Jan. 9, 1923. 1,441,534

J. H. McCOLLOUGH, JR.
AUTOMOBILE SEAT.
FILED DEC. 20. 1921.

Fig. 1.

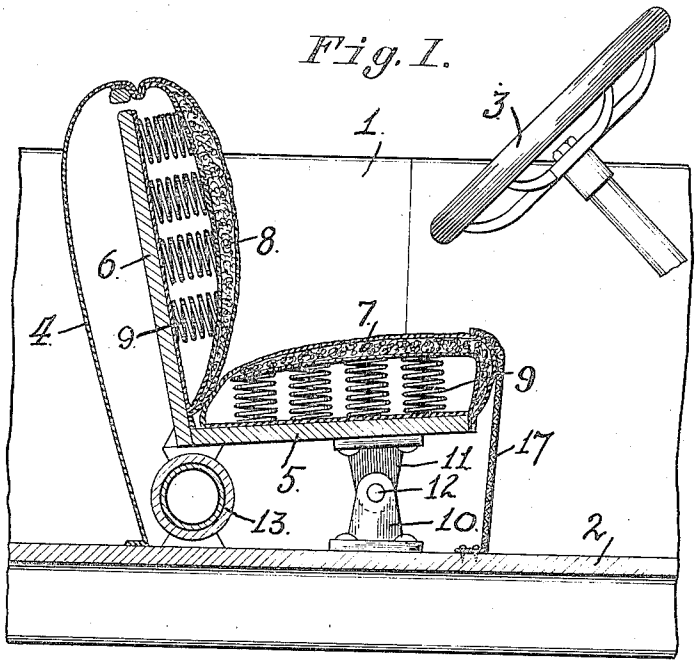


Fig. 2.

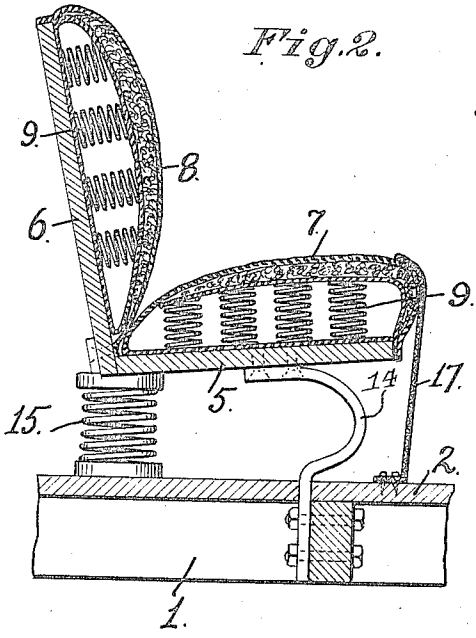
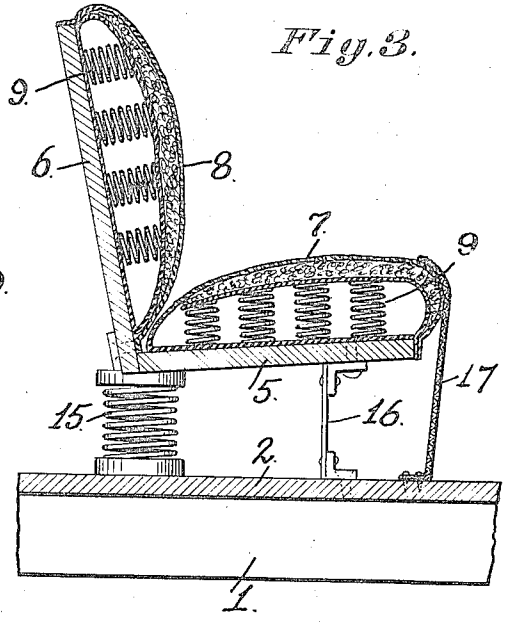


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES H. McCOLLOUGH, JR., OF SAN JOSE, CALIFORNIA.

AUTOMOBILE SEAT.

Application filed December 20, 1921. Serial No. 523,637.

To all whom it may concern:

Be it known that I, JAMES H. McCOLLOUGH, Jr., a citizen of the United States, residing at San Jose, in the county of Santa Clara, and State of California, have invented certain new anad useful Improvements in Automobile Seats, of which the following is a specification.

My invention relates to automobile-seats of a type in which the seat-frame is connected with a fixed support by a hinge or yielding joint, which is controlled by a resilient member or members, the object being to eliminate as far as possible the shocks which reach the occupant through the back of the seat, thereby affording relief from fatigue, especially in the muscles of the shoulders and neck.

