Sept. 8, 1959 C. R. BUSCH 2,903,097

RAILWAY CAR BRAKE MECHANISM

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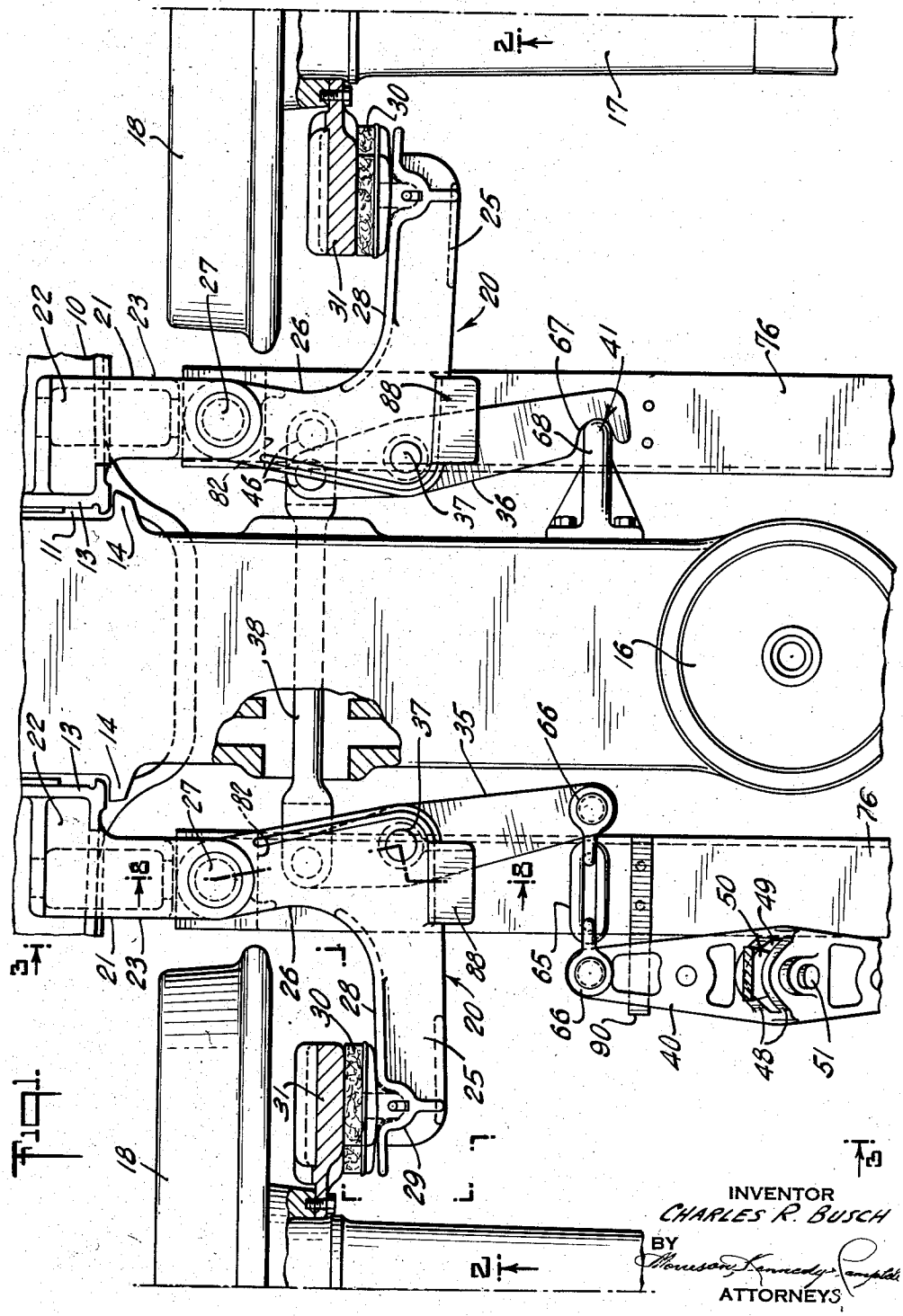

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RAILWAY CAR BRAKE MECHANISM

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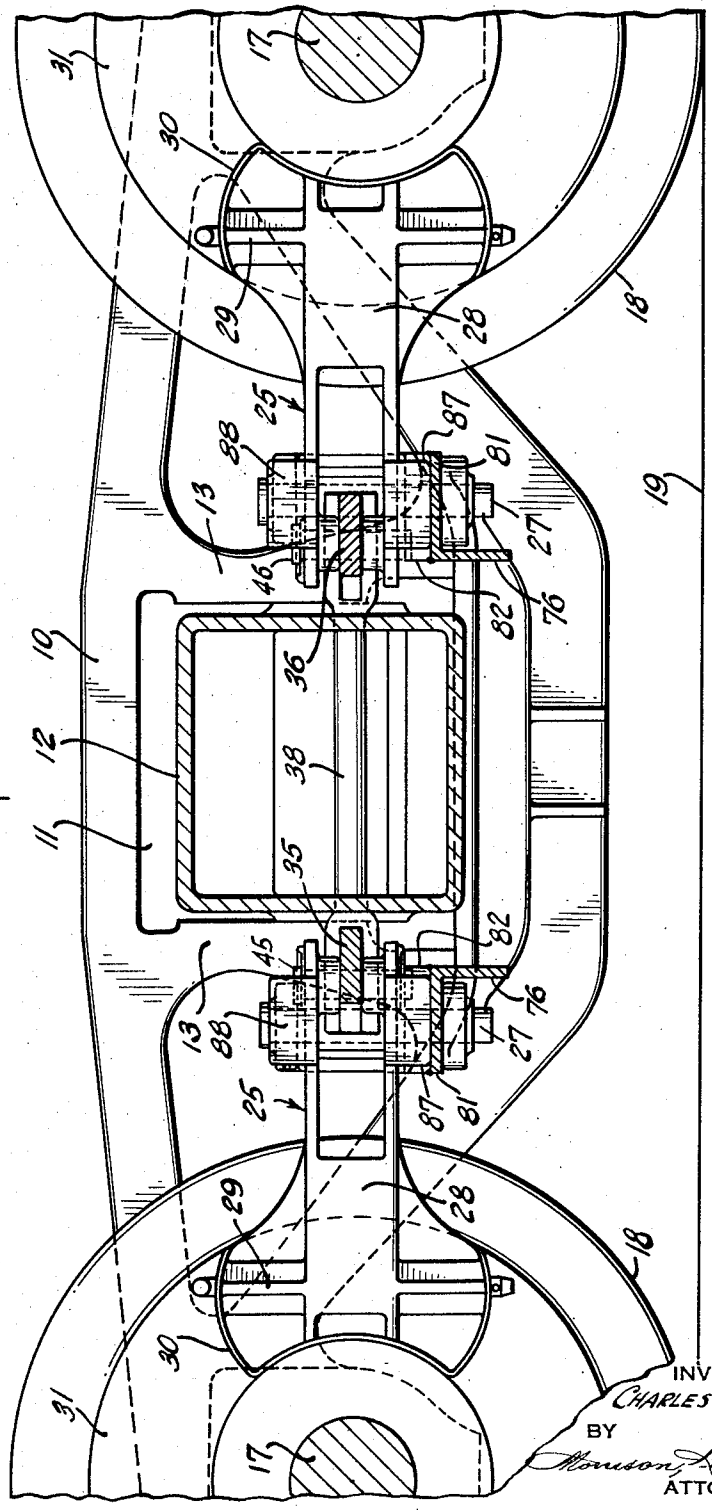

FIG. 2.

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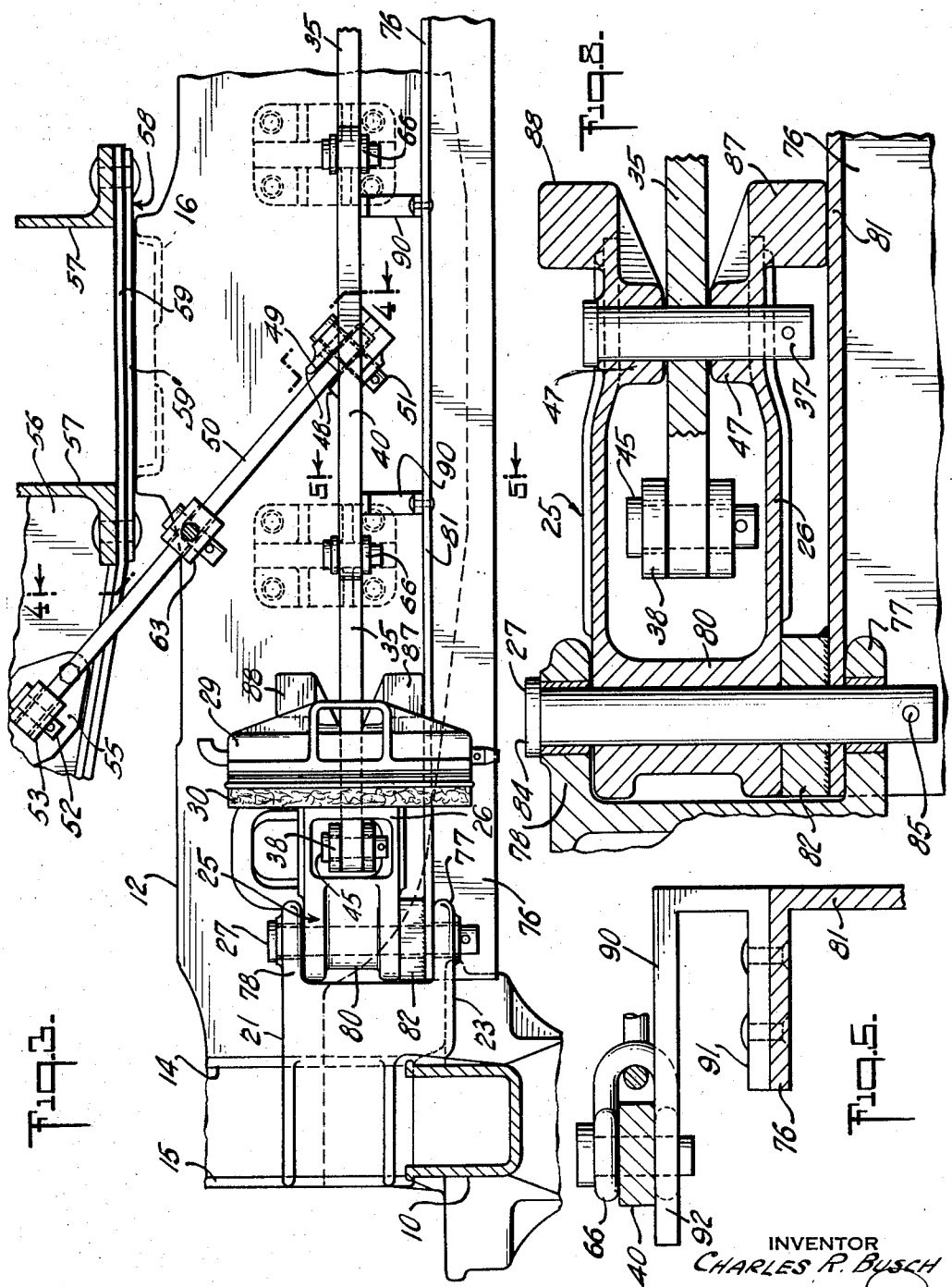

Fig. 3.

