

(No Model.)

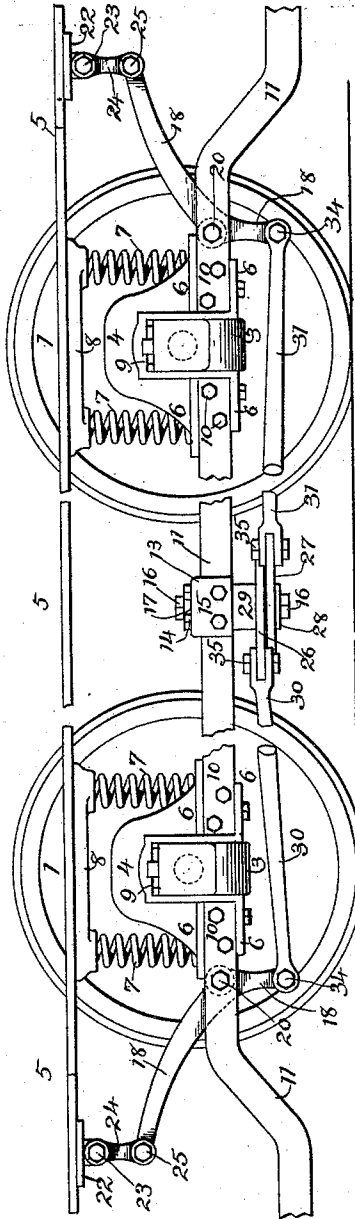
3 Sheets—Sheet 1.

J. A. BRILL & W. S. ADAMS.
EQUALIZING DEVICE FOR CAR TRUCKS.

No. 476,244.

Patented June 7, 1892.

Fig. 1



ATTEST:
H. E. Runkel.
M. F. Daly.

INVENTORS:
John A. Brill &
Walter S. Adams.

By *Joseph L. Reay*
Atty.

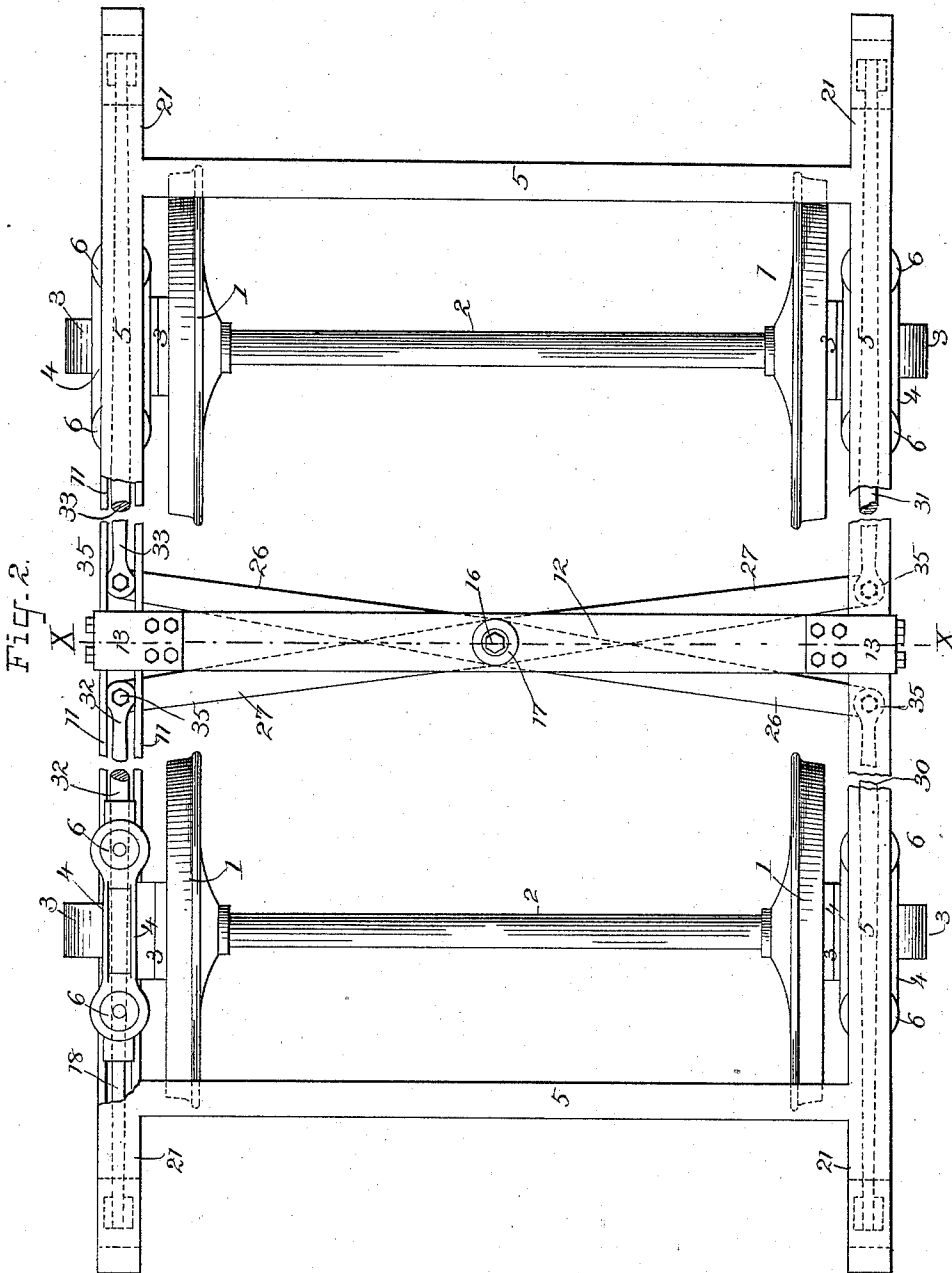
(No Model.)