As far as I am aware, in seats of this nature, the practice has been to locate the hinge joint which connects the seat frame with the fixed support, immediately and directly at the forward edge of the bottom portion of the seat frame, or in front thereof, the resilient member controlling said joint being located rearwardly of the joint.

I have found that in such arrangement the normal position of the occupant in the seat is lost sight of, as no account is taken of the fact that his weight lies, in much the greater part, back of the forwardly disposed hinge joint and is borne chiefly by the resilient controlling member. This results in the pressure being imposed almost wholly upon said member, very little being borne by the hinge joint. The resilient member in order to properly serve its purpose in the general combination should not be made too stiff. But if it be sufficiently sensitive to perform its proper function, it cannot, unassisted, bear the pressure of the occupant as imposed under the conditions of vertical jolting, and, therefore, the seat will strike bottom.

It is one of the objects of my present improvement to correct this difficulty; and this I attain by so locating the hinge or yielding joint as to make it bear such proportion of the occupant's weight, as will prevent the seat striking bottom, and yet allow the resilient member to be properly sensitive, in order to take care of horizontal shocks.

It is apparent that if the hinge joint be located immediately below the center of weight of the occupant of the seat, the resilient controlling member will not be affected by vertical shocks, nor by differences in weight of different occupants. Furthermore, I have found that while the location of the joint, contemplated by my invention is efficient in correcting the main difficulty outlined, there is presented a minor difficulty due to this location, namely the tendency of the forward edge of the seat cushion to oscillate about the joint axis and thereby to give a blow under the knees of the occupant, which, especially to those with short legs, is unpleasant and ultimately fatiguing. It is, therefore, a further object of my invention to correct this minor difficulty, and this I attain by means for establishing and maintaining a predetermined fixed, maximum distance relation between the upper forward edge of the seat cushion and the fixed support with which the seat is associated.

With these ends in view, my invention consists in the novel automobile seat which I shall now fully describe by reference to the accompanying drawings, in which—

Fig. 1 is a vertical cross-section of one form of a seat, embodying my improvement.

Fig. 2 is a vertical cross-section showing my improvement embodied in another form.

Fig. 3 is a vertical cross-section showing still another form.

Referring first to Fig. 1, the numeral 1 indicates part of the body of an automobile, 2 its floor and 3 the steering wheel. 4 is a metal portion of the body which forms the back of the customary seat. The frame of my seat is a rigid, substantially L-shaped one, and comprises a bottom portion 5 and a back portion 6. Upon the bottom portion 5 is the bottom cushion 7, and upon the back portion is the back cushion 8, both cushions being of the usual type with springs 9. The upholstery of the back cushion 8 is carried over and clear of the top edge of the back portion and is properly secured to the top of the metal portion 4 of the body. This serves to keep the upper edge of the back cushion against which the occupant leans, from moving forward, and results in obviating the tendency to pitch him forward when jolts reach him through the back cushion. This is due to the fact that though the seat frame is oscillated, the upper edge of the cushion does not move forward beyond the position it occupies when the seat frame is at rest.

In this seat as shown in Fig. 1, the hinge or yielding connection for the seat frame is,

for the sake of illustration, shown as comprising an upright 10 rising from the floor 2, and a lug 11 depending from the bottom portion 5 of the seat frame, the two parts being pivotally connected by a horizontal hinge pintle 12. The character of this hinge or yielding joint, for the purposes of my present invention, is immaterial, and it may be varied in structure as desired, as I shall presently show. Its relative position is, however, essential. This position must be back of the forward edge of the bottom portion of the seat frame and, in its best disposition, forward of the center of the width of said bottom portion. In other words, it must be in or nearly in the vertical line of greatest weight pressure of the occupant, the object being to make it bear said pressure in greater part. Back of the hinge connection and between the seat frame and floor is the resilient member 13. This may be of any suitable nature. In the form shown in Fig 1, the resilient member is for the sake of illustration shown as a pneumatic tube or air cushion.

In Fig. 2 the form of seat embodying my invention is one in which there is no portion of the body forming the customary seat back, such as the part 4 of Fig. 1, as there is no necessity for concealing the back of the seat frame, or taking care of the upholstery, other than to provide a means for preventing a forward movement at its upper edge, in order to secure the advantage referred to hereinbefore. This, for example, is the case with truck-seats.

