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PATENTED FEB. 18, 1908.

R. D. GALLACHER, JR.
SUBFRAME FOR RAILWAY CARS.

APPLICATION FILED MAR. 14, 1907.

3 SHEETS—SHEET 1.

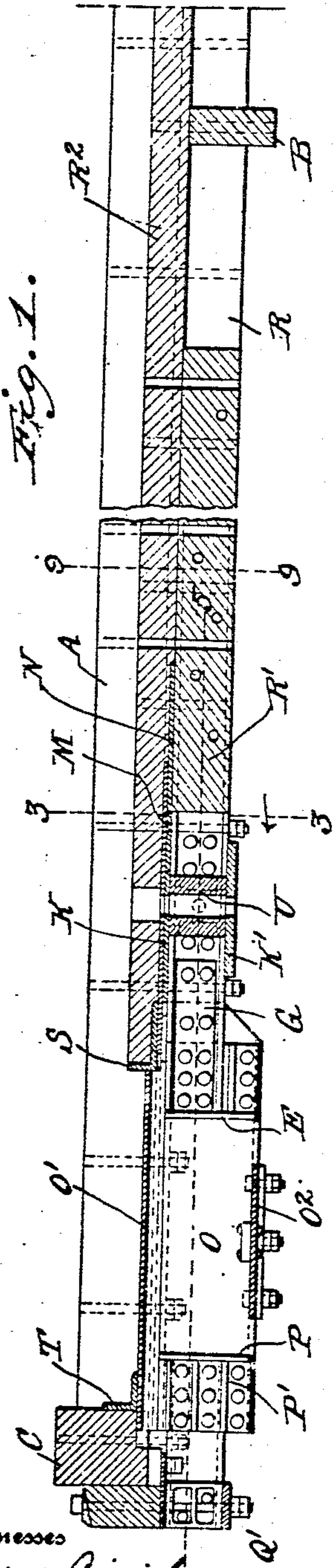


Fig. 2.

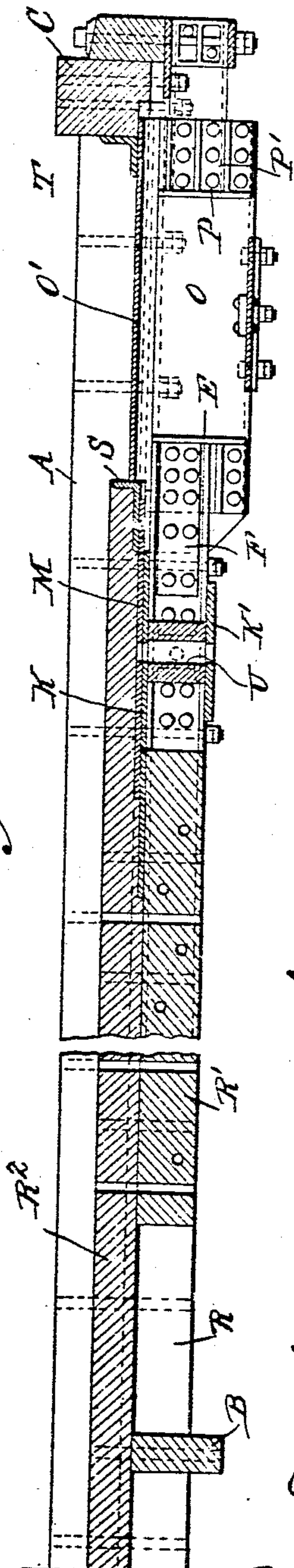
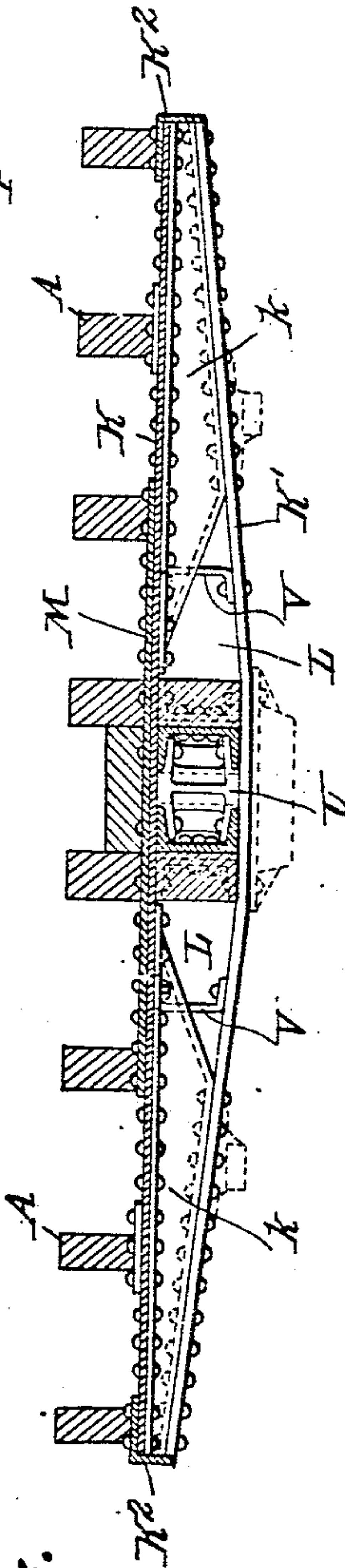


