(No Model.) 5 Sheets—Sheet 1.

B. LOWENBERG.

CONVERTIBLE CAR.

No. 536,034. Patented Mar. 19, 1895.

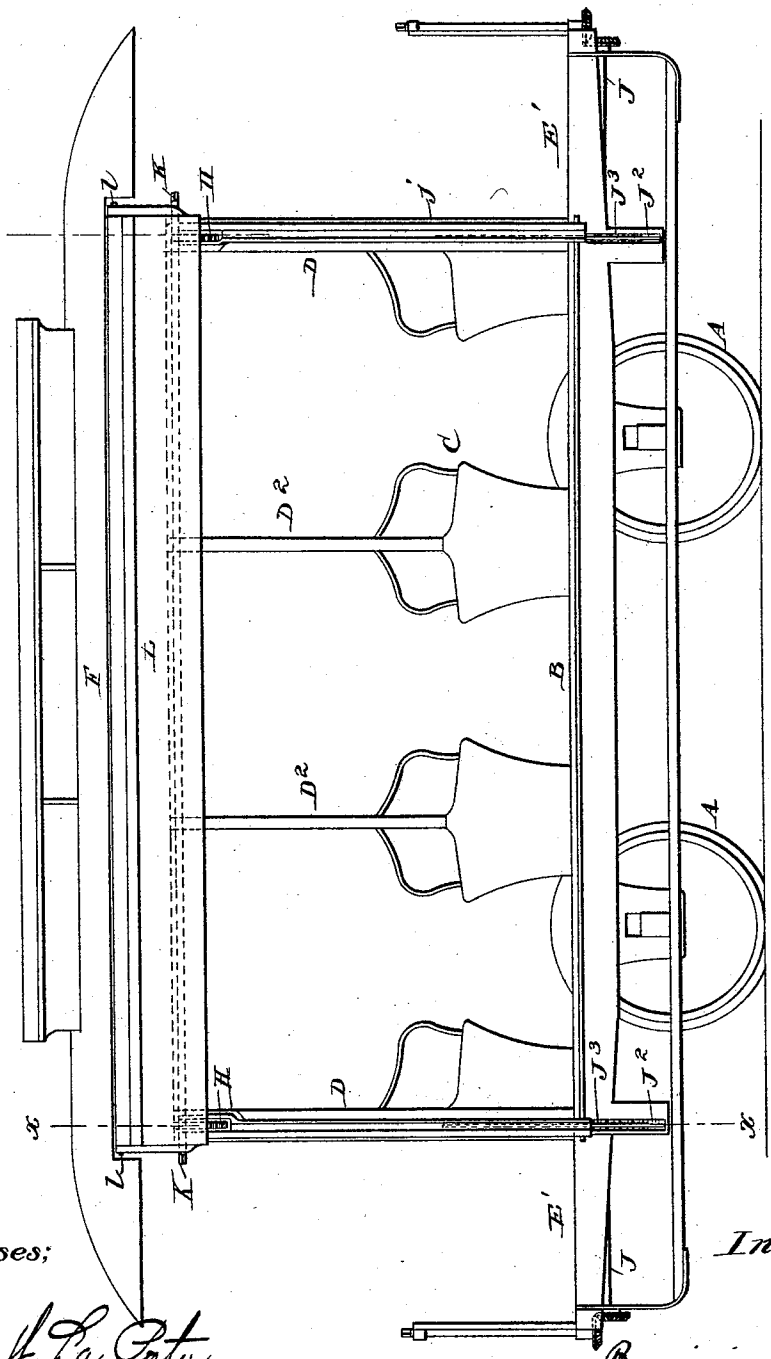

Fig. 1.

