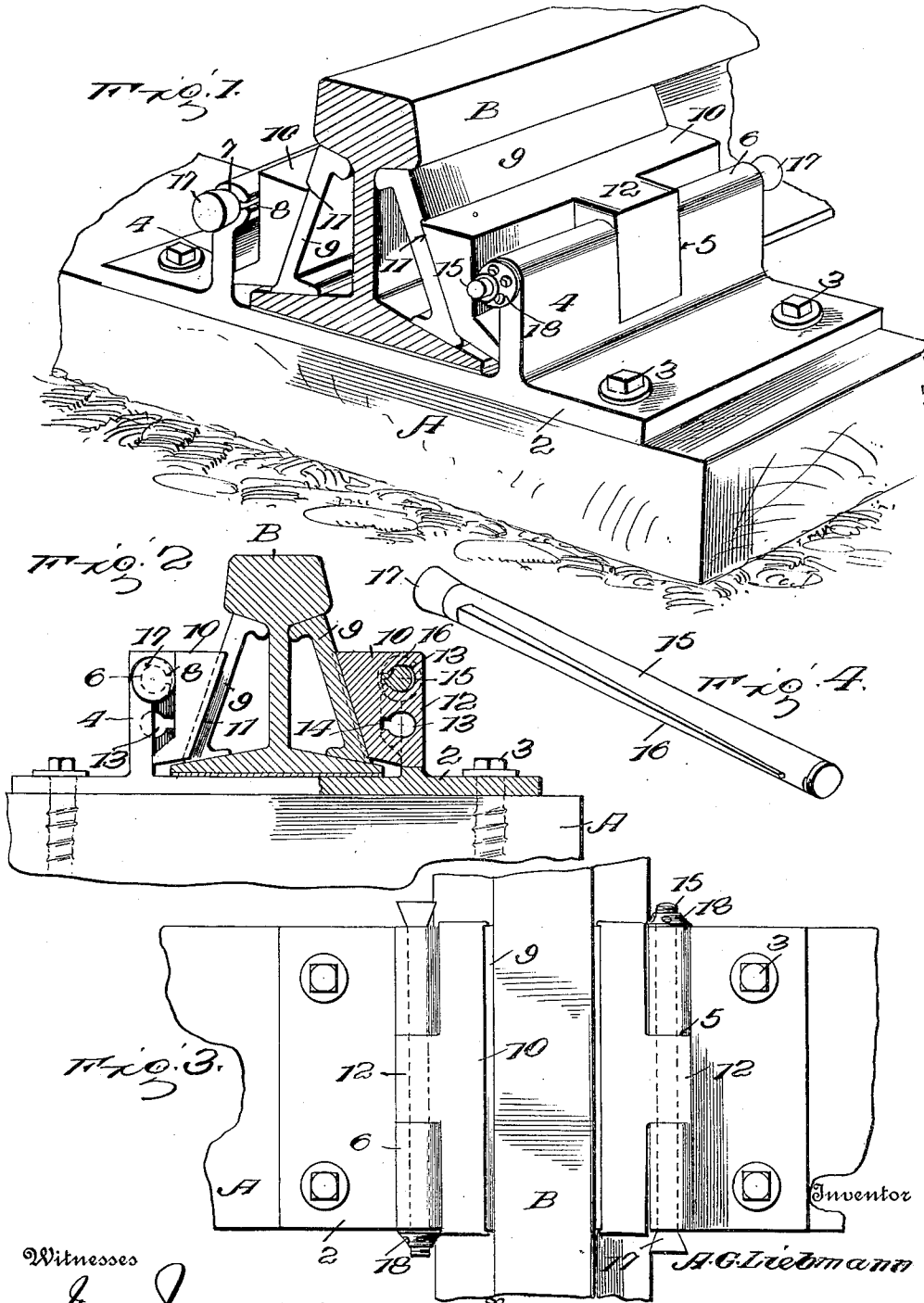


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RAIL CHAIR.
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Patented Jan. 26, 1915.



Witnesses

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RAIL-CHAIR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, AUGUST G. LIEBMANN, a 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 for supporting permanent track.

