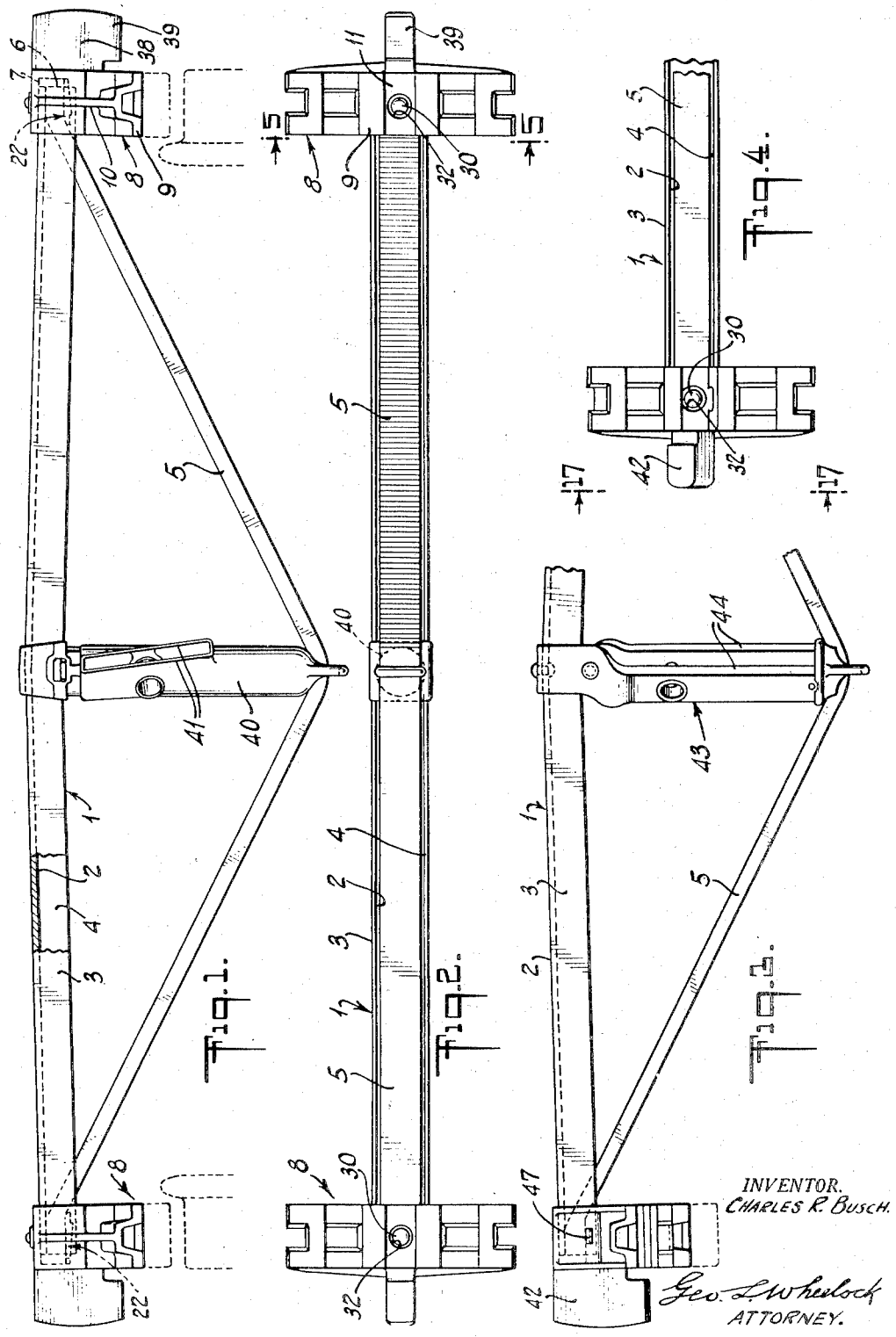
Oct. 9, 1951 C. R. BUSCH 2,570,202

RAILWAY CAR BRAKE BEAM

Filed July 8, 1948 4 Sheets-Sheet 1



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RAILWAY CAR BRAKE BEAM

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Fig. 5.

