

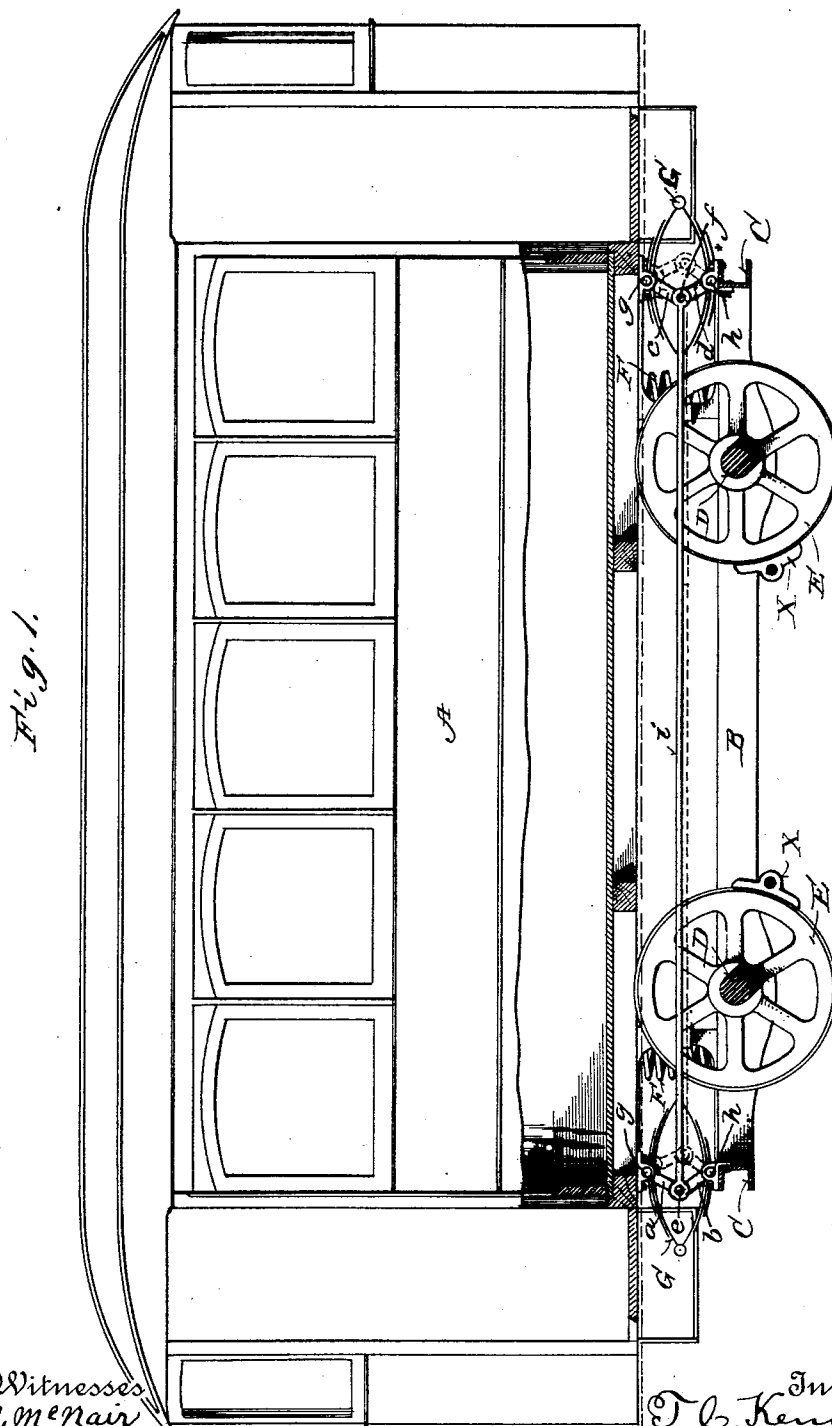
(No Model.)

2 Sheets—Sheet 1.

T. C. KENNEDY.
EQUALIZER FOR CARS.

No. 587,834.

Patented Aug. 10, 1897.



Witnesses
W. M. Mcnair.
B. B. Esterline.

Inventor
D. C. Kennedy,
By his Attorney,
H. A. Coulburn.