Fig. 8.

Fig. 5.

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RAILWAY CAR BRAKE MECHANISM

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Fig. 6.

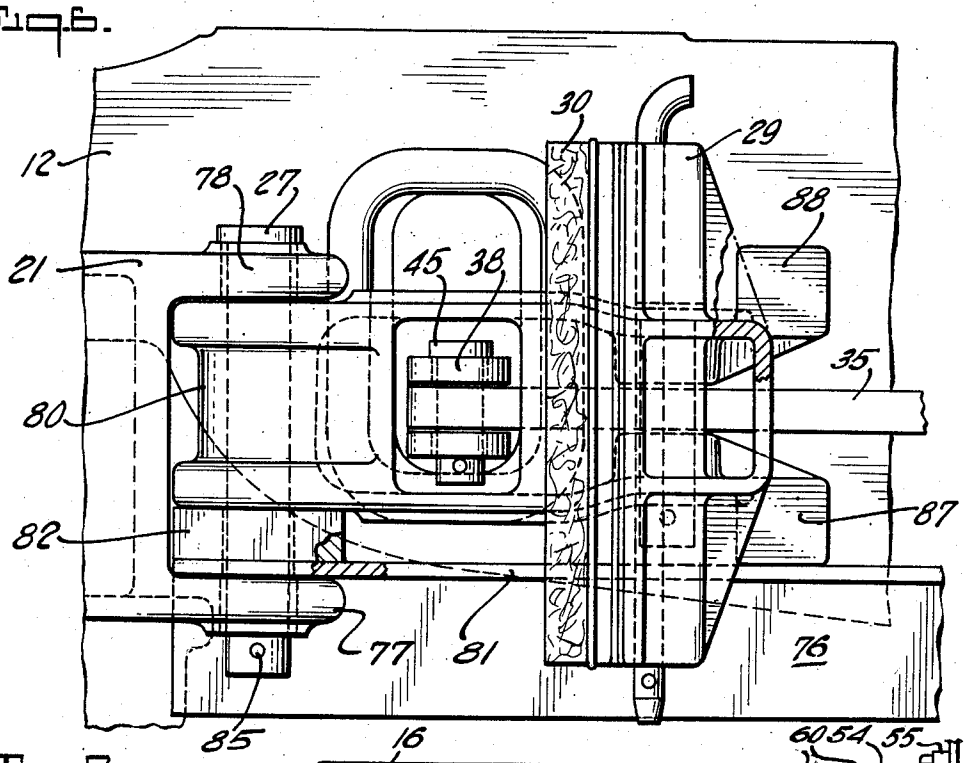

Fig. 7.

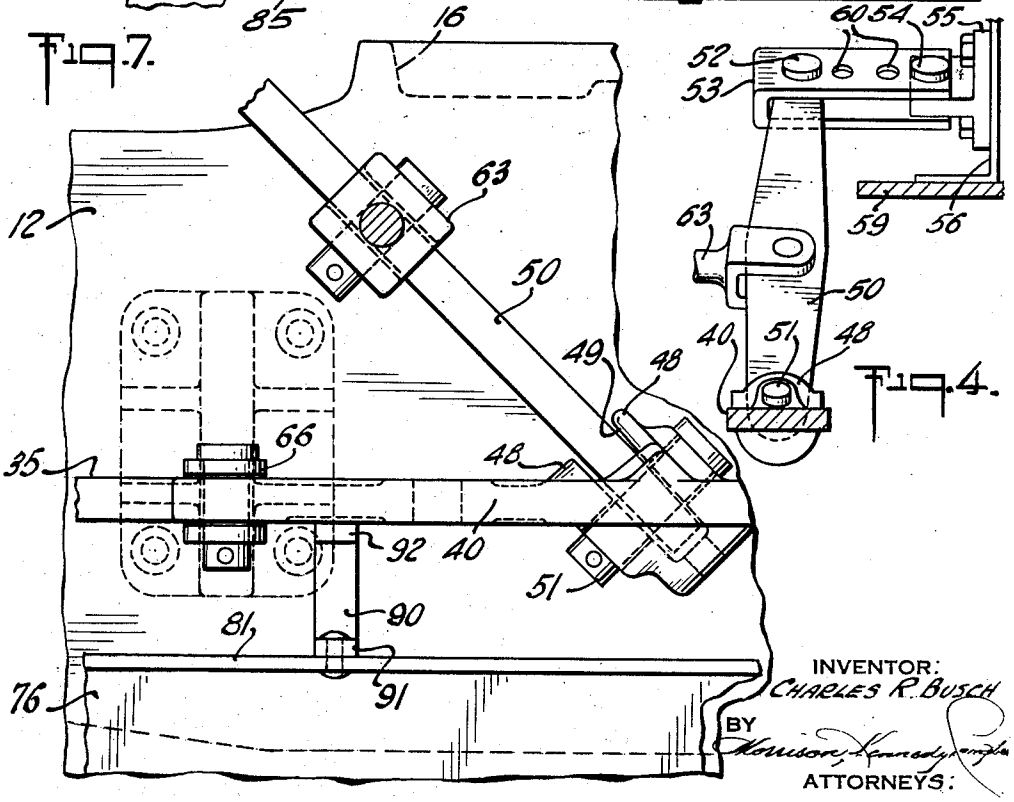

Fig. 4.

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RAILWAY CAR BRAKE MECHANISM

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Fig. 9.

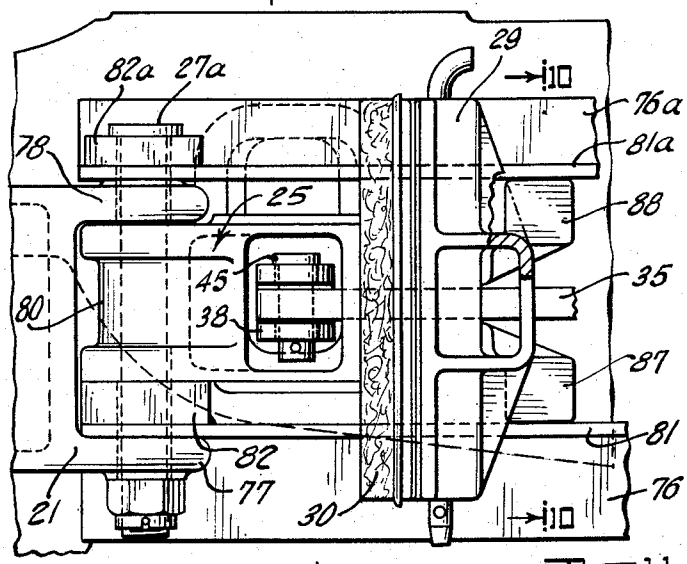


Fig. 10.

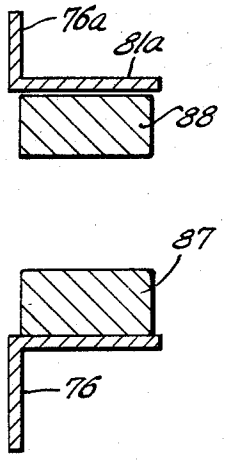


Fig. 11.

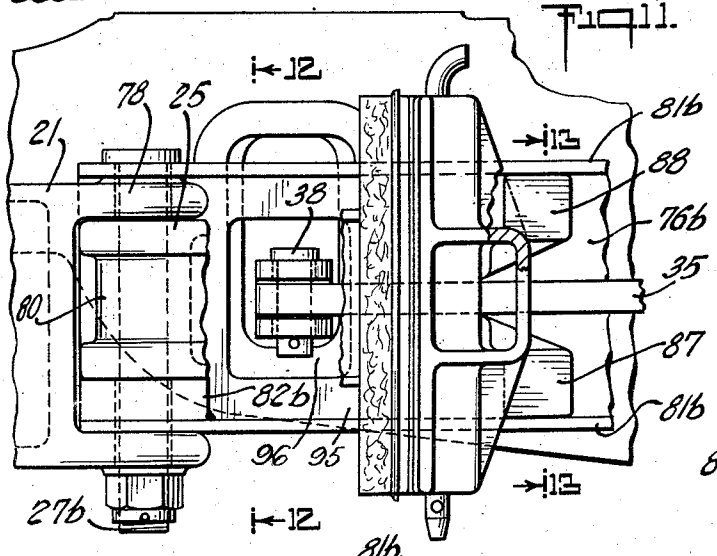


Fig. 12.

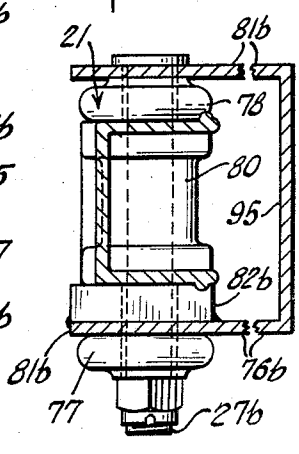
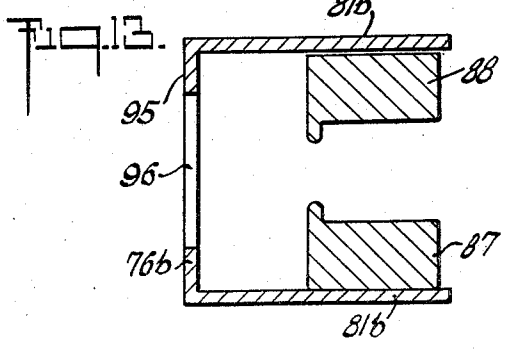


Fig. 13.



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RAILWAY CAR BRAKE MECHANISM

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Fig. 14.

