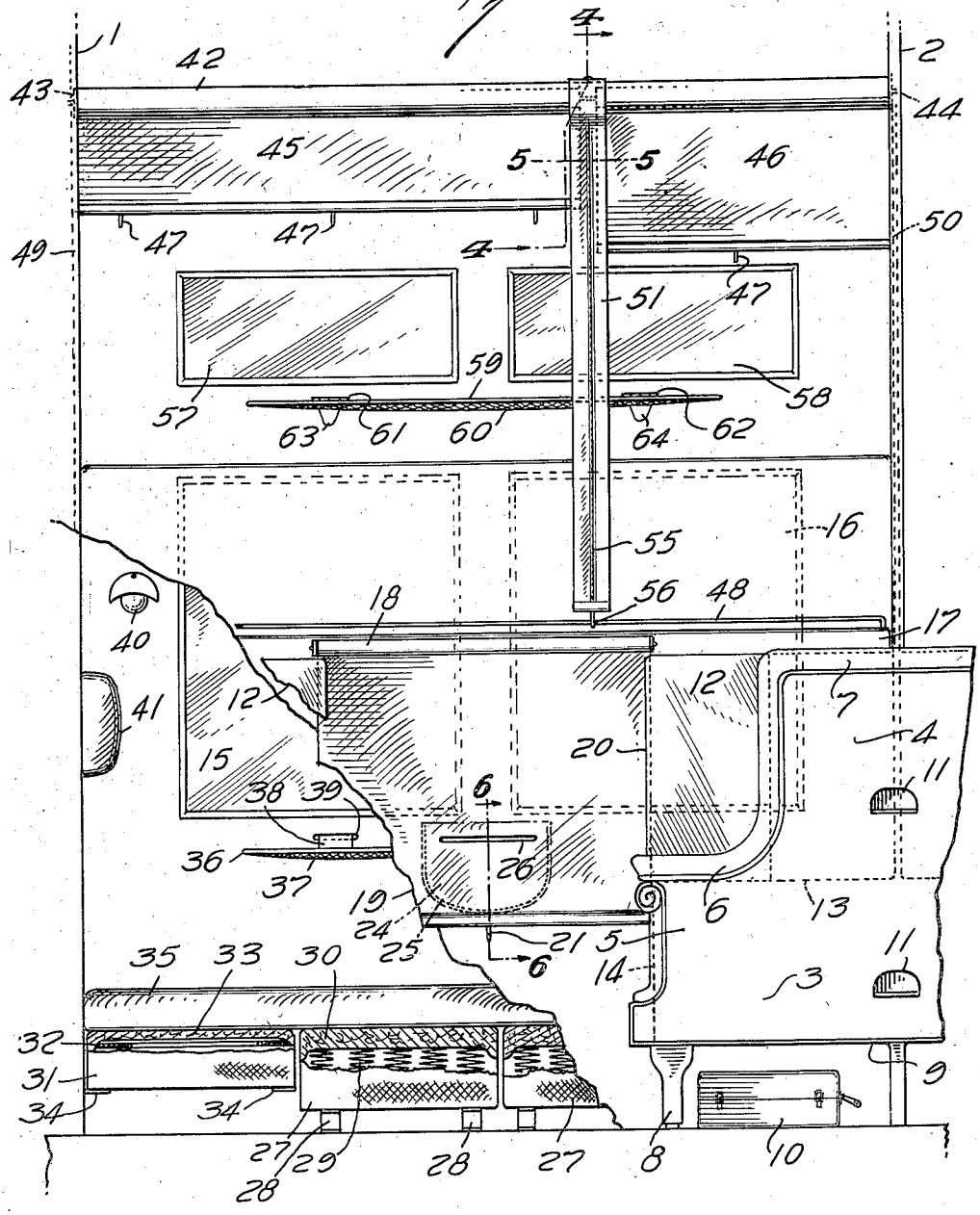
July 27, 1937. H. C. BIERMAN 2,087,964

SLEEPING CAR CONSTRUCTION

Filed July 30, 1932 2 Sheets-Sheet 1

Fig. 1.



