

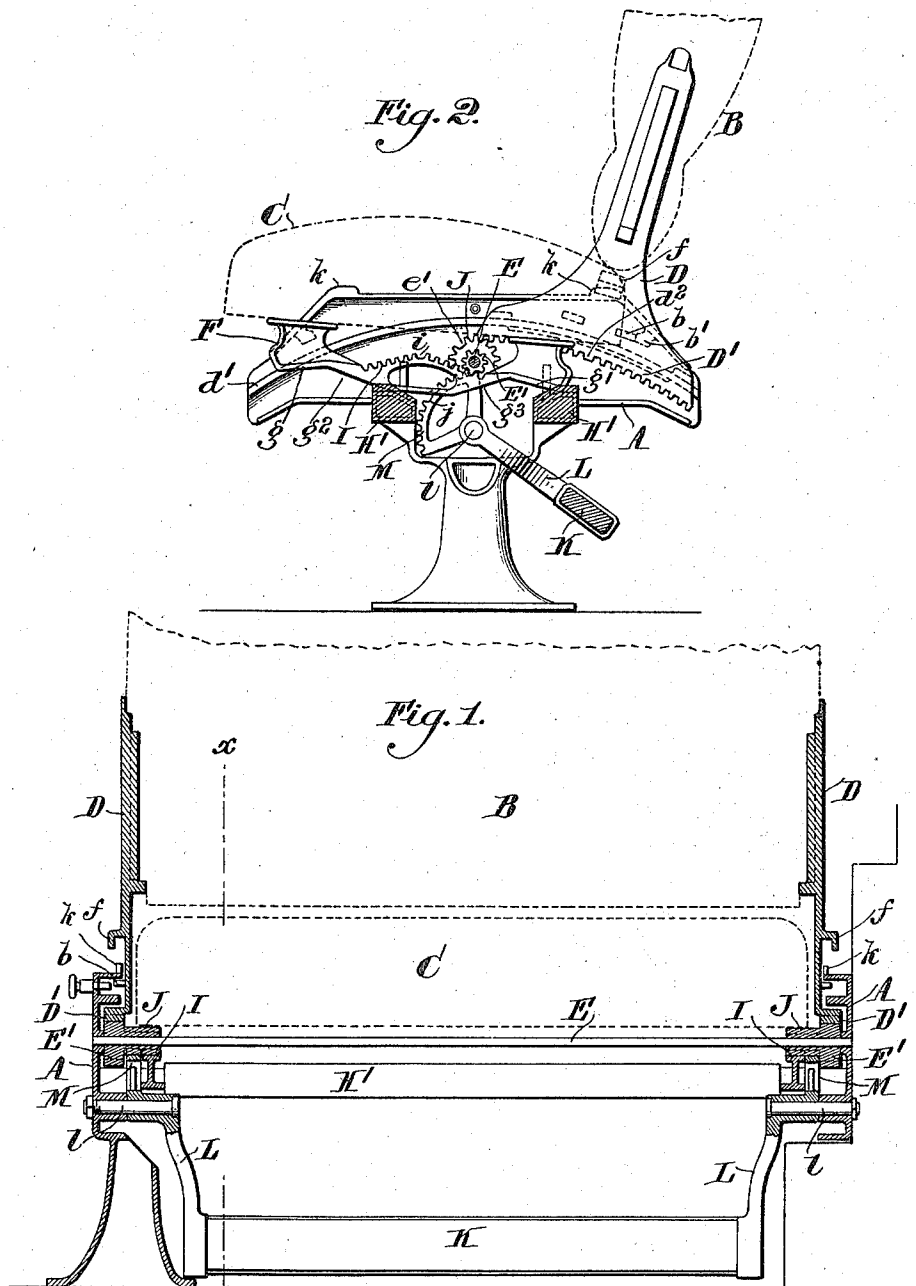
(No Model.)

2 Sheets—Sheet 1.

H. S. HALE.
CAR SEAT.

No. 580,576.

Patented Apr. 13, 1897.



Witnesses.

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Inventor.

