

Oct. 27, 1953

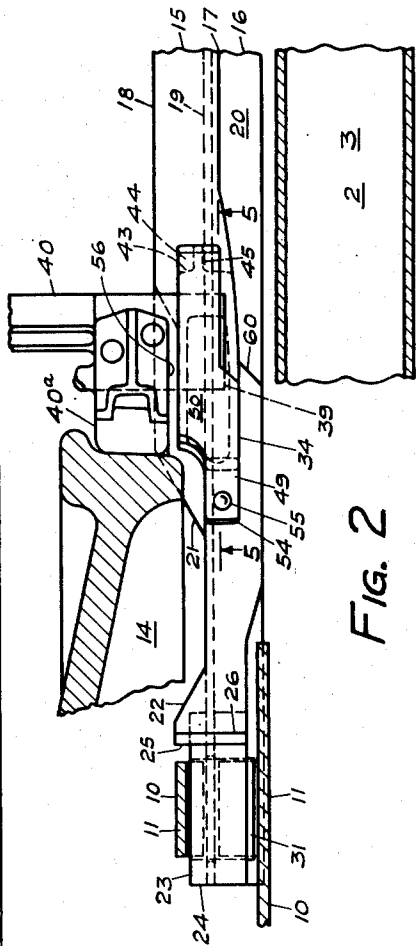
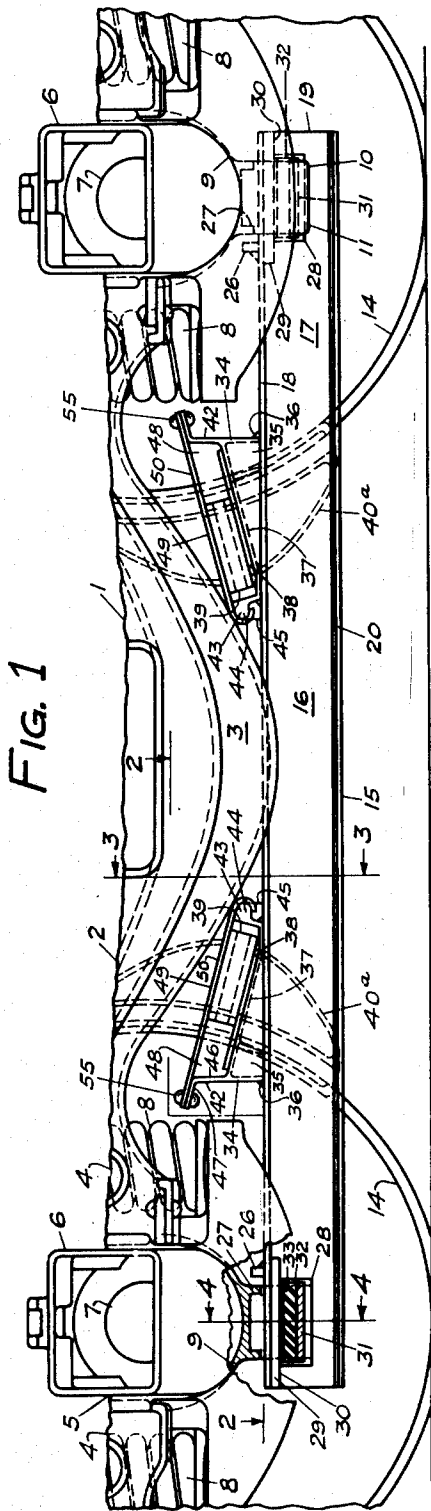
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2,656,901