3 Sheets—Sheet 2.

J. A. BRILL & W. S. ADAMS.
EQUALIZING DEVICE FOR CAR TRUCKS.

No. 476,244.

Patented June 7, 1892.



ATTEST:
H. F. Rusk
M. F. Daily

INVENTORS:
John A. Brill &
Walter S. Adams
By *Joseph L. Levy*
attor.

(No Model.)

3 Sheets—Sheet 3.

J. A. BRILL & W. S. ADAMS.
EQUALIZING DEVICE FOR CAR TRUCKS.

No. 476,244.

Patented June 7, 1892.

Fig. 3

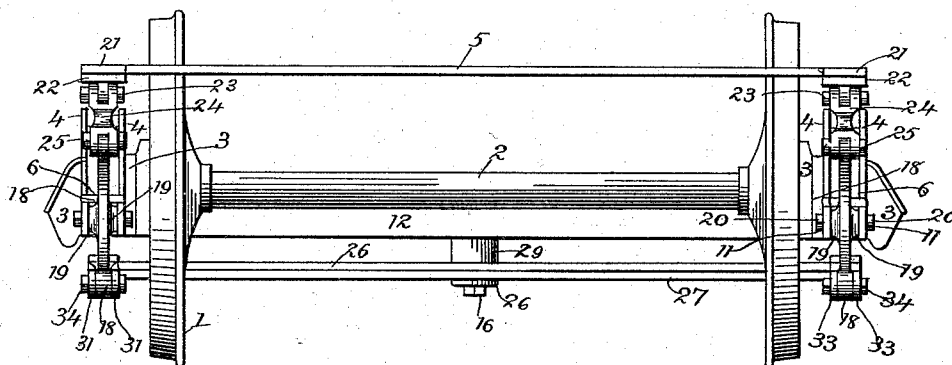
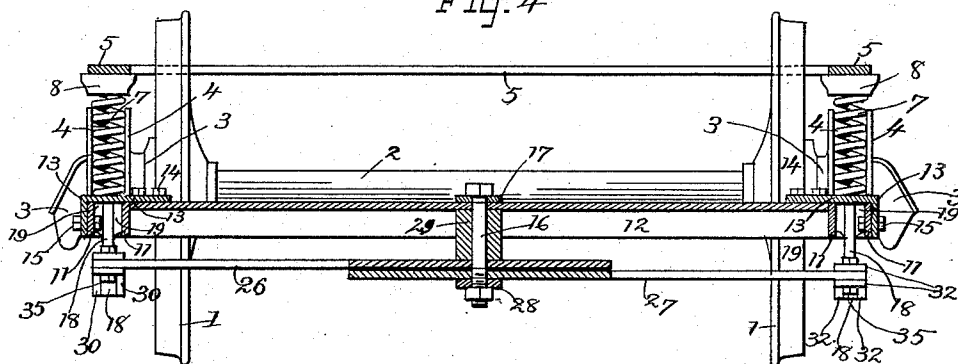


Fig. 4



ATTEST:
H. G. Durbin.
H. F. Daly.

