocker bridge 7 of Fig. 1. At the apex of the rocker bridge 13 a loop 14 is formed, and this loop is received in an elongated transverse depression 15 that is formed at the proper point in a flexible metallic strip 16. On each side of the depression 15, the metal of the metallic strip 16 is raised from the plane of the strip, as shown at 17. After the loop 14 is inserted in the depression 15, a wire 18 is threaded through the loop 14 and the opening formed by the depression 15 and the two upraised portions 17. This pivotally and flexibly secures the rocker bridge 13 to the metal strip 16. In assembling the springs 12, the wire 18 which extends transversely of the lazy back may, if desired, be common to each horizontal row of springs, as shown in Fig. 6. In mounting the vertical rows of springs, the metal strips 16 are welded, as shown at 19, to transverse metal members 20 that are screwed to wood frame members 21. These frame members 21 are, in turn, secured to the lower support 22 and the upper support 23 in any suitable manner.

In the front portion of the lazy back, or that to which the upholstering 24 is applied, the rocker bridges 13 are secured to flexible metal strips 25 that possess a somewhat greater width than the metal strips 16, as shown in Fig. 7. In the construction of Fig. 7, a wire 18*a* is employed to secure each rocker bridge separately to the supporting strip 25.

It will be observed that in the structure of Figs. 5 to 8, inclusive, the end convolutions of each spring 12 are firmly held in the rocker bridges 13 that, in turn, are flexibly attached to the rear metal strips 16 and the front metal strips 25. The rocker bridges cannot slide up and down the strips because of their being pivotally secured thereto by the wires 18 and 18*a*.

In Figs. 9, 10, and 11 another modified form of my invention is disclosed. The rocker bridge 26 is preferably made of a sheet metal stamping and is provided with two dependent flanges 27 in which aligned openings 28 are formed. The end convolution of the coiled spring is received in the bent-over ear portions 29, as shown particularly in Figs. 9 and 10. The rocker bridge 27 is pivotally secured by means of a bolt 29 to a bracket member 30 made preferably of wood. The bracket member 30, in turn, is secured by means of bolts 31 to a flexible metal strap member 32. The bolt 29 serves to flexibly or pivotally attach the rocker bridge 26 which, in turn, firmly graps the end convolution of the spring so as to hold it at all times in the plane of the face of the rocker bridge.

From the foregoing description of my invention it will be noted that both of the end convolutions of each coiled spring are firmly secured to a rocker bridge, each maintaining fixed the plane of each end convolution so held. Each end convolution is, of course, free to oscillate or rock about the pivot of the associated rocker bridge, but this pivoting or rocking action is constrained so that it occurs in one plane only. For instance, when the springs are used in the lazy back of an upholstered seat, the rocking movement of the plane of the end convolutions of the coil is confined to a vertical plane. The degree of rocking movement of the plane of the end convolution is limited to the rocking movement that the associated rocker bridge is allowed to partake of.

The end convolutions of the springs that are in contact with the upholstered portion of the lazy back are allowed to partake of a limited up-and-down movement in conformity with the movements of the back of the seat occupant, but irrespective of the position that these end convolutions occupy against the back of the occupant, the planes of these end convolutions will be substantially parallel to the planes of the end convolutions at the opposite ends of the corresponding springs, since both rocker bridges are similarly pivoted and are allowed to partake of a similar rocking action.

As a consequence of this construction, the axis of each coil is maintained in a substantially vertical plane which bisects the planes of both end convolutions of the coil or the associated rocker bridges. The intermediate convolutions of the coil are, therefore, not subject to forces to cause their displacement from their normal axial position, and the tendency of the intermediate convolutions to buckle or to become displaced is substantially minimized so that at all times the inherent spring action of the coil is fully available to absorb any quick jolts or shocks.

In view of the foregoing, it is apparent that

each spring, by reason of its having both of its end convolutions firmly maintained substantially parallel to each other at all times, is thus precluded from becoming buckled, and the intermediate convolutions are prevented from being displaced to any substantial degree from their normal position in the coil. This condition obtains within the limits of the pivotal movement of the rocker bridges. Again, each rocker bridge engages a sufficient portion of the periphery of the end convolution to preclude the plane of the convolution from being displaced from parallel relation to the plane of the associated rocker bridge.

As above related, the rocker bridges may partake of a limited pivotal movement that is constrained to one plane as, for instance, in a lazy back the pivotal movement occurs in a vertical plane. Consequently, the axis of each coil is thus allowed to move in a vertical plane and is prevented from moving sideways in either direction. In the assembled lazy back all of the coils are allowed to move up and down with the occupant of the seat, thus maintaining the several axes of the coils in vertical planes. Buckling and displacement of the intermediate convolutions of each coil are precluded, and the full spring action of each coil is therefore allowed to function normally as a cushion against the back of the seat occupant.