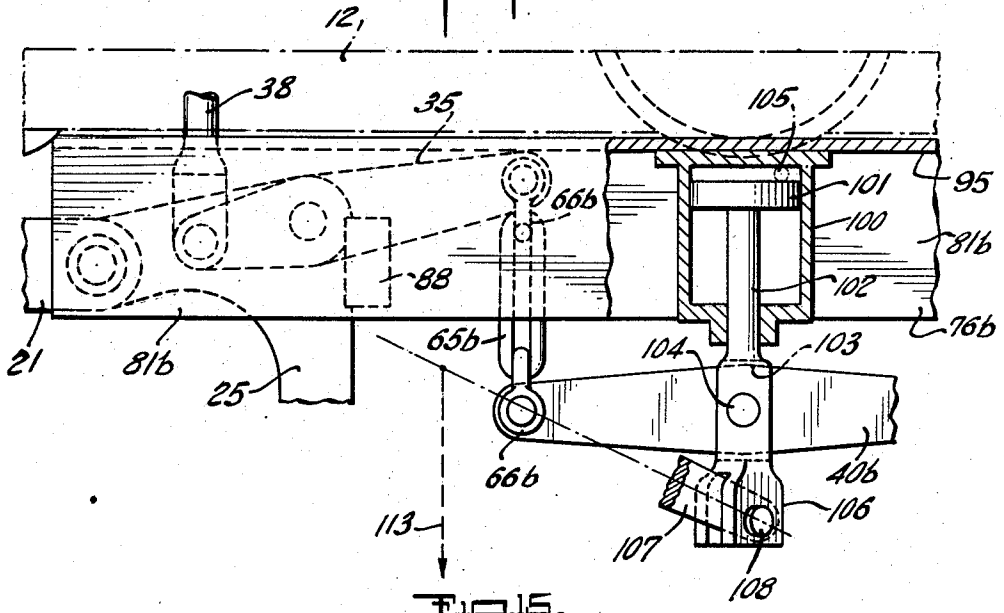
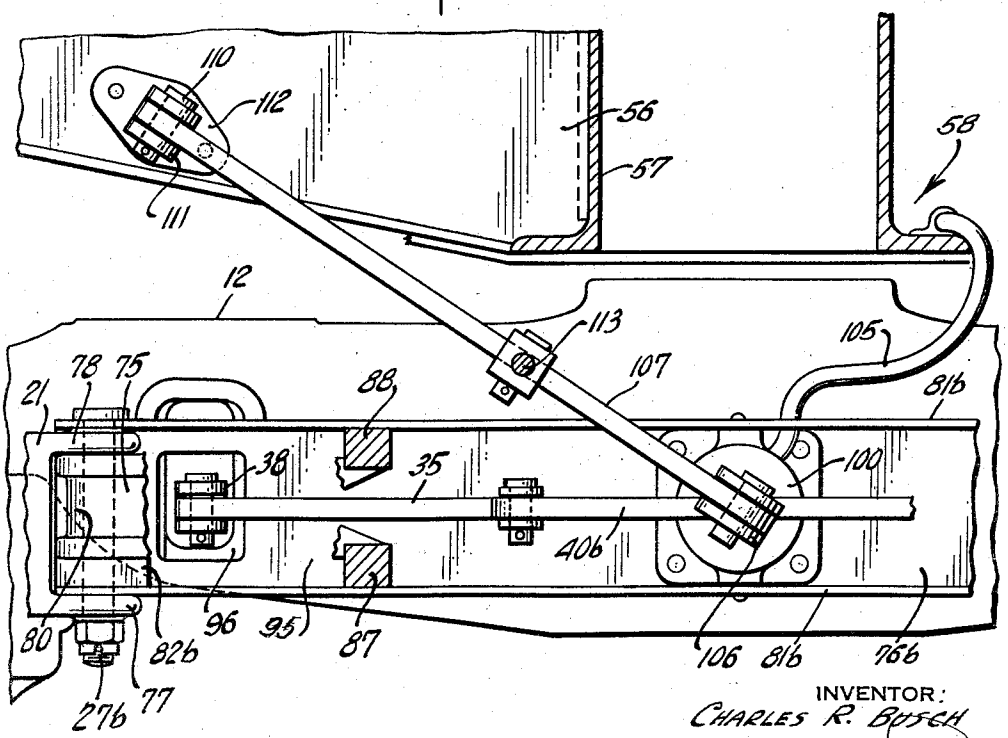


Fig. 15.



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RAILWAY CAR BRAKE MECHANISM

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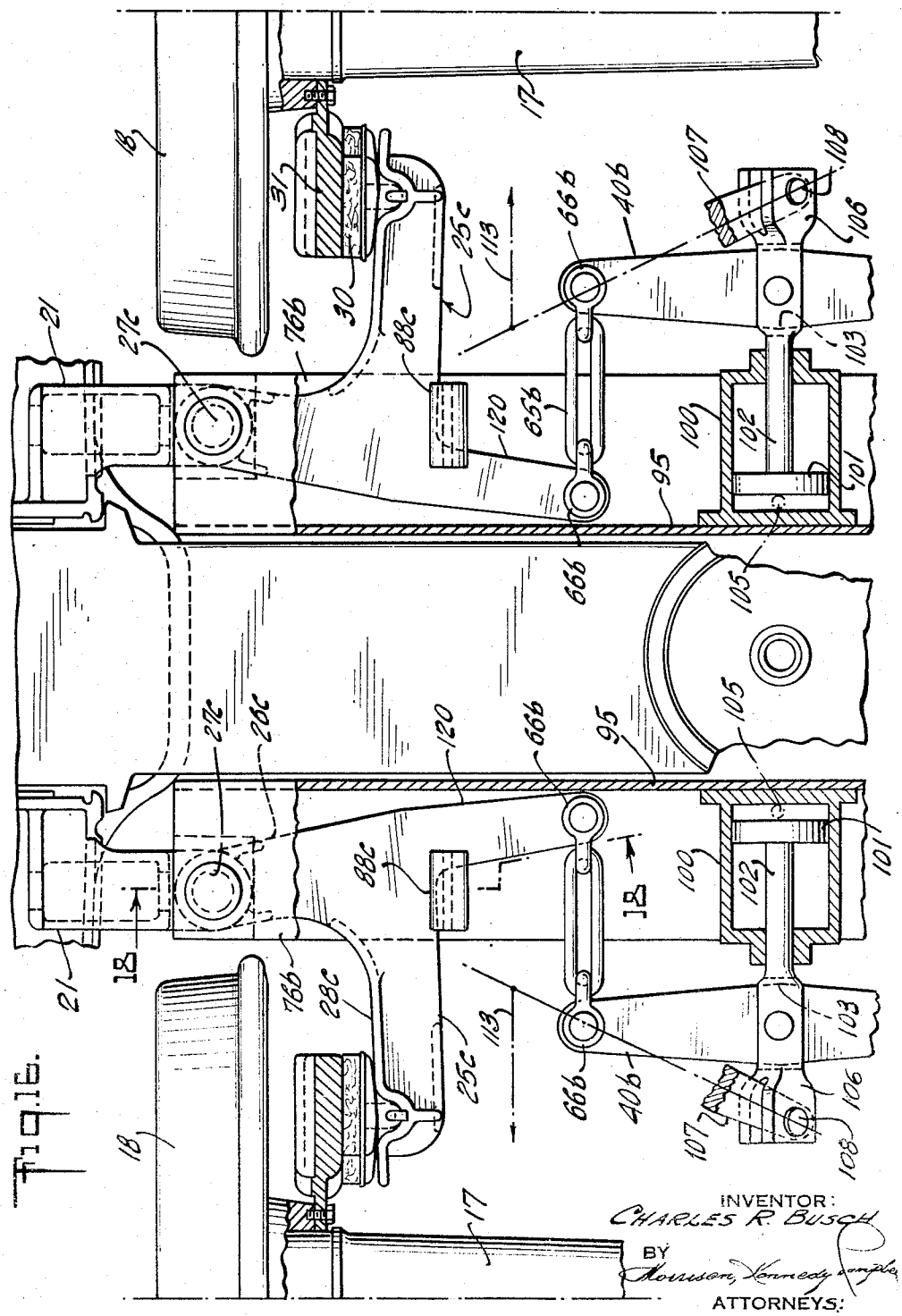

Fig. 16.

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RAILWAY CAR BRAKE MECHANISM

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Fig. 17.

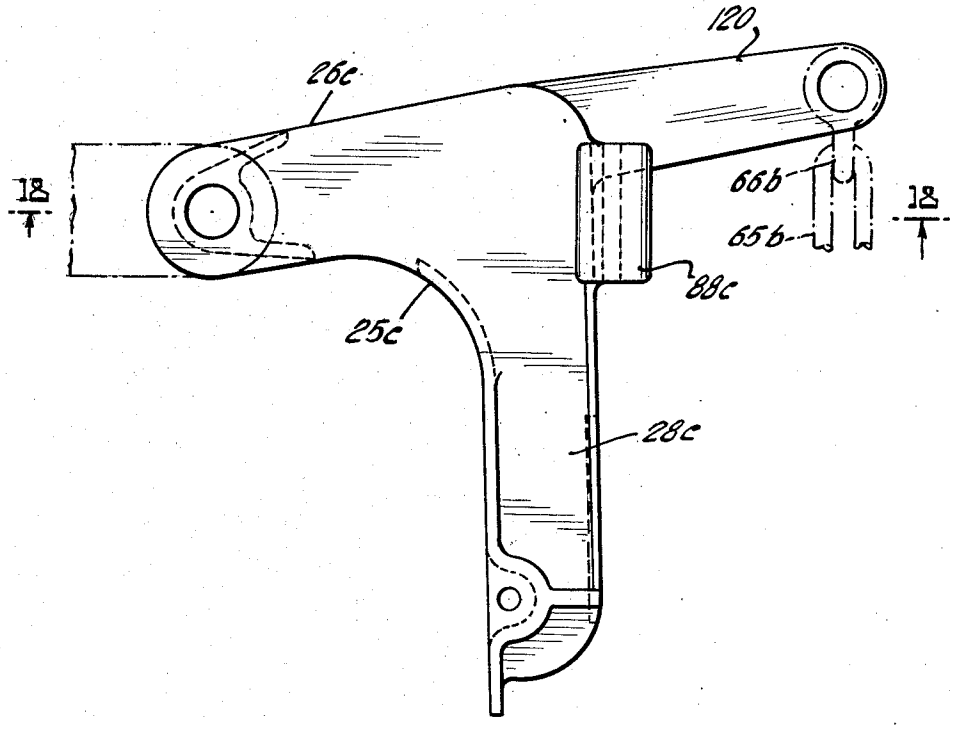
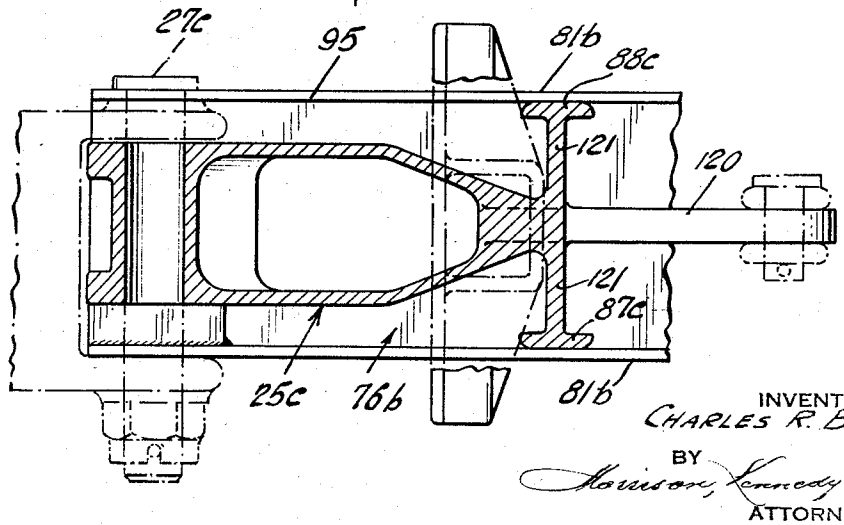


Fig. 18.



