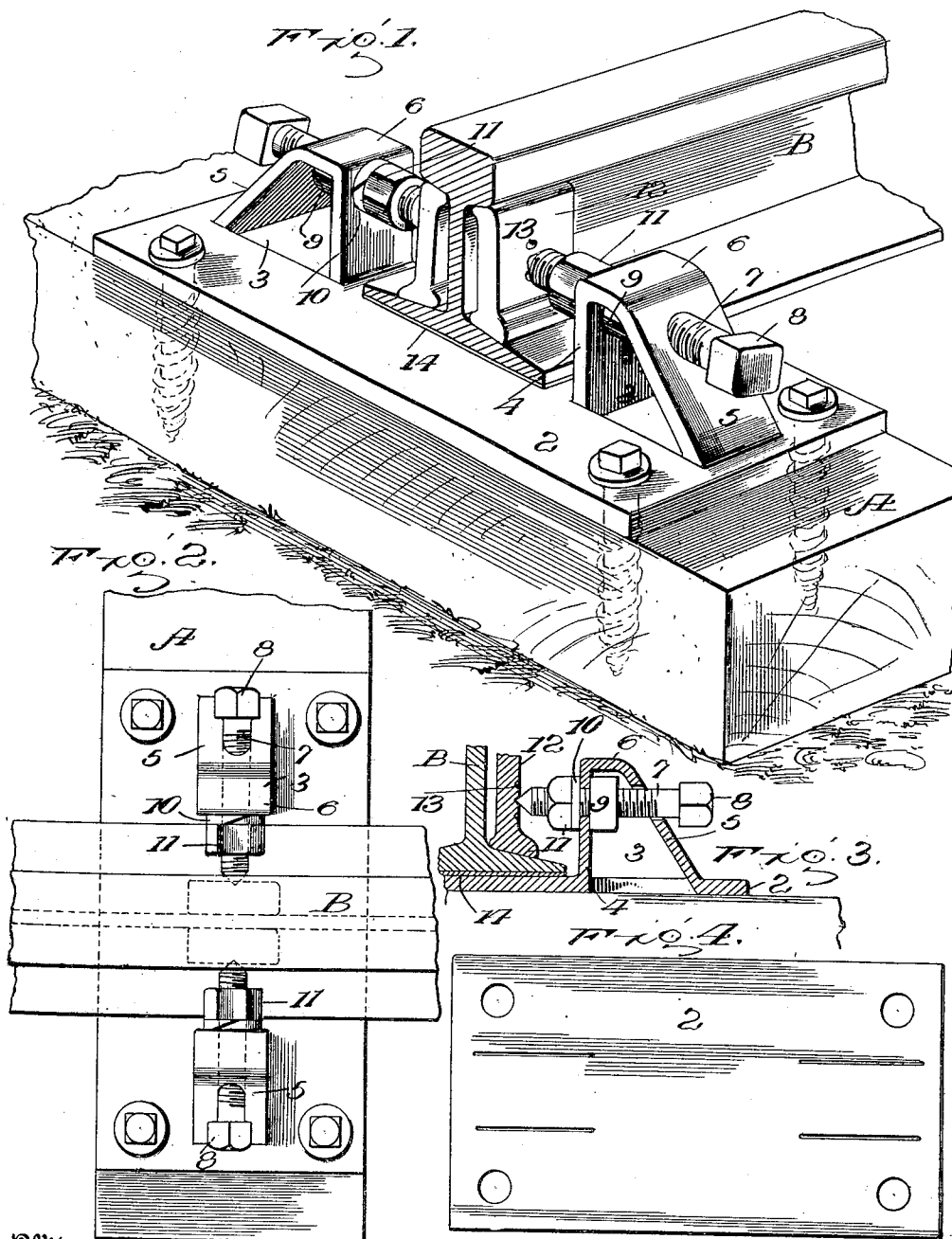


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RAIL CHAIR.
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Witnesses
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RAIL-CHAIR.

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To all whom it may concern:

Be it known that I, AUGUST G. LIEBMANN, citizen of the United States, residing at Butte, in the county of Silverbow and State of Montana, have invented certain new and useful Improvements in Rail-Chairs, of which the following is a specification.

This invention relates to railway track appliance and particularly to rail chairs.