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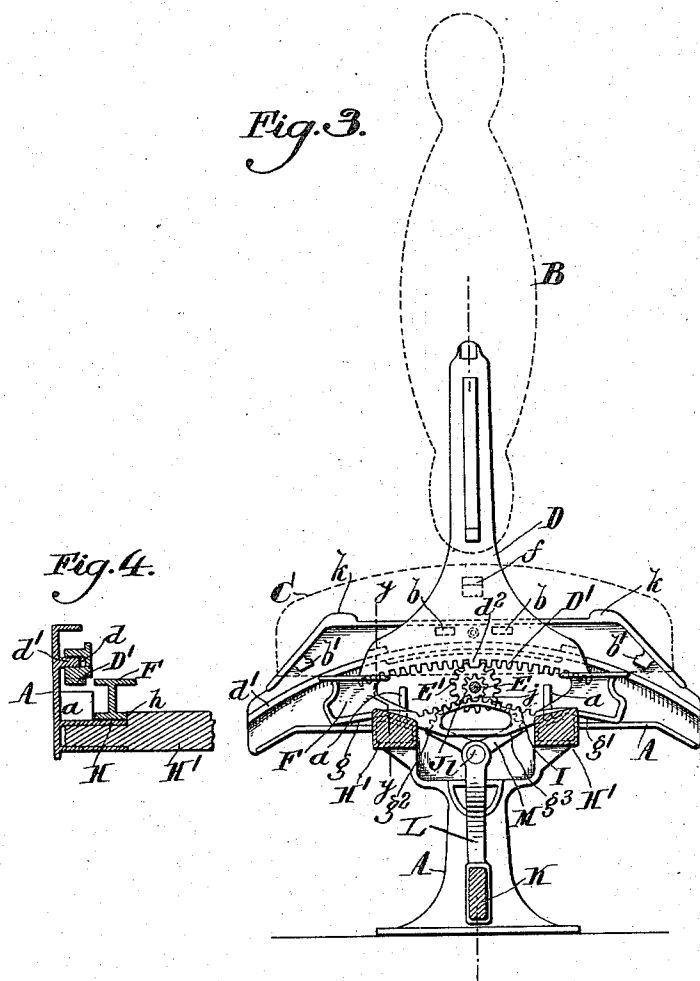


Fig. 6.

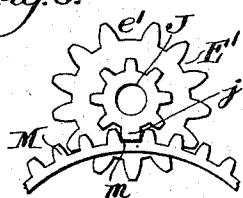
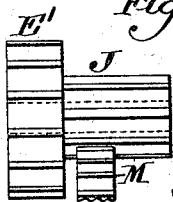


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY S. HALE, OF PHILADELPHIA, PENNSYLVANIA.

CAR-SEAT.

SPECIFICATION forming part of Letters Patent No. 580,576, dated April 13, 1897.

Application filed September 30, 1896. Serial No. 607,385. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. HALE, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Car-Seats, of which the following is a specification.

My invention relates to car-seats; and it consists of the improvements which are hereinafter described and claimed and which are shown in the accompanying drawings.

A part of my improvement relates to the employment of a shifting foot-rest, which, when the seat is reversed by the shifting of the back from one side to the other, is shifted so as to assume a position at the rear of the seat to support the feet of the passenger in the next seat in the rear. The foot-rest shifts or rocks entirely from one side to the other, and the advantage of this construction is that the front portion of the seat below the cushion is always open and unobstructed, thus affording ample space for placing bags and packages which cannot now be stored under the seat owing to the presence of the foot-rests. Another advantage of this construction is that the space under the seat is left open, so that the floor may be easily swept and cleaned.

Another part of my invention relates to the shifting seat-cushion, and embraces improvements whereby the seat-cushion during the commencement of its shifting movement is bodily lowered. The advantage of this construction is that the shifting seat-back may be brought close to the surface of the seat-cushion when in either extreme position, so that the objectionable space or opening in the rear of the seat is avoided. Heretofore it has been necessary to elevate the lower edge of the seat-back above the surface of the cushion in order to enable the seat-back to clear the seat-cushion as it swings over it, and this resulted in the formation of a space or opening between the back and cushion, through which small articles were liable to slip, to the annoyance and inconvenience of the passengers. By the employment of suitable cam-guides between the main frame and seat-cushion I effect the lowering of the cushion as it is shifted, thus enabling the back to clear it without the necessity of raising the edge of the back and forming the opening or space.

My invention also embraces other improvements and combination of parts, which are hereinafter described and claimed.