BRAKE BEAM SUPPORT

Filed Sept. 13, 1946

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

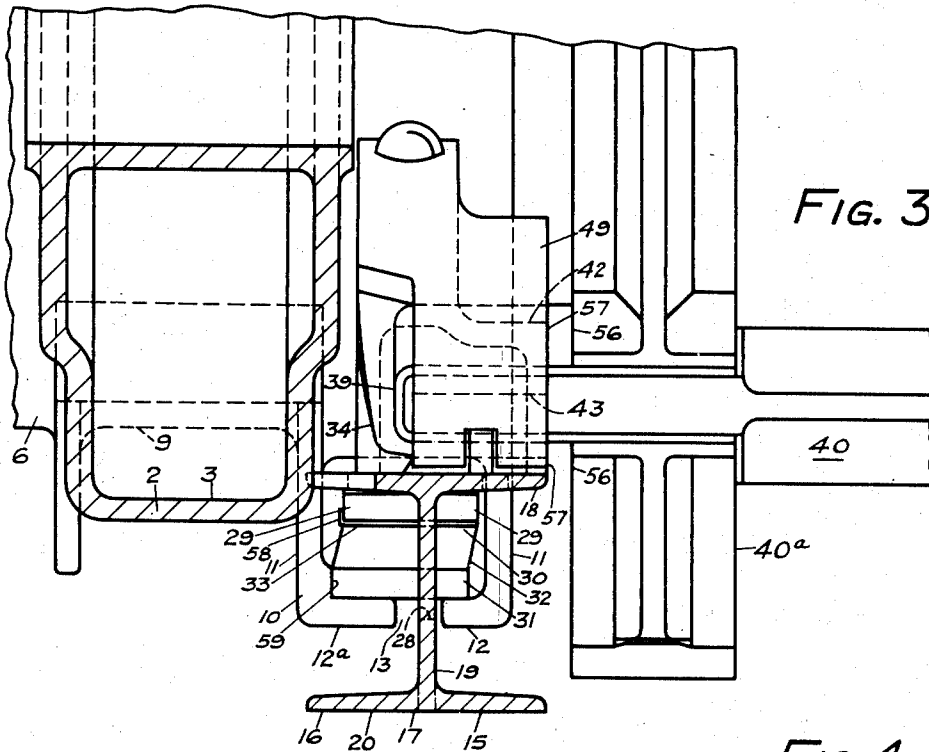


FIG. 3

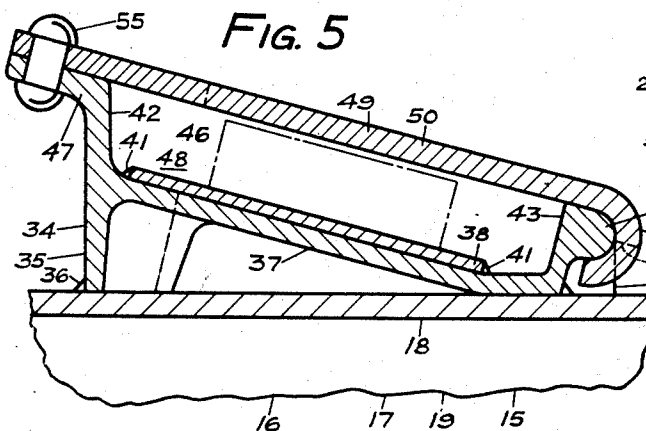


FIG. 5

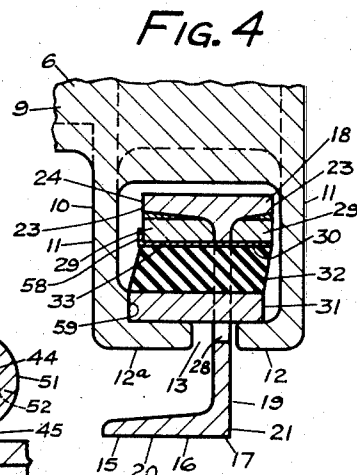


FIG. 4

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BRAKE BEAM SUPPORT

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2 Claims. (Cl. 188—207)

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This invention pertains to a brake beam support for a railway truck and more particularly to a type thereof which is supported by journal boxes independently of a side frame.

An object of the invention is the provision, in a railway truck, of an improved brake beam support capable of maintaining a brake beam in alignment with an axis of an axle during substantially all and every service movement of component parts of the railway truck.

Another object of the invention is the provision of an improved brake beam support carried exclusively and solely by journal boxes of a railway truck, and the brake beam support being arranged to guide a brake beam along a fixed, definite or predetermined path.

A further object of the invention is the provision of a brake beam support carried through the medium of resilient or yieldable mountings, the latter of which are movably associated with journal boxes on the same side of a railway truck.

The above and numerous other objects will become apparent from the succeeding description considered together with the accompanying drawings, the latter of which illustrate a form of the invention and wherein:

Figure 1 is a partial side elevational view of a railway truck embodying the present invention.

Figure 2 is a horizontal sectional view taken along the lines 2—2 of Figure 1, looking in the direction of the arrows.

Figure 3 is an enlarged vertical sectional view taken along the lines 3—3 of Figure 1, looking in the direction of the arrows.

Figure 4 is an enlarged vertical sectional view taken along the lines 4—4 of Figure 1, looking in the direction of the arrows.

Figure 5 is an enlarged vertical sectional view taken along the lines 5—5 of Figure 2, looking in the direction of the arrows.