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United States Patent Office 2,903,097 Patented Sept. 8, 1959

2,903,097

RAILWAY CAR BRAKE MECHANISM

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

Application September 6, 1955, Serial No. 532, 635

23 Claims. (Cl. 188—59)

The present invention relates to railway car brake mechanisms, especially of the freight type, and is an improvement upon the mechanism shown and described in copending application Serial No. 491,838, filed March 3, 1955.

In the railway car brake mechanism disclosed in the aforesaid application, four linkages in each car truck, powered from a single source, operate brakes against brake discs rotatable with respective car wheels. The car body is mounted on a bolster, spring-supported at its ends on side structures, such as the side frames of the truck, and each of the linkages comprises an L-shape brake head lever, having one leg extending along the bolster and pivotally connected to a bracket affixed to a side frame, and having the other leg extending transversely of the bolster and carrying the brake head for the brake shoe. Every truck has four of these brackets for the four linkages respectively, arranged in pairs at each end of the bolster, the brackets of each pair flanking the bolster and being connected to the corresponding side frame on opposite sides of the bolster guide opening in said side frame.

The brake head levers are supported in horizontal position for horizontal braking movement mainly through their pivotal connections with the brackets secured to the side frames, and since these levers are comparatively heavy, they tend to affect adversely the stability and the steadiness of the mehcanism and to exert heavy bending stresses on the pivotal connections. Moreover, during brake application, forces are exerted on these levers substantially vertically up or down depending on the direction of rotation on the wheels being braked. Such vertical braking forces also exert bending stresses on the pivot connections.

Moreover, the operation of the brakes through the brake head levers tends to pull the side frames inwardly, so that the bolster has to serve as a compression member holding the side frames in correct position on the center lines of the journals.

Power is applied to the brake head levers of each car truck through a bridle beam extending horizontally across the center line of the car truck with its middle region substantially on said center line. In one embodiment of the present invention, the intermediate section of this beam is supported from the car body by a lever power-actuated by a pull rod from a remote source of power, and brake applying power is transmitted from the beam to the brake head levers by connections including flexible couplings to allow for relative vertical movement between the braking parts of the mechanism and the power applying parts. These flexible couplings afford little or no support or guidance for the beam in maintaining its horizontal position.

One object of the present invention is to provide means whereby parts of the railway car brake mechanism disclosed in the aforesaid application are supported, steadied, stabilized, guided and strengthened against sag and against the concentration and effect of destructive stresses,

without interfering with efficient braking operations and while permitting interchangeability between the braking parts on opposite sides of the bolster in each car truck.

In accordance with certain features of the present invention, there is provided on each side of the bolster a horizontal equalizer bar connected at the ends to the side frame brackets on the same side of the bolster. Each brake head lever has on its bottom side a shoe integral or otherwise rigid therewith and resting on the corresponding equalizer bar to support and steady the brake head lever. To use this brake head lever on the other side of the bolster for braking action with another of the wheels, the brake head lever would have to be turned upside down. This would cause the support shoe to be on the upper part of the brake head lever above the equalizer bar and therefore to be useless, unless an additional equalizer bar were employed for the shoe in this upper position. To permit the interchangeability of the brake head levers on opposite sides of the bolster, while permitting support of the levers on either side of the bolster, each lever has identical support shoes on its upper and lower sides. With this arrangement, on whichever side of the bolster a brake head lever is used, it will have a lower shoe for support contact with an equalizer bar.

In an alternative form, instead of a single equalizer bar on each side of the bolster, there are provided on each side two parallel equalizer bars, one above the other, to engage the lower and upper shoes respectively on a brake head lever. With this construction, the two support shoes on each brake head lever are confined between the two superposed equalizer bars, and the lever is thereby confined in its vertical movement, not only downward but also upward, thereby exerting additional steadying influence on the brake head lever. This dual equalizer bar construction on each side of the bolster is also useful during braking action, since some brake head levers tend to be raised and others to be lowered during braking action by the rotating wheels, according to the direction of rotation of these wheels, and the two bars on each side of the bolster limit the movements of the brake lever in either vertical direction.

As an additional feature, the equalizer bar on the side of the bolster along which the power applying bridle beam extends has means for supporting the beam in horizontal position against sagging and for guiding said beam horizontally in its movements in and out of braking position.

The equalizer bar thus serves not only to support and steady the movable parts of the braking mechanism, as described, but also serves as a connecting member between the side frames, assisting the bolster in holding the side frames in proper position substantially on the center lines of the journals.

In one embodiment of the present invention, an air cylinder on the car body, forming part of the conventional air brake equipment, supplies the power for operating the brakes for both trucks of a car. This involves the use of long rods, pivot connections, etc., from a remote source of power to the points of application of the braking power on the trucks.

Another object of the present invention is to provide a railway car truck with power means connected and supported directly on each truck in a new and novel manner to apply braking power to the wheels of each truck effectively from said power means, with a minimum of power transmitting connections and without the use of long connections.

In carrying out this object, a fluid power cylinder is provided for and connected to each car truck. One of the aforesaid equalizer bars between the side frames serves to support the power cylinder with its axis along the center

line of the car body. The piston rod associated with the power cylinder has a connection to the bridle beam to actuate said beam when braking action is indicated and to move thereby the four brake head levers simultaneously into braking positions. This arrangement not only applies the braking power close to the source of power, thereby eliminating long transmitting connections with their easily wearable pivots and bearings and their readiness to vibrate, but also serves to steady the bridle beam, so that this beam does not have to be supported on the equalizer bar, as indicated in connection with the embodiment hereinbefore described.

In the embodiments of the invention above described, four similar symmetrically arranged brake head levers are provided, two on each side of the bolster, and these levers are operated from the bridle beam on one side of the bolster by brake arms pivotally joined intermediate their ends to the brake head levers, respectively. The two brake arms on one side of the bolster are connected to and operated directly from the bridle beam, while the brake arms on the opposite side of the bolster are operated by push rods, pivotally connected to brake arms on opposite sides of the bolster and passing through the bolster. It is apparent that this arrangement involves a substantial number of pivotal and bearing connections from the bridle beam to the brake head levers, and that when this arrangement is operated from a remote source of power, it involves in addition long pivoted transmitting connections from said power source. Connections of this type are easily subject to wear and vibrations and easily susceptible to the disruptive action of unbalanced and concentrated forces.

A further object of the invention is to provide new and improved means whereby the aforesaid arrangement with brake arms and pull rods therebetween is simplified and the number of pivotal and bearing connections is consequently reduced to a minimum.

In carrying out this object, instead of employing a single power cylinder on a railway truck on one side of the bolster for ready connection to a bridle beam on the same side of the bolster, there are provided two similar bridle beams on opposite sides of the bolster centered along the center line of the car body and two power cylinders mounted on the two equalizer bars on opposite sides of the bolster and having operating connections to the bridle beams, respectively. The two brake head levers on each side of the bolster are connected to the corresponding bridle beam on the same side of the bolster to operate said levers directly from said bridle beam for braking application, thereby eliminating the brake arms and the pull rods of the aforesaid embodiments and simplifying the car braking mechanisms.

Various other objects, features and advantages of the invention are apparent from the following description and from the accompanying drawings, in which:

Fig. 1 is in general a top plan view of a railway car truck having braking and supporting features constituting one embodiment of the present invention, some of the parts of the truck being shown broken away to reveal some of the interior structure of the truck;

Fig. 2 is a vertical section taken on lines **2—2** of Fig. 1;

Fig. 3 is a vertical section taken on lines **3—3** of Fig. 1;

Fig. 4 is a detail section taken on lines **4—4** of Fig. 3;

Fig. 5 is a detail section taken on lines **5—5** of Fig. 3;

Fig. 6 is an enlargement of part of Fig. 3;

Fig. 7 is an enlargement of another part of Fig. 3;

Fig. 8 is a detail section taken on lines **8—8** of Fig. 1;

Fig. 9 is a detail section of a railway truck with a modified form of braking and supporting features embodying the present invention, the section being taken along lines corresponding to those along which Fig. 3 was taken;

Fig. 10 is a detail section taken along lines **10—10** of Fig. 9;

Fig. 11 is a detail section of a railway truck with still another modified form of braking and supporting features embodying the present invention, the section being taken along lines corresponding to those along which Fig. 3 was taken;

Fig. 12 is a detail section taken along lines **12—12** of Fig. 11;

Fig. 13 is a detail section taken along lines **13—13** of Fig. 11;

Fig. 14 is a top plan detail view of a railway truck showing the modification of the brake mechanism of Figs. 11 to 13, some of the parts of the truck being shown broken away to reveal some of the interior structure of the truck;

Fig. 15 is a view, partly in front elevation and partly in vertical section, of a portion of the railway truck shown in Fig. 14;

Fig. 16 is a general top plan view partly in horizontal section of a railway truck and shows a further modification of the brake mechanism embodying the present invention;

Fig. 17 is a top plan view of a brake head lever forming part of the mechanism of Fig. 16; and

Fig. 18 is a section of the brake head lever of Fig. 17 taken on lines **18—18** of Figs. 16 and 17.

Referring first to Figs. 1 to 8, and especially to Figs. 1 to 3, there is shown a railway freight car truck comprising a pair of side structures shown constituting a pair of side frames **10** having guide openings **11** to receive the ends of a truck bolster **12** extending between said frames and projecting at the ends into said openings, where they are supported on coil springs (not shown) and are guided by side columns **13** of said openings for vertical shock-absorbed movement. The bolster **12** is provided at the ends with lugs **14** (Fig. 1) and **15** (Fig. 3) engaging the side columns of the side frames for vertical guided movement therealong and has a center conformation **16** (Figs. 1 and 3) for direct pivotal connection to the underside of the railway car body. Between the two side frames **10** and supported thereon by suitable bearings are two parallel axles **17** carrying at opposite ends flanged car wheels **18** which ride on rails **19**.