INVENTOR

BY HARRY C. BIERMAN,

Ellis S. Ridderhof

ATTORNEY

July 27, 1937. H. C. BIERMAN 2,087,964

SLEEPING CAR CONSTRUCTION

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Fig. 2.

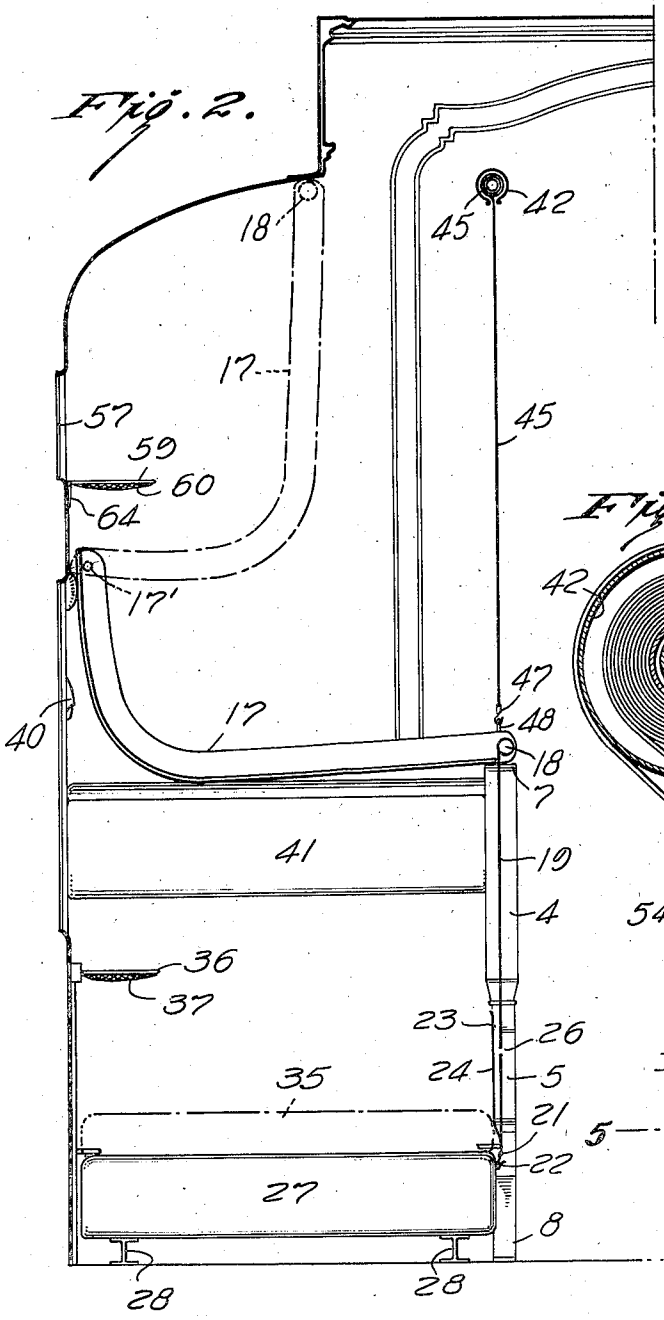


Fig. 3.

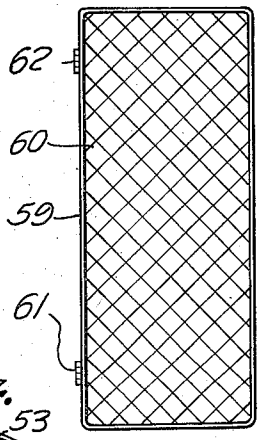


Fig. 4.

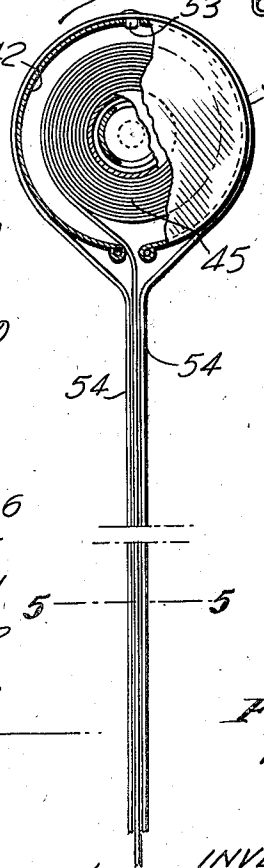


Fig. 6.