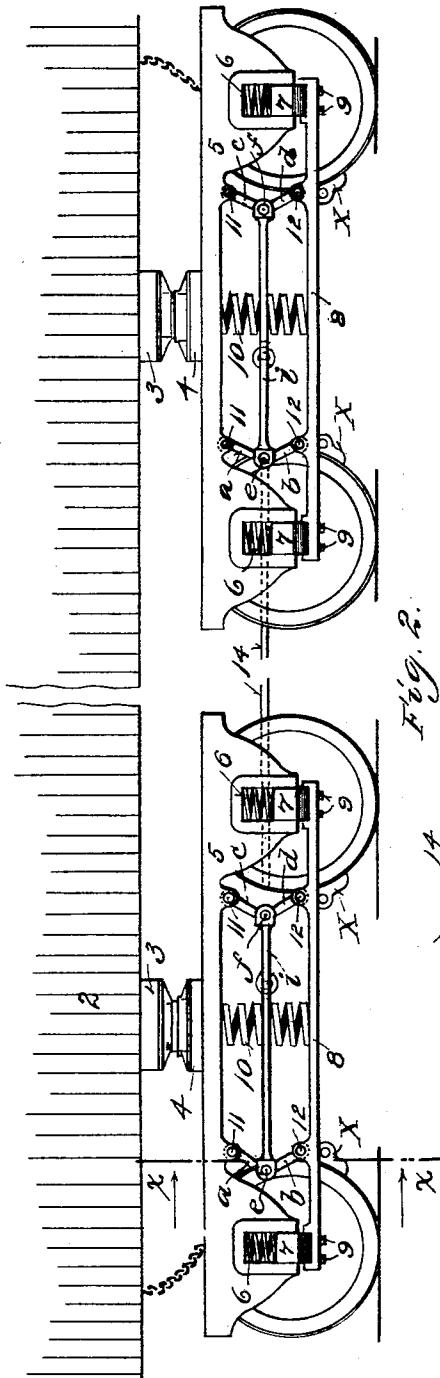
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EQUALIZER FOR CARS.

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Thomas C. Kennedy,
By his Attorney, H. A. Toulmin.

UNITED STATES PATENT OFFICE.

THOMAS C. KENNEDY, OF DAYTON, OHIO, ASSIGNOR OF ONE-HALF TO
ADOLPH NEWSALT, OF SAME PLACE.

EQUALIZER FOR CARS.

SPECIFICATION forming part of Letters Patent No. 587,834, dated August 10, 1897.

Application filed August 27, 1896. Serial No. 604,062. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. KENNEDY, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Equalizers for Cars, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in equalizers for street and railway cars.

The object of my invention is to provide simple and expedient mechanism which shall automatically prevent the street-car bodies and railway-car bodies from surging forward when the brakes are applied and from rebounding and surging backward when the brakes are released, which is a common and very objectionable experience in the daily use of such cars.

It is also the object of my invention to cause a depression of either end of the car, due to weight or jarring and vibrations incident to traveling, to cause the other end of the car to equally settle down.

These several objects I carry into practical effect and operation by means of a system of toggle-levers operating between the car-body and the truck-beams supported by the wheels.

In the accompanying drawings, on which like reference letters and numerals indicate corresponding parts, Figure 1 is a partial longitudinal section and partial side elevation of a street-car with my improved equalizer applied thereto. Fig. 2 is a side elevation of a steam-railway car having two independent trucks with my equalizer applied to each truck; Fig. 3, a transverse vertical sectional view on the line *xx* of Fig. 2, looking in the direction of the arrows; and Fig. 4, an end view of a street-car with my equalizer.

In the accompanying drawings the letter A designates a street-railway car of any approved type mounted upon a truck composed of side beams B, cross-beams C, axles D, and wheels E, together with springs F, which are between the car-body and the side beams B in the usual manner. Elliptic springs G are also shown because they are quite usual in cars of the modern type.

My invention consists of the equalizer hereinbefore referred to. This equalizer is composed of a front and rear set of toggle-bars, (shown at *a b* and *c d*, respectively,) being pivoted together at *e* and *f*, respectively, the upper bars pivoted to blocks *g*, secured to the car-frame, and the lower bars to blocks *h*, secured to the cross-beams C. These toggle-bars are connected together by a connecting-rod *i*, running longitudinally of the car and pivoted to the middle joint of the toggle-bars.

Viewing Fig. 4, it will be seen that there are two sets of these equalizers, a set consisting of the forward toggle-bars, the rear toggle-bars, and the connecting-rod. I prefer to place near each side of the car one of these sets, and have so shown them in Fig. 4.

