March 1, 1949. J. O. EVANS 2,463,366

SHOCK ABSORBING MECHANISM FOR RAILWAY DRAFT RIGGINGS

Filed Nov. 16, 1946 2 Sheets-Sheet 1

Fig. 1

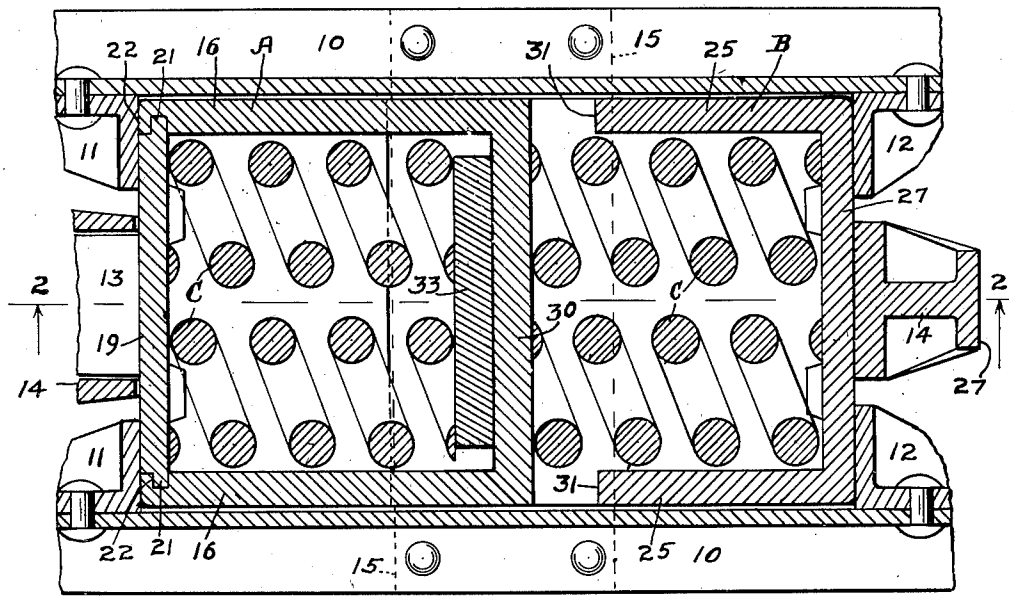
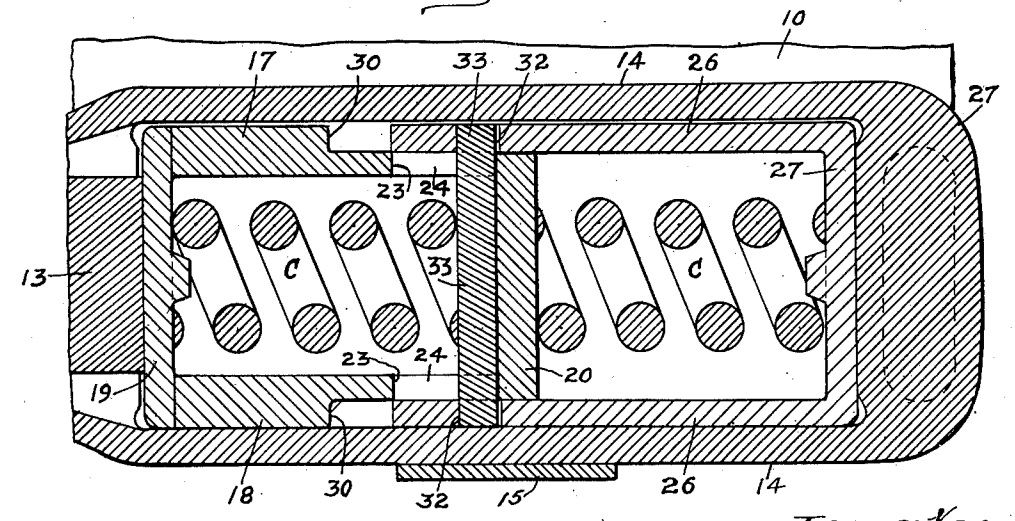