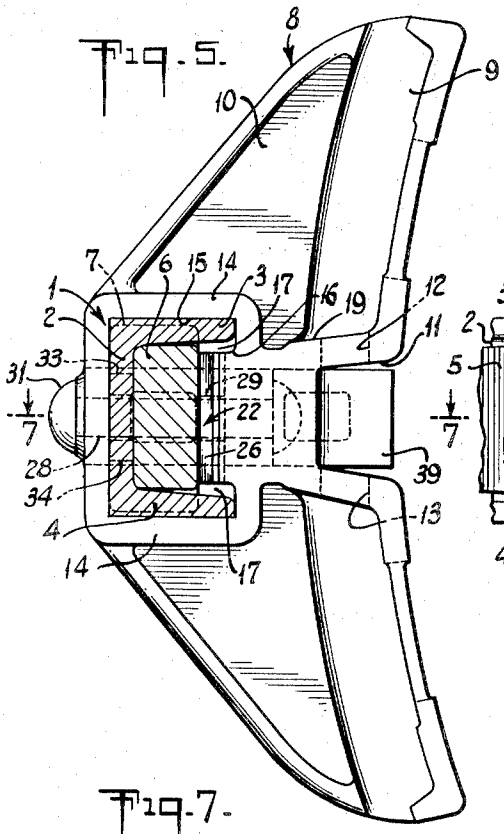


Fig. 6.

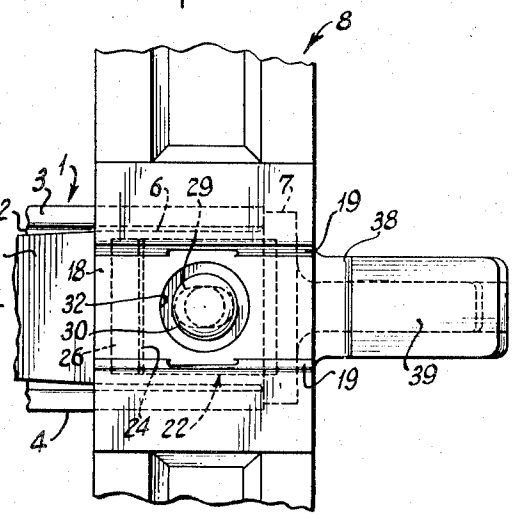


Fig. 8.

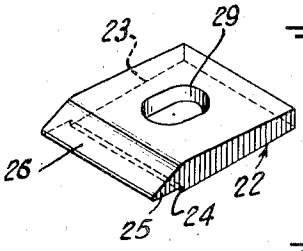


Fig. 7.

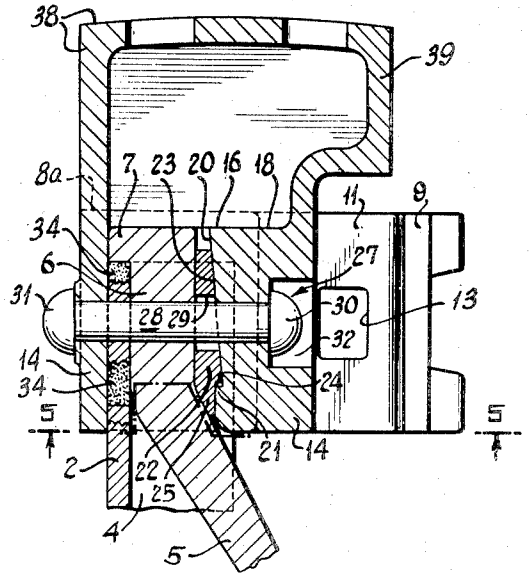
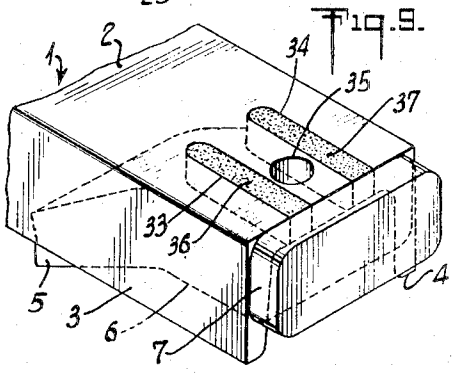


Fig. 9.



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RAILWAY CAR BRAKE BEAM

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Fig. 10.

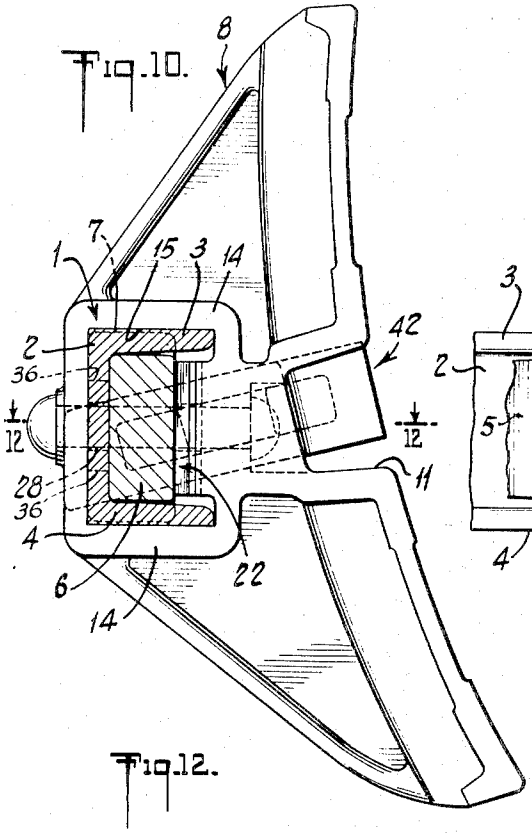

Fig. 11.