Figure 1 is a longitudinal vertical sectional view of a railway-car seat embodying my invention. Fig. 2 is a transverse vertical sectional view of the same on the line *xx* of Fig. 1. Fig. 3 is a transverse vertical sectional view similar to Fig. 2, showing the seat-back, foot-rest, and cushion in intermediate or half-shifted positions. Fig. 4 is a vertical sectional view on the line *yy* of Fig. 3. Fig. 5 is an enlarged front view of part of the shifting mechanism, and Fig. 6 is an end view of the same.

A is the main seat-frame.

B is the shifting seat-back.

C is the seat-cushion.

D are the shifting side arms which carry the seat-back. As shown, these side arms D consist of metal castings provided on their lower ends with segmental racks *D'*, which engage pinions *E'* on a longitudinal shaft *E*, journaled in the main seat-frame. As the seat-back is shifted from one side to the other the segmental racks *D'* travel on the teeth of the pinions *E'*, which they rotate. The side arms D are provided with curved guides *d*, which engage curved tongues *d'* on the side frames A, and thus serve to guide the side arms and hold them steady.

Lugs *b b* on the side arms strike stops *b' b'* on the extremities of the seat-frame, and thus limit the movement of the side arms and seat-back in either direction.

The seat-cushion C is carried by a shifting frame F, provided with cam-faces which rest and move on guides *H H*, carried by the main frames A. The frame F is provided with angular racks *I*, which engage pinions *J* on the shaft *E*, so that when the seat-back is shifted and the shaft *E* is rotated by the action of segments *D'* on the pinions *E'* the pinion *J* will act upon the racks *I* and shift the frame F and cushion C. The cam-faces *G* of the frame F moving on the bars *H H* will at the same time that the frame is shifted tilt it, as indicated in dotted lines in Fig. 2.

So far as the car-seat has been described it is shown in my application for Letters Patent, Serial No. 552,796, filed June 14, 1895, and has been shown and described for the pur-

pose of explaining my improvements, which I shall now describe particularly.

The Shifting Foot-Rest.

5 K is a longitudinal bar constituting the foot-rest located under the seat adjacent to the floor and carried by rocking arms L L, journaled on studs l or otherwise in the main frame. Carried by the arms L L are upwardly-
10 extending toothed segments M M, engaging the pinions on the shaft E. I have shown the segments M engaging the pinions J J, which are sufficiently elongated to receive both the segments M and the racks I of the frame of
15 the seat-cushion. The segments M are shown arranged between the pinions E' and the racks I, so that the construction may be compact and the segments shall not interfere in any way with the shifting of the frame F.

20 The segments M and arms L are so disposed with relation to the other operative parts that they will occupy an extreme position when the seat-back is in either extreme position, with the bar K thrown toward the back of the seat, as in Fig. 2. The foot-rest is then in
25 position to support the feet of the persons sitting in the next seat in the rear, while the entire space below the front of the seat is open and unobstructed. When the seat-back is
30 shifted from the right to the left in Fig. 2, the rotation of the shaft E through the segments D' and pinions E' will rock the segments M and cause the arms L and back to swing to the other extreme position on the left, which
35 is then the back of the seat.

As the movements of the bar K are controlled by the rotation of the shaft E, and as that shaft can only rotate when the seat-back is shifted, the bar K will be held locked in
40 either extreme position by the seat-back and side arms D and can only be moved when the seat-back is shifted. The weight of the seat-back and side arms will offer sufficient resistance to prevent the movement of the bar
45 K and the shifting of the seat-back by the pressure of the foot.

While I have shown the shifting foot-rest combined with the shifting side arms D, which operate the shaft E through the racks D' and
50 pinions E, I do not mean to limit my invention to this combination. So far as the shifting foot-rest is concerned it may be employed with other forms of shifting or reversing devices, and my invention comprehends, broadly,
55 the combination of a shifting foot-rest adapted to move bodily from one side of the seat to the other with a shifting part, (either seat-back or seat-cushion,) by the shifting of which the foot-rest is moved through any suitable
60 connecting mechanism.

The Devices for Shifting the Seat-Cushion.