Witnesses;

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Fig. 2

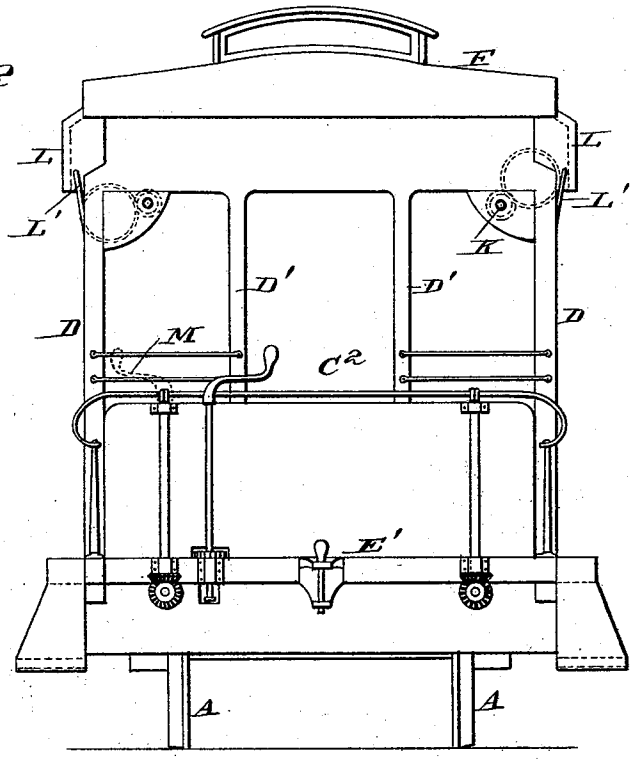

Fig. 4

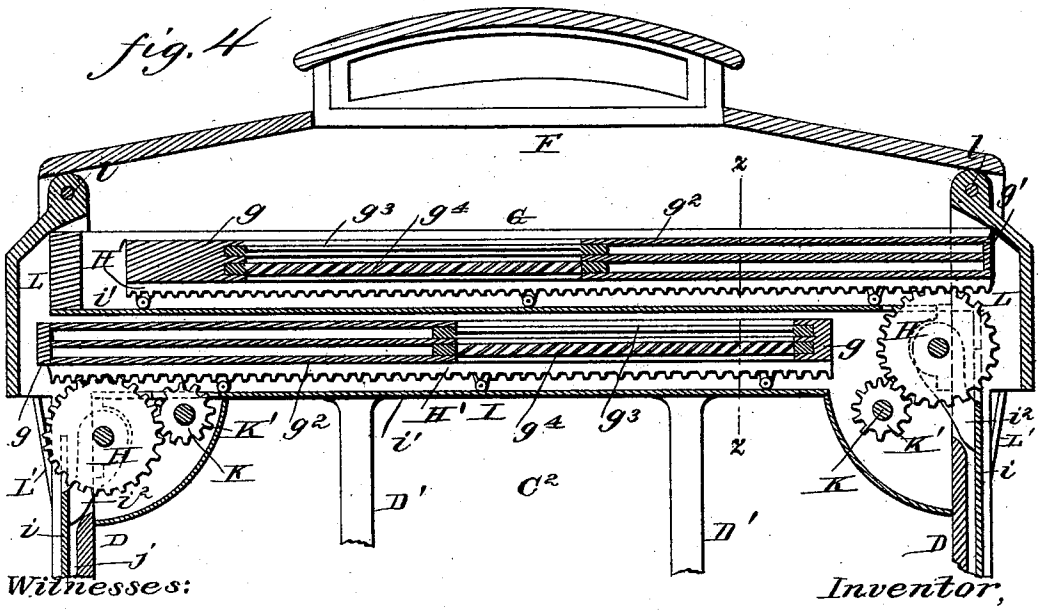