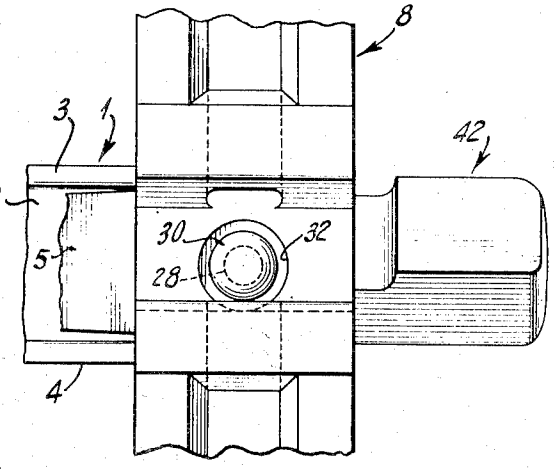

Fig. 12.

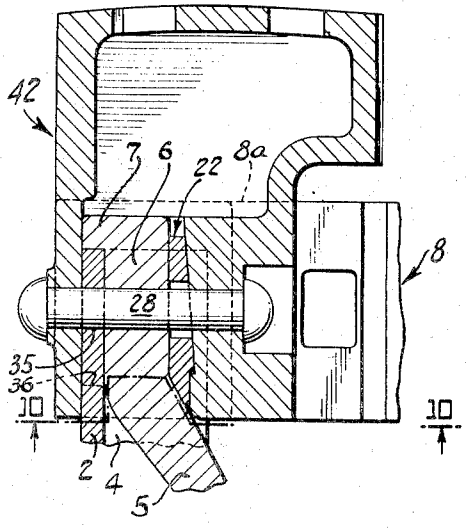

Fig. 13.

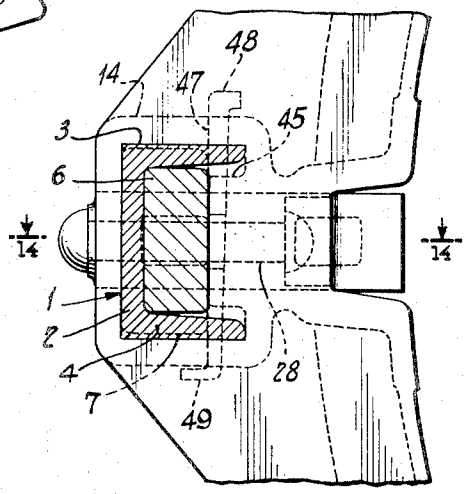

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Fig. 14.

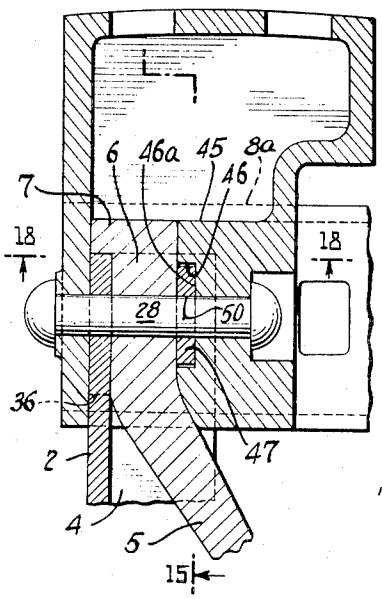


Fig. 15.

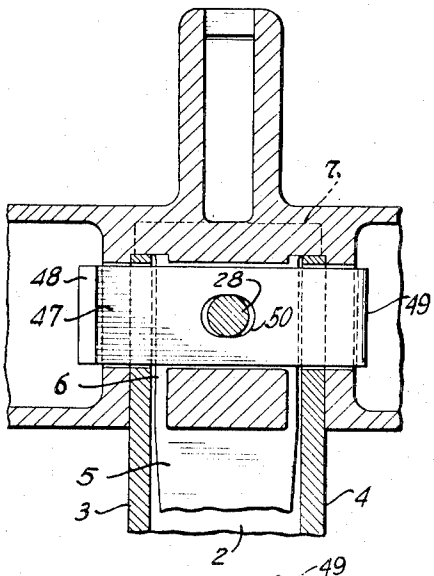


Fig. 19.