Referring now in detail to the drawings, wherein like reference characters indicate like parts, the numeral 1 is employed to designate, in a somewhat general manner, a railway truck only the lower portion of which is illustrated. The railway truck comprises a side frame 2 forming a longitudinal load carrying member positioned adjacent each transverse limit of the truck. Included in each side frame is a lower or tension member 3 joining a top or compression member (not shown) adjacent the longitudinal extremities of the truck to present downwardly extending and opening jaws 4 defining an opening 5 therebetween. Positioned within each opening is a journal box 6 housing an axle extremity 7

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therein and supporting the related side frame extremity through the medium of springs 8 which may be of any design or character and are positioned within the jaws. The side frame is, by reason of the springs, movable in a vertical direction relative to the journal boxes and being thus capable of movement within predetermined or fixed limits. For a more complete disclosure and description of a truck which may be employed with the present invention reference is made to United States Patent Number 2,132,382, granted October 11, 1938, to Donald S. Barrows.

Depending from a floor or bottom wall 9 of each journal box is a cradle bracket, yoke, stirrup or sling 10 preferably formed integral with the floor and comprising transversely spaced, vertically extending inner and outer bails or legs 11 positioned adjacent the rear extremity of the journal box for the purpose to be made hereinafter apparent. Extending toward one another from the lower limits of the legs of each journal box are inner and outer flanges, base plates or shelves 12 and 12a, respectively, spaced a fixed or predetermined distance below the bottom wall. The base plates are desirably spaced from one another horizontally and transversely of the truck to present an opening 13 therebetween for the purpose to be hereinafter made apparent.

It is well known and recognized in the art to which this invention appertains that since wheels 14 are fixed with respect to the axles and are arranged in vertically fixed relation with the journal boxes, any mechanism to be associated with the wheels for the purpose of braking or retarding the progress of the truck should, so far as possible, maintain a vertically constant relationship with the wheels. When the journal boxes are formed integrally with the side frame or removably secured thereto but adapted to move therewith no great difficulty is encountered because, in these events, the braking mechanism may be suspended from or otherwise associated with the side frame proper. However when, as in types of such cases wherein vertically movable side frames are provided in railway trucks to be resiliently supported by the journal boxes, a suspension of the braking mechanism from the side frames will result in the wheel contacting portions of the braking mechanism being carried or urged vertically and, when the brakes are applied to the wheels, thereby subjecting the entire structure to severe strains.

Toward the elimination of this last named and undesirable condition a brake beam support 15 is arranged in subjacent relation to the side frame

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and supported exclusively through the medium of the journal boxes. By reason of this arrangement it is possible to maintain a constant relation between the braking mechanism and the wheels irrespective of any vertical variations or service movements between the side frames and journal boxes.

Each brake beam support at each side of a truck desirably comprises a horizontal or simple bridge, tie or link 16 made up, preferably by a length of commercial section such as an H or I beam 17 forming a strip or platform or brake beam supporting sill member 18 which extends longitudinally of the truck and desirably is positioned inwardly of the truck from a related or associated side frame (see Figure 2). Lengths of commercial sections may be found to be the most economical to employ because, in such cases, very little additional work will be required to convert them into members suitable as components of the present invention and of course it will be clearly understood that the bridges or links of H or I configuration in cross section are used in the present embodiment merely for the purpose of illustration. However, as previously stated, the illustrated section is preferred because it lends rigidity and stability to the links both in horizontal and vertical directions. Accordingly, each bridge is provided with a horizontal top plate 18 having depending therefrom a centrally disposed web 19 which merges with a horizontal bottom plate 20 and this member is, as previously stated, continuous to span the distance between the journal boxes on each side of a truck with certain portions of the top and bottom plates removed so as to avoid interferences between the bridge and other related components of the truck.

The bridge or sill member of the present structure is preferably adapted, arranged and constructed so as to be flexibly connected to or shiftable relative to related journal boxes on the same side of the truck and by reason thereof the bridge is supported in such a manner that any variation, however slight, of the horizontal distance between companion journal boxes will not affect or place any undue strain in the bridge. There is a distinct advantage gained in forming the bridge by means of the fabricated sill member since extremely close tolerances will not have to be maintained as would be the case were the bridge formed of an integral casting and this casting positively or firmly anchored to the journal boxes. By comparison a finer degree of craftsmanship is required in the structure illustrated, described and claimed in United States Letters Patent No. 2,305,949, granted to Donald S. Barrows on December 22, 1942, than in the present structure.