Fig. 3.



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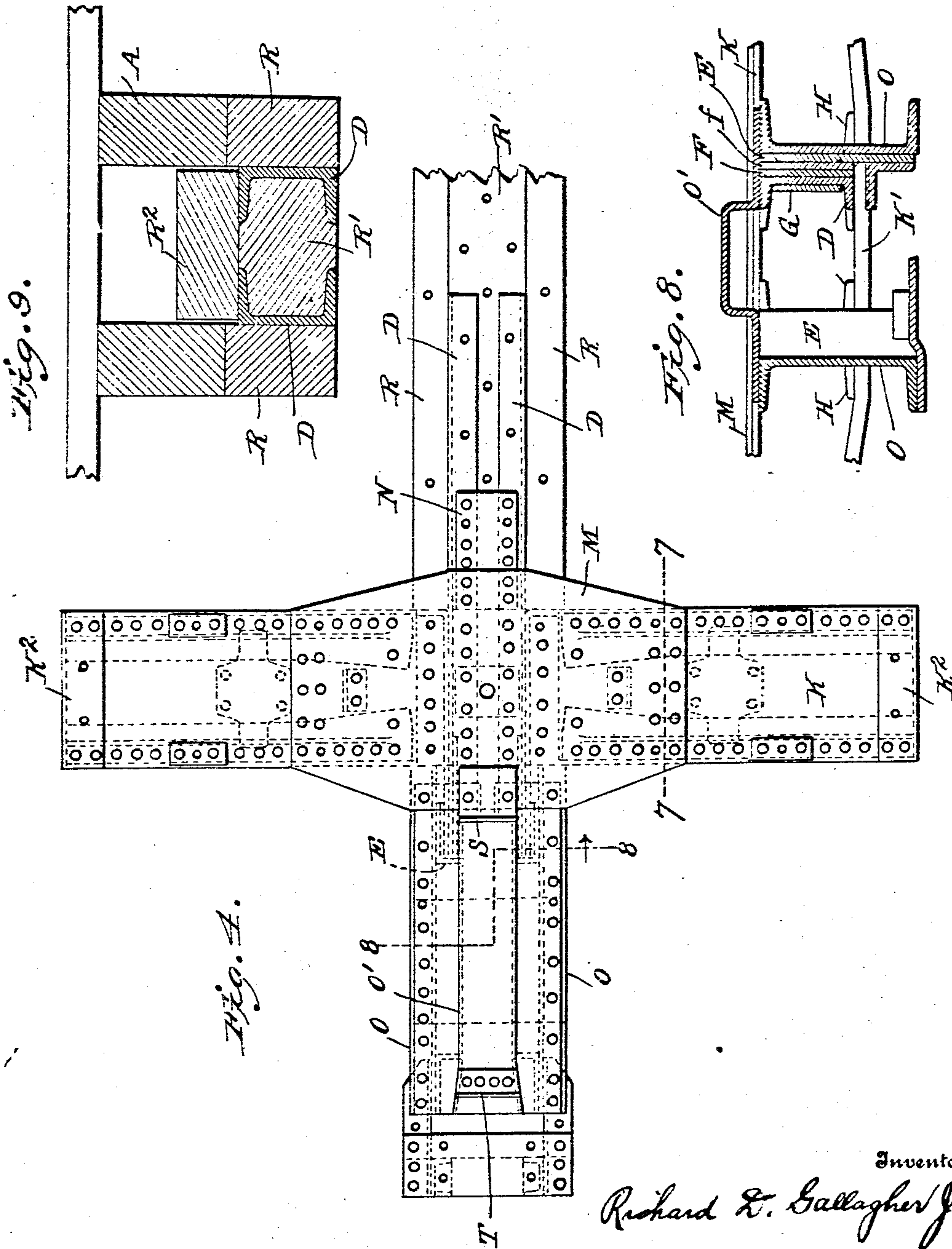
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