It is desirable that the lower edge of the seat-back, when in either extreme position,
65 should be close to the surface of the seat-cushion, so as not to leave an opening between the back and cushion, through which

articles may slip. As the seat-back must occupy a substantially upright position and in shifting is moved for a short distance only, 70 the are described by the lower edge of the seat-back has so little curvature that the lower edge will not clear the surface of the cushion if it is in contact with the seat-cushion in either extreme position. 75

To enable the seat-back to clear the cushion, it has heretofore been customary to elevate it above the cushion, thus forming the objectionable opening in the back of the seat. To avoid this defect and to enable the edge of 80 the seat back and cushion to be close together in either extreme position, I employ means to lower the seat-cushion while the seat-back is being shifted over it and to elevate it again when the seat-back is shifted. These movements 85 are imparted to the seat-cushion by means of the cams which it carries and which move over the guides H. These cams are shown upon the frames F, which carry the seat-cushion and incline upwardly, as at g 90 g' , at each end and then downwardly, as at g^2 g^3 , the inclines g g^2 acting on the guide H on one side and the inclines g' g^3 on the guide on the other side. These inclines are 95 so arranged that when the seat is in the extreme position, as shown in Fig. 2, the high portion of the cam g' on one side will be resting on one guide H and the high portion of the cam g^2 on the other side will be resting 100 on the other guide. This will obviously elevate the seat at both back and front, and as the inclines g^2 g^3 are longer than the inclines g g' the seat will be thrown into the tilted position shown. As the seat is shifted 105 toward the right the incline g' travels upon the guide H, and as that incline tapers upwardly the rear of the seat will be lowered. At the same time the incline g^2 travels upon the other guide H and lowers the seat at the 110 outer end also, and these movements continue until the seat-cushion is in the intermediate position, (shown in Fig. 3,) at which time the lowest portions of the inclines g' g^2 are resting 115 on the supports H, and consequently the seat-cushion is in its lowest position, so that the seat-back may pass freely over it. As the shifting of the seat-cushion continues the cams g g^3 move upon the guides H H and elevate the seat-cushion into exactly the opposite position of that shown in Fig. 2, with the 120 opposite edge of the seat-cushion close to the lower edge of the seat-back. So far as this part of my invention is concerned it is obvious that the particular form of devices used for shifting the seat-back and moving the cushion 125 on the guides H H is not material, and any suitable mechanism may be used for that purpose instead of the particular devices shown, as this part of my invention is equally adapted to any car-seat employing a shifting seat- 130 cushion.

For the purpose of guiding and steadying the seat-cushion in its movements the side frames A A may be provided on the inner faces

with lugs *a*, between which and shoulder *h* on the cross-bars *H'* the cam-frames *F* are guided in their movements on the guides *H*.

As the seat back, cushion, and foot-rest move together it is necessary that the proper positions of these parts with reference to one another should be insured. Otherwise they will not occupy the proper relative positions when the car-seat is in use. If the parts are assembled in the proper relative positions, they will necessarily maintain those positions, and to insure the assembling of the parts in proper relation to one another I form each of the racks *D'*, *M*, and *I* with an enlarged central tooth or recess *d*², *m*, and *i*, adapted to engage correspondingly-enlarged teeth or recesses *e'* and *j* in the pinions *E'* and *J*. These teeth and recesses are so disposed that when the arms *D* are in the central position (shown in Fig. 3) the teeth *d*² will engage the recesses *e'* and the teeth *j* of the pinions *J* will engage the central recesses *m* and *i* in racks *I* and segments *M*, so that the seat-cushion *C* and foot-rest *K* will occupy a central position corresponding with that of the arms *D* and back *B*.

The working parts may thus be easily assembled together without the possibility of any part being out of proper position with relation to any other part.

To support the arms *D* upon the frame when in either extreme position, I provide them with lugs *f*, adapted to engage lugs *k* on the ends of the side frames.

The various details of construction which have been shown for purposes of illustration may be varied without departing from the invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a car-seat, the combination with side frames, of rocking arms carried thereby, a longitudinal foot-rest bar fastened to the rocking arms and fixed with reference thereto and swinging clear of the floor when the rocking arms are moved, a shifting seat-back, and connections between the shifting seat-back and the rocking arms and maintaining the rocking arms and foot-rest on the same side of the seat-frame as the seat-back, whereby the shifting of the seat-back will rock the arms and bodily move the foot-rest carried thereby from one side of the car-seat to the other and will bring the foot-rest to the rear of the seat below the seat-back.