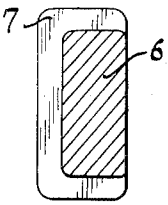


Fig. 17.

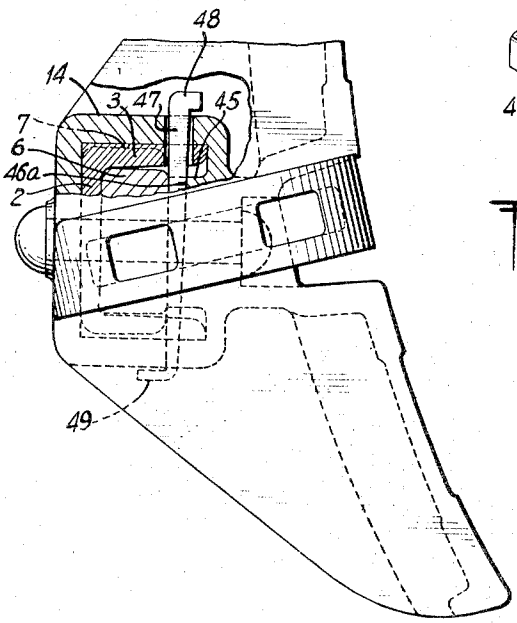


Fig. 16.

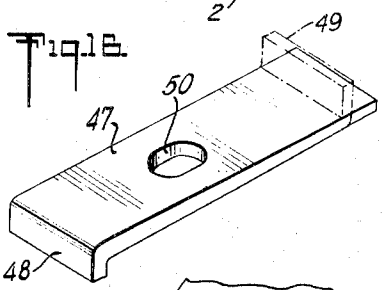
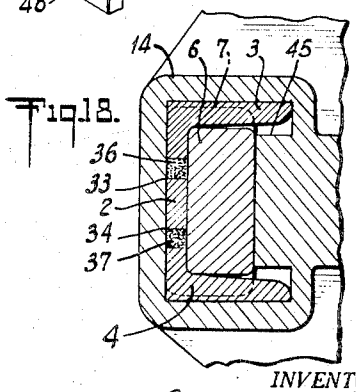


Fig. 18.



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Patented Oct. 9, 1951

2,570,202

UNITED STATES PATENT OFFICE

2,570,202

RAILWAY CAR BRAKE BEAM

Charles R. Busch, Orange, N. J., assignor to Buffalo Brake Beam Company, New York, N. Y., a corporation of New York

Application July 8, 1948, Serial No. 37,567

22 Claims. (Cl. 188—223.1)

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This brake beam preferably makes use of a tension member in which the ends are provided with seating shoulders engaged with a compression member and aimed to prevent the tension thereon from acting to pull either end from the brake beam, although in some aspects the beam is believed to be applicable in a more extensive field.

One of the objections to such type of brake beam was that due to the casting tolerances the compression and tension members would not stay tight, and when there was the slightest relative movement of the component parts of the brake beam it resulted in the brake heads becoming loose, so that the beam could not be repaired for the reason that the holes in the compression and tension members would elongate, and therefore such a brake beam was not economical and lost its capacity.

An object of the present invention is to provide a railway car brake beam to specifically overcome the faults referred to. Other objects are to provide a brake beam not only in such specific connection, but of even broader range which will stand the stresses imposed thereon when the brake shoes are forced against the car wheels during the many brake operations; which can be readily assembled with the brake heads; which is economical in cost, considering its efficiency; and which can be readily repaired when and if necessary.

These being among the objects of the present invention, the same consists of certain features of construction and combinations of parts to be hereinafter described, and then claimed with reference to the accompanying drawings showing different embodiments of the invention, and wherein—

Fig. 1 is a plan view of a brake beam embodying the invention to operate at an angle of 12–14 degrees to the center line of the axle;

Fig. 2 is a front elevation thereof;

Fig. 3 is a plan of one end only of another brake beam embodying the invention, to operate in a plane parallel to the rail but guided to the center line of the axle at an angle of 12–14 degrees;

Fig. 4 is a front elevation thereof;

Fig. 5 illustrates in enlarged side elevation a brake head and a section on line 5—5, Fig. 2 and Fig. 7, the parts corresponding to Fig. 1;

Fig. 6 is a fragmental view as viewed toward the right of Fig. 5;

Fig. 7 is a section on the line 7—7, Fig. 5;

Fig. 8 is a perspective view of a wedging member;

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Fig. 9 is a broken perspective view to show in detail how certain parts may be welded together;