INVENTORS:
John A. Brill &
Walter S. Adams.

By Joseph L. Levy
att'y.

UNITED STATES PATENT OFFICE.

JOHN A. BRILL AND WALTER S. ADAMS, OF PHILADELPHIA, PENNSYLVANIA.

EQUALIZING DEVICE FOR CAR-TRUCKS.

SPECIFICATION forming part of Letters Patent No. 476,244, dated June 7, 1892.

Application filed November 7, 1891. Serial No. 411,160. (No model.)

To all whom it may concern:

Be it known that we, JOHN A. BRILL and WALTER S. ADAMS, both citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have made certain new and useful Improvements in Car-Trucks and Equalizing Devices for the Same, of which the following is a specification.

Our invention has relation to equalizing devices for railway-cars and the improvements in trucks resulting from the use of said devices, said equalizing devices being of the form which in the event of one end of the car becoming loaded, and consequently tending to depress it to a greater extent than the other end of the car, are by such load at or depression of one end of the car brought into action to correspondingly lower the other end of the car, so as to distribute or equalize such load for keeping the car balanced and preventing the inclination of the car and undue oscillation of the body incident thereto.

As heretofore constructed equalizing devices, so far as we know, have been mounted or journaled upon the truck-axles or supported on transverse bars, which in turn are secured to the side beams of what is termed the "axle-box frame" or to the axle-box connections. Examples of these forms are shown in the patents to H. J. Tate, No. 387,827, dated August 14, 1888, and J. A. Brill, No. 418,440, dated December 31, 1889. The first stated method is objectionable for the reason that the friction of such devices on the axles makes the car run hard and more power is required to propel it, and it is expensive to construct and keep it in repair. Under the second method it is usual to stretch transverse bars between the side beams within the axles to support the horizontal levers. In motor-trucks constructed either for the purpose of carrying a grip-frame or motor this would be objectionable, for the reason that the space between the axles should be unencumbered and as free as possible.

The equalizing device in some of the before-stated methods of support have been longitudinally disposed under the car-body above and below the axles and within the wheels. This brings the point where the ends of the

equalizing-levers are secured to the car-body nearer to the longitudinal center of the truck and car-body, and should one side of the car be loaded heavier than the other there is nothing in such disposition of the parts of such device to transfer to the other side of the car its depression and equalize the weight, nor is such possible where the levers are secured to axle-box connection. The only effect the devices on one side of the car will have will be to depress one side equally with the other. This depression of one side of the car may or may not be a detriment, and it also may not occur to a very large extent; but if it should occur the arrangement of the levers, as before described, enables the car-body to take a rocking motion on its supporting-springs, and the nearer the connection of the levers of the devices are made to the longitudinal center of the car, so much more will such disposition aid the car in taking a rocking motion.

Furthermore, so far as we now know, it has been the practice to mount the car-body on the truck-springs, steadying both springs and the car-body on the axle-boxes by means of a pedestal or housing or spring-posts passing from the car-body to the axle-boxes or axle-box connections, and this has been the practice whether equalizing devices have been placed upon the truck or not.

Our invention has for its object to avoid the before-described objections; and we attain this end by supporting the equalizing-levers, which are directly connected to the car-body upon the side beams or bars of the axle-box frame, contradistinguished from supporting them upon bars, extending between the said side bars or axle-box connections; also, uniting the longitudinally-extending levers of the device together, so that the action on or depression of one end of the car or one side of the car will be transferred to both ends and both sides equally, so that the car will always ride with a level body, and rocking or transverse oscillation thereby prevented, and to further insure against this rocking motion we secure the levers, which extend between the side bars and the car-body, outside of the wheels.