2. In a car-seat, the combination with the main frame, of a shifting seat-back, a shifting seat-cushion, a shifting foot-rest movable bodily from one side of the main frame to the other, and power-transmitting connections between the shifting seat-back and the seat-cushion and foot-rest respectively, whereby the seat-cushion and foot-rest are shifted when the seat-back is moved and the foot-rest is moved bodily from one side of the main frame to the other.

3. In a car-seat, the combination with the main frame, of a shifting seat-cushion, a shift-

ing foot-rest located below the seat-cushion and movable bodily from one side of the main frame to the other, and power-transmitting connections between the seat-cushion and foot-rest whereby the shifting of the seat-cushion will effect the shifting of the foot-rest.

4. In a car-seat, the combination of the main frame, a shifting seat-back, rocking arms supported by the main frame below the seat-cushion, a longitudinal foot-rest bar rigidly fastened at its ends to the rocking arms so as to move therewith bodily from one side of the seat to the other and to swing clear of the floor, and occupying a position below the seat-back at the rear of the seat, and means for rocking said rocking arms when the seat-back is shifted, whereby said foot-rest shall always occupy a position at the rear of the seat below the seat-back.

5. In a car-seat, the combination of a main frame, a shaft journaled therein, a shifting foot-rest adapted to be moved from one side of the seat-frame to the other, power-transmitting connections between the shaft and foot-rest whereby the foot-rest is shifted when the shaft is rotated, a shifting seat-back and power-transmitting connections between the seat-back and shaft whereby the shaft is rotated when the seat-back is shifted.

6. In a railway-car seat the combination of a main frame, a rock-shaft journaled therein, pinions on the rock-shaft, a shifting foot-rest, toothed segments connected with the shifting foot-rest and engaging the pinions, a shifting seat-back and power-transmitting connections between the rock-shaft and shifting seat-back.

7. In a railway-car seat, the combination with the main frame, of a rock-shaft journaled therein, pinions *E'* and *J* on the rock-shaft, a seat-back having shifting arms provided with toothed segments engaging the pinions *E'*, a shifting foot-rest, and toothed segments connected with the shifting foot-rest and engaging the pinions *J*, whereby the foot-rest is shifted by the shifting of the seat-back.

8. In a railway-car seat, the combination of the main frame, a shifting seat-cushion carried thereby, and V-shaped cam-guides between the main frame and seat-cushion, so constructed that the seat-cushion will be bodily lowered throughout its entire structure at the commencement of the shifting movement.

9. In a railway-car seat, the combination of a main frame, a shifting seat-cushion carried thereby, and cam-guides between the main frame and seat-cushion having the upward inclines *g*, *g'* and the downward inclines *g*², *g*³ whereby the seat-cushion is bodily lowered at the commencement of the shifting movement.

10. In a railway-car seat, the combination with the main frame, of the shifting seat-back having shifting arms provided with toothed segments, a shifting seat-cushion provided

with toothed racks, toothed pinions journaled in the main frame and engaging the toothed segments and toothed racks, the pinions, segments and racks being respectively provided
5 with an enlarged tooth and recess to insure the engagement of the parts in proper relation.

11. In a railway-car seat, the combination with the main frame, of the shifting seat-back
10 having shifting arms provided with toothed segments, a rocking foot-rest provided with toothed segments, and pinions journaled in the main frame and engaging the toothed segments of the shifting side arms and foot-
15 rest, the pinions and segments being each provided with an enlarged tooth or recess to insure the engagement of the part in proper relation.

12. In a railway-car seat, the combination
20 with the main frame, of a shifting seat-back, a foot-rest suspended beneath the main frame above the floor at the rear of the seat-back and movable bodily clear of the floor from one

side of the main frame to the other, so as to always maintain a position below the seat-
25 back at the rear of the seat when the seat-back is in either extreme position.

13. In a railway-car seat, the combination with the main frame, of a foot-rest suspended beneath the main frame above the floor, and
30 movable bodily clear of the floor from one side of the main frame to the other, a shifting seat-back, and power-transmitting connections between the shifting seat-back and the foot-rest maintaining the foot-rest at the rear of the
35 seat below the seat-back, whereby the foot-rest is moved from one side to the other when the seat-back is shifted and is brought into position at the rear of the seat-frame below
40 the seat-back.

In testimony of which invention I have hereunto set my hand.

HENRY S. HALE.

Witnesses:

R. M. KELLY,

J. W. KENWORTHY.