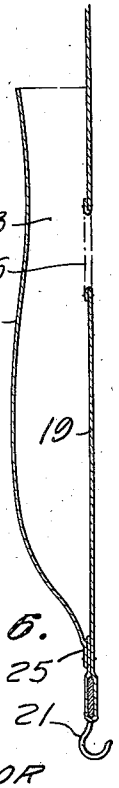
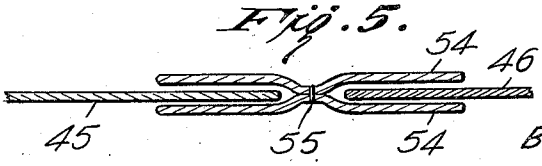


Fig. 5.



INVENTOR
HARRY C. BIERMAN,
BY Allen S. Nicholson
ATTORNEY

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UNITED STATES PATENT OFFICE

2,087,964

SLEEPING CAR CONSTRUCTION

Harry C. Bierman, New Rochelle, N. Y.

Application July 30, 1932, Serial No. 626,742

29 Claims. (Cl. 105—315)

This invention relates to sleeping car construction, more particularly that type of sleeping car which contains "sections", that is, a unit of two seats which may be converted into an upper and a lower berth.

In cars of this type, which have been standard up to the present invention, the upper berth was so located and arranged that passengers did not find it at all desirable and they would not generally occupy such berth unless compelled to do so by their inability to obtain a lower berth. By reason thereof it required practically double the number of cars to carry the passengers, entailing large and otherwise unnecessary expenditures, such as additional porters, excess equipment, more wear and tear on the same, greater power consumption, and other important maintenance costs. The operators of such cars have recognized the serious defects in the situation and have attempted to overcome them by various expedients.

Upper berths have been offered to passengers at a very much lower cost than normal, but nevertheless very few passengers considered it desirable to occupy the upper berth in spite of the relatively large saving. It has also been proposed to allow the passenger occupying a lower berth to have the entire section, including the upper berth, at a small added cost, but in this case also only a comparatively few passengers were willing to pay the extra charge. As a result the upper berth brought in very little revenue and it may be said that they constituted a loss of revenue because they were so seldom occupied.

I have made an exhaustive study of the matter and have concluded that the fault lay in the construction of the section and the present invention, therefore, contemplates important changes in and modifications of sleeping car construction. Incidentally the sleeping car section in use prior to the present invention is, in principle and main features, not materially different from the first constructions which came into use over seventy years ago.

My invention contemplates such changes as will render an upper berth much more desirable than the lower berth in the cars of the prior art. I have improved not only the upper but also the lower berth, in keeping with the upper, so that both berths are highly desirable to the passengers. While my invention comprises a series of improvements in various features, one of the principal features resides in the lowering of the made-up berths so as to render them much more easily accessible to the passengers, and particularly it renders the upper berth accessible without the aid of a ladder. Another important feature is the elimination of the old, unsanitary curtains which seldom remained in their proper places, and the substitution therefor of devices which are positive in their action and which assure complete privacy in the berth. Various other important features of berth construction are contemplated by my invention, and these are set forth below.

In practicing my invention, I lower the level of the upper berth. Wheras in the old construction the level was about five feet above the floor, I place it less than four feet above the floor, and usually about 3'8" or 3'9" so that the passenger may be enabled to enter the upper berth without the use of a ladder which was necessary in the old construction. Instead of suspending the same from above, I cause it to rest upon and preferably be secured to the top of the seat backs. This gives solidity and security to the berth, eliminates vibration, and avoids the necessity for unsightly devices for holding it in place. The lower berth is lowered to the extent that the seat cushions which constitute the same are placed on the floor or 1" to 2" above the same so that when fully made up the passenger sleeps about one foot or more above the floor. In the sides of the seats I provide footholds of suitable number and design, usually one or two in each side so that the passenger may without assistance step into the upper berth. The lowered position of the lower berth is highly desirable in that air entering an open window does not create a draft on the passenger but provides an adequate circulation above the passenger. It also appeals to various persons, particularly women, who find it easier to enter and leave the lower berth. The head-room in the lower berth is approximately the same as in the old construction and may be made greater.