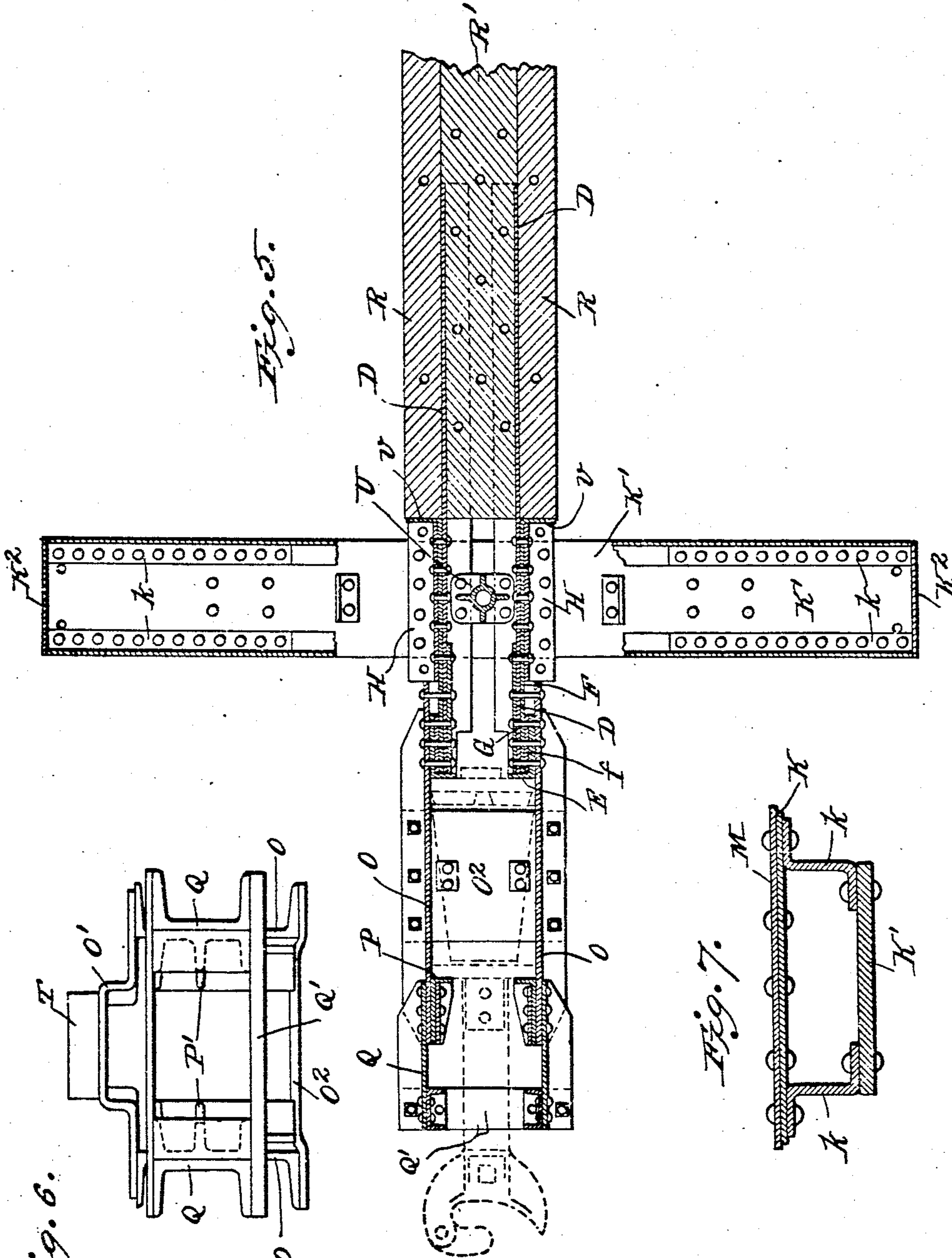
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3 SHEETS—SHEET 3.



