

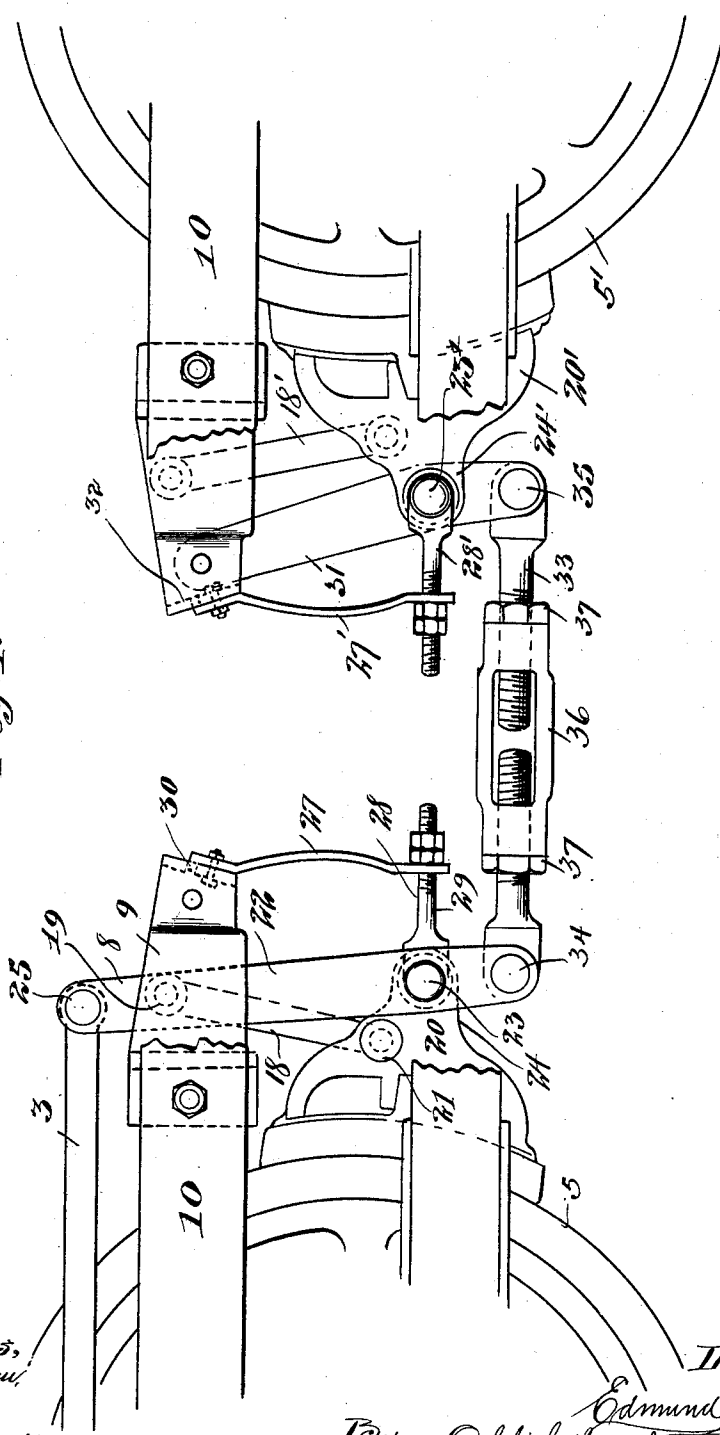
E. A. CURTIS.  
BRAKE RIGGING.

APPLICATION FILED SEPT. 12, 1901.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



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No. 737,713.