Fig. 10 is a section similar to Fig. 5 on line 10—10, Fig. 12, illustrating the modification shown in Figs. 3 and 4;

Fig. 11 is a fragmental elevation as viewed toward the right of Fig. 10;

Fig. 12 is a section on the line 12—12, Fig. 10;

Fig. 13 is a fragmental elevation, partly in section, to illustrate another modification;

Fig. 14 is a section on line 14—14 of Fig. 13;

Fig. 15 is a section on line 15—15 of Fig. 14;

Fig. 16 is a perspective view of the wedge key shown in Figs. 13, 14 and 15;

Fig. 17 is an end view broken away and partly in section of the construction shown in Fig. 13;

Fig. 18 is a section to illustrate the welds for the different types illustrated; and

Fig. 19 is a section of one end of the tension member illustrating a preferred form of shoulder at that end.

Referring to the drawings they illustrate more particularly, but also in a broader sense, however, to a truss brake beam for railway cars of the type wherein the compression and tension members are coupled together as a unit at their terminals to form a truss, by providing the tension member with end shoulders which are engaged with the transverse end edges of the compression member. The construction at both ends of each form of brake beam is the same, so detailed illustration of one end will suffice.

In Figs. 1, 2, 5–9, 18 and 19, the compression member 1 is of channel section which may have a vertical web 2 and horizontal webs 3, 4 to provide a rectangular cross section, or the compression member may be of U-shaped section or some other section answering the purpose.

Tension member 5 may be of flat bar section or some other suitable section, arranged flatwise vertically, and having upset flat ends 6, that is, ends which are thicker and wider than the bar, their enlarged flat upper and lower surfaces being at right angles to the vertical surfaces of the tension member. The end portions 6 of the tension member are provided with shoulders 7 at their terminals preferably extending around three sides, so as to engage with the transverse end edges of the compression member. The flat portions 6 of the enlarged ends of the tension member are squarely engaged with webs 2 at the longitudinal end portions of the compression member, as the latter and such portions are parallel.

Brake heads 8 are provided which are in one piece each, and the face portions of the heads are

provided with the usual means for receiving brake shoe keys. Also each brake head is provided with a vertically extending back rib 10 to reinforce it. The recess 11 at the midlength of the face portion 9 of each brake head is for receiving the usual shoe lug, such recess being defined by upper and lower walls which are provided with holes 12, 13 for receiving the brake shoe key.

Brake head 8 is also provided with a back collar 14 which stands vertically, it being integral with the back rib 10, and the opening 15 therein extends transversely of the face portion of the brake head.

The brake head is furthermore provided with a rearward boss or protuberance 16 extending from side to side of the brake head and protruding into the opening 15, it being separated from the top and bottom portions of the collar 14 by spaces or grooves 17.

Extending to opposite sides of the back rib 10 the brake head is formed with a solid portion 18 from which extend the walls 19 which define the recess 11, the solid portion having the boss or protuberance 16 projected rearwardly therefrom.

Boss 16 has a longitudinal surface 20 slanting inwardly toward the face of the brake head from the outer end of boss 16, which end is at the outmost side of the brake head, and such surface extends for the greater part of the distance between the ends of such boss. One end of such slanting surface 20 is formed with a shoulder 21 which faces away from the inner side of the brake head on the brake beam.

In assembling the described parts, the respective engaged ends of compression member 1 and tension member 5 are fitted into the opening 15 of the collar which forms a socket therefor, with the webs 3, 4 of the compression member straddling at oppostie sides of boss 16 and seated in spaces 7 after positioning the member now described. A wedge 22 shown in Fig. 8, or other suitable member, is adapted to press in opposite directions against the enlarged end of the tension member and against the slanting surface 20 of said boss after the end portions of the compression and tension members are inserted in the collar opening and to hold the parts together as an assembled unit.

Said wedge 22 is provided with a slanting face 23 to match and bear upon the slanting face of boss 16, and at its thicker end it has a transverse shoulder 24 and a lip 25 which is flat on the surface extending directly from the shoulder, which lip has a bevel 26 at its other surface against which the tension member bears so that under tension during brake operation the said member forces the wedge inwardly.

To properly assemble the parts of the brake beam such wedge member 22 is first applied to the brake head with its slanting surface 23 squarely against the slanting surface 20 of the brake head and the wedge shoulder 24 brought up to a point near the head shoulder 21, whereupon the positively united or weld-connected ends of the compression and tension members are inserted into the opening 15 of the brake head collar 14 so that the end portion 6 of the tension member engages with the wedge member and then the brake head is forcibly pressed on to the said ends until centered.