In this form, I have shown the yielding joint connection for the seat-frame, as being formed of a strip of bendable metal 14, but its essential location in the arrangement is the same as in Fig. 1, that is, between the front edge of the bottom portion of the seat frame and the center line of the width thereof. In this Figure 2, I have shown the resilient controlling member as a coiled spring 15.

In Fig. 3, I have shown the yielding joint as a vertical metallic strap 16, capable of distortion under pressure to yield the required hinge effect, but the position of this strap is as heretofore described with relation to the hinge connections of the previous figures.

It will now be seen that when an occupant is in the seat his weight is borne in greater part by the hinge or yielding connection, thus permitting the resilient controlling member to be made as sensitive to the long leverage of the back portion of the seat frame as may be required without danger of the seat frame hitting bottom. Consequently, when a shock is received by the occupant, the vertical component will be largely absorbed by the springs of the seat cushion and only a small amount of help received from the resilient members 13 or 15; but on the other hand, the horizontal component of the shock acting through the back cushion will be greatly lessened in intensity in a horizontal direction and an actual conversion of direction occurs in proportion as the shocks which flex the horizontal springs of the back cushion now act through these springs and the back 6 of the seat to flex the resilient controlling member in a vertical direction.

Thus the primary object of my invention is secured. But, it will readily be seen that due to the location of the hinge joint, which in its best arrangement, in order to carry most effectively the weight of the occupant, is well back of the forward edge of the seat bottom, the front of the seat will oscillate or have a tendency so to move, up and down about the hinge axis. This movement results in unpleasant and fatiguing blows under the knees, especially in the case of short-legged persons. To remedy this without affecting the primary object of the arrangement, I have a flexible strap or tie member 17, secured at its upper edge to the upper front edge of the cushion 7 of the seat bottom 5, and at its lower edge secured to the fixed member or floor 2. This member 17 may be of any suitable material, and may be a sheet across and covering the front of the structure or in the form of one or more straps. Its height is predetermined, to establish and maintain the maximum distance relation or upper limit of oscillation of the front edge of the cushion 7, above the fixed floor 2. The cushion, therefore, at its upper front edge can be so tied down that it will not strike under the knees of the occupant, but at the same time it will be seen that this partial directional limitation of the cushion does not in any manner affect the movements of the rigid, L-shaped seat frame required for attaining the primary object in view, since the bottom 5 of the seat frame may still oscillate about the hinge axis, its front edge rising and falling under the control of the forward cushion springs 9, but without affecting the maximum fixed height of the tied-down front edge of the cushion.

I claim:

1. An automobile seat comprising a rigid L-shaped seat-frame having a bottom portion and a back portion; a cushion fitted to the back portion; a fixed support underlying the bottom portion of the seat-frame; a connection between said seat frame and fixed support constituting a horizontally disposed yielding joint, said joint-connection lying between the fixed support and the bottom portion of the seat-frame in a line back of the forward edge of said bottom portion; means for controlling the movement of the seat frame about said joint connection, and means for keeping the upper edge of the back cushion, when the seat frame is oscil-

lated, from moving forward beyond the position it occupies when the seat frame is at rest.

2. An automobile seat comprising a rigid L-shaped seat-frame having a bottom portion and a back portion; an upholstered cushion fitted to the back portion; a fixed support underlying the bottom portion of the seat-frame; a connection between said seat frame and fixed support constituting a horizontally disposed yielding joint, said joint connection lying between the fixed support and the bottom portion of the seat-frame in a line between the forward edge of said bottom portion and the midway line between the front and rear of said bottom portion; means for controlling the movement of the seat-frame about said joint connection; and a flexible connection with the upholstery of the back cushion, for preventing the forward movement of the upper edge of said cushion.

3. An automobile seat comprising a rigid L-shaped seat-frame, having a bottom portion and a back portion; a cushion carried upon the back portion; a cushion carried upon the seat-portion; a fixed support underlying the bottom portion of the seat-frame; a connection between said seat frame and fixed support constituting a horizontally disposed yielding joint, said joint-connection lying between the fixed support and the bottom portion of the seat-frame in a line back of the forward edge of said bottom portion; means for controlling the movement of the seat frame about said joint connection; means for preventing the forward movement of the upper edge of the back cushion; and means for holding the upper front edge of the bottom cushion in a predetermined maximum spaced relation above the fixed support, independently of and relatively to the movement of the bottom portion of the seat-frame.

In testimony whereof I have signed my name to this specification.

JAMES H. McCOLLOUGH, Jr.