

G. C. MURRAY
DRAFT RIGGING.
APPLICATION FILED AUG. 21, 1909.

1,061,315.

Patented May 13, 1913.

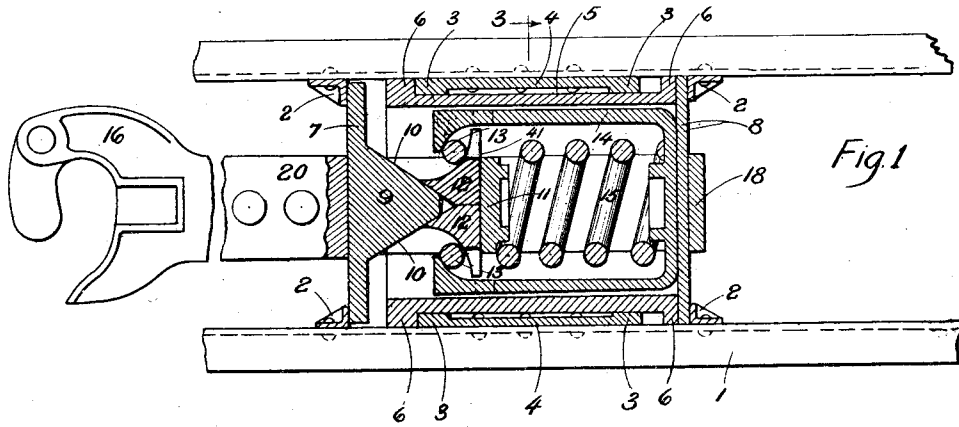


Fig. 1

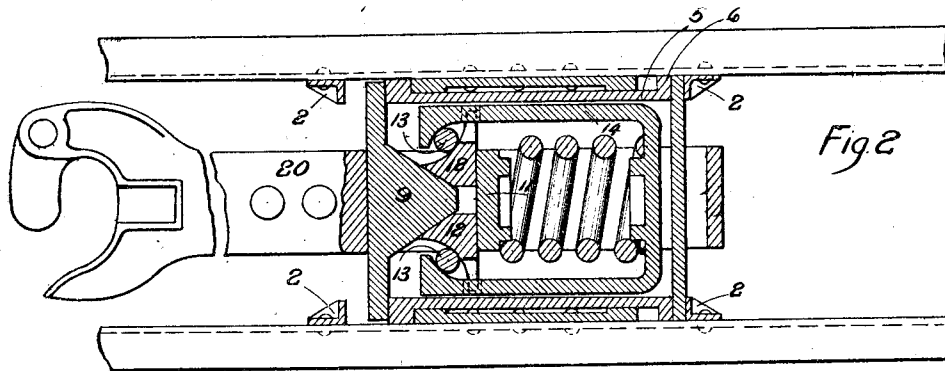


Fig. 2

Fig. 4

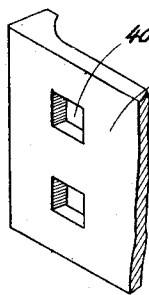


Fig. 5

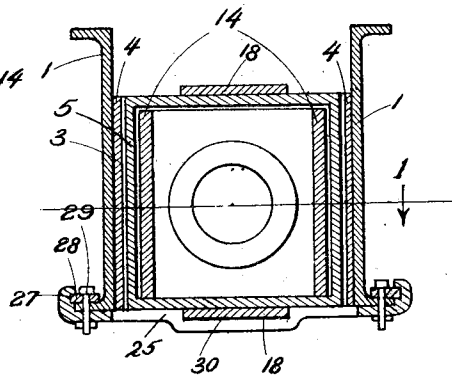
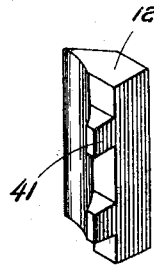


Fig. 3

Witnesses:

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UNITED STATES PATENT OFFICE.

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DRAFT-RIGGING.

1,061,315.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE C. MURRAY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Draft-Rigging, of which the following is a specification.

The object of my invention is to provide an improved shock absorber, and more particularly adapted for use as a draft rigging for railway cars, but also applicable to other mechanisms, in which the gradual absorption of shocks is necessary or desirable.

One aspect of the invention disclosed herein is broadly claimed in my Patent No. 927,810, namely, the use of co-acting combined surfaces of different inclinations at different points, with an intervening pressure transmitting roller.

Stated generally, one of the purposes of my invention, as described in this application and my patent referred to, is to apply the force of the blow or shock to the spring or other yielding element with progressively decreasing advantage, and to provide mechanism of such form that the rate of decrease may be varied at will by altering the conformation of the inclined surfaces referred to above. At the initiation of the blow or shock, almost the entire force, or a large component thereof, may be transmitted to the spring or other yielding element, and as the force continues to act the component thereof, acting to compress the spring or yielding resistance element, may be decreased at any rate desired according to the conformation of the surfaces of certain co-acting parts, while the remainder of said force will cause compression and friction between the elements of the mechanism, and thus be absorbed.