Today about one-half of the maintenance cost on American railroads, chargeable to way and structure, is spent for up keep of track and labor thereon. A very large proportion of this charge is spent in re-driving and renewing spikes to keep the main track in reasonably good condition under even moderate traffic. In hundreds of cases money is spent over and over again upon the same stretch of track without any permanent improvement being attained. Year by year traffic on the roads of the United States becomes heavier and heavier and year by year faster speeds are attempted and heavier rolling stock is used. Under these circumstances, it becomes a vital necessity to provide better means for supporting the rails whereby the track rails shall be so held as to resist vertical thrust, lateral thrust and any tendency to tip.

The primary object of the invention is to provide a rail chair having means for permanently attaching the bed-plate thereof to a cross tie and which will permit of requisite adjustments of a rail without disturbing the bed-plate or its securing means, thereby eliminating mechanical wear on the tie and reducing the cost of maintenance to a minimum.

A further object of the invention is the provision of a rail chair so constructed as to give solid support under various stresses of the rail.

A further object is to so form the chair that it may be cheaply made by rolling and pressing, or that it may be made of malleable iron.

A further object is to so construct the chair that the rail may be readily adjusted either vertically or laterally and held securely in its adjusted position.

A still further object is to provide adjusting means which may be readily operated by a track walker.

The invention is illustrated in the accompanying drawings wherein:

Figure 1 is a perspective view of a tie and rail with the improved chair applied thereto; Fig. 2 is a plan view of the construction shown in Fig. 1; Fig. 3 is a fragmentary sectional view; Fig. 4 is a plan view of the bed plate before the abutments are pressed out therefrom.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

In these drawings, A designates the tie, and B the rail. The rail is shown as of the standard type, though of course it will be obvious that any type of rail may be used.

The improved chair consists of a bed plate 2 preferably having the same width as the tie A and disposed beneath the base of the rail. The middle portion of this plate forms the rail seat. On opposite sides of the rail seat the bed plate is provided with upstanding abutments 3, which, in the present form, are made by striking up or forcing up the material at the middle of the plate. Each abutment is narrower than the width of the bed plate and each abutment has a vertical element 4, and a downwardly and outwardly extending buttressing element 5 connected by an integral horizontal web 6. By reason of the stretching of the material when the abutments are pressed up from the material of the bed plate, the elements 4, 5 and 6 are thinner than the plate 2 but this is compensated for by the additional rigidity given to the structure by its deformation. Passing loosely through each abutment transversely is a screw pin 7. These screw pins form adjusting and securing means for the rail. The screw pins are not screw threaded in the abutments but are held in position by set nuts. Each screw pin is formed with a head 8. On each screw pin is an adjusting nut 9 which is housed between the elements 4 and 5 and on the inner end of each pin is a lock washer 10 and a set nut 11.

Disposed on each side of the rail and between the head and base thereof is a brace plate 12 having beveled upper and lower faces, these faces engaging respectively with the head and base of the rail so as to support the brace plate in spaced relation to

the web of the rail. The outer face of each plate 12 is formed with a vertical series of indentations 13 with which the pointed or conical extremity of the adjacent screw pin engages. As illustrated, a shim 14 is shown between the base of the rail and the bed plate 2.

The chair is held to the tie by regulation screw spikes which may be used with or without helical steel linings. Each screw spike is formed with a many sided head whereby a wrench may be applied to the screw.

The action of this improved chair will be obvious. Under normal circumstances, the rail will rest with its base flat upon the chair and midway between the abutments. If, however, it is desired to raise the rail, a shim 14 of greater or less thickness is driven beneath the rail base as illustrated. This shim is preferably of wood but may be made of other material. The screw pins or clamps are turned until the plates 12 are forced solidly home and when this is done, the screw clamps are locked in position by the nuts 9 and 11. If no shim is used, the points of the screw clamps engage with the uppermost notches. If, however, a shim is used then the points of the screw clamps engage with the lower notches. While only three notches or indentations are shown in the brace plates 12, it will be understood that the plates may be provided with as many indentations or notches as may be desired. When it is necessary to laterally shift the rail in order to bring it to gage, one of the screw pins or clamps is retracted and the other advanced, thus shifting the rail laterally. It will be obvious that the rail may be shifted laterally by means of these screw clamps without the necessity of using other appliances for the purpose than the ordinary wrench. Attention is here called to the fact that by having the screw-pins or rail securing members 7 arranged in longitudinal alinement, the base of the rail may be adjusted to different angular positions with respect to the bed-plate to permit angular shimming of the rail independently of the bed-plate and sub-structure at the run-off of a curve. It will also be noted that the abutments 3 are of sufficient height to brace the rail holding portions of the securing means against lateral, vertical and tipping thrust, regardless of the position of the rail with respect to the bed-plate.