Fig. 2



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Fig. 3

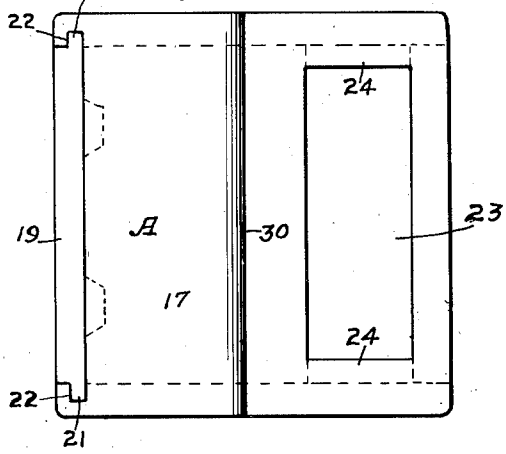


Fig. 5

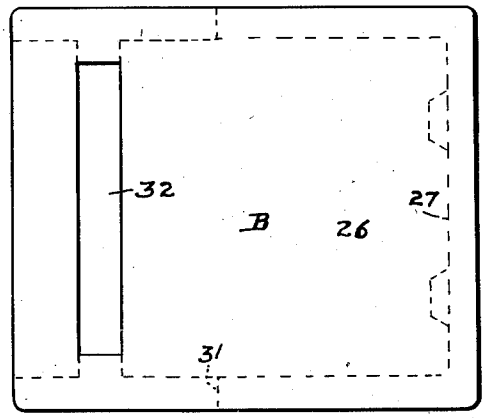


Fig. 4

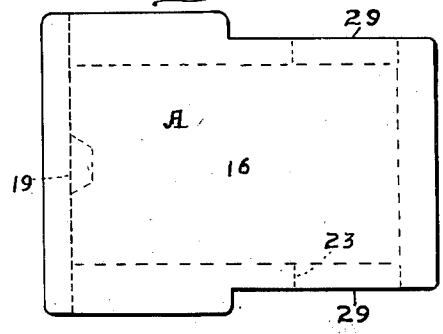


Fig. 6

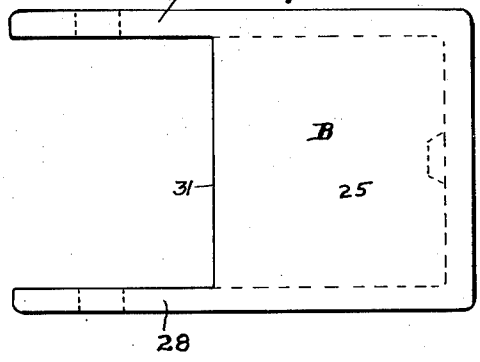
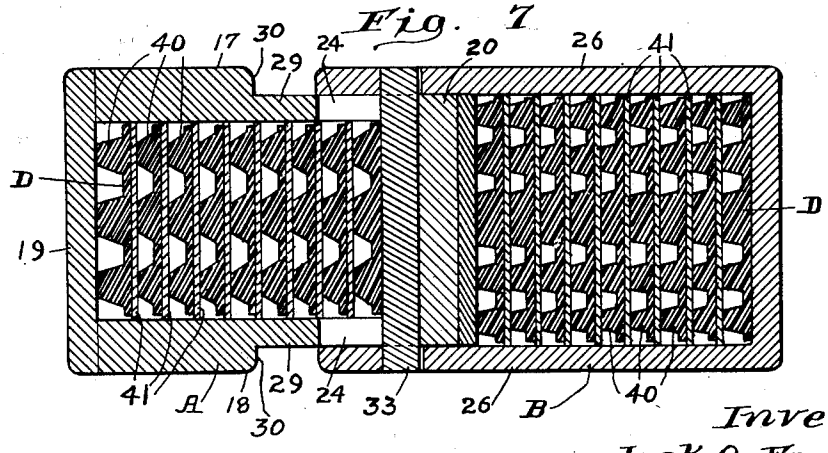


Fig. 7



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SHOCK ABSORBING MECHANISM FOR RAILWAY DRAFT RIGGINGS

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7 Claims. (Cl. 213—45)

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This invention relates to improvements in shock absorbing mechanisms and more particularly to shock absorbing mechanisms for railway draft riggings.

One object of the invention is to provide a shock absorbing mechanism including a pair of cushioning units and means for compressing the cushioning units in tandem, wherein the means for compressing the units comprises a minimum number of parts and provides an exceedingly rugged construction presenting a heavy column load sustaining element limiting the compression of the mechanism.

Another object of the invention is to provide a tandem shock absorbing mechanism of the character hereinbefore set forth wherein the means for compressing the cushioning units comprises a pair of housings movable toward and away from each other lengthwise of the mechanism, and having front and rear, outer follower acting members and front and rear, intermediate follower acting members forming parts thereof and cooperating with the cushioning units, the housings being designed to interchangeably accommodate either cushioning units composed of coil springs or cushioning units composed of rubber elements.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the accompanying drawings forming a part of this specification, Figure 1 is a horizontal, longitudinal sectional view of a portion of a railway draft rigging, illustrating my improvements in connection therewith. Figure 2 is a longitudinal, vertical sectional view, corresponding substantially to the line 2—2 of Figure 1. Figure 3 is a top plan view of the left hand housing or casing, as seen in Figure 1. Figure 4 is a side elevational view of Figure 3. Figure 5 is a top plan view of the right hand housing or casing, as seen in Figure 1. Figure 6 is a side elevational view of Figure 5. Figure 7 is a view, similar to Figure 2, showing another embodiment of the invention, illustrating the use of rubber cushioning units in place of the spring units shown in Figure 2, only the shock absorbing mechanism proper being shown in Figure 7.