The head-room in the upper berth is much greater than previously and the ventilation therein is improved. Because the berth is lower, it may be fitted with windows at such a level that the passenger sitting in bed may look out of the same. This has a remarkable psychological effect as it gives the passenger a sense of freedom and eliminates the thought that ventilation is defective.

According to the present invention each of the berths its provided with means replacing the old, loose curtains which insure privacy therein, and which at the same time allow adequate ventilation without drafts. In the lower berth, the upper portions of the sides of the seats are provided with sliding panels adapted to be pulled out

substantially flush with the forward edges of the lower portions of said sides. The approximately rectangular opening thus provided is closed by a roller shade fixed in the upper berth and adapted to be pulled down by the passenger and fastened in place.

The upper berth is provided with a tubular member containing two roller shades, usually but not necessarily of unequal width. Said member is held in position on the side panels of the section and is prevented from being accidentally displaced by a strap, preferably elastic, passing over the member and secured to the lower berth. The larger of the roller shades is secured to the berth at the time it is made up and the remaining opening is closed by the passenger when he retires and pulls the smaller shade down into place. The strap is located between the roller shades and provides means for closing the space between them and of keeping them in alinement. The edges of each of the shades of both berths fit in grooves in the adjacent parts thus holding them rigidly in place. The rigidity may be increased by making the shades of material which is quite stiff transversely but flexible longitudinally.

To make more convenient the handling of the passengers' shoes, I provide a pocket therefor in an upper and the lower shade, preferably near the bottom thereof, and a slit in the shade allows the removal and replacement of the shoes from outside of the berth. There is thus no possibility of a mistake between passengers' shoes and they are conveniently located for all concerned.

Because of the use of roller shades which are fully protected from dirt and mishandling both in use and during storage, it becomes possible for the first time to make the shades of delicate tints, of elaborate designs and of fine and expensive materials. The cars may be decorated harmoniously and thus be made more attractive.

In order to provide ample space for the storage of unused baggage there is provided a construction of cushion and seat which is highly advantageous. The seat back cushions, which are used to provide the head and the foot of the made-up berth, have shallow or flat springs just below the upper surface thereof so that a considerable space is left between the springs and the floor, sufficient for the storage of baggage, when the berth is made up. In some cases it is desirable to have the foot of the seat moved forward to practically the front edge thereof and the side of the seat may be cut away for the same purpose.

In the old construction fabric hammocks were provided in the berth for holding the passengers' clothes after retiring. These hammocks were usually so twisted as to render it difficult to place clothes therein. In any case, it was impossible to place clothes therein without wrinkling thereof. I provide a different type of hammock which includes a frame, such as of metal or wood, across which is secured a fabric netting. This allows clothes to be placed thereon neatly and there is no danger of the same becoming wrinkled. In the upper berth my new hammock is usually hinged to the wall and in the lower berth it is usually provided with extended portions adapted to be slipped into place in slots ordinarily provided for holding a table.

These and other features of my invention have resulted in a general and an important improvement in sleeping car construction.

In the accompanying drawings constituting a part hereof and in which like reference characters indicate like parts.—

Fig. 1 is a side elevational view of a section, some parts being shown in cross-section and other parts being shown broken away for clearness;

Fig. 2 is an end elevational view of a section with some parts omitted for the sake of clearness;

Fig. 3 is an enlarged plan view of a hammock of the upper berth;

Fig. 4 is an enlarged fragmentary view partly in cross-section taken along the line 4—4 of Fig. 1;

Fig. 5 is an enlarged cross-sectional view taken along the lines 5—5 of Fig. 1 and Fig. 4, and

Fig. 6 is an enlarged vertical cross-sectional view taken along the line 6—6 of Fig. 1.