As traffic has increased in the United States, and as the speed of trains has increased, with an increase in the weight of the rolling stock, it has become more and more necessary to provide means for securely and firmly supporting the rails of the track upon the ties. Throughout the United States it is common to use spikes for this purpose with or without using tie-plates upon which the rails are disposed. The objections to the use of spikes directly engaging the rails are many. The spikes have constantly to be redriven and replaced; the undulatory movement of the track due to the passage of trains tends to shift the spikes, thereby causing wear of the ties; the lateral thrusts upon the rails tends to shift the spikes and to partially withdraw and loosen them; and further, when it is necessary to shift the rails, even a small fraction of an inch, it is necessary to withdraw the spikes, shift the rails and again respike the rails. It is, of course, obvious that these spikes can never be driven in the same holes after the rails are shifted, and hence in a relatively short time the tie is ruined by spike holes. Further, it is a relatively difficult matter to laterally shift the rails under these circumstances, and it requires the assistance of several laborers even where the shifting of the rails is relatively small. Where the rails are spiked either directly through the ties or upon tie plates, no provision is made for permitting the surface of the rail to be raised by frost. This often causes either the pulling out of the spikes or the shearing of the base flanges of the rails. The use of tie-plates does not obviate the difficulties above referred to; it only provides for a better distribution of the downward pressure of the rails, so that the rails will not in a short time crush and mangle the surface of the ties.

The primary object of the present inven-

tion is to overcome the objections referred to above by the provision of a chair for supporting the rail, which chair is adapted to be permanently attached to the tie by means preferably of screw-spikes, and which includes rail engaging devices. These rail-engaging devices, while holding the rails securely to the chair, will permit the rails to be laterally shifted and vertically adjusted.

A further object of the invention is to provide a chair construction so formed that the rail will be braced against lateral thrust and stress, so that the tendency to tip will be resisted and the rail firmly engaged both at its head and base.

A still further object is to provide rail engaging members or braces adapted to securely clamp the rail between them, and further adapted to be moved vertically or laterally with the rail and to provide means engaging the bed-plate of the chair whereby these clamping means or rail braces may be shifted laterally or held in any vertically or laterally adjusted position.

Other objects will appear in the course of the following description.

The invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of a tie and portion of a rail with the improved chair applied thereto; Fig. 2 is a front elevation partly in section; Fig. 3 is a plan view of the chair and part of the rail; Fig. 4 is a perspective detail view of one of the drift bolts.

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.

Referring to these figures, A designates a tie and B a rail of any standard cross section. The tie B is shown as made of wood, but I, of course, do not wish to be limited to the use of wood in the construction of the ties as they may be made of any suitable material. Resting upon the tie B and immediately supporting the rail is a bed-plate 2. This bed-plate preferably has a width equal to that of the tie and a length considerably greater than the width of the rail base. The bed-plate is held to the tie at its four corners by means of standard screw-spikes designated 3.

The bed-plate is formed with upstanding abutments designated 4 and spaced from each other a distance, greater than the width of the rail base. The bed-plate and its upstanding abutments may be readily formed from an I-beam or like standard structural shape. This affords economical construction and permits the bed-plate to be manufactured by rolling and pressing. Each of the abutments is vertically slotted as at 5, these slots being relatively wide and extending nearly to the base of the abutments. Each abutment at its upper end is formed with a head or bulb 6 through which extends a passage 7. This passage 7 is cylindrical in shape for the greater portion of its diameter but on its inside is formed with a lateral extension 8 which opens upon the inside face of the abutment.

Disposed against the sides of the rail B are the rail engaging members designated 9. These are in the form of plates having the same length as the width of the bed-plate, and each plate at its upper end is formed with an inwardly extending rounded flange adapted to engage beneath the head of the rail at the intersection of the head with the web thereof. The lower end of each of these rail engaging members is formed with a base adapted to rest upon the base of the rail adjacent the margin thereof. The outer face of each of these bracing or rail engaging members 9 is downwardly and outwardly inclined.

Engaging the abutments 4 and the rail engaging or bracing members 9, and vertically movable in the space between the abutments and the members are the wedges 10. These wedges preferably have a length somewhat greater than the length of the bracing and clamping members 9, and at each end each wedge is formed with inwardly extending lips or flanges 11 adapted to engage over the adjacent end of the member 9 so as to interlock with the member 9 and prevent the member from being longitudinally shifted with relation to its corresponding wedge. Each of the wedges is formed upon its outer face with an outwardly projecting enlarged portion or relatively wide rib 12 adapted to be received between the walls of the recess 5 of the corresponding abutment.

The inner face of the wedge is downwardly and outwardly inclined so as to extend parallel with the base of the corresponding bracing or rail engaging member 9, and each rib 12 of the wedges is provided with a plurality of transversely extending passages 13. Each of these passages, as illustrated, is cylindrical for the greater portion of its diameter, but on its inside face is laterally extended as at 14. Each one of these passages is adapted to register with the passage 7, in the upper end of the corresponding abutment, and

passing through each of the abutments and through the proper passage or perforation in the rib is a longitudinally extending drift-bolt designated 15 and illustrated in detail in Fig. 4.