In our arrangement of the parts of the de-

vice the horizontal levers on both sides are united by diagonally-extending rods, which when the car-springs are under tension are very close together and are supported below the side bars, so as to be free and clear and not encumber the open space between the wheels. The bars connecting the longitudinal rods work in a horizontal plane, and by reason of the further fact that the side beams to which they are secured remain at a permanent height above the track said transverse bars can be located as much below the axle-box frame as desirable to free the space between the axles. We therefore eliminate from this space all horizontally-disposed rods and all upwardly-extending levers, connecting the horizontal rods, and diminish the number of transversely-extending supports for said horizontal levers. We use but one transversely-extending bar, which in its turn can be used for supporting a motor or grip mechanism.

In our device very little stress is put upon the transverse bar and no downward strain from the equalizer at all, except its weight, so that no extra friction is brought upon the axles, whereas in the methods before described extra friction is brought upon the axles by reason of the longitudinal rods being given a lifting movement instead of a pulling movement.

In the cases where the longitudinal bars are given a lifting movement they are usually connected together between the axles by upwardly-extending links, which place the inner ends of the longitudinal rods some distance apart, and when mobile occupy considerable vertical space, and when under action require a greater space or clearance for movement. It follows from this arrangement that the rods and connecting-links should be located high enough above the roadway to permit of the movement of those parts, and in doing this much space which could otherwise be utilized for a motor or grip is occupied. These further objections are also obviated by our structure.

In our device we are also enabled to entirely eliminate pedestals, housings, or spring-posts for either the axle-box or springs, and thereby secure a much cheaper and lighter truck, while strength and rigidity of parts are at the same time retained. All bracings for the pedestals and spring-posts are also eliminated.

Our device when used with what is called an "independent truck" forms a truck structure from which can be omitted the pedestals, housings, or spring-posts, and bracing for the same, in which case the upright levers of the devices are secured to what is known as an "upper chord," the only connection between said upper chord and the axle-box or the axle-box frame being the springs and equalizing-levers, so that the car-body will be, when secured to the upper chord, as rigidly held on the truck as it would be were pedestals or spring-posts used. Instead, however, of se-

curing the equalizing-levers to the upper chord, said equalizing device can be secured directly to the car-body.

In trucks where an upper chord is used it is usual to run braces from spring-post to spring-post and thence to the upper chord. In the present case the equalizing-levers not only take the place of the spring-posts, but do away with the necessity of using these braces. This is also true in cases where braces have been led either from the axle-boxes or axle-box connections or pedestals to the upper chord or car-body.

Our device can also be used for the purpose of eliminating those parts from the truck structure even if such device be not used for the purpose of equalizing the depression of the car-body on its springs, and so far as the structure illustrated in the drawings is concerned it would only be necessary to remove the horizontal and transverse elements of the device, retaining the upright elements between the car or upper chord and the side bars to accomplish this.

Our invention accordingly consists of the combination, construction, and arrangement of parts, as hereinafter described in the specification, and pointed out in the claims.

Reference is had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a truck constructed according to our invention, showing certain longitudinal parts broken away for the purpose of saving space in illustration; Fig. 2, a plan having the same characteristics, and also to disclose certain parts; Fig. 3, an end elevation; and Fig. 4 a transverse sectional elevation taken approximately on the line *x x*, Fig. 2.

Like numerals of reference refer to like parts throughout the several views.

In the drawings, 1 are the wheels, and 2 the axles.

3 are the axle-boxes, and 4 the axle-box saddles.

5 is the upper chord.

When the equalizing device is not to be used on an independent truck, (where the truck has an upper chord adapted to be bolted directly to the car-sills, thus avoiding the use of separate saddles,) the word "sill" is used as synonymous with "upper chord."

In the preferred structure shown in the drawings the axle-box saddles are provided with extensions 6, which provide seats for the truck-springs 7, the upper ends of said springs being held by spring-caps 8, which spring-caps in turn are secured to the upper chord. An elastic cushion or block 9 may be placed between the saddles and the axle-boxes. To the extensions 6 of the saddles 4 are secured by the bolts 10 the side bars 11 of the axle-box frame, which are extended beyond the truck or when both sides are laterally united

form what is known as an "axle-box frame," which is not affected by the action of the car on its springs, and when flexibly supported on the axle-boxes is not subject to the lateral thrust of the axle.

The specific form of the axle-box frame and running-gear, as well as the general detail of the truck, may be altered without departing from the spirit of our invention.