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fig. 3

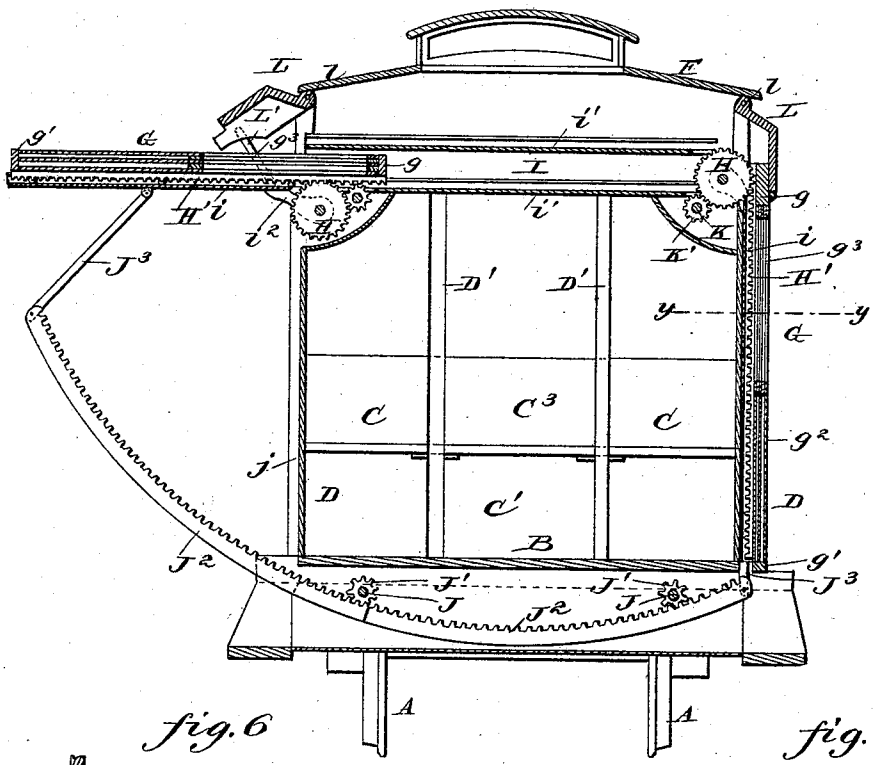


fig. 6

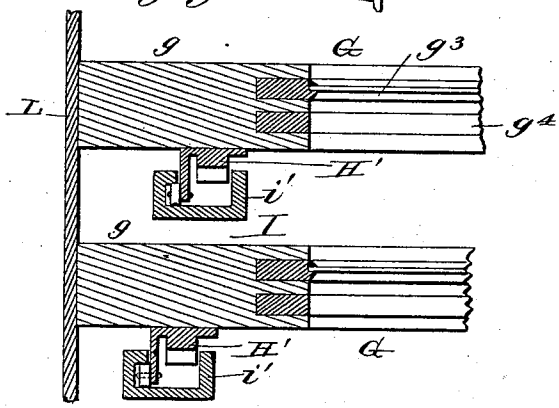
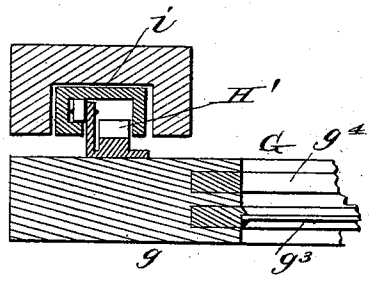