A rivet 27 is preferably used to unite the assembled parts, the shank 28 thereof passing snugly through holes in solid portion 18 and boss 16 of the brake head, through its collar and snugly through holes in the compression and tension members. The wedge 22, shown in detail in Fig. 8, is provided with a rivet hole 29 in its middle portion, which hole is preferably elongated for the purpose to be explained. When the rivet is headed up it has heads 30, 31, the head 31 pressing against the back of the collar 14, while the forward head 30 is fully located in a cavity 32 opening into the shoe lug recess 11, the said cavity being formed in the solid portion 18 of the brake head back of said recess. The rivet head 32 is spaced inwardly for a distance beyond the front face of the solid portion 18 so as not to protrude into recess 11.

When and if the rivet 27 is driven in hot, its ends will be upset to form its heads and it will be expanded into the enlarged opening 29 in the wedge 22, which expansion is not shown but may be desirable in order to more strongly anchor the wedge which has been used to force the engaged parts in opposite directions, while the heads of the rivet restrain such tendency of the wedge whether the rivet is driven cold or hot.

Longitudinal slots 33, 34 are formed in the ends of the compression member, they preferably being in the intermediate web 2 of the compression member, and one of the slots is at each side of the rivet hole 35 in the compression member, which slots are suggested in Fig. 5 and shown in full lines in Figs. 9 and 18. Welds 36, 37 are preferably made in the slots 33, 34 so that the welding metal will penetrate through the compression member and solidly unite the ends and shoulders of the tension member with the compression member, although said slots and welds may be omitted if the parts solidly bound in the collar of the brake head are deemed sufficient for the required strength of the brake beam.

Integrally with the outer side walls 8a of each brake head shown in broken lines in Fig. 7, there is provided a lateral projection or lug 38 which is hollow and located at the midlength of the head and extends in a plane at right angles to the longitudinal axis of the head, so that the brake head is reversible for use as a right or as a left head. Against walls 8a the end of the tension member abuts, as one of the walls is above and the other is below the said projection.

Such projections 38 being at each end of the brake beam actually serve as guiding extensions of the brake beam when and if used and, when used, they and the brake heads should be strictly rigid with the brake beam, and the middle horizontal plane of the projections should coincide with the middle horizontal plane of the truss of the beam when the strut is applied to the compression and tension members, and when the brake beam is subjected to service conditions. These requirements are due to the fact that in the first place the wedge 22 spreads and continues to hold spread apart the elements engaged thereby, and that the rivet 27 acts in the opposite direction to bind and hold the parts it passes through with considerable strength, thus providing a most efficient and immovable and organized mass of metal back of the face portion of each brake head, so that the brake heads and the extensions or projections 38 will not have any objectionable tendency to have a turning or twisting movement about the longitudinal axis of the brake beam.

Each of the projections or extensions 38 have a forwardly extending nose 39, and it may be desirable to either harden the surfaces thereof or apply a harder coating metal to the surfaces than

said projections are composed of, such, for example, as chromium plating, or well known wear caps or plates can be applied to the projections.

The said beam extensions or projections serve as means for supporting and guiding the brake beam upon guides of car truck side members or frames. Therefore if a strut **40** is properly applied to the compression and tension members to camber the compression member, the strength of the beam is assured. Such strut, as shown in Fig. 1, has doubly canted parallel guide portions **41**, which provides a brake beam to operate at an angle of 12–14 degrees with respect to the center line or axis of the wheel axle.

It is most desirable that the brake shoes (not shown) when keyed onto the brake heads apply the brake squarely against the bevelled treads of the car wheels to obtain even wear. Therefore, as clearly shown in Figs. 1 and 2, the brake heads are slightly canted inwardly to converge towards each other for receiving the brake shoes. This canting of the brake heads is usually due to the cambering of the compression member when the strut is strongly forced between and fixed to the compression and tension members. Referring to Figs. 3, 4, 10, 11 and 12, the same reference numerals are applied to the principal parts of the brake beam as in the before described illustrations, and the said figures represent a modification of the invention. Here, a similar guiding projection **42** from the brake head or end extension of the brake beam is shown, but in this particular case the same is canted or on a bias with respect to the horizontal plane of the brake beam, and the brake head is tilted rearwardly from its upper end and forwardly at its lower end. Thus modified, and with a strut **43**, the brake beam is adapted to lie in a plane parallel with the rails but is guided toward the center line of the axle at an angle of 12 to 14 degrees to the horizontal. The strut **43** has guide portions **44** which extend parallel with its longitudinal axis and which are canted only laterally with respect to such axis.

Referring to Figs. 13–17 inclusive, another modification of the invention is shown whereto the same reference numerals are used to designate the principal parts corresponding to those in the modification previously described.