Referring particularly to Fig. 1, lines 1 and 2 designate the sides of the section and may be considered as being the panels which ordinarily separate adjacent sections. Each of the seats 3 has an upper portion 4 and a lower extended portion 5, the latter having an arm-rest 6 thereon. The top of the seat is designated by numeral 7. A foot 8 is placed substantially at the forward portion of the seat and the height 9 thereof is sufficient so that package 10 may be inserted under the seat. Foot-holds 11, two in number, although more or less may be used, are formed in line with the panels 1 and 2 of the section and provide means for the passenger entering the upper berth. A slidable panel 12 is provided and when not in use is slid back into position 13 within portion 4 of the seat. A groove 14 is provided in portion 5. A set of windows 15 and 16 are provided, as is well known.

The upper berth 17 is pivoted at 17' and the forward end thereof rests upon the tops 7 of the seats and is secured thereto by a suitable lock, not shown. A roller 18 carrying a shade 19 is secured in the front portion of berth 17 and when in use the edges thereof fit into grooves 20 in panels 12. A hook 21 in shade 19 is adapted to engage with an eye 22 on a seat cushion. At the lower end of the shade is a shoe pocket 23 formed of a piece of elastic fabric 24 secured to the shade by stitching 25. A slit 26 in the cushion allows access to the pocket from the outside. Generally the pocket is made of elastic material so that when it is empty the fabric 24 lies closely against shade 19 and thus does not interfere with the rolling of the shade into roller 18.

Seat cushions 27 having short feet 28 are placed on the floor and constitute a central portion of the lower berth. They contain coil springs 29 and padding 30 thereover. Back-rest cushions 31 are placed as shown at 31 to complete the ends of the lower berth. They include flat springs 32 placed near the top thereof and padding 33 covers the same. The cushions 31 rest upon short brackets 34 formed in the structure as is well known, so as not to interfere with the placing of baggage under the seat, and extending within cushion 31. Such a cushion which is relatively shallow and which allows a sufficient space so that baggage may be slipped under the same as shown in Fig. 1, is termed a "hollow" cushion. A mattress 35 completes the lower berth.

A frame 36 having an open fabric mesh 37 is provided with tongues 38 adapted to fit into the ordinary slots 39 and thus be located temporarily in place. A light fixture 40 is provided and the head-rest cushion 41 remains in its ordinary position.

In the upper berth a roller 42 has its ends 43 and 44 slipped into suitable recesses in panels 1 and 2 respectively and are there held loosely in

position. Roller 42 carries a relatively wide shade 45 and a relatively narrow shade 46. A series of hooks 47 on said shades allows the same to be hooked onto rod 48 secured to berth 17 and there be held in operative position. Panel 1 is provided with a groove 49 in which the edge of shade 45 is held, and panel 2 is provided with a groove 50 in which the edge of shade 46 is held. A strap 51 of fabric preferably elastic, in part at least, is formed into a loop 52 which passes over roller 42 and is held in place by a button 53. The principal parts 54 thereof are held together by a central line of stitching 55. This provides two pockets in which the free edges of shades 45 and 46 are held. A hook 56 at the extreme lower end of strap 51 is secured on rod 48.

A pair of windows 57 and 58 are placed at a height approximating the height of the passenger when sitting in bed and are approximately in alinement with windows 15 and 16 respectively. Windows 57 and 58 are formed in a vertical portion of the car body. The hammock for the upper berth consists of a frame 59 of metal or wood or the like, having an open mesh fabric 60 secured therein and a pair of hinges 61 and 62 secure the same to the side of the car. Depending flanges 63 and 64 serve to hold the hammock in horizontal position when in use.

From the above description it is clear that I have provided numerous improvements in sleeping car section construction and that many conveniences and advantages are afforded thereby. In addition to those enumerated above, it will be apparent that a section constructed as herein set forth is less expensive to make and is much easier to operate. The work of making up and taking down the beds is much simplified and it can now be performed in a fraction of the time previously necessary.

Although I have described my invention setting forth a single embodiment thereof, the invention is not limited to the details herein described. Many changes in details of construction, arrangement of parts, omission of elements, and addition of further elements may be made within the scope of the invention. For instance, I may add in the upper berth a removable or a hinged seat which may be secured to the wall of the car or to one of the panels, whereby a passenger may be seated while dressing. In order to raise berth 17, I may provide a coil spring secured to the side of the car and to the berth in such a position as not to be readily visible and which will serve to hold the berth down when desired, and to pull it up into closed position at the proper time. I may provide pivoted lever arms for the cushions 28 and 31 so that they may be raised and lowered into their various positions with very little effort. These and other changes may be made in the details of construction of my invention within the scope thereof. The invention is not to be limited except by the claims appended hereto.