fig. 7



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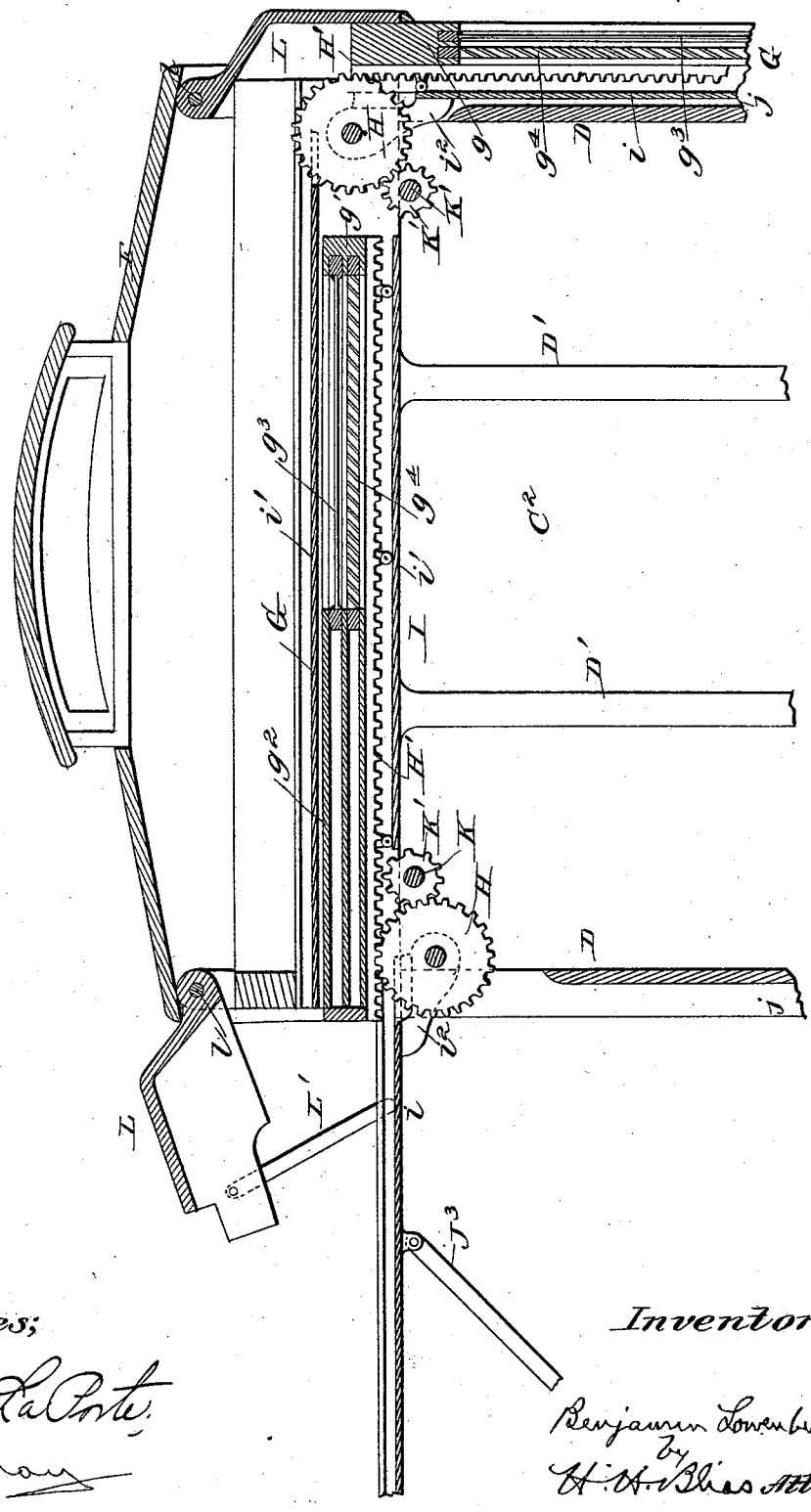

Fig. 5

Witnesses;