It often occurs that because of a temporary sinking of a portion of a track or a temporary elevation thereof through the action of rain, frost or thaw, it becomes necessary to adjust the rails so as to bring said rails to proper surface. This is accomplished by loosening the clamp screws, placing a shim beneath the base of the rail and the seat formed on the bed plate and then

again setting the clamp screws. When the use of a shim is no longer necessary, the shim may be readily driven out and the rail again clamped in its position directly upon the bed plate.

The value of means for permitting the vertical adjustment of the rail is obvious. When provision is not so made, there is great likelihood of breakage. Thus frost will often act to raise a certain section of a track while an adjacent section remains at its normal level. This will either act to break the rail where the difference in level occurs, shear off its base, or withdraw the spikes. Where the spikes are withdrawn and the rail again settles to its position, the rail is of course loose and the spikes have to be redriven. This is entirely obviated by the use of the present chair as any section hand or track walker may adjust the rails vertically or laterally to suit the condition of the surface.

The improved chair is adapted for use on all classes of railroad track and may be used to support rails having any degree of curvature. It is adapted for use in any section of the United States, no matter what the climatic conditions are. It will firmly brace the rail against either vertical or lateral thrust, affords a solid abutment for such thrust and the rail, as before stated, may be readily adjusted to suit any service conditions. Preferably the bed plate has the same width as the tie and the bed plate may extend longitudinally along the tie to any desired distance so as to secure such an area for the bed plate that it will not cut into the tie and so as to fully distribute the weight.

The importance of the proper support and the fastening of rails is apparent. In the first place, the hard woods in the United States are becoming scarcer and though efforts have been made toward the use of soft woods, such efforts have not been economically successful for the reason that when rails are spiked upon soft wood ties, the crushing action of the rail soon mashes the face of the tie, distorts its fibers and permits water to enter the tie which very soon rots it, even where preservative processes have been used. Furthermore, the spikes whether used with tie plates or directly upon the rails themselves, tend to cause a rapid deterioration of the tie by the crushing of the fibers. These spikes have to be constantly re-driven in different positions in the tie to secure proper adjustment of the rails. The life of the tie is comparatively short, and spikes in the soft wood ties do not hold with sufficient firmness to resist undulations of the rail, when placed in direct contact with the rails. This necessity of frequent respiking is the cause of tie deterioration and very greatly increases the charge for up keep and maintenance. Fur-

thermore spike driving is a more or less hazardous affair and the spikes are driven into the tie at all angles. The present rail chair not only provides for a relatively extended bearing surface resting upon the tie by which the weight of the rail and the weight of the rolling stock is more uniformly distributed over the tie, but it permits the use of permanent fastenings which are preferably screw spikes and thus eliminates the necessity of respiking. This elimination of respiking is due to the fact that the rail may be laterally adjusted and vertically adjusted without removing the primary fastening devices, namely, the screw spikes, and it is only the secondary rail fastening devices that need to be shifted in order to adjust the rail properly. This is obviously not the case where spikes are used either to hold the rail directly to the tie or to hold the rail upon a tie plate.

Particular attention may be called in connection with my improved rail chair to the official report of the Block Signal and Train Control Board of the Interstate Commerce Commission, this report being dated June 29, 1912, wherein certain requirements are laid down for rail supports and wherein the board says: "A fundamental defect in design which is most apparent is the failure to realize and appreciate the overturning movement due to the wheel flange pressure against the head of the rail. It is not sufficient that the tie should support the vertical loads and resist directly horizontal thrusts and the tendency of the track to move laterally and longitudinally, but the overturning movement must be resisted. In order that the tie may properly support the stresses transmitted to it by the rail, a suitable fastening of the rails to the tie is most essential." Further the report states that "under conditions existing in a large proportion of the railroads in this country the means of adjustment of rail to tie must be such as to admit of blocking up or shimming." The board further says that adequate means should be provided for shimming or for widening gage and this means should not involve lost motion and change of adjustment. It is pointed out that the improved rail chair, as heretofore described, conforms to all of the requirements referred to in this report and at the same time that the fastenings are not of a complicated nature and that the chairs may be made relatively cheap.