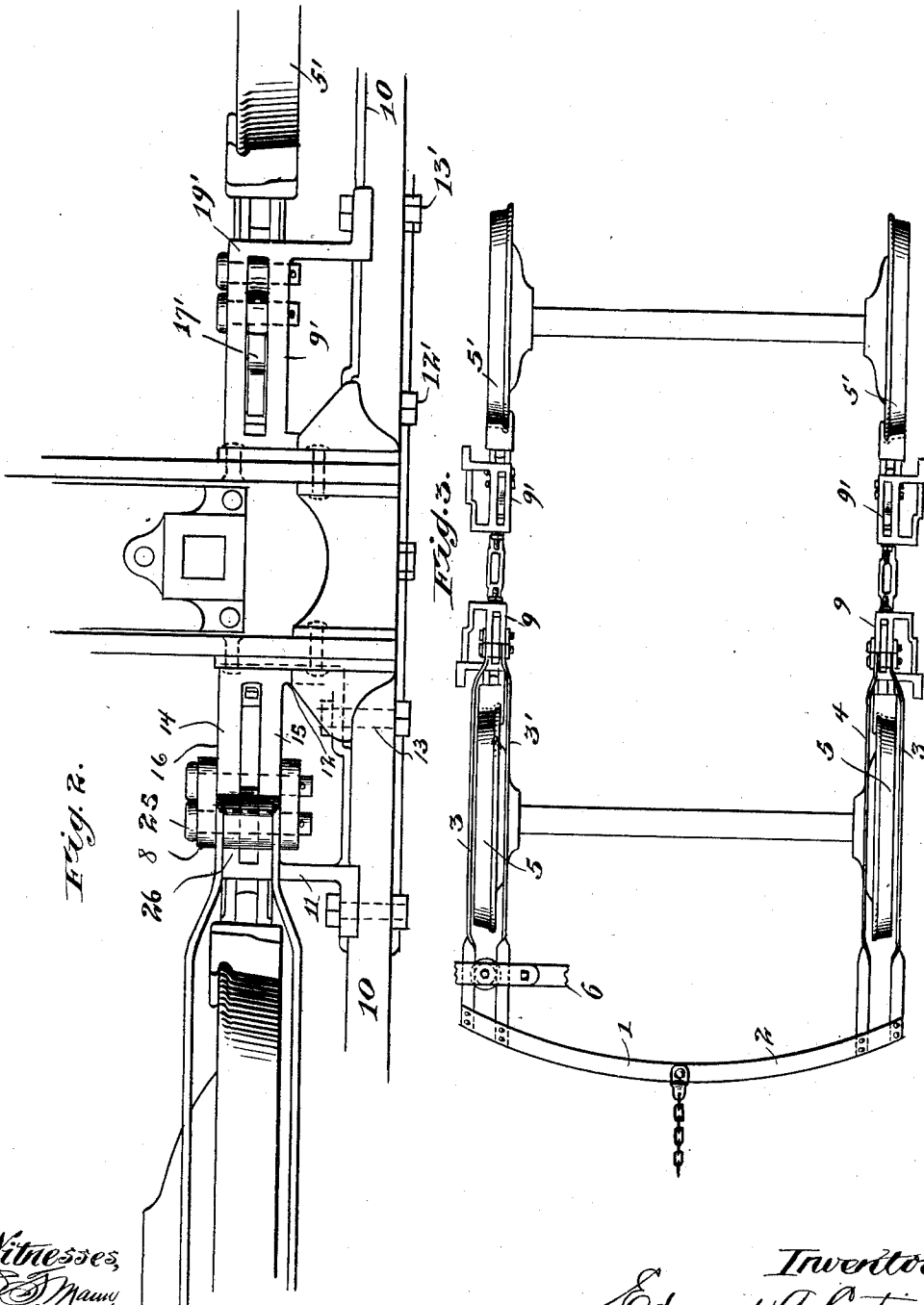
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E. A. CURTIS.  
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NO MODEL.