It is, of course, understood that my invention is not limited in the field of use and that it may be incorporated in various types of vehicles, such as ships, busses, aircraft, rail cars, and the like. It is even suitable for use in stationary structures. Therefore, the term "sleeping car" as used in the claims is to be construed in a broad sense to include all of these fields. By the term "upper outer edge" of the upper berth I mean that edge of the berth which is at the entrance side of the berth when it is made up for sleeping purposes.

What I claim is:

1. In a sleeping car, a section, seats therein facing each other, the sides of said seats having a lower portion and an upper portion narrower than said lower portion, panels in said upper portions adapted to be pulled out and grooves in the edges of said panels, an upper berth, a roller curtain secured thereto and adapted to fit into said grooves.

2. In a sleeping car, a section, seats therein facing each other, the sides of said seats having a lower portion and an upper portion narrower than said lower portion, panels in said upper portions adapted to be pulled out and grooves in the edges of said panels, an upper berth, a roller curtain secured thereto and adapted to fit into said grooves, and a shoe pocket in said curtain.

3. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions when arranged horizontally as a berth being on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth, the center cushions being supported from the floor and the end cushions from the seat structure.

4. In a sleeping car, a section, seats therein facing each other, the backs of said seats constituting walls of said section, an upper berth held in the closed position at a point above the said backs and when in use being adapted to be directly secured to and contacting with an integral portion of said backs, the height of said upper berth when ready for occupancy being sufficiently low so that the need for a ladder is obviated.

5. In a sleeping car, a section, seats therein facing each other, the backs of said seats constituting walls of said section, an upper berth hinged to the wall of said car at a point above the said backs and when in use being adapted to be directly secured to and contacting with an integral portion of said backs, the height of said upper berth when ready for occupancy being sufficiently low so that the need for a ladder is obviated.

6. In a sleeping car, a section, seats therein facing each other and cooperating to form a sleeping compartment, the sides of said seats having a lower portion and an upper portion narrower than said lower portion, and panels in said upper portions adapted to be pulled out to form front walls for said berth.

7. In a sleeping car, a section, seats therein facing each other and cooperating to form a sleeping compartment, the sides of said seats having a lower portion and an upper portion narrower than said lower portion, and panels in said upper portions adapted to be pulled out flush with said lower portion to form front walls for said berth.

8. In a sleeping car, a section, seats therein facing each other and cooperating to form a sleeping compartment, the sides of said seats having a lower portion and an upper portion narrower than said lower portion, panels in said upper portions adapted to be pulled out to form front walls for said berth, grooves in the edges of said panels and means fitting into said grooves adapted to complete said walls.

9. In a sleeping car having a section, seats therein facing each other and an upper berth secured to said car and adapted to cooperate with said seats to form two sleeping compartments, the

improvement which comprises a roller carrying at least one shade secured above said upper berth along the upper outer edge thereof.

10. In a sleeping car having a section, seats therein facing each other and an upper berth secured to said car and adapted to cooperate with said seats to form two sleeping compartments, the improvement which comprises a roller carrying at least one shade secured above said upper berth along the upper outer edge thereof and a strap secured to said roller and said berth.

11. In a sleeping car having a section, seats therein facing each other and an upper berth secured to said car and adapted to cooperate with said seats to form two sleeping compartments, the improvement which comprises a roller carrying shades secured above said upper berth along the upper outer edge thereof and a strap secured to said roller and said berth at the junction of two shades.

12. In a sleeping car having a section, seats therein facing each other and an upper berth secured to said car and adapted to cooperate with said seats to form two sleeping compartments, the improvement which comprises a roller carrying shades secured above said upper berth along the upper outer edge thereof and a grooved strap secured to said roller and said berth at the junction of two shades, and grooves in the sides of said section, whereby the respective edges of said shades rest in said grooves and said strap.

13. In a sleeping car, a section, an upper berth therein hinged to a wall thereof, the form of said berth being such that when opened the plane thereof is below a horizontal plane passing through the hinge.

14. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth.

15. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth and an upper berth in said section above said seats, said upper berth forming part of the enclosure for the lower berth.

16. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth, an upper berth in said section above said seats adapted to be placed in a substantially horizontal plane, said upper berth forming part of the enclosure for the lower berth.

17. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth, an upper berth in said section above said seats adapted to be placed in a substantially horizontal plane not over four feet from said floor, said upper berth forming part of the enclosure for the lower berth.

18. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth, an upper berth in said section above said seats adapted to be placed in a substantially horizontal plane and adapted to be secured to the ends of said seats, said upper berth forming part of the enclosure for the lower berth.

19. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth, at least one of the end cushions being shallow and adapted to allow baggage to be placed thereunder when said cushions are in proximity to said floor.

20. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth, at least one of the end cushions being shallow and adapted to allow baggage to be placed thereunder when said cushions are in proximity to said floor, the supporting foot of the sides of at least one of said seats being sufficiently forward to permit baggage to be slipped under said end cushions.

21. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth, a window in said section, said berth being a substantial distance below the lower edge of said window.

22. In a sleeping car, a section, seats therein adapted to be converted into a berth, removable back and bottom cushions on said seats, said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the cushions when arranged as seats and being in proximity to the floor of said car, the upper surface of said cushions being on a substantially horizontal plane to form a berth, an upper berth in said section above said seats and means for lowering the same into a substantially horizontal plane and a window in

said upper berth, said upper berth forming part of the enclosure for the lower berth.

23. In a sleeping car, a section, seats therein facing each other, a hinged upper berth adapted to cooperate with said seats to form two sleeping compartments, removable back and bottom cushions on said seats, the top of said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the top of said cushions when arranged as seats and being in proximity to the floor of said car to form a lower berth.

24. In a sleeping car, a section, seats therein facing each other, a hinged upper berth adapted to cooperate with said seats to form two sleeping compartments, removable back and bottom cushions on said seats, the top of said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the top of said cushions when arranged as seats and being in proximity to the floor of said car to form a lower berth, at least one of the end cushions being shallow and adapted to allow baggage to be placed thereunder when said cushions are in proximity to said floor.

25. In a sleeping car, a section, seats therein facing each other, a hinged upper berth adapted to cooperate with said seats to form two sleeping compartments, removable back and bottom cushions on said seats, the top of said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the top of said cushions when arranged as seats and being in proximity to the floor of said car to form a lower berth, at least one of the end cushions being shallow and adapted to allow baggage to be placed thereunder when said cushions are in proximity to said floor, the supporting foot of the side of said seats being sufficiently forward to permit baggage to be slipped under said end cushions.

26. In a sleeping car, a section, seats therein facing each other, a hinged upper berth adapted to cooperate with said seats to form two sleeping compartments, removable back and bottom cushions on said seats, the top of said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the top of said cushions when arranged as seats and being in proximity to the floor of said car to form a lower berth, said upper berth being lowered so that the customary vertical spacing of the berths is maintained.

27. In a sleeping car, a section, seats therein facing each other, a hinged upper berth adapted to cooperate with said seats to form two sleeping compartments, removable back and bottom cushions on said seats, the top of said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the top of said cushions when arranged as seats and being in proximity to the floor of said car to form a lower berth, at least one window in the side wall of said upper berth, said window being covered by said berth when the latter is in the closed position.

28. In a sleeping car, a section, seats therein facing each other, a hinged upper berth adapted to cooperate with said seats to form two sleeping compartments, removable back and bottom cushions on said seats, the top of said cushions being arranged as a berth in horizontal alinement and being supported in said section on a lower level than the top of said cushions when arranged as seats and being in proximity to the floor of said car to form a lower berth, at least one window in the side wall of said upper berth, said window being covered by said berth when the latter is in the closed position, said window being fixed.

29. In a sleeping car, a section, seats therein adapted to be converted into a berth, an upper berth adapted to cooperate with said seats to form two sleeping compartments, a roller carrying a shade above at least one of said berths, a shoe pocket on said shade and an opening in said shade allowing access to said pocket.

HARRY C. BIERMAN.