A channel-beam 12 extends transversely of the truck between the side bars, it being supported thereon by the strap 13 and bolts 15. Any other form of beam can be used, and likewise the method of supporting on the side bars can be altered at pleasure. A bolt 16 depends from the channel-beam 12, the enlarged head thereof having a washer 17 under it.

Lever 18 in the shape of bell-cranks, having bosses 19, Fig. 3, are fulcrumed by means of the bolts 20, passing through said bosses, to the contiguous side bars 11 of the axle-box frame. The upper arms of these levers extend away from the fulcrum, and the lower arm extends downwardly from the fulcrum. The upper arm being the longest, the leverage is very great. The extended ends 21 of the upper chord 5 have secured thereto the journal-block 22, said block being provided with holes for the passage of bolts 23. Depending from the said journal-boxes are links 24, having bifurcated extremities, the upper end embracing the upper arm of the upright lever 18, to which it is secured by the bolts 25. All these connections are pivotal.

By reason of the upper chord 5 being secured to the axle-box frame or stationary part of the truck by means of the lever 18 and link 24 the necessity for using pedestals, housings, or spring-posts to restrain the truck upon the axle-box is obviated, and also the axle-box frame being located outside of the wheels the journal-box 22 can be secured either to the upper chord or car-sill to the car-body at its extreme side, thereby obviating the rocking motion before set forth. The links 24 and upright levers 18 take up the longitudinal strain of the car on the truck, so that the necessity of using bracing, as before described, is not here necessary.

Two transverse rods 26 27 extend diagonally across the truck, they finding their fulcrum on the bolt 16. The washer 28 is placed between the rod 27 and the nut of said bolt. By reference to Fig. 1 it will be seen that these two rods are supported above the lower arm of the lever 18. In the present structure to support these transverse rods at any desired height it is only necessary to use a longer or shorter thimble 29, which surrounds the bolt 16 and which extends between the channel-beam 12 and the uppermost rod 26. Extending between the lower arms of the levers 18 and the ends of the transverse rods 26 27 are connecting-rods 30 31 32 33, the connecting-rods 30 33 being connected to the transverse rod 26 and the connecting-rods 31 32 being

connected to the transverse rod 27. All the horizontal connecting-rods are bifurcated at both ends and are secured to the lower arm of the lever 18 by the bolts 34, the bolts 35 securing said rods to the transverse rods. All the connections are pivotal.

It must be plain from the foregoing that if the car becomes overweighted at one end that end will be depressed, said depression bringing the transverse levers 26 27 together, and by reason of their alternated connection with the longitudinal connecting-rods and the connection of said connecting-rods to the levers 18, which in turn are connected to the car-body or upper chord of the truck, a like depression will be given to that end of the truck or car opposite that upon which the original load is had. Likewise if one side of the truck becomes depressed a corresponding depression will be given the other side of the truck, so that whatever depression takes place on any part of the truck said depression will be transferred equally to the other parts of the truck, bringing the car-body down on the supporting-springs equally at all points.

Instead of using the straight transverse channel-beam 12 an arched or depressed one could be used, or the spring could rest on the side bars or modifications of the same, and many other changes and modifications can be made without altering the character of our invention.

Although we have stated that by our construction spring-posts, housings, or pedestals can be eliminated from the truck and the car supported firmly without them, yet under certain conditions it may be found advantageous to use them, and it is our intention that such may be done without in any way changing the nature of our invention.

What we claim as new, and desire to secure by Letters Patent, is—

1. A truck having side bars, upwardly-extending levers pivotally secured to said side bars, and devices for securing the said upwardly-extending levers to the car-body or upper chord of the truck and for uniting them longitudinally and transversely, substantially as described.

2. The combination, in a truck, of wheels and running-gear for the same, side bars supported on the running-gear, upright levers pivotally secured to the side bars, an upper chord or car-sill, springs between said upper chord or sill and the running-gear, and means for securing said upper chord or sill to the upright levers and for uniting them longitudinally and transversely, substantially as described.

3. In a truck, the combination of the upright levers pivotally supported on the truck and a car-sill or upper chord supported on said upright levers, the upright levers on both sides of the truck being mechanically united by longitudinally and transversely disposed rods and levers, substantially as described.