What I claim is:

1. A rail chair including a bed-plate having a seat and provided with fixed abutments, means for securing the bed-plate to the upper surface of a sub-structure, and adjustable rail securing means cooperating with the abutments for holding a rail directly on the seat or on a shim in different

positions of lateral and vertical adjustment without disturbing the bed-plate or its securing means, said abutments being of sufficient height to brace the rail holding portions of the securing means in the different positions of vertical adjustment of the rail.

2. A rail chair including a bed-plate having a seat and provided with stationary abutments, means for securing the bed-plate to a sub-structure, and adjustable rail securing means independent of the plate securing means cooperating with the abutments whereby a rail may be held directly on the seat or on a shim in different positions of lateral and vertical adjustment with respect to the bed-plate without disturbing said bed-plate, said abutments being of sufficient height to brace the rail holding portions of the securing means in the different positions of vertical adjustment of the rail.

3. A rail chair including a bed-plate having a seat, means for securing the bed-plate to a sub-structure, and adjustable rail securing means independent of the plate securing means adapted to cooperate with a rail whereby the rail may be held directly on the seat or on a shim in different positions of vertical and lateral adjustment with respect to the bed-plate without disturbing said bed-plate, the rail holding portions of the rail securing means being braced against lateral, vertical and tipping thrust irrespective of the position of the rail with relation to its seat.

4. A rail chair including a bed-plate having a seat and provided with a fixed abutment, means for securing the bed-plate to the surface of a sub-structure, and adjustable rail securing means cooperating with the abutment for holding a rail directly on the seat or on a shim in different positions of lateral and vertical adjustment without disturbing the bed-plate or its securing means, said abutment being of sufficient height to brace the rail holding portion of the securing means in the different positions of vertical adjustment of the rail.

5. A rail chair including a bed-plate having a seat and provided with fixed abutments, means for securing the bed-plate to a sub-structure, and adjustable rail securing means carried by the fixed abutments for cooperation with a rail whereby the rail may be held directly on the seat or on a shim in different positions of lateral and vertical adjustment with respect to the bed-plate without disturbing said bed-plate or its securing means.

6. A rail chair including a one-piece bed-plate having a seat adapted to support a rail directly thereon or on a shim and provided with stationary abutments, means for securing the bed-plate to a sub-structure, and adjustable rail securing means independent of the plate securing means for ad-

justing said rail both laterally and vertically with respect to the bed-plate, said abutments being of sufficient height to brace the rail holding portions of the securing means in the different positions of vertical adjustment of the rail.

7. The combination with a bed-plate having a seat and provided with stationary abutments, of a rail adapted to rest directly on the seat or a shim, and adjustable rail securing means co-acting with the abutments for adjusting the rail laterally on said seat or shim and serving to hold the rail in different positions of vertical adjustment, said abutments being of sufficient height to brace the rail holding portions of the securing means in the different positions of vertical adjustment of the rail.

8. The combination with a bed-plate having a seat and provided with abutments, of a rail resting directly on the seat or on a shim, and adjustable vertically and laterally between the abutments, and interchangeable rail securing devices carried by the abutments for adjusting the rail laterally with respect to the bed-plate, said rail securing devices serving to hold the rail in different positions of vertical adjustment.

9. A rail chair including a bed-plate having a seat and provided with fixed abutments, and interchangeable rail securing devices adjustably mounted on the abutments for coöperation with a rail for holding the rail directly on the seat or on a shim in different positions of both vertical and lateral adjustment.

10. A rail chair including a bed-plate having a seat adapted to support a rail and provided with abutments, means for permanently securing the bed-plate to a sub-structure, and interchangeable rail securing devices independent of the plate securing means and coöperating with the abutments for holding the rail in different positions of both vertical and lateral adjustment with respect to the bed-plate, said abutments being of sufficient height to brace the rail holding portions of the rail securing means in the different positions of vertical adjustment of the rail.

11. The combination with a bed-plate, of a rail resting directly on the bed-plate or on a shim and adjustable vertically and laterally of the bed-plate and capable of being tilted at different angular positions with respect thereto, and means for holding the rail in different positions of adjustment without disturbing said bed-plate.

12. The combination with a tie, of a chair provided with abutments, means for permanently holding the chair to the tie, and adjustable means carried by the abutments for holding the rail on the chair, said adjustable rail holding means permitting the

rail to be laterally and vertically adjusted independently of the permanent chair holding means, the abutments being of sufficient height to brace the rail holding portions of the securing means in the different positions of lateral and vertical adjustment of the rail.