In this case the modified boss or protuberance **45** into the collar of the brake head has a vertical groove **46**, the inward surface **46***a* of which is slanted. Such groove receives a vertical wedge key **47** which is bendable, and passes downwardly through slots in the brake head collar and the forward webs or flanges of the compression member, in order to press forwardly on the boss **45** and rearwardly against the end portion of the tension member.

Bendable wedge key **47** is provided with a lip or stop **48** at its upper end which restrains the entering of the key, at that end, into the brake head collar, and its lower end is afterwards bent out to provide a bottom stop **49** immediately below and in engagement with the collar for holding the key in place. Such key has an opening **50** for rivet **28**.

In all forms of the invention as described and shown it is apparent that all of the involved parts at each end of the brake beam are compactly arranged in a substantially solid mass at each end, rigidly locked together and united.

It will be obvious to those skilled in the art that the invention as illustrated and described is susceptible to modification in various particulars not specified, without departing from the spirit of the invention and the scope of the appended claims.

What I claim as new is:

1. In a brake beam, a brake beam proper having ends extending longitudinally thereof, brake heads on such ends, and wedging means directly between such ends of the beam proper and the heads and acting to press the ends and heads in opposite directions, and means positively uniting the ends, wedges and heads and restraining the action of the wedging means.

2. In a brake beam, a brake beam proper, having ends extending longitudinally thereof, brake heads on such ends, and wedging means directly between such ends of the beam proper and the heads and acting to press the ends and heads in opposite directions, and means positively uniting the ends, wedging means and heads and restraining the action of the wedging means, the brake heads provided with outwardly extending guides integral therewith for movement and support on side members or frames of a car truck, the central plane of the guides intersecting the plane of action of the wedging means.

3. In a brake beam, compression and tension members arranged to form a truss having ends extending longitudinally thereof, brake heads on such ends of the truss, wedging means between such ends of the truss and the heads and acting to hold the ends and heads in opposite directions, such means and the heads having mutually engaged slanting surfaces, and means positively uniting the truss ends and heads and restraining the action of the wedging means.

4. A brake beam according to claim 3, wherein the uniting means includes rivets passing through the longitudinally extending ends of the compression and tension members, the slanting surfaces of the brake heads and the wedging means to provide a rigid brake beam, the brake heads having shoulders and the wedging means having shoulders at their thicker portions in abutment with the shoulders on the heads.

5. A brake beam according to claim 3, wherein the compression member is of channel type of the same dimensions from end to end, the uniting means includes rivets passing through the ends of the truss, the brake heads and the wedging means, and including welds between the ends of such compression member and the tension member, a weld above and below each rivet.

6. A brake beam according to claim 3, wherein the uniting means includes headed rivets passing through the ends of the truss, the brake heads and the wedging means, the brake heads having rearward front cavities slightly larger than the forwar heads of the rivets and opening into the shoe lug recesses thereof, and the forward heads of the rivets spaced from the openings of the cavities.

7. In a brake beam, compression and tension members having ends extending longitudinally of the brake beam, of which the tension member is provided at its ends with shoulders abutting the terminals of the compression member, brake heads, the heads having openings receiving the abutted longitudinally extending ends of the two members, means between the abutted longitudinal ends of the two members and heads, such means having slanting surfaces bearing along the heads from points directly in front of the shoulders and the opposite surfaces thereof bearing upon the front surfaces of the tension member, such in-between means acted upon outwardly by the ten-

sion member when the brake is applied to press the ends and heads in opposite directions, and means positively uniting the ends of the two members, the said in-between means and the heads and restraining the pressure of such in-between means.

8. A brake beam according to claim 7, wherein the brake heads have back collars to provide the openings thereof, and the brake heads also having rearwardly protruding bosses at the fronts of the collars, the opposed surfaces of the ends of the compression and tension member entered in the openings being in contact, and the in-between means consisting of wedges bearing on the ends of the tension member and on the rearward protruding bosses on the heads.

9. In a brake beam, compression and tension members to form a truss, brake heads having back collars, the openings of the collars transverse of the heads and receiving in parallel the ends of the two members, the ends of the tension member having shoulders engaged with the transverse terminal edges of the compression member, and the brake heads having bosses protruding rearwardly into the openings of the collars, wedges bearing on the opposing surfaces of the ends of the tension member and the bosses, the opposed bearing surfaces of the wedges and the bosses being inclined relatively to the ends of the tension member, and means solidly uniting the compression and tension member and the wedges within the collars of the brake heads.

10. A brake beam according to claim 9, wherein the uniting means comprise rivets extending through the backs of the collars, the ends of the compression and tension members, the wedges and the bosses, the wedges having enlarged holes into which the rivets may be expanded.