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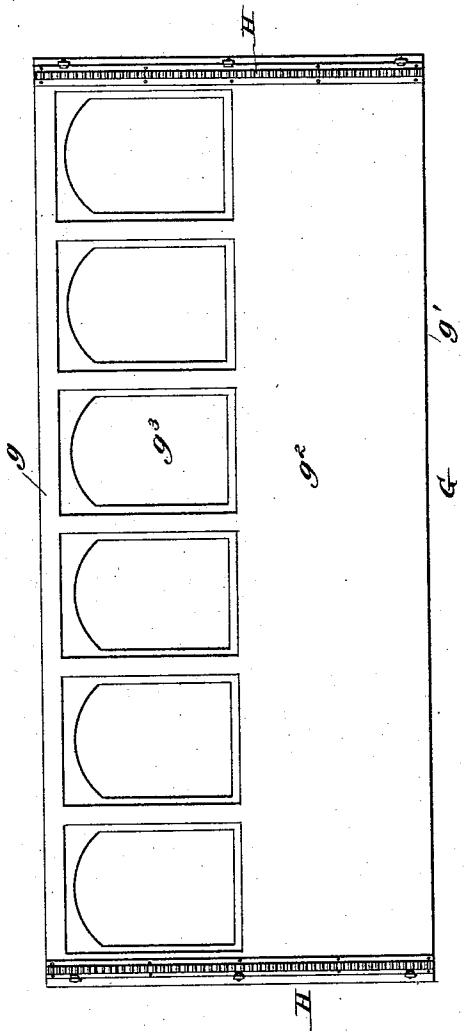

Fig. 8

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UNITED STATES PATENT OFFICE.

BENJAMIN LOWENBERG, OF NORFOLK, VIRGINIA.

CONVERTIBLE CAR.

SPECIFICATION forming part of Letters Patent No. 536,034, dated March 19, 1895.

Application filed May 19, 1894. Serial No. 511,805. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN LOWENBERG, a citizen of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Convertible Cars; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of a car embodying my improvements. Fig. 2 is an end elevation. Fig. 3 is a cross section on line x—x Fig. 1, showing the parts at the time when the wall lifting devices are in their upper most position. Fig. 4 is a similar view showing the parts at the time when the wall has been carried inward at the top. Fig. 5 is a similar view showing the parts in the position occupied after the lifting frame on one side has been raised and the movable side has been slid into the car below the roof. Figs. 6 and 7 are enlarged sections showing some of the parts in detail. Fig. 8 shows the side of the car detached.

In the drawings, I have shown a sufficient portion of a street car to illustrate the manner of applying my invention thereto; but it will be understood that in this respect it can be considerably modified, as the invention is of such nature as to be applicable to cars of any of the sorts now commonly in use, so far as concerns the main frame-work, the parts at the rear and the front ends, the wheel trucks, &c. I prefer to construct the frame-work with some features of special adaptation so that the improvements can be completely applied, as will appear from the description below in connection with the drawings.

In order to understand more readily the parts which essentially characterize the invention, I will indicate, generally, the parts of the frame-work, to be borne in mind in forming a correct idea of the improvements.

A, A, indicate the track wheels, to be mounted as aforesaid on any suitable trucks.

B indicates the floor frame, as a whole, it being supported above the seats C C. The latter may also be of any approved sort, though I prefer to arrange them transversely of the car.

At C′ there is a center aisle running longitudinally to permit access from any seat from the end doors C^2, C^2 which will ordinarily be necessary when the car is closed at the sides; but to permit an enlargement of the seating capacity when the sides of the car are open and entrance is permitted through them, I provide supplemental seat sections as shown at C^3 which are adapted to be slipped across the aisle and joined to opposing seats C C.

From the floor frame, there rise at the corners, uprights or studs D, D, more or less of the nature of those in ordinary use in cars as now made. They in conjunction with the uprights or studs D′ D′ support the paneling or end walls, the end window-sash, and the end doors, there being doorways at C^2, C^2, communicating with the platforms E′, E′, one at the front and the other at the rear and of substantially the ordinary character.

Between the front and rear corner uprights or studs D, D, there are or may be placed intermediate uprights D^2 D^2 of any suitable number, arranged and connected substantially the same as those now in use.

The roof is indicated by F and may be of the usual sort.