It will be observed from Fig. 1 that the middle joint stands slightly out of line with the upper and lower joints or pivots, so that the joint of the toggle-bars may be said to be "broken," which means that the pivots are not in line. Now if the brakes are suddenly applied the momentum of the truck is arrested immediately, while the momentum of the body of the car still continues, causing a surging forward of the body due to the flexible connections between it and the truck-frame, and causing also a rebound or rearward thrust of the car-body relatively to the truck when the forward momentum of the body has spent itself. This produces the unpleasant surging back and forth of the car-body commonly experienced every day. I overcome this objectionable thing by my equalizer. I overcome it in this way: As the car-body surges forward it necessarily tips down or lowers at the forward end somewhat. The effect of this is to force the middle joint of the forward toggle-bars forward, or, in other words, to further bend the toggle-bars relatively to each other. This causes them to draw upon the connecting-rod *i*, which acts to quickly further bend the rear toggle-bars. Thus the car-body is drawn downward equally at both ends and throughout its length. This throws a direct downward pressure on the supporting-springs, which they resist yieldingly and not suddenly. As the downward tendency of the body soon expends itself, the springs react and lift it to normal position.

Thus I have arrested and prevented the forward and backward surging of the car-body by utilizing the forward momentum and tipping tendency of the front end of the car to actuate my equalizer, which absorbs such momentum and tendency of the body and converts them into a downward tendency only, to meet which the usual springs come into play.

10 The same operation takes place in the application of my equalizer to a steam-railway car. Referring to Figs. 2 and 3, it will be seen how the equalizer is applied to such a car, or to a car which has two independent trucks, 15 as in the modern long electric car. The car is shown at 2 with bolsters 3, one at each end, pivotally mounted, as usual, on bolsters 4, one for each truck. The truck-frame 5 supports the bolster 4 and is itself supported by 20 springs 6, resting on the axle-boxes 7. A truck-girder 8 is bolted, as usual, to the axle-boxes by bolts 9, and a stout spring 10 rests upon the girder to additionally support the parts above. This description applies to each 25 side of the truck of the form illustrated, as shown in Fig. 3. Now I apply my toggle-bars to the truck-frame 5 and the girder 8 in the same manner as they are applied in Figs. 1 and 3, except that the blocks *g* and *h* are 30 omitted and the pivotal connections of the bars *a b* and *c d* are made to the truck-frame and girder, as shown at 11 and 12. I also supply a cross-bar 13, extending from each of the rods *i*, and to these cross-bars I attach a supplemental connecting-rod 14, which extends 35 from truck to truck and thus connects the set of toggle-bars on one truck with the set on the other truck, so that the motions of either set are transferred to the other set. 40 Viewed from Fig. 3, it will be seen that there is a set of these bars, with their connecting-rod *i*, at each side of each truck, just as in the case of the street-car with the single truck. Now when the brakes are applied to the 45 trucks and their momentum arrested the first tendency of the car-body is to continue on, the forward end settling down more or less as the forward momentum spends itself and gravity begins to affect the structure. Then 50 it is that my toggle-bars of the forward truck bend more and more and, through the beam 13 and the supplemental connecting-rod 14, draw upon the toggle-bars of the rear truck equally and bend them, so that the whole body 55 is pulled downward against all of the springs, which distribution of the momentum and forces so equalizes their effects as that this plunging forward and then plunging backward is annihilated in practice.

I regard myself as the first to devise an equalizer involving toggle-bars or mechanism 60 combined with car structures to produce the effects stated, and therefore wish to be understood as laying broad claim to such invention. 65

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

1. The combination with a car-body, a truck and their springs, of an equalizer consisting 70 of toggle-bars applied thereto, and a connecting-rod interconnecting each pair of toggle-bars and movable longitudinally to itself by the movement of either pair of said toggle-bars, so that when one pair is folded or 75 opened, more or less, said rod so moves and draws equally on the other pair.

2. The combination with a car, a truck and their springs, of an equalizer consisting of 80 toggle-bars applied thereto in sets near each side, each set consisting of the forward and rear pairs of bars, and a connecting-rod from pair to pair of the same set and movable longitudinally to itself by the movement of either 85 pair of toggle-bars, so that when one pair is folded or opened, more or less, said rod so moves and draws equally on the other pair.

3. The combination with a car, its trucks and their springs, of an equalizer consisting 90 of a pair of toggle-bars pivoted to parts connected by springs so that when said parts change their relative position the bars will change the relative position of their three 95 pivots, and an interconnecting rod from one pair to the other of said toggle-bars, movable longitudinally to itself so as to cause said pairs to open or fold equally.

4. The combination with a car-body, its trucks and their springs, of an equalizer consisting of toggle-bars applied thereto and a 100 supplemental rod connecting the toggle-bars of one truck with those of the other.

5. The combination with the car-body and its trucks and their springs, of an equalizer 105 consisting of a set of toggle-bars pivoted to spring-connected parts in each truck, the sets of truck being interconnected by a rod, and a supplemental rod connecting the sets of 110 both trucks so that the movements of the toggles of one truck are transferred to the toggles of the other truck.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS C. KENNEDY.

Witnesses:

LEO J. HEINREICH,
W. S. MCCONNAUGHEY.