4. In a truck, upright levers pivotally sup-

ported upon said truck, a car-sill or upper chord supported on said upright levers, and longitudinal rods secured to said upright levers below their fulcrum, the said upright levers and longitudinal rods on both sides of the truck being mechanically united, substantially as described.

5. In a truck, the combination of the following instrumentalities for holding or supporting a car-body on a truck, comprising the upper chord or car-sill, springs without spring-posts or housings between said chord or sill and the running-gear of the truck and upon which the upper chord or car-sill is supported, and upright levers uniting the said chord or sill and running-gear, and longitudinal rods connecting the upright levers, substantially as described.

6. The following instrumentalities for supporting a car-body on a truck-frame: running-gear, side bars supported on the running-gear, an upper chord or car-sill, springs between the chord or sill and the side bars, upright levers pivotally secured to the side bars and to the chord or sill, and longitudinal and transverse rods and levers secured to the upright levers, substantially as described.

7. The following instrumentalities for supporting a car-body on a truck, comprising the side bars supported on the running-gear, upright levers pivotally secured to the side bars, links pivotally secured to the upright levers, an upper chord or car-sill supported upon said links, and springs between said upper chord or sill and the side bars, substantially as described.

8. The following instrumentalities for supporting a car-body on a truck, comprising a stationary element of the truck structure, a sill or upper chord, springs between the stationary part of the frame and the upper chord or sill, and articulated devices between said stationary part of the frame and said upper chord or sill, substantially as described.

9. In a truck having side bars, the combination of the upper chord or car-sill, upright levers fulcrumed on the side bars and secured to the upper chord or sill, longitudinal rods secured to the upright levers below their fulcrum, and transverse levers uniting the longitudinal rods, substantially as described.

10. In a truck having side bars, the combination of the upper chord or car-sill, upright levers fulcrumed on the side bars and secured to the upper chord or sill, longitudinal rods secured to the upright levers below their fulcrum, transverse levers, and springs between the said chord or sill and side bars, substantially as described.

11. An equalizing device having upright levers and longitudinal rod, the said upright levers being adapted to be secured to the upper chord of the truck or sill of the car, the longitudinal rod being transversely connected, substantially as described.

12. An equalizing device having upright levers, longitudinally-parallel rods, and trans-

verse levers alternately connected with the longitudinal rods, and a fulcrum for each transverse rod, substantially as described.

13. An equalizing device having upright levers, longitudinally-parallel rods, and transverse levers alternately connected with the longitudinal rods, and a mutual fulcrum for the transverse rods, substantially as described.

14. In a truck having side bars extending outwardly from the axle-boxes, an upper chord or car-sill extending past said axle-boxes, and equalizing-levers extending between the extended upper chord or sill and the extended side bars and connected by horizontal rods, substantially as described.

15. In a truck having side bars extending past the axle-boxes, an upper chord or car-sill supported above and extending between and past said axle-boxes, equalizing-levers extending between the extended upper chord or sill and side bars, and devices for longitudinally connecting said levers, substantially as described.

16. In a truck having side bars extending past the axle-boxes, an upper chord or car-sill extending past said axle-boxes, equalizing levers extending between said extensions, and devices for transversely connecting said levers, substantially as described.

17. In a truck having side bars extending past the axle-boxes, an upper chord or car-sill extending past said axle-boxes, equalizing devices extending between the extended upper chord or sill and the side bars, and devices for longitudinally and transversely connecting said levers, substantially as described.

18. A truck having an upper chord and side bars with equalizing-levers united by transverse levers and longitudinal rods supported on the side bars and secured to said upper chord, substantially as described.

19. A truck having contiguous side bars spaced apart, an upper chord and longitudinal rods connecting the said upright levers, and equalizing-levers supported on said side bars between the juxtaposed members thereof and secured to the upper chord, substantially as described.

20. In a truck, an equalizing device having upright levers supported on the side bars thereof, horizontal rods secured to the upright levers which extend under the said side bars, and a support for the inner ends of said horizontal rods, which support is located below the horizontal plane of the axles, substantially as described.

21. In a truck having side bars, an equalizing device having horizontal rods on both sides of the truck, transverse levers connecting the horizontal rods, and a support for said transverse levers carried by the side bars, substantially as described.