With the parts above referred to, I combine side walls which are capable of being readily secured in position so as to tightly inclose the interior apartment whenever desired, but which can also be as readily moved up into such position as can be practically entirely concealed from the outside and so as to leave the sides of the car entirely open. In other words, I have succeeded in constructing a car which can be converted in a moment from a closed vehicle having substantially the appearance and the capabilities of the ordinary box or in closed street car, to one which shall have the appearance and the capabilities of what is known as an "open car." To accomplish these ends, I employ the following means: G, G, indicate the movable sides. Each is formed with a suitable number of frame pieces as at g, g, g'. At the bottom, the frame-work is closed, preferably by sheathing or tight paneling as at g^2 extending upward

to the ordinary height, and above those there are window-sashes g^3 and shutters g^4 or equivalents capable of being independently moved to or from their normal places, the same as in the ordinary car. With each side wall, I combine means for turning it into a substantially horizontal position and then moving it horizontally into a chamber or space at the top of the room in the car below the roof. Preferably I make this mechanism in what may be regarded as two parts, one for effecting the turning of the side and the other for accomplishing its inward and outward movement; and although these two parts of the mechanism are related so as to be at times co-operative, yet they are more or less independent so that they can be respectively moved in different directions to effect their being concealed and made compact with respect to the car.

The form of mechanism which I have selected for illustration comprises a hinge-like or pivotal connection for the sides, consisting mainly of two toothed wheels H, H, mounted in the frame on a line near the top of the car. At the ends of the car there are two racks H′ H′ engaging with these wheels H. After it has been moved up around the axis of the wheels as a center to a horizontal or nearly horizontal position, the wheels and racks can be utilized as the means for causing the inward or outward movement of the side wall. At each end there is a guide-way I. It is made in two separable parts i and i'. The part i' is fixed permanently in the cross frame of the car at the top. The part i is hinged on the axis of the wheels H, preferably by means of radius bars i^2 i^2 sleeved on said axle. At said end of the side wall there is a tongued or flanged piece fitting in the guideway i i' and adapted to readily pass from one part of the guide to the other when they are in alignment.

To throw the parts i of the guides into line I employ the devices shown at J J′ J^2 J^3, J indicating a rotary shaft, J′ pinions thereon, J^2 racks engaging with the pinions and J^3 being links connecting the ends of the racks with the ends of the side wall, being pivoted to the metal guides i.

It will be seen that when the shaft J is rotated in the proper direction, the rack J^2 will be driven outward as shown in Fig. 3, the result of which is to force upward the link J^3 which in turn swings upward the lower edge of the side wall around the axis of wheels H as aforesaid. Such upward movement can be continued until the guides i i' are in line. Then the shaft J can remain stationary, and with it the elevating devices described, and the wheels H can be rotated by means of the pinions K, K′, on the shaft K, the result of which is to compel the wheels through their engagement with the racks H′ to draw the side wall under the guide plates on the wall passing into the inner guide sections i' and escaping from those at i. After they have escaped from the outer guides the elevating devices are free and if the shaft J be turned in the opposite direction the racks J^2 and the links J^3 will be lowered, the racks passing into a position of concealment under the car floor and the links J^3 seating themselves in chambers or recesses in the framework, as shown at j.

In order to provide at all times a tight as well as ornamental cover for the opening at the upper part of the side of the car adjacent to the wheels H, I combine with the parts described a movable cornice L. It is hinged at l l of the car frame. Its upper edge is placed snugly beneath the eaves or overhanging edges of the roof and it is so shaped as to exclude water and also be tasty in appearance. I also prefer to support and arrange this part L so that it shall serve as a stop or lock for the side wall in both positions of the latter; that is to say, arrange it so that it shall lie directly upon the upper edge of the side when it is in its lowermost position and directly against its outer edge when it has been thrown up under the roof. It is moved properly relatively to the other parts by means of a link L′ pivoted to it and also pivotally connected to the elevating devices, there being preferably one at each end.

It will be understood of course that there is on each side of the car a mechanism having parts corresponding to those above described. Inasmuch as one side wall must be superposed as to the other, I arrange the guideway sections i' for one side wall on transverse lines in front or in the rear of the lines of the guides of the other side. To compensate for these the racks and other parts are placed on proper lines transverse to the side so that when the two side walls are down they will be similarly situated with respect to the body of the vehicle.