The brakes for the four car wheels **18** of each car truck are operated by four sets of linkages **20** (only two being shown in Fig. 1) interconnected and actuated from a single source of power. These brake operating linkages **20** are supported from respective brackets **21** flanking the bolster **12** and rigidly connected to the side frames **10** on opposite sides of the bolster guide opening **11**. The brackets **21** can be forged or pressed and welded to the side frames **10** so as to be rigid therewith and each bracket is in the form of an L having a short leg **22** rigidly connected to a corresponding guide bolster column **13** and extending along the corresponding side frame and a longer bracket leg **23** extending inwardly and transversely of said side frame substantially midway between the bolster **12** and the adjacent car wheel **18**.

Each brake operating linkage **20** comprises a brake head piece **25** desirably in the form an an L-shaped lever, one leg **26** of which is pivotally connected to the end of the bracket leg **23** by a hinge or pivot pin **27**, and the other leg **28** carrying at its end a brake head **29**. This brake head **29** carries a shoe **30** for application to a brake rotor or disc **31** affixed to the corresponding axle **17** near the corresponding car wheel **18**.

Each car truck has four similar brake head levers **25** symmetrically arranged for action on four rotor brake discs **31**, respectively. To actuate the brake head levers **25** for uniform braking action on the respective brake discs **31**, there is provided for each pair of opposed brake head levers **25**, on opposite sides of the bolster **12**, a parallel device comprising a pair of parallel brake arms **35** and **36** of equal lengths, pivotally joined intermediate

their ends to the elbows of the brake head levers by pins 37, and pivotally interconnected at one end by a connecting push rod 38 passing through the bolster 12. At their other ends, the brake arms 35 are power-actuated through a power input member 40 in the form of a bridle beam, while the other brake arms 36 are fulcrumed against brackets 41 affixed to the side of the bolster.

The brake head levers 25 are hollow and have open sides in their legs 26, as shown in Fig. 8, and the ends of each push rod 38, where it is pivotally connected to the associated brake arms 35 and 36, extend into and are housed in the cavities of the legs of said brake arms. The ends of each push rod 38 are forked to receive the flat ends of the brake arms 35 and 36 between the projections of the fork (Figs. 1 to 3 and 8). Pins 45 hold the ends of the brake arms 35 and 36 in pivotal knuckle relationship to the ends of the push rod 38. Each push rod 38 at one end has a fixed pivot connection with the brake arm 35. However, at the other end, the push rod 38 has one or more additional adjusting holes 46 (Fig. 1), to extend the pivotal connection for the brake arm 36 to compensate for undue brake shoe wear.

At the elbow of each brake lever 25, where it pivotally connects into the intermediate sections of the corresponding brake arm 35 or 36, this elbow is provided with bosses 47 (Fig. 8) extending inwardly from opposite walls of the brake lever to receive therebetween, with a snug pivotal fit, the flat intermediate section of said brake arm and to receive the hinge pin 37.

Power is applied to the brake arms 35 on each car truck through the beam 40 (Figs. 1, 3, 4 and 7). This beam 40 extends horizontally across the center line of the car truck with its middle point on said center line, and at this region, the beam is integrally formed with a pair of jaws or projections 48 extending obliquely upwardly and defining therebetween a socket 49 to receive therein the lower end of an inclined lever 50. A pivot pin 51, passing through these projections 48 and through the lever 50, pivotally connects the lower end of the lever to the beam 40. The upper end of the lever 50 is pivotally connected by a pin 52 to a lever guide 53 in the form of a U-shaped link, pivotally secured at 54 to a lever bracket 55 affixed to a car body bolster 56 secured to the center sill 57 of the car body 58, and to a bottom plate 59 which carries the center plate 59' shown having a pivot extension into the center conformation 16 of the truck bolster 12 (Fig. 1). The guide 53 has a series of holes 60 (Fig. 4) to permit adjustments in the location of the pin 52 and to permit corresponding adjustments in the length of the stroke of the beam 40 in its brake applying movements; and the intermediate section of the lever 50 is pivotally secured to a pull rod 63 (Figs. 3, 4 and 7) operated from the lever (not shown) of the air cylinder (not shown), supported in the usual manner on the car body and forming part of the conventional air brake equipment.

Since the brake head levers 25 and the brake arms 35 and 36, forming part of the linkages 20, are supported on the side frames 10 against vertical movement by the mounting brackets 21 affixed to said side frames, and since the beam 40, associated pull rod 63, lever 50 and air brake cylinder are attached to the car body 58, and therefore are vertically movable with said car body through the bolster spring supports, flexible connections are provided between the ends of the beam 40 and the inner ends of the brake arms 35 to allow for relative vertical movement between the braking parts of the mechanism and the power applying parts. Each of these flexible connections includes a link 65 (Fig. 1) in the form of an elongated loop pivotally coupled at its ends to the ends of the beam 40 and the ends of the brake arms 35 by means of clevises or shackles 66.

The bridle arrangement, with the flexible connections described, permits the car body with the air brake equipment attached thereto to move up and down against the shock-absorbing action of the springs on the side frames 10 supporting the bolster 12, without transmitting these movements or the stresses therefrom to the brake head levers 25 and in turn to the brake shoes 30 carried thereby, and without disturbing the transmission of full braking power to said shoes from the air brake equipment.

Since the bolster 12 is secured to the car body and spring-supported in the side frames 10 for vertical movement and since the brake arms 36 are held against vertical movement by their support from the side frames 10 through the side frame brackets 21, the brackets 41 (Fig. 1) on the bolster 12, against which the free ends of the brake arms 36 bear, serve as fulcrums for said brake arms, as already described; and in order to permit the up and down movements of the bolster without interfering with the transmission of full braking power, the free ends of these brake arms are provided with rounded vertical guide channels 67 and the bolster brackets 41 are provided with vertical slide flanges 68 seating in said channels and rounded off at their outer edges to permit smooth angular movement of said brake arms about said flanges. With this arrangement, not only are the brake arms 36 fulcrumed about the bolster brackets 41 in their transmission of braking power to the brake head levers 25 connected thereto, but moreover the brackets 41 are permitted to move vertically with respect to the brake arms 36, due to the vertically spring-resisted movements of the bolster 12, without interrupting the fulcrum connection between the bolster brackets 41 and the brake arms 36.

In the operation of the brake mechanism, when the usual air cylinder lever is actuated to apply the brakes, power is transmitted from the air cylinder through said cylinder lever to the pull rod 63, causing said rod to move towards the left (Fig. 1). This causes the lever 50, pivotally suspended from the car body, to move angularly towards the left about its upper pivot support and the horizontal beam 40 to move horizontally towards the left. Since the beam 40 is pulled at its center by the mechanism described, this exerts equal pull at the ends of the beam towards the left, this pull being transmitted to the two brake arms 35 on one side of the bolster 12 through the flexible connections 65, 66. Considering the upper left-hand linkage shown in Fig. 1, pull on the brake arm 35 at one end towards the left causes said brake arm to swing horizontally clockwise about its support at 37 at the elbow of the brake head lever 25. Since at the other end of the brake arm 35, this clockwise movement of the brake arm about its support 37 is resisted by the push rod 38 connected thereto at this end and operating the other brake linkage on the opposite side of the bolster 12, the pull on the brake arm 35, as described, also causes the brake head lever 25 on the left to swing horizontally clockwise about the axis of its pivot pin 27 on the side frame bracket 21, thereby moving the brake shoe 30 carried by said lever against the brake disc 31 and braking the corresponding car wheel 18.

After the brake head lever 25 on the left (Fig. 1) has been immobilized by the brake engagement of its brake shoe 30 with the corresponding brake disc 31, the further clockwise rotation of the brake arm 35 about its support at 37 is continued, causing the push rod 38 to move to the right and thereby to swing the brake arm 36 clockwise about the bracket 41. This moves the brake head lever 25 on the right counterclockwise about its pivot support 27 into braking position in relation to the corresponding brake disc 31.

According to the resistances offered by the different parts of the construction and/or the differences in wear in the different linkages 20, the operation, instead of following the sequences described, may be explained as follows in connection with Fig. 1: When the bridle beam 40 is moved towards the left, the brake arm 35 is swung clockwise about its pivot support 37, thereby moving the push rod 38 towards the right and causing the brake arm 36 to swing clockwise about the bracket 41. This rotates the brake head lever 25 on the right counterclockwise

about its pivot support 27 until its shoe 30 engages the corresponding brake disc 31, thereby immobilizing said brake head lever. Continued movement of the bridle beam 40 towards the left swings the brake arm 35 clockwise about its upper pivotal support to the push rod 38, which pivotal support has become immobilized, thereby causing the brake head lever 25 on the left to swing clockwise about its pivot support 27 until its shoe 30 is in brake engagement with the brake disc 31.

Although the two alternative operations have been described as though definite sequences are followed, this has been done only to make clear the operation of the construction. Actually, the different linkages 20 operate substantially simultaneously and if one linkage reaches braking position before the others, due perhaps to differences in wear, the interval involved is very small and the linkage reaching braking position first serves as an anchorage by which the other linkages are move quickly into braking positions. In every case, the linkages 20 mutually assist each other, since an immobilized brake head lever 25 on one side of the bolster 12, while bearing against its corresponding brake disc 31, at the same time serves as an anchorage by which the opposed brake head lever 25 on the other side of the bolster is quickly moved into braking position in relation to the corresponding brake disc 31.

Except for the manner in which the lever 50 is supported from the car body, the construction of the car truck with its braking mechanism so far described is disclosed and covered in the aforesaid copending application. Reference is made to said application for any details of construction and operation not described or disclosed herein.

It should be noted that, whenever the brakes are applied to the brake discs 31 on the wheels 18, the pulls on the brake head levers 25 tend to pull on the side frame brackets 21 inwardly in a direction transverse to the side frames 10 and to exert bending forces on said brackets tending to break them away from the side frames 10 to which they are rigidly secured. Also, the inward pulls on the side frame brackets 21 are transmitted to the side frames 10, tending to move these frames inwardly in an inboard direction out of alignment with or out of proper position with respect to the wheel journals. Since the bolster 12 is provided at its ends with lugs 14 engaging the side columns 13 of the side frames 10 for vertical guided movement therealong, these lugs permit the bolster to be used to a certain extent as a compression member holding the side frames in correct position on the center lines of the wheel journals, but these lugs may be insufficient for this purpose, unless they are increased in size from conventional practice to add sufficient strength to the bolster to accept this compressive action.