22. A truck having side bars, an equalizing device comprising upright levers and horizontal rods supported upon the side bars and transverse levers uniting said horizontal rods, said transverse levers being carried by the

side bars and supported below the horizontal axis of the axles, substantially as described.

23. In an equalizing device, the combination, with the side bars of the axle-box frame, 5 of the upright levers 18, fulcrumed on said bars, the arms of which extend above and below said side bars, upwardly-extending links 24, supported on the levers 18, devices for connecting the upright levers, and an upper chord 10 or car-sill 5, supported on said links, substantially as described.

24. In an equalizing device, the combination of the side bars of the axle-box frame with the upright levers 18, fulcrumed to the 15 side bars, devices for connecting the upright levers, an upper chord or car-sill 5, the journal-blocks 22, secured to said upper chord or sill, and the links 24, pivotally uniting said journal-blocks and levers 18, substantially as 20 described.

25. The side bars 11, the levers 18, fulcrumed on said side bars, devices for connecting the upright levers, the upper chord 5, springs between the side bars and upper chord, 25 the journal-blocks 22, secured to the upper chord, and links 24, uniting the levers 18 and journal-blocks, substantially as described.

26. Side bars 11, the upright levers 18, fulcrumed on said side bars, the upper end of 30 said levers 18 having links 24, the upper chord or car-sill 5, supported on said links, horizontal rods 30 31 32 33, secured to the levers 18, and transverse levers 26 27, secured to said horizontal rods, substantially as described.

35 27. An equalizing device comprising an upper chord or car-sill 5, links 24, depending therefrom, levers 18, suitably supported and united to said links, horizontal rods 30 31 32 33, united to said levers 18, and transverse 40 levers 26 27, uniting said horizontal rods, substantially as described.

28. An equalizing device comprising the levers 18, suitably supported, links 24 on said levers, horizontal rods 30 31 32 33, secured to 45 said levers, and transverse levers 26 27, connecting said horizontal rods, substantially as described.

29. An equalizing device comprising the levers 18, links 24 on said levers, horizontal rods 50 30 31 32 33, secured to said levers below their fulcra, and transverse bars 26 27, uniting said horizontal rods, the bar 26 being secured to the rods 30 33 and the bar 27 to the rods 31 32, substantially as described.

55 30. An equalizing device having horizontal rods and a plurality of transverse levers, each

one of said levers being secured at each end to a horizontal rod leading in opposite directions, said levers crossing each other, substantially as described. 60

31. The horizontal rods 30 31 32 33 and the transverse levers 26 27, said horizontal rods being in operative connection with the upper chord, the lever 26 being secured to the rods 30 33 and the lever 27 to the rods 31 32, sub- 65 stantially as described.

32. The combination of the side bars 11, transverse beam 12, strap 13, uniting the side bars and beam 12, the bolt 16, depending 70 from the said beam 12, and the transverse bars 26 27, fulcrumed on said bolt and operatively connected with other levers to the upper chord or sill, substantially as described.

33. The side bars 11, transverse beam 12, supported on said side bars, a bolt 16, hung 75 from said beam 12, transverse levers 26 27, fulcrumed on said bolt, and the thimble 29 between the beam 12 and transverse levers, the levers 26 27 being operatively connected with other levers to the upper chord or sill, 80 substantially as described.

34. The side bars 11, transverse beam 12, supported on said side bars, a bolt 16, hung 85 from said beam, a thimble 29, supported about the bolt 16, and levers, combined with a car-sill or upper chord supported by the said bolt, substantially as described.

35. The side bars 11, bell-crank levers 18, having bosses 19, fulcrumed between the side bars, one arm of said lever extending below 90 said side bars, the other arm extending above it, links having bifurcated ends pivoted to the upper arm of said levers, journal-blocks embraced by one end of the links, and an upper chord on said journal-blocks, and means 95 for connecting the levers 18, substantially as described.

36. The side bars, the levers 18, fulcrumed thereto, the longer arm thereof extending 100 upwardly and outwardly and the short arm downwardly away from its fulcra, and means for connecting said short arms, substantially as described.

Signed at the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, 105 this 5th day of November, 1891.

JOHN A. BRILL.
WALTER S. ADAMS.

Witnesses:

HOWARD DICKEY,
HENRY C. ESLING.