As hereinbefore related, this instant application is a continuation of my copending application identified above. The structure shown in Figs. 1 to 4, inclusive, is the same in all details as that shown in my said copending application. My invention, nevertheless, is also disclosed in the construction shown in Figs. 8 to 10, inclusive. In all instances the end convolutions of the coiled springs are firmly secured in rocker bridges that firmly hold at all times the plane of the end convolution parallel with the plane of the rocker bridge. The rocker bridges are, in turn, flexibly attached or pivotally mounted to suitable mounting members. These several embodiments of my invention preclude the intermediate convolutions of the spring from being displaced from their normal axial position. In this manner the coil springs are prevented from buckling and the inherent spring action is available to its full extent at all times in order to absorb any shocks or jolts.

It is conceivable, of course, that other shock absorbing devices, such as rubber cushions, may be substituted for the coil springs 1 and 12. If rubber cushions are employed they may be made either in cylindrical or prismatic form wherein their bottom and top plane faces are received in flexibly mounted rocker bridges of the same character as shown in Figs. 1, 5, and 9. In such a circumstance the rubber cushions are substituted for the helically coiled springs and the function of the front and rear pivotally mounted rocker bridges will be of the same nature as obtains when helical coils are employed.

While I have herein shown and described several embodiments of my invention, it is to be understood that I desire only such limitations to be imposed thereupon as are set forth in the appended claims.

I claim:

1. A seat construction comprising a plurality of vertically spaced resilient members, a rocker bridge secured to each end of said resilient members, two spaced and relatively movable supporting means, said resilient members being interposed between said supporting means, and means flexibly attaching said rocker bridges to both of said supporting means to allow said rocker bridges to pivot about horizontal axes and to rock in vertical planes only.

2. A seat construction comprising a plurality of vertically spaced resilient members, a rocker bridge secured to each end of said resilient members, two spaced supporting means having relative movement therebetween and at least one of said supporting means being adapted to be upholstered, cross members carried by at least one of said supporting means, said resilient members being interposed between said cross members and the other supporting means, and means flexibly attaching said rocker bridges to said cross members and to said other supporting means to allow pivotal movement of said bridges about horizontal axes only.

3. A seat construction comprising a plurality of coiled springs arranged in spaced vertical and horizontal rows, a rocker bridge secured to each end convolution of each spring to hold the plane of the end convolution in substantially parallel relation to the approximate plane of the rocker bridge at all times, spaced supporting means, attaching members carried by one of said supporting means, said rows of coiled springs being interposed between said attaching members and the other of said supporting means, and pivoting means flexibly securing the rocker bridges to said attaching members and the other of said supporting means, said pivoting means allowing vertical pivotal movement of said rocker bridges, about horizontal axes only, one of said supporting means being adapted to be attached to a seat back and the other supporting means being adapted to be upholstered whereby the said supporting means may have relative movement therebetween.

4. A seat construction comprising a plurality of vertically spaced coiled springs, a rocker bridge which subtends each end convolution of each of said springs and is firmly secured thereto at spaced points of the periphery of the end convolution, spaced supporting means, said coiled springs being interposed between said supporting means, and corresponding rocker bridges being pivotally mounted on said spaced supporting means whereby both rocker bridges attached to each spring may rotate in unison about horizontal axes only, one of said supporting means being adapted to be attached to a seat back and the other supporting means being adapted to be upholstered whereby the said supporting means may have relative movement therebetween.

5. A seat construction comprising a plurality of vertically spaced coiled springs, rocker bridges subtending each end convolution of each of said springs and secured firmly thereto, said rocker bridges being substantially conical in cross-section, spaced supporting means, said coiled springs being interposed between said supporting means, and means pivotally mounting said rocker bridges at the apices thereof about horizontal axes to said supporting means to allow said rocker bridges to rock in vertical planes only, one of said supporting means being adapted to be attached to a seat back and the other supporting means being adapted to be upholstered whereby the said supporting means may have relative movement therebetween.

6. A seat construction comprising a plurality of vertically spaced coiled springs, a rocker bridge firmly secured at each end of each of said springs and comprising a relatively wide band

for subtending a substantial portion of each end convolution of each of said springs and having an intermediate loop portion, spaced supporting means, said coiled springs being interposed between said supporting means, and means pivotally connecting said loop portions of said rocker bridges about horizontal axes to said supporting means to allow said rocker bridges to rock in vertical planes only, one of said supporting means being adapted to be attached to a seat back and the other supporting means being adapted to be upholstered whereby the said supporting means may have relative movement therebetween.

7. A seat construction comprising a plurality of vertically and horizontally spaced resilient members, a rocker bridge firmly secured to each end of each resilient member, two spaced and relatively movable supporting means between which said resilient members are interposed, and horizontally disposed mounting members on at least one of said supporting means, each of said mounting members being common to a plurality of horizontally spaced resilient members, said rocker bridges being flexibly secured at one end to said mounting members and at the other end to the other of said supporting means to allow them to rock in vertical planes only, one of said supporting means being adapted to be attached to a seat back and the other supporting means being adapted to be upholstered.

HYLAND C. FLINT.

CERTIFICATE OF CORRECTION.

Patent No. 1,940,853. December 26, 1933.

HYLAND C. FLINT.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 106, for "graps" read grasps; page 3, line 108, claim 3, strike out the words and comma "about horizontal axes only,"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 13th day of February, A. D. 1934.

F. M. Hopkins
Acting Commissioner of Patents.

(Seal)