11. In a brake beam, compression and tension members to form a truss, the ends of the members engaged, brake heads each provided with a transverse opening at the back and receiving the ends of the members, bosses on the heads protruding into the openings, wedge-shaped keys bearing on the ends of the tension member and the bosses and provided with means for preventing movement thereof, and means solidly uniting the truss members and the keys within such openings.

12. A brake beam according to claim 11, wherein the uniting means comprises rivets passing through and beyond the openings and through the ends of the truss, the keys and bosses.

13. A brake beam according to claim 11, wherein the uniting means comprises rivets passing through and beyond the openings and through the ends of the truss, the keys and bosses, and a weld at opposite sides of each rivet to weld together the brake heads and the truss.

14. A brake head having a transverse opening at the back, an integral wall defining the opening, and a boss or protuberance protruding from the wall rearwardly into the opening, the rear surface of the boss extending on a backward slant transversely of the brake head and away from the face of the brake head such slanting surface being closer to the said face towards the inboard side of the head than the outboard side and terminating at the outboard side.

15. A brake head having a back collar forming an opening which extends transversely of the face portion of the head, a solid portion integral with the face portion, from which solid portion the collar emerges, and a boss or protuberance extending rearwardly from the solid portion and having a rear surface on a slant across the brake head for a substantial distance on the head, the slanting surface being closer to the brake head face towards the inboard side of the head than the outboard side and terminating at the outboard side.

16. A brake beam, including compression and tension members, the end portions of the tension member engaged with the terminals of the compression member, such end portions resting longitudinally against the compression member, brake heads having back collars and rearward bosses or protuberances extending from the face portions of the heads into the collars, spreading means bearing directly on the bosses and directly on the longitudinal end portions of the tension member, rivets driven through the bosses, the thus so acting spreading means, the compression and tension members and the backs of the collars and forming solid masses, and guide lugs or beam end extensions integral with the heads, such riveted solid masses preventing the heads and the guide lugs or extensions having a twisting movement about the longitudinal axis of the brake beam when in operation.

17. A brake beam according to claim 16, wherein each guide lug or extension is substantially flat at an inclination to the plane of the axis of the rivet.

18. In a brake beam, compression and tension members, of which the tension member is provided at its ends with shoulders abutting the terminals of the compression member, brake heads having openings receiving the abutted ends of the two members, and the heads also having abutment walls at the outward ends of the openings and against which the shoulders abut, wedging means between the abutted ends of the two members and the forward surface between the opposite sides of each of the heads, such wedging means having a tendency to press the abutted ends of the two members and heads in opposite directions, means extending through and positively uniting the ends of the two members, the said in-between means and the heads and restraining the pressure of such in-between means, and outwardly extending guides integral with said abutment walls for movement and support of the brake beam on side members or frames of a car truck.

19. A wedge adapted for use between a brake beam and brake head thereon, the same comprising a plate-like body with the opposite surfaces which have the greater areas disposed in planes at an angle to each other, one of which surfaces slants with respect to the other surface, and a projecting tapered lip along and extending out from the thickest part of such wedge body and having a beveled surface disposed in a plane at an obtuse angle to the slanting surface of such wedge body.

20. A wedge adapted for use between a brake beam and brake head thereon, the same comprising a plate-like body with the opposite surfaces which have the greater areas disposed in planes at an angle to each other, one of which surfaces slants with respect to the other surface, and a projecting tapered lip along and extending out from the thickest part of such wedge body and having a beveled surface disposed in a plane at an obtuse angle to the slanting surface of such wedge body, the opposite surface of the projecting tapered lip being at a sharp acute angle to and joined with the slanting surface of the wedge body by a shoulder extending substantially parallel with such lip.

21. A wedge adapted for use between a brake beam and brake head thereon, the same comprising a plate-like body with the opposite surfaces which have the greater areas disposed in planes at an angle to each other, one of which surfaces slants with respect to the other surface, and a projecting tapered lip along and extending out from the thickest part of such wedge body and having a beveled surface disposed in a plane at an obtuse angle to the slanting surface of such wedge body, the opposite surface of the projecting tapered lip being at a sharp acute angle to and joined with the slanting surface of the wedge body by a shoulder extending substantially parallel with such lip, and the wedge body having an elongated rivet hole between such lip and the thinnest part formed between such opposite surfaces.

22. A brake head having a transverse opening at the back, an integral wall defining the opening, and a boss or protuberance protruding rearwardly into the opening, the rear surface of the boss on a slant transversely of the brake head and away from the face of the brake head and a stop at that end of the slanted rear surface which is nearest the face of the brake head.

CHARLES R. BUSCH.

REFERENCES CITED

The following references are of record in the file of this patent:

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