The two shafts J which effect the elevating may be connected together as by a sprocket chain or otherwise so that a single hand wheel M or crank can be utilized to effect the raising of both sides, and, similarly, the wheels H on the two sides can be connected to a common driver so that the operator can by one and the same act, cause the outward movement of the two side pieces.

What I claim is—

1. In a car or similar vehicle, the combination with the two part supporting and guiding frame, of a side wall and means for moving it from a vertical position in one of the parts of said frame to a horizontal position in the other part of said frame, substantially as set forth.

2. In a car or similar vehicle, the combination with the movable side wall, of the two part guideway, the parts of which are adapted to be separated whereby one part can lie in one position as to the horizon and the other being inclined to another position, substantially as set forth.

3. In a car or similar vehicle, the combina-

tion with the body thereof, of a vertically swinging and inward horizontally sliding side wall, means for swinging said wall, and independent means for sliding it horizontally substantially as set forth.

4. In a car or similar vehicle, the combination with the movable side wall, and a guideway for it between the sides of a car, of a shaft for elevating said wall, levers adapted to be connected to said side wall, and means connecting the shaft with the levers, substantially as set forth.

5. In a car or similar vehicle, the combination with the movable side wall, and the guide therefor between the sides of the car, of the movable guide pivotally supported to move into and out of alignment with the aforesaid guide, substantially as set forth.

6. In a car or similar vehicle, the combination with the guide extending from side to side of the car, and the vertically movable guide, of a removable side wall adapted to lie in either of said guides, and means for moving it from one to the other of said guides, substantially as set forth.

7. In a car or similar vehicle, the combination with the guide between the side walls of the car and the movable side wall of means for elevating the side wall, and means supplemental thereto for causing it to move on the aforesaid guide, substantially as set forth.

8. The combination with the car body, and the movable side wall, of a rack and pinion for moving said side wall, into a horizontal position, and a supplemental rack and pinion for sliding said wall horizontally, substantially as set forth.

9. The combination with the car body and the movable side wall, of the side or support between the sides of the car for the side wall, means for moving the side wall to a horizontal position and a rack and pinion supplemental to the said means for moving said side wall bodily around the said support, substantially as set forth.

10. The combination with the car body and the movable side wall, of the interior support for the side wall and the vertically rocking frame for the side wall detachable therefrom, substantially as set forth.

11. The combination with the car body, the movable side wall and the interior support, of the hinged guide or frame and means for detaching the side wall therefrom, substantially as set forth.

12. The combination with the car body and the movable side wall, of a rising and falling frame or carrier for the side wall adapted to move independently thereof, substantially as set forth.

13. The combination with the car body, and the movable side wall, of the transversely moving racks J^2 for moving the side wall and detachably connected thereto, and pinions J' engaging with and actuating said racks, substantially as set forth.

14. The combination with the car body and the movable side wall, of the vertically moving frame or support for the said wall, the racks J^2, the links J^3, and means for moving the racks longitudinally, substantially as set forth.

15. The combination with the car body, and the movable side wall, of a movable cornice or cover piece, means for moving said side wall into a horizontal position within said car, and means independent of the side wall for automatically reciprocating said cornice when the side wall is moved, substantially as described.

16. The combination with the car body, and the movable side walls, of the racks for elevating said walls extending under the car floor, and shafts provided with pinions for operating said racks extending longitudinally of the car under the floor thereof, substantially as set forth.

17. The combination with the car body and the movable side wall, of a frame for supporting the said wall said car frame having vertical recesses for receiving the wall supporting frame, substantially as set forth.

18. In a convertible car, the combination with the car body and the movable walls, of the parallel supports one arranged vertically above the other in the car, and the two swinging frames for the movable walls, each adapted to register with one of the supports, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN LOWENBERG.

Witnesses:
J. R. SMALL,
D. E. LEVY.