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SUBFRAME FOR RAILWAY-CARS.

No. 879,536.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed March 14, 1907. Serial No. 362,418.

To all whom it may concern:

Be it known that I, RICHARD D. GALLAGHER, Jr., of New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Subframes for Railway-Cars; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

It is well recognized by those skilled in the art that the common wood frame construction of railway cars has many advantageous features, not least among which may be enumerated the elasticity and adaptability of the car to the conditions of the load or track and to train stress whereby not only is the life of the car itself prolonged, but overloading does not result in permanent deflection and shocks and distortions are absorbed without injury. Unfortunately modern traffic conditions have imposed upon the cars of ordinary wooden frame construction burdens which they are not calculated to withstand, and largely due to their use coupled to or in trains with modern unyielding cars of the so-called steel or all metal construction which together with the increasing tendency to overload has resulted in a large percentage of car failures and a constantly increasing burden for repairs.

It is the object of the present invention to overcome these difficulties and to provide a car frame which, while it will afford the necessary strength to withstand the shocks and strains of modern traffic conditions and increased loads, will not reduce the limit of elasticity, or capacity of the car, to absorb strains and accommodate itself to existing conditions.

The invention consists primarily in a sub-frame which may be applied to existing cars or, if desired, incorporated in new cars in supplement to the ordinary framing; said sub-frame embodying metal bolsters, sub end frames and girders extending in the line of buffing strains from the draft rigging and the ends of which girders form the inner stops for the draft rigging.

The invention further consists in certain novel details of construction and combina-

tions and arrangements of parts all as will be now described and pointed out particularly in the appended claims.

Referring to the accompanying drawings: Figures 1 and 2 are longitudinal vertical sections through a car frame and sub-frame embodying the present invention. Fig. 3 is a vertical section on the line 3—3, Fig. 1, looking toward the left. Fig. 4 is a top plan view of the end of the sub-frame shown in Fig. 1 but omitting the top timber or filling piece. Fig. 5 is a horizontal section on the line 5—5, Fig. 1, looking down. Fig. 6 is an elevation looking at the left hand end of the frame, as shown in Fig. 4. Fig. 7 is a vertical section on the line 7—7, Fig. 4. Fig. 8 is a vertical section on the irregular line 8—8, Fig. 4, looking toward the right. Fig. 9 is a vertical section on the line 9—9, Fig. 1.

Similar letters of reference in the several figures indicate the same parts.

The usual wood under-framing of a car is shown in outline in Figs. 1, 2 and 3, and includes the sills A, cross tie timbers B and buffer beams C all of any well known or usual construction, these parts being illustrated to show the combination of the sub-frame therewith.

At each end of the car the sub-frame embodies a body bolster and a longitudinal frame incorporated therewith and having longitudinal beams the outer ends of which constitute the stops against which the draft gear abuts, whereby the buffing strains are transmitted to the beams in line with their longitudinal axes to avoid any tendency to buckle or bend the same. The said longitudinal beams are preferably channel iron beams as shown at D, Fig. 9. They extend through the body bolster and at their outer ends terminate in position to form the stops against which the buffer rigging takes its bearing. For this purpose they are sufficiently close together to lie within the area covered by the rear follower of the said rigging and in order to afford a somewhat wider seat for said follower plate angle iron cap pieces E are applied to the ends of the beams and strengthening and filling plates F, f and G, are firmly riveted to the sides of the beams at the ends. To the outer sides of the beams and plates F, channel irons H are secured, said plates caps, irons and beams being all

rigidly connected by a large number of rivets of sufficient cross section to eliminate any possibility of shearing.