3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

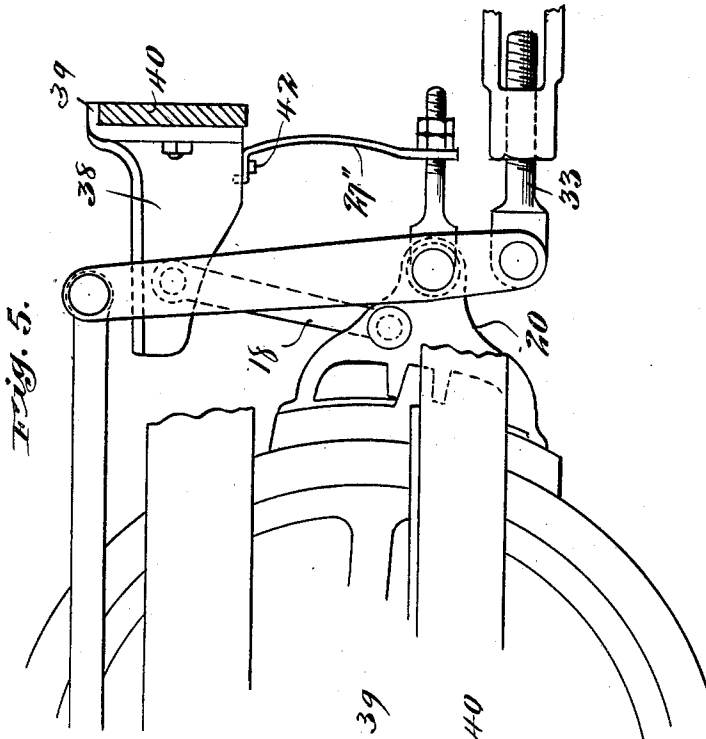


Fig. 5.

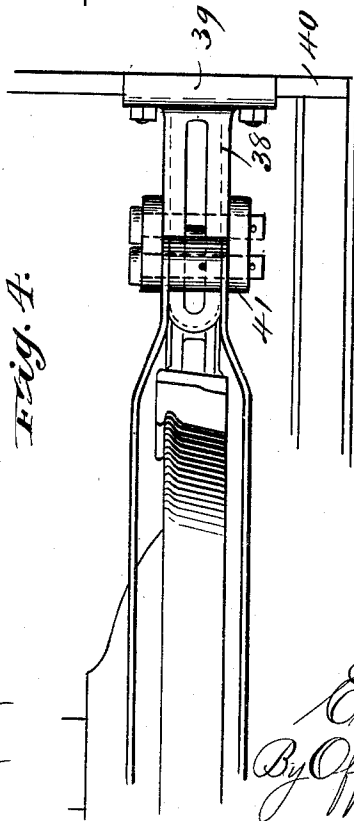


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## BRAKE-RIGGING.

**SPECIFICATION** forming part of Letters Patent No. 737,713, dated September 1, 1903.

Application filed September 12, 1901. Serial No. 75,155. (No model.)

*To all whom it may concern:*

Be it known that I, EDMUND A. CURTIS, of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Brake-Riggings, of which the following is a specification.

This invention relates to improvements in brake-riggings, and refers more particularly to an improved construction in which the power applied to the brakes is transmitted to the same in an equalized or balanced manner, thereby rendering the application of power more effective and avoiding undue friction and loss of power and at the same time relieving the parts which transmit the power from unbalanced and torsional strains.

Among the salient objects of the present invention are to provide a construction in which the power transmitted to the brake-shoes to hold the latter in bearing with the treads of the wheel is applied in a direct manner or in lines coincident with the planes of the wheels, to provide an improved brake-rigging embodying this feature which is not only extremely simple, strong, and durable, but which at the same time dispenses with the brake-beams which have heretofore been commonly employed, to provide a construction which is capable of being applied to most car-trucks as now constructed without materially reconstructing or redesigning the same, and in general to provide simple and improved constructions of the character referred to.

To these ends the invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims, and the same will be readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 is a view in side elevation of certain parts of an ordinary street-car truck equipped with my invention, parts of the main side frame or truss members of the truck being broken away to expose the construction and arrangement of the brake-rigging more clearly and certain parts not essential to the present invention being omitted. Fig. 2 is a top plan view of the parts shown in Fig. 1, with certain of the parts omitted in Fig. 1 shown in this figure. Fig. 3 is a plan view,

on a smaller scale, of those parts of a complete truck concerned in the present invention. Figs. 4 and 5 are plan and side elevations, respectively, of a modified form of brake-rigging.

Referring to said figures, and more particularly to Fig. 3, 1 designates as a whole a yoke comprising a main cross member 2 and a pair of yoke-arms, one at each side of the truck-frame, and each of which is composed in the present instance of a pair of substantially parallel strap-like members or bars 3 and 4, the several yoke-arms being arranged to respectively straddle the wheel 5 of the truck at that end of the latter upon which the yoke is mounted. At points between the cross-bar 2 and adjacent truck-wheels the yoke is supported and slidingly mounted upon the end frame member or sill 6 of the truck, as shown clearly in the drawings, it being noted that the yoke-arms are so constructed and arranged that their central longitudinal lines of the draft are coincident with the planes of the respective truck-wheels.

8 8 designate vertically-disposed pivotally-mounted brake-levers respectively connected with the ends of the yoke-arms at their upper ends and serving to transmit power applied to the yoke 1 to the brake-shoes in a manner now to be described.