It should also be noted that the horizontal brake head levers 25 are comparatively heavy and project for comparatively long distances from their pivotal or hinge connections at 27 with the side frame brackets 21, so that unless supported in addition at some other point, the resulting cantilever action wll exert large bending stresses on said pivotal connections.

It should also be noted that the beam 40 is horizontally positioned and, because of its flexible and yieldable connections with the brake head levers 25 and the car body, will be unsteady, unless supported and guided in its horizontal position.

As a feature of the present invention, in order to steady and stabilize the different parts of the braking mechanism, to prevent the application of destructive stresses to different parts of the mechanism and especially to the hinge pins 27, and to resist successfully braking forces tending to bring the side frames 10 inwardly in an inboard direction out of parallelism and out of alignment with the wheel journals, there is provided in the construction of Figs. 1 to 8, two equalizer bars 76 on opposite sides of the bolster 12, each connecting the two side frame brackets 21 on the corresponding side of the bolster. For securing each equalizer bar 76 to the corresponding pair of side frame brackets 21, the two hinge pins 27, which pivotally connect the two head levers 25 to said brackets, also pass through the ends of the equalizer bar. To provide the hinge connection between a side frame bracket 21 and a corresponding brake head lever 25 in a manner to permit anchoring of one end of the equalizer bar 76 to said connection, the bracket has a pair of spaced superposed projections 77 and 78 (Figs. 3, 6 and 8) straddling a projection 80 in the lever 25 to form a knuckle joint therewith, and these projections are retained in interconnected pivotal relationship by the hinge pin 27 passing through openings in said projection. The equalizer bar 76 is in the form of an angle, one leg 81 of which is seated at each end upon the lower projection 77 of the corresponding side frame bracket 21 and at said end has a hole through which the corresponding hinge pin 27 passes.

In order to afford a large bearing area between the equalizer bar 76 at each end and the corresponding hinge pin 27, there is welded or otherwise rigidly affixed to the leg 81 of the equalizer bar at each end over the hole in said leg, a collar 82 located between said leg and the projection 80 on the corresponding brake head lever 25 and embracing the hinge pin with a snug rotative fit. This collar 82 serves not only to provide extra bearing surface for the equalizer bar 76 but also serves to afford clearance for the support shoe on the corresponding brake head lever 25, as will be more fully described.

The hinge pin 27 has a head 84 seated on the top projection 78 of the corresponding brake head lever 25 and at the lower end has a cotter pin 85 passing therethrough. If desired, to assure against the shearing of the cotter pin 85, a castle nut may be threaded on the lower end of the hinge pin 27 and employed in connection with the cotter pin, as shown in the modification of Figs. 9 to 12.

As will now be clear, the equalizer bars 76, secured to the side frame brackets 21 through the hinge pins 27 as described, assist the bolster 12 in maintaining the truck side frames 10 in alignment or parallel to the respective rails. The equalizer bars 76 also serve the important function of supporting the weight of the brake head levers 25, thus relieving the hinge pins 27 from excessive stresses, which will be considerable especially when the brake shoes on said levers are pressed against the wheel discs during a brake application. To the latter end, each of the brake head levers 25 has a support shoe 87 at the bottom of the outer end of its leg 26, seated on the top flange leg 81 of the corresponding equalizer bar 76. These support shoes 87 are desirably cast integral with their corresponding brake head levers 25, but they may be welded, riveted, bolted or otherwise made rigid with said levers. The shoes 87 support the outer ends of the legs 26 of the corresponding brake head levers 25, and thereby prevent excessive bending stresses from being transmitted to the hinge pins 27. The shoes 87 on the brake head levers 25 maintain the levers in horizontal position, thereby steadying said levers against vibration during normal running operations when the brakes are disengaged and also guide the levers horizontally in their brake applying and releasing movements.

If each of the brake head levers 25 is provided with a single support shoe 87 at the bottom, then although the brake head lever aside from the shoe may be placed interchangeably on either end of the bolster 12 or on either side thereof, when the brake head lever is placed on the opposite side of the bolster, it must be turned upside down, so that a shoe which was on the bottom side of the brake head lever when on one side of the bolster will be on the top side when on the opposite side of the bolster. Under these conditions, it would be necessary to provide a left-hand brake head lever and a right-hand brake lever. To avoid this condition, and to make all of the four brake head levers 25 on each

truck interchangeable, each of the brake head levers has two similar support shoes **87** and **88**, one on the bottom and one on the top in vertical alignment. On either side of the bolster **12**, the brake head lever **25** will have a bottom support shoe in seating and supporting engagement with a corresponding equalizer bar **76**.

The bridle beam **40** is suspended from the car body through the pivoted lever **50** and at the ends is connected to the brake arms **35** and **36** through the flexible connections **65** and **66**, as already described. The beam **40**, therefore, would be somewhat unsteady unless supported and guided. To steady the beam **40** and support it in horizontal position and to guide it for horizontal movement when actuated into and out of braking position, the equalizer bar **76** on the same side of the bolster **12** as the beam **40** has secured thereto two supports **90** (Figs. 1, 3, 5 and 7) spaced to seat the beam at spaced regions thereof near their outer ends. These supports **90** are shown in the form of U-shaped members having a lower leg **91** affixed to the top flange **81** of the equalizer bar **76**, as for example by rivets, and having an upper leg **92** on which the flat beam **40** rests, as shown more fully in Fig. 5, and across which the beam is guided horizontally in its brake applying and brake disengaging movements. The upper beam supporting legs **92** of the supports **90** could, if desired, have a certain amount of inherent elasticity to absorb some of the shocks transmitted to the bridle beam **40**.

In the constructions of Figs. 1 to 8, each of the brake head levers **25** has a pair of support shoes **87** and **88**, and only one equalizer bar **76** on each side of the bolster **12**, to engage only the bottom shoe **87**, while the upper shoe **88** remains idle and serves merely to allow for interchangeability of the brake head lever for either side of the bolster. During brake applications, the rotating wheel **18** on which the brake is being applied imparts to the corresponding brake head lever a force having a substantial vertical component which extends up or down depending on the direction of rotation of the wheel. For example, considering the car truck of Fig. 1, and assuming that the car is moving towards the right, the wheels **18** on the left-hand side of the bolster **12** will urge the corresponding brake head levers **25** on this side of the bolster downward during brake application, while the wheels **18** on the right-hand side of the bolster **12** will urge the corresponding brake head levers on the latter side of the bolster upward during brake application. To hold the brake head levers **25** against movements up or down, while retaining the features by which the brake head levers may be interchangeably used on either side of the bolster **12**, there is shown in the modification of Figs. 9 and 10, on each side of the bolster, an upper second equalizer bar **76***a* similar to the lower equalizer bar **76** and serving as a stop for the upper shoes **88** on the two brake head levers on the corresponding side of the bolster. This upper equalizer bar **76***a* is also in the form of an angle, and has a flange or leg **81***a* close to the upper projection **78** of the corresponding side frame bracket **21** and having a hole to snugly receive the corresponding hinge pin **27***a*. To afford a large bearing area between each of the upper equalizer bars **76***a* and the corresponding hinge pin **27***a*, a collar **82***a* is welded or otherwise rigidly affixed to the leg **81***a* of the equalizer bar at each end over the hole in said leg through which the hinge pin passes.

With the two equalizer bars **76** and **76***a* located on each side of the bolster **12**, one above the other, the lower shoe **87** on each of the brake head levers **25** seats on the upper side of the leg **81** of the corresponding lower equalizer bar **76** and slides therealong during brake application or disengagement, while the upper shoe **88** on said brake head levers **25** either engages the underside of the leg **81***a* on the corresponding upper equalizer bar **76***a* and slides therealong during brake application or disengagement, or at least is close enough to said leg **81***a* to cause said lever to be held thereby against upward movement, except to the smallest extent. With this arrangement, the brake head levers **25** are confined and steadied against movement vertically during normal running operations and also during brake application and disengagement. Also, the double equalizer bars **76** and **76***a* on each side of the bolster **12**, secured to the side frame brackets **21**, serve to sustain the side frames **10** against inward movement out of parallelism with the rails with additional compressive resistance.

In the form of the invention disclosed in Figs. 11 to 15, instead of providing two separate equalizer bars on each side of the bolster **12** as shown in Figs. 9 and 10, there is provided a single equalizer bar **76***b* on each side of the bolster **12**, having two webs or flanges **81***b* for engaging the upper and lower shoes **87** and **88** on each brake head lever **25**. This equalizer bar **76***b* is desirably in the form of a channel bar, having its upper and lower flanges **81***b* seated at each end on the lower and upper projections **77** and **78** respectively of the corresponding side frame bracket **21** at said end and receiving at said end the corresponding hinge pin **27***b*. The lower channel flange **81***b* has welded or otherwise rigidly affixed thereto, over each hole through which the hinge pin **27***b* passes, a collar **82***b* embracing said pin with a snug fit to afford added bearing area between the equalizer bar **76***b* and said pin. If desired, a similar collar may be provided on the upper flange **81***b* of the equalizer bar. The equalizer bar **76***b* serves as one of its functions to hold the side frames **10** against inward movement out of alignment or parallelism with the rails, as in the constructions of Figs. 1 to 10.

The two shoes **87** and **88** on each brake head lever **25** engage the inner faces of the two flanges **81***b* of the corresponding equalizer bar **76***b* to confine the brake head lever against vertical movements and to guide said lever horizontally during brake application and disengagement.

The back web or wall **95** of the equalizer bar **76***b* would have openings **96** therein sufficiently large to permit the push rods **38** to pass therethrough.

In the forms of the invention shown in Figs. 1 to 10, an air cylinder on the car body, forming part of the conventional air brake equipment, supplies the power for operating both trucks of a car through the pull rods **63**, which are pivotally connected to the intermediate sections of the levers **50** of said trucks and operated from the usual lever (not shown) of the cylinder. In this form of the invention, when the hand brake is used in the conventional manner instead of the air power brake, as for example, for prolonged braking periods during loading, the braking pressure manually set is transmitted to the pull rod **63** of each truck, in the manner well known in the art.

As an additional feature of the present invention and according to the modification of Figs. 11 to 15, instead of operating the brakes from an air cylinder located on the car body remotely from the car trucks and serving both trucks of a car, the power for operating the brakes is derived from an individual fluid power unit **100** on each truck, thereby eliminating the long pivoted transmitting connections from said unit to the points of application of the brakes. In the specific form shown, this power unit **100** in the form of an air cylinder is rigidly secured to one of the equalizer bars **76***b* and specifically to the back wall **95** of said bar on the center line of the equalizer bar and of the truck. In this air cylinder **100** is a piston **101** with a rod **102** connected at one end to said piston and projecting out of said cylinder for connection to the bridle beam **40***b*. For connecting the piston rod **102** to the bridle beam **40***b*, the projecting part of the rod has an opening **103** through which the beam passes, and is connected to said beam by a pin **104** passing through said rod in the region of said opening and through said beam.