My invention in one aspect may be considered as involving the use of wedges or inclined planes of varying inclination, with an intervening pressure transmitting member, which preferably takes the form of a roller, though in some cases a pressure transmitting member of other form may be employed. While the variably inclined wedges referred to are preferably formed with surfaces having a continuous curvature, my invention may in some instances be applied by the use of wedges of other form. In any event, the mechanism progressively decreases the component of the applied force

acting upon the spring or other yielding member, and increases the component absorbed in compression and friction, the ultimate effect being equivalent to an increase in the resistance acting in opposition to that force. Otherwise stated, the ratio of compression of the yielding resistance element to the distance through which the applied force acts progressively increases during the action of the force,—that is, the resistance is accelerated.

The objects and nature of my invention will more clearly appear from the following description and accompanying drawings, in which—

Figure 1 is a horizontal sectional view through one form of draft rigging embodying my invention, the parts being in normal position. Fig. 2 is a view corresponding to Fig. 1, showing the parts in the position assumed under a buffing strain. Fig. 3 is a transverse section, taken on the line 3—3 of Fig. 1. Fig. 4 is a fragmentary perspective view of a detail showing part of a U-shaped member. Fig. 5 is a perspective view of a thrust member.

The mechanism illustrated in the drawings is so designed as to operate in accordance with the general principle above set forth, but said mechanism may be considerably modified without departing from the mode of application of said principle embodied in this specific mechanism.

The usual draft sills 1 are provided upon their inner faces with outer stops 2 and inner stops 3, the latter being formed by the ends of cheek plates 4, which are riveted to the draft sills. Mounted between the draft sills, and supported therefrom, is an open-ended rectangular casing 5, provided at its ends with flanges 6, which act as stops to limit the movement thereof. Movable between the ends of the casing 5 and the outer stops 2 are followers 7 and 8. The front follower 7 is formed with an inwardly projecting wedge-shaped extension 9, which forms a longitudinal thrust member having oppositely disposed inclined surfaces or thrust elements 10. Extending across the casing 6 is a bridge 11, preferably formed integral therewith. The bridge 11 constitutes a fixed abutment and friction member. Intermediate thrust members 12 abut against said bridge and are provided with inclined surfaces which co-

act with the inclined surfaces or thrust elements 10 of the thrust member 9. On their outer sides, the thrust members 12 are formed with concave surfaces, which, through rollers 13, co-act with similarly concave surfaces or thrust elements upon the inner sides of the ends of a U-shaped member 14, which extends around the bridge 11. A draft spring or other resilient element 15 is located between the loop of the U-shaped member 14 and the bridge 11. The thrust members 12 are provided with projections 41 adapted to enter apertures 40 in the U-shaped members 14 when the members 12 are spread apart as shown in Fig. 2. The purpose of the projections 41 is to afford support for the rollers 13 when the parts are shown in Fig. 1, and the apertures 40 permit the members 12 to spread as shown in Fig. 2. A coupler 10, draw-bar 20, and yoke 18 are shown as a means of transmitting the buffing and pulling strains to the member 7 and the casing 6, respectively. In the present instance a follower 8 is shown intervening between the inner end of the yoke 18 and the rear edge of the casing 6. It will be apparent, however, that the specific form of these elements may be altered without departing from the mode of operation contemplated by my invention.

The draft rigging derives its support from the bridges 25, which are secured to the lower edges of the draft sills 1. The bridges 25 have upturned ends 26, notched at 27, and retaining plates 28 lie upon the upper sides of the lower flanges of the channel draft sills and project into the notches 27. Bolts 29, passing through openings in the retaining plates 28, draft sill flanges 40 and bridges 25, hold the parts in place. The upper side of the bridge 25 is formed with a recess 30 to receive the yoke 18, and the casing 5 rests upon the upper surface of the bridges 25 and upon the yoke 18.

It will be apparent that upon a buffing strain, the longitudinal thrust member 9 will be moved inwardly toward the center of the car to the position illustrated in Fig. 2, thus wedging apart or spreading the thrust members 12. During this operation the casing 6 and the attached bridge 11 will be held stationary by the inner stops 2. The spreading apart or transverse movement of the thrust members 12 will impart a longitudinal movement to the inner longitudinal thrust member 14, through the intervening rollers 13. As shown in Fig. 1, when in normal position the parts of the concave surfaces of the members 12 which are opposed to the concave surfaces upon the members 14 are more nearly parallel to the transverse axis of the draft rigging than the other parts of said surfaces which are brought into play as the movement of the

mechanism progresses. Therefore, at the initiation of the movement under a buffing strain, a smaller component of the longitudinal movement of the draw bar will be communicated to the inner thrust member 14 than at any later stage of the operation. Otherwise stated, the buffing force will act at the initiation of the movement upon the draft spring with greater efficiency than at the conclusion of the movement. By varying the inclination of the opposed concave surfaces, any relation desired between the efficiencies of the force at different stages of its action may be secured. Upon a pulling strain the action will be similar to that above described, except that the outer thrust member 9 will remain stationary and the pull exerted upon the draw bar will move the follower 8, casing 5, and bridge 11 outwardly, thus carrying the intermediate thrust members 12 toward the base of the wedge-shaped thrust member 9. This will separate the thrust members 12, causing them to move transversely of the draft rigging and bring about the compression of the spring in the manner above described.