In the preferred embodiment shown in Figs. 1 to 3, inclusive, 9 9 designate bracket-like castings respectively mounted upon the upper side frame members 10 of the truck-frame adjacent to the rear or inner sides of the truck-wheels embraced by the yoke-arms. Each bracket 9, as shown herein, comprises two base members 11 and 12, respectively, suitably bolted to the inner face of the frame member 10 by means of bolts 13 13', and an outer main body portion 14, having parallel side face portions 15 and 16 and a longitudinally-extending vertical slot 17, the side walls of which are likewise parallel with the side faces 15 and 16 of the body of the brackets.

18 designates a brake-shoe hanger or suspension-link having its upper end pivotally supported within the slot 17 by means of a pivot-bolt 19 and supporting at its lower end a brake-head 20, with which it is pivotally engaged by means of a thumb-bolt 21, it be-

ing noted that the slot 17, the tension-link or brake-shoe hanger 18, and the brake-head 20 are all arranged in the same vertical plane and in the same plane with the tread of the truck-wheel 5.

The brake-levers 8, hereinbefore referred to, are of duplex construction, each comprising a pair of duplicate straight bars 22, pivotally connected with the brake-head 20 at points intermediate of their length and in parallel relation with each other by means of a through-bolt 23, extending through said members and through an interposed rearwardly-extending extension 24 of the brake-head. At their upper ends said members are connected with the ends of the two members 3 and 3' of the yoke-arm by means of a through-bolt 25, a space-block 26 (see Fig. 2) being interposed between the yoke-arm members, which space-block is, together with the two interposed arms, equal in thickness to the distance between the two side faces 15 and 16 of the bracket 9. That part of the brake-head 24 which is embraced by the two members of the brake-lever 8 is also of the same thickness as the distance between the side faces 15 and 16 of the bracket 9, so that the brake-lever members are thus held parallel with each other throughout their length, while the said side faces 15 and 16 serve as guides to confine said levers accurately in the same vertical plane while permitting them to oscillate freely upon the pivot-bolt 23.

The brake-head 20 is normally held retracted from the truck-wheel by means of a spring, which conveniently, and as herein shown, takes the form of a plate-spring 27, bolted to the rear side of the bracket 9 and depending thence downwardly to a point opposite the extension 24 of the brake-head, at which point it is apertured to receive the stem 29 of a yoke 28, which is connected with the brake-head by means of the pivot-bolt 23. The spring 27 is also made to serve as an additional means of confining the brake-head accurately in its vertical plane, and to this end the upper end of said spring is provided with an inwardly-extended lug 30, arranged to fit within a corresponding recess formed in the end of the casting, whereby said spring is held rigidly against lateral movement and by reason of its connection with the yoke 28 obviously aids in holding the brake-shoe.

That part of the brake-rigging which operates upon the truck-wheel 5' in longitudinal alinement and at the other end of the truck is generally similar to the brake-rigging acting upon the wheels 5, but nevertheless modified in certain respects, as will now be explained.

9' designates a bracket similar to the bracket 9, hereinbefore described, and likewise secured to the side frame member 10 by means of bolts 12' and 13'. The bracket 9' is likewise centrally slotted, as indicated at 17', and within the slot is pivotally mounted a brake-shoe hanger 18', supporting at its lower end

a brake-head 20', generally similar to the brake-head 20, hereinbefore described.

Within that end of the slot 17' remote from the truck-wheel 5' is pivotally mounted a brake-lever 31, which for convenience of description will be hereinafter designated the "dead" brake-lever to distinguish it from the corresponding lever 8, which is the active or live lever through which the power is transmitted to the brake-head. The lever 31, as shown in the present instance, consists of a single bar loosely mounted at its upper end within the slot 17' and held against movement in a direction away from the truck-wheel 5' by the internal end wall 32 of the slot. At a point intermediate its length it extends through a bifurcated or slotted extension 24' of the brake-head 20' and is pivotally connected with the latter by means of a bolt 23'.

33 designates a strut or compression link arranged to extend between the lower ends of the levers 8 and 31 and pivotally connected with each by means of through-bolts, as indicated at 34 and 35, respectively. In order to adjust the brake-heads relatively to each other and to the tread-faces of the truck-wheels upon which they respectively act, the strut or compression link 33 is made in two parts united at a point intermediate its length by means of a turnbuckle 36, which is provided with suitable check-nuts 37, whereby the turnbuckle may be accurately adjusted and locked to lengthen or shorten the link as a whole to the desired extent.