Accordingly, the ends of the sill member bottom wall are cut away as at 21 and the ends of the sill member top wall are cut away as at 22 to thereby prevent interference between the bridge and related wheel (see Figure 2). Further, each end of the sill member is notched as at 23 to present reduced necks 24 and a step, shoulder or abutment 25. Each shoulder is spaced longitudinally and inwardly of the truck from a related journal box inner leg and this established distance between a shoulder and inner leg will permit the bridge to execute a certain degree of longitudinal shifting. Also, as will be apparent, each shoulder is in position to strike an inner leg and thereby limit a bridge shifting action and by reason of this arrangement the bridge is prevented from becoming accidentally displaced or separated from the journal boxes to which it is

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connected. To assist the shoulders and inner legs in limiting a horizontal shifting action the top plate is provided with a bulkhead or barrier 26 welded or otherwise secured to the bridge in transverse alignment with a related abutment. Each barrier is spaced a predetermined distance from a fin or lug 27 depending from the bottom wall of the journal box with an inner surface of each lug being disposed in transverse alignment with an inner edge of a related inner leg so that each abutment will strike a related leg at the same time as a barrier strikes a lug. For supporting the bridge from the journal box yokes or brackets the sill member web 19 adjacent each end thereof, is provided with a rectangular opening 28 and filler blocks 29 are welded to the bridge top plate therebeneath to present a plane horizontal downwardly facing surface 30. Extending through each rectangular opening transversely of the truck is a skid or shoe forming member 31 spaced a predetermined distance below a related surface 30 and being supported directly by having substantially flat surface contact with the companion intumed or reentrant flanges 12 and 12a. By disposing the skids in their illustrated and described location as to intersect the bridge a simple, definite and positive interlock is formed between these components. Some regard has been given to providing means for preventing the bridge from rattling in its supporting yokes and toward the accomplishment of this feature a resilient element or compressible means 32 is interposed between the filler blocks and adjacent skid within each rectangular opening. The compressible means is characterized in the drawings by a block of rubber, rubber composition or any such or like material but need not be so limited as long as it forms a yieldable, shock absorbing, sound deadening medium. The resilient element is preferably bonded to the skid to maintain the element and skid in assembled relation as well as for another purpose hereinafter mentioned. Bonded to the upper limits of each resilient element is a clip or upper bearing pad or plate 33 arranged to form a direct supporting area for the overlying downwardly facing surface 30. Accordingly disposed within each rectangular opening and arranged to slide or skid in each yoke 10 and move or shift with the beam longitudinally of the truck is a shoe or unit comprising a skid and an upper bearing plate having a resilient element interposed therebetween and bonded thereto.

Intermediate the ends of each bridge and spaced at predetermined intervals along the length thereof are a pair of saddles, chairs or guide members 34 which are desirably but not necessarily of cast form. Each block comprises a foot, standard or substantially U-shaped vertical plate 35 having a lower extremity resting upon the bridge top plate and preferably secured thereto by means of welds 36. By making the chairs as components separate from the bridge they may be accurately positioned on the bridge and secured thereto so as to form rigid parts thereof. Spanning the upper limits of each foot or standard is an inclined wall, shelf or sloping rest 37 which is disposed at such an angle as to form an acute angle with a horizontal plane or with the beam top plate. The inclined wall is purposely and desirably directed toward a point adjacent to the axis of a related axle for the purpose to be hereinafter made apparent. Mounted upon the inclined rest is a wear plate 38 upon which an end 39 of a brake beam 40,

may bear with welds 41 securing the wear plate to the shelf (see Figure 5). As is well known, a brake beam suitable for the present supporting structure comprises in addition to the brake beam 40, a brake head and brake shoe assembly 40a secured to the brake beam adjacent an end thereof. The brake shoe, through suitable mechanism (not shown) is directed toward and away from a related wheel depending entirely upon the particular function to be performed. The rest and bearing or wear plate are inclined at such an angle that an extension of an axis of the brake beam will intersect the axis of the axle thus arranging a path along which the brake beam will at all times move in alignment with the axle axis.

Some arrangement must be made to maintain the brake beam in an operable position within the guideway and toward the accomplishment of this feature each guide member is provided with longitudinally spaced upstanding means, end walls or posts 42 and 43, respectively. The post 43 rises from the trailing end of the shelf and is formed as a bulbous member having a protuberance or knob 44 facing or extending in a direction away from the shelf. The post 43 is provided with a partition 45 extending downwardly from the knob and forming a part thereof. The end wall 42 is formed as an angle shaped leg and rises from a leading end of the rest so that, as illustrated, the leg has a substantially vertical portion 46 forming in effect an upward continuation of the subjacent part of the related foot and the upper extremity of the vertical portion merges or blends into a flange 47 desirably parallel with the inclined rest. The posts partially define, together with the rest bearing plate, a guideway 48 therebetween and are spaced apart a sufficient distance to permit a free unrestricted service movement of the brake beam.