13. The combination with a bed-plate and abutments, of a rail seated between the abutments and capable of being shifted laterally and secured at different elevations between the abutments upon the insertion or removal of a shim, and adjustable rail securing means coöperating with the abutments for securing the rail in laterally and vertically shifted positions, said abutments being of sufficient height to brace the rail holding portions of the securing means in the adjusted positions of the rail.

14. The combination with a bed-plate having stationary abutments, of a rail seated between the abutments and adapted to be supported in laterally and vertically shifted positions with respect to the bed-plate, and adjustable rail securing means coöperating with the abutments in the laterally and vertically shifted positions of the rail, said abutments being of sufficient height to brace the rail holding portions of the rail securing means in the different positions of adjustment of the rail.

15. The combination with a bed plate having fixed abutments, of a rail adapted to be supported on the bed-plate or on a shim in lateral and vertical transition thereto, and adjustable rail securing means coöperating with the abutments and rail whereby the rail may be held in different positions with respect to the bed-plate on curves and tangents, said abutments serving to brace the rail holding portions of the securing means when the rail is adjusted vertically.

16. A rail chair including a bed-plate provided with fixed abutments and having a seat of greater length than the width of the base of a rail to permit the rail to be adjusted both vertically and laterally with respect to said seat, and adjustable rail securing means carried by the abutments and disposed wholly above the bed-plate for supporting the rail in different positions of vertical and lateral adjustment.

17. A rail chair including a bed-plate having a seat and provided with abutments, means for securing the bed-plate to a sub-structure, adjustable rail securing means coöperating with the abutments whereby a rail may be held in different positions of lateral and vertical adjustment with respect to the bed-plate, the rail securing means being independent of the plate securing means and disposed entirely within the lines of the chair, the abutments being of sufficient

height to brace the rail holding portions of the securing means in the different positions of vertical adjustment of the rail.

18. A rail chair including a bed-plate provided with fixed abutments and having a seat of greater length than the width of the base of a rail to permit the rail to be adjusted both vertically and laterally with respect to said seat, and adjustable rail securing means carried by the abutments for holding the rail in different positions of vertical and lateral adjustment, said rail securing means being positioned wholly above the bed-plate and disposed entirely within the lines of the chair.

19. A rail chair including a bed-plate provided with abutments and having a seat of greater length than the width of the base of a rail to permit the rail to be adjusted both laterally and vertically with respect to the bed-plate, and tilted at different angular positions with respect to said seat, and adjustable rail securing means carried by the abutments for holding the rail in all of its different positions of adjustment.

20. A rail chair having oppositely disposed abutments with an intervening rail seat, rail securing means engaging said abutments, brace plates engaging opposite sides of the rail, and means whereby the rail securing means may engage the brace plates at different levels.

21. A rail chair having oppositely disposed abutments with an intervening rail seat, each of said abutments being pressed out from the metal of the chair and comprising a vertical web, a horizontal web and a downwardly and outwardly extending buttressing web, and rail clamping screws passing horizontally through said abutments.

22. A rail chair having oppositely disposed abutments with an intervening rail seat, each of said abutments being pressed

out from the metal of the chair and comprising a vertical web, a horizontal web and a downwardly and outwardly extending buttressing web, rail clamping screws passing loosely through said abutments, an adjusting nut on each screw disposed between the vertical and buttressing webs of each abutment, and locking nuts on the screws.

23. A rail chair comprising a bed plate, oppositely disposed abutments spaced from each other to provide an intervening rail seat, each abutment comprising a strip integral with the bed plate and forced outward therefrom to form integral, vertical, horizontal, and downwardly and outwardly extending webs, and rail clamping devices engaging said abutments and disposed in a horizontal plane.

24. A rail chair including a stationary bed-plate provided with abutments and having a seat of greater length than the width of a rail base to permit the rail to be adjusted on the seat or a shim laterally and vertically between the abutments, and rail securing means cooperating with the rail and abutments whereby the rail may be held in laterally adjusted positions, vertically adjusted horizontal positions, and acute angular positions with respect to the bed plate.

25. The combination with a bed-plate having a seat and provided with abutments, of a rail adjustable laterally and vertically of the seat and capable of being tilted to different angular positions with respect to the seat, and oppositely disposed rail securing devices carried by the abutments and cooperating with the rail for holding the rail in different positions of adjustment.

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

AUGUST G. LIEBMANN. [L.S.]

Witnesses:

FREDERIC B. WRIGHT,
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