Each drift-bolt is nearly circular in cross section, but is provided at one side with a fin or rib 16, whose outer face is inclined relative to the longitudinal axis of the bolt, so as to act as a wedge. This fin not only has a face which is inclined toward the longitudinal axis, as before stated, but the fin itself is tapered in thickness so that the fin acts as a wedge in two directions. By driving the drift-bolt inward, it will act to force the wedge 10 inward against the rail engaging members 9, and it will also act to force the wedge downward. By placing the drift-bolt in one or the other of the perforations in the wedge, the wedge may be raised or lowered to accommodate the raising or lowering of the rail. It is obvious that by retracting one of these wedging drift-bolts and forcing the other wedging drift-bolt farther in, that the rail will be shifted laterally in the chair and will be held in this shifted position. For the purpose of holding the drift-bolt when driven in to the required degree, I form one end of the drift-bolt with a head 17 and the other end of the drift-bolt with a screw-threaded portion or shank adapted to be engaged by a nut 18.

Under ordinary circumstances, the rail rests flat upon the rail chair, but under some circumstances it is necessary to raise the rail, and this is done by the insertion of a shim between the rail and seat formed upon the upper face of the bed-plate. After this is done the wedges 10 are driven downward until the rail is securely clamped and until one or the other of the perforations in the wedge register with the drift-bolt perforations or passages in the abutment. The drift-bolts are then placed in position and locked against displacement by means of the nuts 18.

When the parts of the chair are completely assembled, it is plain that the rail will be held very firmly to the chair, that the rail cannot rise, and that it cannot move laterally, but that it may be readily adjusted either laterally or vertically with only a minimum of labor. These adjustments may be made without the necessity of disturbing the primary fastenings of the rail chair to the rail, and thus the tie is not damaged by adjustment of the rail upon the chair. Furthermore, the bracing or rail engaging members 9 are of such character that if the rail be subjected to lifting strain, as for instance through the action of frost, in such manner as would ordinarily tend to withdraw the spikes of a spike rail or else shear the base flanges, the bracing or

clamping members 9 will yield or the drift-bolts will be slightly twisted or deflected. This provides for a certain amount of yield in the chair which is necessary in any practical construction. It will be further observed that this form of chair translates any lateral strain against the head of the rail into a vertical strain, and thus the rail is solidly braced on each side. A rail chair of the character described above is particularly adapted for use with rock ballasted roads where the road bed is well drained and on prairie and valley lines of average construction. It is also adapted to high speed passenger traffic.

It is obvious that where a chair is permanently fixed to a tie, it will be economical to apply a preservative, whereas where spikes are constantly being replaced in ties, it is not worth while to preserve the tie for the reason that the spikes crush and break the wood, and the preservative does not fulfil its full function.

Particular attention may be called in connection with the present 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 ties 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 present 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 comprising a bed-plate having upstanding abutments, the abutments being spaced from each other a distance greater than the width of a rail base, rail clamping wedges disposed between the

abutments and interlocking with the abutments, and means for supporting said wedges at different levels.

2. A rail chair comprising a bed-plate having upstanding abutments extending across the bed-plate and parallel to the rail to be supported, the abutments being spaced from each other a distance greater than the width of the rail base, each of said abutments being vertically slotted, and rail clamping wedges disposed between said abutments and each having a tongue or rib engaging in said slot, the walls of each abutment and the rib of each wedge being formed with alining perforations, and locking devices passing through said perforations and holding the wedges in their adjusted position.

3. A rail chair comprising a bed-plate having upstanding abutments extending across the plate and parallel to the rail to be supported, the abutments being spaced from each other a distance greater than the width of the rail base, each of said abutments being vertically slotted at its middle, and rail clamping wedges disposed between said abutments and each having a tongue or rib engaging in said slot, the walls of each abutment and the rib of each wedge being formed with alining perforations, and drift-bolts passing through said perforations and holding the wedges in their adjusted position.

4. A rail chair comprising a bed-plate having upstanding abutments extending across the bed-plate and parallel to the rail to be supported, the abutments being spaced from each other a distance greater than the width of the rail base, each of said abutments being vertically slotted at its middle, rail clamping wedges disposed between said abutments and each having a tongue or rib engaging in said slot, the walls of each abutment and the rib of each wedge being formed with alining perforations, and drift-bolts passing through said perforations and holding the wedges in their adjusted position, each drift-bolt being formed on its inner face with a tapered fin adapted to engage the wedge and force it laterally inward.