Air under pressure for power braking is carried to the right-hand end of the air cylinder **100** by a flexible hose **105** coming from the body of the car and connected to the main train line on the car. When power braking is indicated, air is admitted through the flexible hose **105** into the cylinder **100** to cause the piston **101** therein to move. This movement of the piston **101** is transmitted to the piston rod **102** and directly therefrom to the bridle beam **40***b* to cause said beam to apply the four brakes on the wheel discs of the truck in the manner already described.

For applying a hand brake to the arrangement of Figs. 11 to 15, the outer end of the piston rod **102** terminates in a pair of jaws or a fork **106** for receiving the lower end of a lever **107** and a pivot pin **108** passing through said fork and said lever to pivotally connect said lever directly to said piston rod and to pivotally indirectly connect thereby said lever to the bridle beam **40***b*. The lever **107** extends upwardly in an inclined direction, and at its upper end is connected by a pin **110** to a guide **111** in the form of a U-shaped link, pivotally connected to a bracket **112** secured to the car body bolster **56** which in turn is secured to the center sill **57** of the car body **58**. The guide **111**, which has a series of holes to permit adjustments in the location of the pin **110** and to permit corresponding adjustments in the length of the stroke of the beam in its hand brake applying movements, is similar in construction to the guide **53** in Fig. 4. The lever **107** extends at a comparatively wide angle (for example at an angle of 57°) with the vertical plane, to permit said lever to be straight instead of kinked.

For applying the hand brake, the lever **107** is pivotally attached intermediate its ends to one end of a hand pull rod **113**, the other end of which is attached to the usual body lever (not shown) of the car. For hand brake application, the pull rod **113** is moved in the usual manner, causing the lever **107** to swing about its upper pivotal support on the guide **111** into position to move the bridle beam **40***b* and the brakes to be applied simultaneously to the four discs on the wheels of the truck.

It is seen that, with the construction of Figs. 11 to 15, the air cylinder is mounted rigidly on the truck side frames **10** and remains rigid during the running operation of the car, this being most advantageous over other types of disc brakes in which the air cylinder or air cylinders are mounted above the spring line and on the car body.

In the construction of Figs. 11 to 15, flexible connections **65***b* and **66***b* are provided between the bridle beam **40***b* and the brake arms **35** to operate these brake arms, these connections being similar to the connections **65** and **66** in the construction of Figs. 1 to 8, except that the loops **65***b* connecting the clevises **66***b* might be longer to accommodate the bridle beam.

In the construction of Figs. 11 to 15, in the absence of an air cylinder **100** connected to each car truck as described, and with the bridle beam supported and operated from a remote air cylinder as in the construction of Figs. 1 to 10, the bridle beam would be supported for horizontal movement by means of two supports, similar to the supports **90** in the construction of Figs. 1 to 8, and rigidly secured to the top of the flange **81***b* of the equalizer bar **76***b*. However, with the direct connection between the piston rod **102** and the bridle beam **40***b*, as shown in Figs. 14 and 15, the beam will be sufficiently supported and guided for horizontal movement by said piston rod to permit the elimination of special supports similar to the supports **90** of Figs. 1 to 8.

In the construction of Figs. 11 to 15, with one air cylinder **100** and one bridle beam **40***b* to each car truck, although the power source is located close to the regions of application of the brakes, thereby eliminating long pivoted transmitting connections between said power source and the bridle beam, there are still pivoted members between the bridle beam and the brake applying regions. According to the modification of Figs. 16 to 18, two air cylinders **100** are provided for each car truck on opposite sides of the bolster **12***c* to operate the two pairs of brake head levers **25***c* on opposite sides of the bolster, thereby eliminating the brake arms **35** and **36** and the pull rods **38** with associated pivot and bearing connections employed in the constructions of Figs. 1 to 15. In the construction of Figs. 16 to 18, the two equalizer channel bars **76***b* on opposite sides of the bolster **12** are connected at their ends to the side frame brackets **21** by pivot pins **27***c* as in the construction of Figs. 11 to 15. These pins **27***c* also pivotally connect the brake head levers **25***c* to the side frame brackets **21**, as in the construction of Figs. 11 to 15.

Connected to the back webs or walls **95** of the equalizer bars **76***b* are the two air cylinders **100** in axial alignment along the center line of the car truck but in reverse relationship. Each of these cylinders **100** is supplied with air under pressure when brake application is indicated, by hose connections **105**, similar to that shown in Figs. 14 and 15.

Instead of one bridle beam **40***b* for each car truck, as in the construction of Figs. 11 to 15, two bridle beams **40***b* are provided, each operated from the corresponding air cylinder **100** as in the construction of Figs. 11 to 15. This double cylinder and bridle beam arrangement permits each bridle beam **40***b* to be connected directly to the corresponding brake head lever **25***c* in the manner to be described.

The brake beam levers **25***c* are modified in construction to permit their direct connection to the bridle beams **40***b*. To that end, each brake beam lever **25***c* is angular in shape with legs **26***c* and **28***c*, as in the construction of Figs. 1 to 15, but the lever has a third leg **120** integral or otherwise rigid therewith and extending substantially in line with the leg **26***c*. The outer end of each leg **120** is flexibly connected to the corresponding outer end of a bridle beam **40***b* by a loop **65***b* and clevises **66***b*. The four brake head levers **25***c* are thereby operated directly from the two bridle beams **40***b* and in turn from the two air cylinders **100** adjacent thereto, without the use of brake arms **35** and **36** and the pull rods **38** employed in the construction of Figs. 1 to 15.

The brake head levers **25***c* have integral or otherwise rigid therewith flanges **121** with shoes **87***c* and **88***c* adapted to engage the inner confronting faces of the upper and lower flanges **81***c* of the equalizer bars **76***b*, as to be supported on the lower flanges and limited against upward movement by the upper flanges.

The two bridle beams **40***b* may be operated for hand brake application as in the construction of Figs. 11 to 15 and, except as otherwise indicated, the construction and operation of the mechanism of Figs. 16 to 18 in all respects are similar to those of Figs. 1 to 15 described.

In the construction of Figs. 16 to 18, instead of two cylinders **100**, as far as certain aspects of the invention are concerned, a single cylinder **100** may be provided for the two bridle beams **40***b* and while the piston rod **102** operates directly one of the bridle beams for brake applying operation in the manner described in connection with the construction of Figs. 16 to 18, a reverse connection between said piston rod and the other bridle beam may be employed to cause the latter bridle beam to move simultaneously in the opposite direction for brake applying operation. In such a construction, the features of the brake head levers **25***c* with their direct connections to the bridle beams **40***b* shown in Figs. 16 to 18 could be retained.

Also, as far as certain aspects of the invention are concerned, the simplified arrangement of Figs. 16 to 18 may be employed in connection with the construction of Figs. 1 to 10, in which the fluid power is derived from a remote source. In such a construction, two bridle beams would be employed on opposite sides of the bolster and would be operated from the remote source of fluid power.

These bridle beams would have direct connections with brake head levers similar to the brake head levers 25c of Figs. 16 to 18.

While the invention has been described with particular reference to specific embodiments, it is to be understood that it is not to be limited thereto, but is to be construed broadly and restricted solely by the scope of the appended claims.

What is claimed is:

1. In a railway car truck, the combination of a pair of opposed side structures extending along the longitudinal direction of the truck, a plurality of wheels supported on said side structures, two of said wheels extending coaxially near opposite sides of the truck with their common axis extending between said side structures transverse to said longitudinal direction, means for resiliently supporting a railway car on the truck permitting the railway car to move up and down under resilient action relative to the side structures, brake discs located on the inboard sides of and rigid with said coaxial wheels respectively for rotation therewith, said brake discs presenting respective brake faces on the inboard sides thereof, a pair of brake head levers for said brake discs respectively, a hinge connection between each brake head lever and the corresponding side structure supporting the latter brake head lever from the latter side structure for angular movements substantially horizontally about the axis of said hinge connection into and out of braking position in relation to the brake face on the corresponding brake disc, means for actuating said levers into braking position, said levers when in braking positions exerting pressures on said side structures through said hinge connections in directions having substantial components transverse to the longitudinal direction of the truck, and a bar extending between said side structures and pivotally secured near its ends to said hinge connections on hinge axes coextensive with the hinge axes respectively of said levers, said bar through said hinge connections resisting said transverse components of the pressures, thereby holding said side structures against transverse movements resulting from said pressures and at the same time permitting limited relative movements of said side structures along the longitudinal directions of the truck.

2. In a railway car truck, the combination of a pair of opposed substantially parallel side structures extending along the longitudinal direction of the truck, four wheels supported on said side structures with two wheels on each side of the truck and with each wheels on one side coaxial with a corresponding wheel on the opposite side, the axes of said wheels extending substantially parallel between said side structures and transverse to said longitudinal direction, means for resiliently supporting a railway car on the truck permitting the railway car to move up and down under resilient action relative to the side structures and comprising a truck bolster extending between said side structures and located between the two pairs of coaxial wheels, and spring means supporting the ends of said bolster on said side structures respectively, means for applying brakes to the wheels comprising brake discs on the inboard sides of the wheels respectively rigid with the wheels respectively for rotation therewith and presenting brake faces on their inboard sides, four brake head levers, one for each disc, and a hinge connection between each brake head lever and the corresponding side structure for supporting the latter brake head lever from the latter side structure for angular movements substantially horizontally about the axis of said hinge connection into and out of braking position in relation to the brake face on the corresponding brake disc, said hinge connections being arranged with two being located between one side of the truck bolster and the axis of the coaxial wheels on the latter side of the truck bolster and being connected to said side structures respectively and two being located between the other side of the truck bolster and the axis of the coaxial wheels on the latter side of the truck bolster and being connected to said side structures respectively, said brake head levers when in braking positions exerting pressures on said side structures having substantial components in inboard directions, and a pair of parallel bars on opposite sides of the bolster extending between the side structures and each secured at its ends to the side structures through said hinge connections on hinge axes coextensive with the hinge axes respectively of said levers, said bars serving to resist said inboard components of the pressures and to hold thereby the side structures against inboard movements, and forming with said side structures a parallel motion mechanism permitting limited relative endwise movements of the truck when rounding a curve.