The brake-head 20' is connected with a spring 27' by means of a yoke 28', constructed and arranged substantially similar to those of the opposite brake-head, as shown clearly in the drawings.

The operation of the rigging constructed as described is probably entirely obvious, but may be briefly stated, as follows: Power applied to the yoke 1 to move the latter longitudinally forwardly or in the direction toward that end of the truck upon which the yoke is mounted operates to oscillate the live levers 8 upon the pivot-bolts 23 of the brake-heads 20, thereby during the first part of this movement forcing the strut or compression link 33 endwise toward the opposite truck-wheels 5'; and thus serving to move the brake-heads 20 and 20' in opposite directions away from each other and toward their respective wheels in opposition to the springs 27 and 27'. As soon as either brake-head comes into bearing with the tread of the truck-wheel the advance of the opposite brake-head is made positive, the pivot-bolts 23 or 23' becoming in either case the fixed fulcrum-point, and consequently advancing the opposite brake-head positively through the means of the interconnections described.

It will be noted that the power or stress transmitted through each yoke-arm is therefore transmitted to the brake-heads in a perfectly-equalized and direct manner, the lines of resistance being all in the same vertical

plane and in the same plane with the treads of the truck-wheels. All tendency of the parts to cramp and create undue friction is therefore avoided, and the brake-heads advance not only in a most positive and direct manner, but also with the least possible braking or distorting strain upon the mechanism.

A further feature of importance incident to the present invention is that I am enabled to dispense with the usual brake-beams and connected parts, thereby materially economizing in space and material, as well as leaving the central space beneath the car-body free for the accommodation of other mechanism—as, for example, parts of the motor mechanism. It is also to be noted that the brake-rigging herein described is capable of application to car-trucks as now commonly constructed with but slight or no modification, it being only necessary to provide brackets 9, adapted for attachment to the side frame members of the particular truck to which the mechanism is to be applied.

In Figs. 4 and 5 I have shown a modified form of bracket and slightly-modified embodiment of the other features of the invention. As shown in said figures, 38 designates as a whole the main supporting-bracket, which is in this instance provided with a base portion 39, secured to the cross-frame member or transom 40 of the truck in alinement with the tread portions of the truck-wheels. The live levers 41 are in the present instance substantially identical with the levers 8 of the previously-described construction and similarly arranged to embrace the sides of the bracket 38 and are guided by the latter, while at their lower ends they are connected with the brake-head 20, compression-link 33, and spring 27" in substantially the manner described in said former construction. In the present instance, however, the spring 27" is connected with the under side of the bracket 38, as indicated clearly at 42. The brake-head 20 is suspended from the bracket 38 by means of a tension-link or brake-head hanger 18 in the same manner as in the previous construction. The operation of this construction is obviously identical with that first described.

While I have herein shown and described a yoke having two arms, one for each side of the truck, yet it will be obvious that with the exception of said yoke member the brake-riggings on each side of the truck are complete and independent of each other and might be used independently by simply providing separate or independent yoke-arms or equivalent draft-transmitting devices. I have accordingly claimed said mechanism separately as well as when combined with a single yoke.

It will be seen from the foregoing that the details of construction and arrangement may be modified to some extent without departing from the invention, and I do not, therefore, wish to limit myself to the details de-

scribed herein except to the extent that they are made the subject of specific claims.

I claim as my invention—

1. In a car-truck, the combination with the truck-frame and a pair of truck-wheels, of a yoke, the longitudinal draft-lines of the two arms of which lie in the planes of the respective truck-wheels, vertically-disposed oscillatory brake-levers connected with the respective ends of said yoke-arms and having their draft-arms coincident with the planes of the treads of the truck-wheels, and brake-heads operatively connected with the respective brake-levers to act upon said wheels.

2. In a car-truck, the combination with the truck-frame and a pair of truck-wheels mounted therein, of a yoke provided with yoke-arms longitudinally divided and arranged to embrace the peripheral portions of the respective truck-wheels, vertically-disposed oscillatory brake-levers connected with the respective ends of said yoke-arms and having their draft-arms coincident with the planes of the treads of the truck-wheels, and brake-heads operatively connected with the respective brake-levers to act upon said wheels.