5. A rail chair comprising a bed-plate having upstanding abutments spaced from each other a distance greater than the width of a rail base, each abutment extending parallel to the rail to be supported, and each abutment being formed at its upper end with an enlarged portion and with a passage extending through the enlarged portion and having a lateral extension opening at the inner face of the abutment, each abutment being vertically slotted at its middle, and wedge members having downwardly and outwardly inclined inner faces disposed between the abutments, each of said wedge

members having on its outer face a rib or tongue engaging in the slot of the corresponding abutment, and each of said tongues or ribs being formed with a vertical series of transversely extending perforations, each perforation being formed with a lateral extension, and fastening members extending through the perforations or passages of each abutment and the corresponding wedge, said fastening members each having a tapered fin on one side adapted to be received in said extension of the perforations and to engage the wedge.

6. A rail chair comprising a bed-plate having upstanding parallel abutments spaced from each other a distance greater than the width of a rail base and extending transversely across the bed-plate, each of said abutments having a transverse perforation or passage at its upper end, rail braces having downwardly and outwardly inclined outer faces and wedging members having interlocking engagement with the abutments, each wedging member having a downwardly and outwardly inclined inner face contacting with the corresponding brace and each wedging member being formed with a plurality of longitudinally disposed passages or perforations, and locking members extending longitudinally through the perforations or passages of the abutments and each through one of the perforations of the corresponding wedge member.

7. The combination with a tie and a rail, of a rail-chair comprising a bed-plate having upstanding abutments spaced from each other a distance greater than the width of a rail base, rail braces engaging the head and base of said rail on each side thereof and each having a downwardly and outwardly extending outer face, vertically movable wedging members engaging said rail braces and having interlocking engagement with the abutments to thereby prevent longitudinal movement of the wedging members relative to the abutments, and means for holding the wedging members in vertically adjusted position.

8. In a rail-chair, a bed-plate, a downwardly and outwardly inclined rail-engaging member, an adjusting member disposed against the rail-engaging member and having a downwardly and outwardly inclined inner face, and being vertically and laterally movable, and means for vertically and laterally shifting said adjusting member.

9. In a rail chair, a bed-plate, downwardly and outwardly inclined rail braces, adjusting members disposed against the rail braces and having downwardly and outwardly inclined inner faces and being vertically and laterally movable, oppositely disposed abutments, and means engaging said abutments for supporting the adjusting members in vertically adjusted position, said means act-

ing to wedge the adjusting members laterally inwardly against the rail braces.

10. In a rail chair, a bed-plate, a rail adjustable vertically and laterally with respect to the bed-plate, an abutment, a rail-brace, and an adjusting member engaging the rail-brace, said adjusting member having interlocking engagement with the rail brace to prevent relative longitudinal movement thereof, and interlocking engagement with the abutment to prevent relative longitudinal movement of said adjusting member. said interlocking means permitting the vertical adjustment of the adjusting member relative to the abutment and the rail brace.

11. A rail chair comprising a bed-plate having spaced abutments, rail braces disposed between said abutments and adapted to engage one on each side of a rail, a wedge disposed between each abutment and the corresponding rail brace, and a drift bolt engaging with each abutment and the corresponding wedge.

12. A rail chair comprising a bed-plate having spaced abutments, rail bracing members disposed between the abutments and adapted to engage one on each side of a rail, a vertically movable wedge interposed between each abutment and the corresponding bracing member, and means passing through the abutments and locking the wedges in adjusted positions.

13. A rail chair comprising a bed-plate having spaced abutments, each having a vertical inner edge, rail braces disposed between said abutments and adapted to engage with a rail and each having a downwardly and outwardly inclined outer face, a vertically movable wedge disposed between the inside edge of each abutment and the corresponding rail brace, said wedges having vertical outer faces and downwardly and outwardly inclined inner faces, and means for holding said wedges in vertically adjusted position.

14. The combination with a tie and a rail thereon, of a bed plate resting on the tie and upon which the rail is supported, upwardly extending pairs of abutments disposed at each end of the bed plate, said pairs of abutments being spaced from each other a distance greater than the width of the rail base, rail braces engaging one on each side of the rail and bearing against the base flange thereof, vertically movable wedging members disposed between the abutments and the rail braces for holding the rail in different positions of lateral and vertical adjustment with respect to the bedplate, and means for locking said wedging members in different positions of adjustment.

15. The combination with a tie and a rail thereon, of a bed plate mounted upon the tie and upon which the rail is supported, said bed plate having a pair of upstanding abutments at each end, the abutments being

spaced from each other, rail braces bearing
on each side of the rail and against the base
thereof and having outwardly and down-
wardly inclined outer faces, wedging mem-
5 bers disposed between the abutments and the
corresponding rail brace, each of said wedg-
ing members having a downwardly and out-
wardly inclined inner face, each wedging
10 member having a laterally projecting exten-
sion, and means engaging said extensions

with the corresponding abutments but per-
mitting vertical movement of said wedging
members and extensions.

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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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."