3. In a railway car truck, the combination of a pair of opposed side structures extending along the longitudinal direction of the truck, a plurality of wheels supported on said side structures, two of said wheels extending coaxially near opposite sides of the truck with their common axis extending transverse to said longitudinal direction, means for resiliently supporting a railway car on the truck permitting the railway car to move under resilient action up and down relative to the side structures, brake discs located on the inboard sides of and rigid with said coaxial wheels respectively for rotation therewith, said brake discs presenting respective brake faces on the inboard sides thereof, a pair of brake head levers for said brake discs respectively, a hinge connection between each brake head lever and the corresponding side structure supporting the latter brake head lever from the latter side structure for angular movements substantially horizontally about the axis of said hinge connection into and out of braking position in relation to the brake face on the corresponding brake disc, means for actuating said levers into braking positions, said levers when in braking positions exerting pressures on said side structures through said hinge connections in directions having substantial components transverse to the longitudinal direction of the truck, and a bar extending between said side structures and pivotally secured near its ends to said side structures respectively, said bar resisting said transverse components of pressures, thereby holding said side structures against movements resulting from said pressures and at the same time permitting limited relative movements of said side structures along the longitudinal directions of the truck, each of said levers having a section remote from its hinge axis seated on said bar, said bar presenting a seating surface to said lever sections extensive enough to support said levers at said remote sections throughout the full extent of angular movements of the levers.

4. In a railway car truck, the combination as described in claim 3, wherein the ends of the bars are connected to said hinge connections respectively on hinge axes coextensive wtih the hinge axes of said levers respectively.

5. In a railway car truck, the combination as described in claim 3, wherein each of said brake head levers has a first leg extending over and along said bar and hinged near one end to the corresponding hinge connection, said leg carrying the section seated on said bar and remote from the latter end, each of said brake head levers also having a second leg transverse to said first leg and carrying a brake head for a brake shoe.

6. In a railway car truck, the combination as described in claim 3, wherein the brake head levers are interchangeable in any one of two positions, each of said levers having integral therewith on its lower side remote from its hinge axis a support wear shoe defining its section for seating engagement with said bar when the latter lever is in one position to coact with one brake disc and having integral therewith a similar support wear shoe on its upper side located substantially directly over the lower shoe for seating engagement with said bar when the lever is turned upside down in its other position to coact with the other brake disc.

7. In a railway car truck, the combination of a pair of opposed substantially parallel side structures extending along the longitudinal direction of the truck, four wheels supported on said side structures with two wheels on each side of the truck and with each wheel on one side coaxial with a corresponding wheel on the opposite side, the axes of said wheels extending substantially parallel between said side structures and transverse to said longitudinal direction, means for resiliently supporting a railway car on the truck permitting the railway car to move up and down under resilient action relative to the side structures and comprising a truck bolster extending between said side structures and located between the two pairs of coaxial wheels, and spring means supporting the ends of said bolster on said side structures respectively, means for applying brakes to the wheels comprising brake discs on the inboard sides of the wheels respectively rigid with the wheels respectively for rotation therewith and presenting brake faces on their inboard sides, four brake head levers, one for each disc, and a hinge connection between each brake head lever and the corresponding side structure for supporting the latter brake head lever from the latter side structure for angular movements substantially horizontally about the axis of said hinge connection into and out of braking position in relation to the brake face on the corresponding brake disc, said hinge connections being arranged with two being located between one side of the truck bolster and the axis of the coaxial wheels on the latter side of the truck bolster and being connected to said side structures respectively and two being located between the other side of the truck bolster and the axis of the coaxial wheels on the latter side of the truck bolster and being connected to said side structures respectively, said brake head levers when in braking positions exerting pressures on said side structures having substantial components in inboard directions, and a pair of parallel bars on opposite sides of the bolster extending between the side structures and located between the bolster and the axes of the wheels, each of said bars having its end pivotally secured to the side structures respectively, said bars serving to resist said inboard components of the pressures and to hold thereby the side structures against inboard movements and forming with said side structures a parallel motion mechanism permitting limited relative endwise movements of the truck when rounding a curve, said levers having respective sections remote from their respective hinge axes seated on said bars, two levers on one side of the truck bolster having their remote sections seated on the bar on the latter side of the truck bolster, and the other two levers on the other side of the truck bolster having their remote sections seated on the other bar on the latter side of the truck bolster.

8. In a railway car truck, the combination as described in claim 7, wherein each of said brake head levers has a first leg extending along one side of said bolster and along and over the bar on the latter side of the bolster and hinged near one end to the corresponding hinge connection, said leg carrying the section seated on said bar and remote from its hinge axis, each of said levers also having a second leg transverse to said first leg and carrying a brake head for a brake shoe.

9. In a railway car truck, the combination as described in claim 7, wherein the four brake head levers are similar and interchangeable in any one of four positions, each of said levers having integral therewith on its lower side remote from its hinge axis a support wear shoe defining its section for seating engagement with one of said bars when the latter lever is in one position to coact with one brake disc, and having integral therewith a similar support wear shoe on its upper side located substantially directly over the lower shoe for seating engagement with one of said bars when the lever is turned upside down in another position for coaction with another brake disc.

10. In a railway car truck, the combination of a pair of opposed side structures extending along the longitudinal direction of the truck, a plurality of wheels supported on said side structures, two of said wheels extending coaxially near opposite sides of the truck with their common axis extending between said side structures transverse to said longitudinal direction, means for resiliently supporting a railway car on the truck permitting the railway car to move up and down under resilient action relative to the side structures, brake discs located on the inboard sides of and rigid with said coaxial wheels respectively for rotation therewith, said brake discs presenting respective brake faces on the inboard sides thereof, a pair of brake head levers for said brake discs respectively, a hinge connection between each brake head lever and the corresponding side structure supporting the latter brake head lever from the latter side structure for angular movements substantially horizontally about the axis of said hinge connection into and out of braking position in relation to the brake face on the corresponding brake disc, means for actuating said lever into braking position, said levers when in braking positions exerting pressures on said side structures through said hinge connections in directions having substantial components transverse to the longitudinal direction of the truck, and a bar extending between said side structures and pivotally secured near its end to said side structures respectively, said bar resisting said transverse components of the pressures, thereby holding said side structures against transverse movements resulting from said pressures and at the same time, permitting limited relative movements of said structures along the longitudinal directions of the truck, said means for actuating said levers into braking positions comprising a substantially horizontal bridle beam extending between the side structures, and means connecting the ends of the beam to the brake head levers for moving the brake head levers into and out of brake applying position, said bridle beam being supported on said bar and being guided thereby for substantially horizontal movement.

11. In a railway car truck, the combination as described in claim 2, said levers having respective sections remote from their respective hinge axes seated on said bars, two levers on one side of the truck bolster having their remote section seated on the bar on the latter side of the truck bolster, and the other two levers on the other side of the truck bolster having their remote sections seated on the other bar on the latter side of the truck bolster, the means for applying brakes to the wheels also comprising a substantially horizontal bridle beam extending between the side structures on one side of the bolster, and means connecting the ends of the beams to the two brake head levers respectively on the latter side of the bolster, said bridle beam being supported on the bar on the latter side of the bolster and being guided thereby for substantially horizontal movement.

12. In a railway car truck, the combination according to claim 3, wherein there is provided a second bar extending between said side structures and pivotally secured near its ends to said side structures respectively, said second bar resisting said transverse components of pressures and at the same time permitting limited relative movements of said side structures along the longitudinal directions of the truck, said second bar presenting a substantially horizontal seating surface adapted to engage the upper sides of the brake head levers at regions of said brake head levers spaced from the hinge axes respectively of the brake head levers to confine said levers against excessive upward movements.

13. In a railway car truck, the combination according to claim 12, wherein said second bar is parallel to and extends above the first-mentioned bar.

14. In a railway car truck, the combination according to claim 12, wherein said bars are separate.

15. In a railway car truck, the combination according to claim 12, wherein said second bar is parallel to and extends above the first-mentioned bar, said bars con-

stituting a single channel member, the flanges of which present the seating surfaces for the lower and upper sides respectively of the levers.

16. In a railway car truck, the combination according to claim 3, wherein the means for actuating said levers into braking positions comprises a fluid power chamber rigidly secured to said bar and power-transmitting means operated from said chamber for operating said brake head levers substantially at the same time into braking positions.

17. In a railway car truck, the combination according to claim 1, wherein the means for actuating said levers into braking positions comprises a fluid power chamber rigidly secured to said bar and power-transmitting means operated from said chamber for operating said brake head levers substantially at the same time into braking positions.

18. In a railway car truck, the combination according to claim 2, comprising two bridle beams, one for each pair of brake head levers associated with a corresponding pair of coaxial wheels, means containing a source of fluid power supported on at least one of said bars to form a unit with the truck, transmission means between the fluid power containing means and the beams for operating the beams simultaneously for brake applications, and connections between each beam and the corresponding pair of brake head levers associated with a corresponding pair of coaxial wheels for moving the latter pair of brake head levers simultaneously into brake applying position.

19. In a railway car truck, the combination according to claim 7, comprising two bridle beams, one for each pair of brake head levers associated with a corresponding pair of coaxial wheels, said beams being supported on said bars respectively for substantially horizontal movements, means for operating the beams simultaneously for brake applications, and connections between each beam and the corresponding pair of brake head levers associated with a corresponding pair of coaxial wheels, for moving the brake head levers simultaneously into brake applying positions.

20. In a railway car truck, the combination according to claim 10, each of said brake head levers having three legs, one of the legs being hingedly connected to the corresponding side structure and another leg carrying the brake head, the means connecting the ends of the beam to the brake head levers being connected to the third legs of said brake head levers.

21. In a railway car truck, the combination according to claim 7, each of said brake head levers having three legs, one of the legs being hingedly connected to the corresponding side structure and another leg carrying the brake head, said combination comprising two bridle beams, one for each pair of brake head levers associated with a corresponding pair of coaxial wheels, said beams being supported on said bars respectively for horizontal movements, means for operating the beams simultaneously for brake applications, and connections between the ends of each beam and the third legs respectively of the corresponding pair of brake head levers associated with a corresponding pair of coaxial wheels for moving the brake head levers simultaneously into brake applying positions.

22. In a railway car truck, the combination according to claim 7, comprising two bridle beams extending across the longitudinal center line of the truck, a pair of axially aligned air cylinders along said center line supported on said bars respectively, a piston in each cylinder, a piston rod connected to the piston and to the center of the corresponding bridle beam, and connections between each beam and the corresponding pair of brake head levers associated with a corresponding pair of coaxial wheels for moving the brake head levers simultaneously into brake applying positions.

23. In a railway car truck, the combination according to claim 3, wherein each of said levers has three legs rigid with the body thereof, one of said legs having means for hingedly connecting the lever to the corresponding side structure for angular movements substantially horizontal, another leg carrying a brake head and a third leg having means for connection to a brake power-transmitting member forming part of the means for actuating said levers into braking positions, each of said levers having rigid therewith on its lower side and at a region spaced from the hinge axis thereof a support wear shoe seated on said bar.

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