3. In a car-truck, the combination with the truck-frame and the pair of truck-wheels mounted therein, of a yoke having yoke-arms longitudinally divided and arranged to embrace the peripheral portions of the respective truck-wheels, supporting-brackets mounted upon the truck-frame and having supporting parts arranged to extend in longitudinal alinement with the tread portions of the truck-wheels, brake-heads swingingly suspended from said brackets in position to act upon the respective truck-wheels and oscillatory levers operatively engaged with said yoke-arms and brake-heads.

4. In a car-truck, the combination with the truck-frame and the pair of truck-wheels mounted therein, of a yoke having yoke-arms longitudinally divided and arranged to embrace the peripheral portions of the respective truck-wheels, supporting-brackets mounted upon the truck-frame and having supporting parts arranged to extend in longitudinal alinement with the tread portions of the truck-wheels, brake-heads swingingly suspended from said brackets in position to act upon the respective truck-wheels, oscillatory levers operatively engaged with said yoke-arms and brake-heads and retracting-springs arranged to act upon said brake-heads to normally hold the latter retracted from the truck-wheels.

5. In a car-truck, the combination with the truck-frame and the two pairs of truck-wheels mounted therein, of a brake-rigging comprising a yoke having longitudinally slotted or divided arms arranged to respectively embrace the peripheral portions of one pair of trucks, brake-heads swingingly supported adjacent to the tread portions of the proximate sides of the truck-wheels from fixed supports upon the truck-frame, a pair of vertically-

disposed live brake-levers operatively connected with the yoke-arms and with one pair of said brake-heads, a pair of "dead" brake-levers operatively connected with the opposite pair of brake-heads and with fixed parts of the frame structure, and strut members operatively connecting the live and "dead" brake-levers at the respective sides of the truck-frame.

6. In a car-truck, the combination with the truck-frame and the two pairs of truck-wheels mounted therein, of a brake-rigging comprising a yoke having longitudinally slotted or divided arms arranged to respectively embrace the peripheral portions of one pair of trucks, brake-heads swingingly supported adjacent to the tread portions of the proximate sides of the truck-wheels from fixed supports upon the truck-frame, a pair of vertically-disposed live brake-levers operatively connected with the yoke-arms and with one pair of said brake-heads, a pair of "dead" brake-levers operatively connected with the opposite pair of brake-heads and with fixed parts of the frame structure, strut members operatively connecting the live and "dead" brake-levers at the respective sides of the truck-frame, and a series of retracting-springs operatively connected with the several brake-heads and operating to normally hold the latter away from their respective wheels.

7. In a car-truck, the combination with the truck-frame and a pair of truck-wheels arranged in longitudinal alinement with each other; of a draft member arranged to extend longitudinally of the truck and having its draft-line in alinement with said truck-wheels, a vertically-disposed oscillatory brake-lever connected with one end of said draft member and supported adjacent to one of said truck-wheels, a second vertically-disposed oscillatory lever pivotally supported

from the truck-frame adjacent to the opposite alined truck-wheel, swingingly-supported brake-heads operatively connected with the respective brake-levers and arranged to act upon the respective truck-wheels and a link connecting said brake-levers whereby the power transmitted through said draft member operates to simultaneously apply both brake-heads.

8. In a car-truck, a brake-rigging comprising a bracket member supported adjacent to and in a plane coincident with one of the truck-wheels and having a longitudinally-disposed slot arranged coincident with the plane of the brake-wheel, a suspension-link pivotally connected at one end within said slot and supporting at its lower end a brake-head, a divided brake-lever arranged to embrace opposite sides of said bracket and pivotally connected at a point between its ends with said brake-head, a spring tending to hold said brake-head normally retracted from the wheel and operative connections for oscillating said lever to advance the brake-head positively.

9. In a brake-rigging, the combination with the truck-frame and a bracket mounted thereon adjacent to and in a plane coincident with one of the truck-wheels, of a vertically-disposed link pivoted at its upper end in said bracket and arranged to swing in a plane coincident with the plane of the wheel, a brake-head pivotally united to the lower end of said link, and a plate-spring likewise arranged in the same plane with the wheel and in a position in rear of and approximately parallel with said suspending-link and acting to normally retract said brake-head.

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