In order further to prevent an accidental or unwarranted separation of the brake beam and a related chair as well as facilitate assembly and disassembly of these components there is provided a clip, bar means or retainer 49 extending between spaced posts of the block in parallel spaced relation to a rest wear plate to thereby close the otherwise top opening into each chair. The retainer is preferably hook shaped and thus comprises a main plate 50 provided at one end thereof with a claw or U-shaped extremity 51 arranged to extend around and grasp the post knob to form an interlock between that extremity of the retainer and related post. The U-shaped extremity is split or bifurcated as at 52 to accommodate a post partition and thus this retainer extremity is prevented from shifting inwardly or outwardly of the truck off of its supporting post. The opposite extremity 54 is arranged to bear upon the post flange 49 where these two components are secured together through the medium of any holding means such as the illustrated rivet 55. As will be appreciated if, for any reason, it becomes necessary to remove the brake beams from an assembly only one securing means 55 of each guide member need be eliminated to facilitate a brake beam removal.

It will be noted that an outer surface 56 of a brake shoe head and brake shoe assembly 40a is spaced inwardly of the truck from a related chair so as to accommodate a free transverse shifting of the brake beam. This transverse shifting movement of the brake beam results from the wheel and axle assembly moving transversely relative to the accommodating journal boxes

through the clearances intentionally provided therein and, in some instances, from any lateral movement of the journal boxes relative to the side frames. The normal transverse shifting of the wheel and axle assembly relative to a side frame which includes both above contingencies can, of course, be definitely determined and this normal movement therefore determines the normal position of the surface 56 from an opposing surface or surfaces of the related chair and its retainer. Since the space in which these components may be positioned is limited the bar means or retainer 49 and the rest and its related wear plate are provided with plane substantially square shouldered surfaces 57 opposing the surfaces 56 so that an adequate bearing area will be presented between the brake shoe and brake head assembly and a related chair and retainer when the brake beam is shifted transversely a sufficient amount to bear against the brake beam support.

Further, as will be appreciated, after a railway truck has been in service for some length of time the bearings and stops (not shown) housed within a journal box become somewhat worn and thus the initially established clearances have been increased so that the wheel and axle assembly will shift transversely of the truck a greater amount than was first provided for when all the components of the truck were new. Adequate provision has been made for this contemplated increase in transverse shifting to avoid subjecting the concerned components to abnormal strains. As exemplary of such provisions each upper bearing plate or pad 33 is provided with an upwardly extending lip or finger 58 which overlaps, in surface bearing relation, a related part of the filler blocks 29 outwardly thereof. Also each journal box outer reentrant flange 12a has formed thereon a shoulder 59 having bearing thereagainst an associated skid 31. This arrangement is such that any transverse movement of the brake beam in excess of the amount originally provided for will cause the brake beam support to be shifted outwardly of the truck from its illustrated position during which time, by reason of the interlock between the filler blocks and upper bearing pad, the resilient element will be subjected to horizontal shear forces and thus permit or cause a displacement of the brake beam support from its normal or illustrated position. A portion of the beam top plate 18 may be removed such as at 60 (see Figure 2) to avoid interference between the beam and side frame tension member during a transverse shifting of the brake beam outwardly of the truck toward the side frame. As soon as the wheel and axle assembly and the journal box have returned to a normal relationship the forces urging the brake beam support from its normal position will have been removed and accordingly the forces stored up in the resilient element will return the brake beam support to its normal illustrated position.

It will be noted that various changes and alterations may be made to the instant structure and that the drawings and description herein contained are for the purpose of illustration only and not to be construed as a limitation or definition of the elements of the invention; reference being had to the appended claims for the scope of the invention.

I claim:

1. In a brake beam support of a railway truck the combination with a side frame having a journal box adjacent each end thereof, of a yoke depending from said journal box, a resilient shoe

in each of said yokes, substantially flat contacting surfaces on said shoes and yokes, and a brake beam supporting sill having end portions in said yokes and supported therein on said shoes, said shoes being interlocked with said sill for longitudinal movement therewith relative to said yokes. 5

2. In a brake beam support of a railway truck the combination with a side frame having a journal box adjacent each end thereof, of a yoke depending from each journal box, a resilient shoe in each of said yokes, substantially flat contacting surfaces on said shoes and yokes, said shoes through said contacting surfaces being slidable longitudinally of said truck relative to said yokes, a brake beam supporting sill having end portions in said yokes and supported therein on said shoes,

and means for interlocking said shoes and sill, said shoes through said interlocking means being shiftable longitudinally with and yieldably resisting outward lateral movement of said sill.

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