While I have referred to the member 9 as the outer thrust member, to the parts 12 as intermediate thrust members, and to the member 14 as the inner thrust member, the relation of these parts might be reversed, and I have used these terms for convenience in the nomenclature of the different elements. Furthermore, the principle of my invention is not dependent upon placing the apparatus with its axis in the line of draft. It will, therefore, be apparent that the general relation of the different elements which form the essence of the invention claimed herein may be preserved, without adhering to the precise arrangement and configuration of the elements described and illustrated.

I claim:—

1. In a device of the class described, a fixed abutment, a draft spring, outer and inner longitudinal thrust members and intermediate transverse thrust members, said intermediate thrust members being movable independently of each other and both longitudinally and transversely with relation to said outer thrust members, said intermediate thrust members having inclined surfaces co-acting with inclined surfaces upon said outer and inner thrust members and having friction surfaces coacting with said fixed abutment, a draw-bar, and means for transmitting buffing and draft forces from said draw-bar directly to said outer and intermediate thrust members.

2. In a device of the class described, a fixed abutment, a draft spring, outer and inner longitudinal thrust members and in-

intermediate transverse thrust members, all of the thrust surfaces of said thrust members being located at one end of said draft spring, said intermediate thrust members being
 5 movable independently of each other and both longitudinally and transversely with relation to said outer thrust members, said intermediate thrust members having inclined surfaces coacting with inclined surfaces upon said outer and inner thrust mem-
 10 bers and having friction surfaces coacting with said fixed abutment, a draw-bar, and means for transmitting buffing and draft forces from said draw-bar directly to said
 15 outer and intermediate thrust elements.

3. In a device of the class described, an outer longitudinal follower having a wedge-shaped longitudinal thrust member, intermediate thrust members co-acting with said wedge-shaped projection, an inner thrust member, said intermediate and inner thrust members having co-acting inclined surfaces converging toward their ends, rollers between said converging surfaces, a casing surrounding said thrust members, a bridge extending across and secured to said casing, said bridge forming an abutment for said intermediate thrust members, an extension secured to said inner thrust member and
 25 spaced from said bridge, a draft spring between said bridge and extension, a draw-bar, means for transmitting force acting in one direction from said draw-bar to said wedge-shaped thrust member and for transmitting force in the opposite direction from
 30 said draw-bar to said casing.

4. In a device of the class described, draft sills, stops secured thereto, a casing fitted between said draft sills and movable to the extent permitted by said stops, a bridge extending across said casing, intermediate thrust members abutting against said bridge, a wedge-shaped outer thrust member acting between inclined surfaces on said intermediate thrust members, an inner thrust member of U-form and having inclined surfaces at the ends of the arms thereof coacting with inclined surfaces on said intermediate thrust members, said inclined surfaces presenting
 45 different angles to the draft line at different points, rollers between said surfaces, a draft spring between said bridge and the loop of the U-form inner thrust member, a draw-bar, means for transmitting forces in one di-
 50 rection from said draw-bar to said outer thrust members and for transmitting forces

in the other direction from said draw-bar to said casing.

5. In a device of the class described, draft sills, stops secured thereto, a casing, a
 60 bridge secured to said casing and extending transversely thereof, a draw-bar, an outer wedge-shaped longitudinal thrust member, intermediate thrust members in operative relation with said outer thrust member and
 65 bridge, an inner longitudinal thrust member having inclined surfaces operatively related to inclined surfaces upon said intermediate thrust members and having an extension spaced from said bridge on the side oppo-
 70 site said intermediate thrust members, a resilient element between said bridge and extension, means for transmitting force from said draw-bar to said outer and intermediate thrust members, the co-acting surfaces be-
 75 tween said intermediate and one of said longitudinal thrust members being of varying inclination to the draft line, and rollers between said surfaces.

6. In a device of the class described, draft
 80 sills, stops secured thereto, a casing and front and rear followers movable between said stops, a bridge secured to said casing and extending transversely thereof, a draw-bar, a yoke secured to said draw-bar and
 85 extending around said followers and casing, an outer longitudinal wedge-shaped thrust member upon said outer follower, intermediate thrust members in operative relation with said outer thrust member and bridge,
 90 an inner U-shaped longitudinal thrust member having inclined surfaces operatively related to inclined surfaces upon said intermediate thrust members, the loop of said U-shaped inner thrust member being spaced
 95 from said bridge on the side opposite said intermediate thrust elements, a resilient element between said bridge and loop, means for transmitting force from said draw-bar to said outer and intermediate thrust mem-
 100 bers, the co-acting surfaces between said intermediate and one of said longitudinal thrust members being of varying inclination to the draft line, and a roller between said
 105 surfaces.

In testimony whereof, I have subscribed my name.

GEORGE C. MURRAY.

Witnesses:

WALTER A. SCOTT,
 HENRY A. PARKS.