The channel irons H extend a short distance beyond the body bolster for the reception of bolts passing up through the sills and they have their flanges firmly united by rivets to the top and bottom plates K K', of the bolster, whereby the bolster becomes in effect an integral part of the structure. Said body bolster is in the form of a truss the top plate K being somewhat wider than the bottom plate K' but the latter being the compression member is of heavier cross section as shown clearly in Fig. 7. The two plates approach each other toward the ends of the bolster and are connected throughout the greater part of their length by Z-irons or webs k the outwardly turned flanges of which are riveted to the wide upper plate while the intumed flanges are riveted to the narrower lower plate. To provide a space in the bolster for the passage of rods, pipes etc., the said Z-irons or webs are tapered at their inner ends, the flanges, however, being continued throughout the tapered part. Obviously they may taper toward either the top or the bottom plate, but as shown they taper toward the top plate leaving spaces L at each side of the center frame for the passage of rods, pipes, etc., as before stated.

The ends of the body bolster may have caps K² applied thereto or said ends may be otherwise made to conform to the side sills of the car in accordance with known practice.

Overlying the central portion of the top plate of the bolster is a top strengthening plate M, preferably tapered from the ends where it is the width of the bolster to a considerably greater width at the center where its sides are firmly riveted and bolted to the center frame. This center strengthening top plate is connected rigidly with the frame and bolster preferably by the rivets which connect the parts of the bolster together and which connect the center frame and bolster, in other words, it forms a part of the bolster and is connected rigidly with the center frame to form a unitary structure which may be manufactured and sold as an article of manufacture ready for application to cars of ordinary construction and without change other than the removal of the existing bolster and the substitution of the present bolster and center frame.

Connecting plates N preferably connect the beams D in rear of the bolster and forward of the bolster and ends of the beams D, the center frame is continued in the form of a housing, open at the bottom, for the reception of the draft and buffing rigging.

The sides of the forwardly extending part of the center frame are formed by relatively

deep channel irons O riveted at their rear ends to the outer sides of the beams D, but with their flanges turned outwardly. These outwardly flanged channel irons are connected at the top by a cover or arch plate O' having its central part bent upwardly for the accommodation of the strap, while a removable bottom plate O² connects the bottom of said channel irons and serves as the support or carry plate of the draft rigging. Near the front end, the channel irons O have front stops secured thereto, said stops consisting essentially of a broad angle iron P, the flange of which forms the bearing face of the stop and a plurality, preferably three, bracket angle irons P', the ends of whose flanges form braces for the flange of the angle iron P. Supplemental narrower channel irons Q are secured to the outer sides of the channel irons O, preferably by the rivets which secure the forward stops in place and these supplemental channel irons extend under the bumper beam C and support the carry iron Q' on which the drawbar rests.

In applying the sub end frames to a car they are connected with the sills by vertical bolts and have longitudinally extending girders or sub-sills and filling pieces of wood extending through the whole or the major portion of the whole center part of the car. These longitudinally extending girders and filling pieces are well illustrated in Figs. 1, 2, 5 and 9, where the girders are indicated by the letter R and the filling pieces by the letters R' R². To form firm abutments for the ends of the girders the rear ends of the strengthening plates F are turned out at an angle as at v and the girders seat against such ends in proximity to the bolster. The filling piece R² preferably extends beyond the bolster and its end seats against the upwardly extending flange of an angle iron S secured to the top plate of the bolster and preferably resting against the arch O' of the cover plate.

The bumper beam is centrally supported by an angle iron T also secured to the cover plate O' thus the whole structure is woven into the under framing of the car in such manner as to become an integral part thereof with the capacity to distribute the strains uniformly, present a substantially rigid end structure supported from points well back in the under framing for resisting draft and buffing strains and shocks and while the whole serves to stiffen and strengthen the car frame it does not reduce the limit of elasticity thereof. As a consequence, while the power of resistance is greatly increased the range of deflection or distortion permissible without permanent injury is not reduced.

Obviously the bolster will have a center pin casting U secured therein and may be ad-

ditionally braced by cross ties V designed to prevent buckling of the compression chord of the truss.

While the invention is particularly applicable to and is especially designed for use on cars now in use in order that they may be made to meet modern traffic conditions and to this end the sub-frame is so designed that it may be made up as an article of manufacture well adapted to be supplied to the railroads and applied to the cars by their shop mechanics or carpenters, still it will be seen that the invention may be applied to new cars of the wooden frame type with great advantage both from an economical point of view and because of the increase in the strength of the car.

It will be noted that the beams are as narrow vertically as practicable in order that they may occupy the space now available without raising the level of the body of the car, and to give the necessary space for the draft and buffing rigging the channel irons O are of considerably greater width and project below the level of the bottom of the beams.

With especial reference to the center beams forming at their ends the rear stop for the draft and buffing rigging it will be noted that said beams are located centrally from the line of the draft sills O a considerable distance which may be roughly stated as a greater distance than the thickness of the web, inasmuch as the thickness of the web alone is insufficient to form effective stops and the addition of brackets on the inner sides would cause strains which it is the object of this invention to avoid.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. As an article of manufacture, a metallic sub-frame end for application beneath the under frames of cars, embodying a bolster, a center frame having beams rigidly united to the bolster and formed at their inner ends for connection to center sills extending from one sub-frame end to the other and a draft and buffing rigging housing mounted rigidly on the outer end of said center frame and forming a continuation thereof.

2. In a sub-frame adapted for application beneath the under frames of cars, the combination of separate metallic sub-frame ends, each embodying a bolster, a center frame having center beams and a buffing rigging housing rigidly connected together and wood sub-sills interposed between and connecting the beams of the sub-frame ends.

3. In a sub-frame for application beneath the under frames of railway cars, the combination with draft sills forming a housing for the draft and buffing rigging, of

longitudinal beams located centrally from the line of the draft sills a distance greater than the thickness of the webs of the beams, said beams being a distance apart less than the width of the rear end of the draft and buffing rigging and having their ends positioned to form the rear stops therefor whereby buffing thrust is in alinement with and directly against the ends of the beams.

4. In a sub-frame for the underframing of railway cars, the combination with the longitudinal beams extending through the bolster, of strengthening plates applied to the sides of said beams at the ends and caps extending across and taking a bearing on the ends of said beams and plates to form the rear stops for the buffing rigging.

5. In a sub-frame for the under frames of railway cars, the combination with the body bolster, longitudinally extending beams passing through said bolster, channel irons of greater width than and overlapping the ends of the beams and forming the sides of the buffing rigging housing and spacers between the overlapping ends of the beams and channel irons whereby the beams are brought into alinement with the buffing rigging and directly receive the thrust from said rigging.

6. In a sub-frame for the under frames of railway cars, the combination with the body bolster, longitudinally extending beams passing through the bolster, channel irons forming the sides of the buffing rigging housing and spaces between the beams and channel irons having their ends flush with the ends of the beams to form with the ends of said beams the rear stops for the buffing rigging.

7. In a sub-frame for railway cars, the combination with the body bolster and longitudinal beams rigidly connected with said bolster, of channel irons of greater width than and forming extensions of the beams to receive the draft and buffing rigging between them and extensions of less width than the channel irons secured to the ends of said channel irons for supporting the bumper and carry irons; substantially as described.

8. In a sub-frame for under frames of railway cars, the combination with the longitudinal beams, of a bolster through which said beams pass and to which they are attached embodying a wide top plate, a narrower bottom plate and connecting webs between the edges of said plates having oppositely turned flanges riveted to the plates, the inner ends of said webs being tapered to leave openings in the bolster for the passage of rods and pipes.

9. In a sub-frame for under frames of railway cars, the combination with the longitudinal supporting beams, of stops for the draft rigging formed of wide angle irons the

flanges of which form the stop faces and a plurality of separate angle irons connected with the wide angle irons and having their ends seating against the face flange thereof
5 to form supporting brackets therefor.

10. A metal sub-frame end for railway car under frames having a bolster and longitudinal beams extending through and rigidly

connected with said bolster and angle irons having vertically extending flanges mounted 10 on said sub-frame end and forming abutments for the car frame timbers.

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