In said drawings, referring to Figures 1 and 2, 10—10 indicate channel-shaped center or draft sills of a railway car underframe structure, to the inner sides of which are secured front and rear stop lugs 11—11 and 12—12. The inner end of the drawbar is designated by 13 to which is operatively connected a yoke 14 of well-known

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form. The shock absorbing mechanism proper is disposed within the yoke, and the yoke and the parts therewithin are supported by a detachable saddle plate 15 fixed to the draft sills.

Referring first to the embodiment of the invention illustrated in Figures 1 to 6 inclusive, my improved shock absorbing mechanism comprises broadly front and rear casings A and B, and tandem arranged spring resistance elements C—C.

The front casing A is in the form of an oblong, boxlike member having vertically disposed, laterally spaced, longitudinally extending side walls 16—16, horizontally disposed, longitudinally extending, top and bottom walls 17 and 18, and vertically disposed, transversely extending, front and rear walls 19 and 20. The rear wall 20 forms a permanent part of the casing, but the front wall 19 is detachable, being in the form of a plate having laterally projecting, vertically extending flanges 21—21 at opposite sides engaged in vertical slots or grooves 22—22, formed in the side walls 16—16. The wall 19 may be secured in any suitable manner, the ends of the same being preferably upset or peened over. The top and bottom walls of the casing A are provided with vertically aligned guide openings or ways 23—23 which are of rectangular shape. The sides of the openings 23—23 terminate short of the inner sides of the opposite side walls 16—16 of the casing, thereby providing ledges or shoulders 24—24 and 24—24 which are presented by the interior surfaces of the top and bottom walls of the casing.

The casing B is also in the form of an oblong, boxlike member open at its front end and having vertically disposed, lengthwise extending side walls 25—25, horizontally disposed, lengthwise extending, top and bottom walls 26—26, and a transversely extending rear wall 27. The top and bottom walls are extended forwardly of the side walls, thus presenting top and bottom, forwardly extending arms 28—28. The rear end of the front casing A is slidingly telescoped between the top and bottom arms 28—28 of the casing B, the top and bottom walls 17 and 18 being cut away, as indicated at 29—29, to accommodate the arms 28—28 and provide stop shoulders 30—30 with which the front ends of the arms are engageable to limit compression of the mechanism. At the inner ends of the arms 28—28, the vertical end edges of the side walls 25—25 of the casing B form stop shoulders 31—31, which are adapted to be engaged by the end of the casing A at the same time that the ends of the arms 28—28 of the casing B come into abutment with the shoulders 30—30.

The arms 28—28 are provided with vertically aligned, transversely extending slots 32—32 therethrough, adapted to receive a rectangular key plate 33, which closely fits the slots. The slots 32—32 are of the same dimensions, transversely of the mechanism, as the openings 23—23 of the casing A, and the key plate 33 extends through these openings, being disposed forwardly of the rear end wall 20 of the casing A. The key plate 33 forms the front intermediate follower of the mechanism and also serves to hold the same assembled, anchoring the front casing to the rear casing and limiting lengthwise separation of the casings.

The rear wall 20 of the casing A forms, in effect, the rear intermediate follower of the mechanism, and the front and rear end walls 19 and 27 of the casings A and B, respectively, form the front and rear outer followers.

The tandem arranged spring resistance elements C—C comprise front and rear units, each unit including a pair of heavy coil spring members arranged lengthwise side by side. The front spring unit is interposed between the front end wall 19 of the casing A and the front, intermediate follower formed by the locking plate 33, and the rear spring unit is interposed between the rear wall 20 of the casing A and the rear wall 27 of the casing B. Both of the spring units C—C are housed within the casings.

In assembling the mechanism, the rear cushioning unit C comprising the two springs is placed within the casing B before the locking plate 33 is applied. The rear end of the front casing A, with the front wall 19 of this casing removed, is then telescoped between the arms 28—28 of the casing B and the locking plate 33 applied by engaging the same through the slots 32—32 of the arms 28—28 and through the openings 23—23 of the casing A. The front cushioning unit C, comprising the two springs, is next placed within the casing A by insertion through the open front end thereof, and the wall 19 is then applied and fixed in place.

The operation of my improved shock absorbing mechanism is as follows: During draft action, the yoke is moved forwardly, carrying the casing B therewith, while the casing A is held stationary by the front stop lugs, thereby compressing the front spring unit C between the front wall 19 of the casing A and the plate 33, which moves forwardly with the casing B, and compressing the rear spring between the rear wall 20 of the casing A and the rear wall 27 of the forwardly moving casing B. During buffing action, the yoke is moved rearwardly, carrying the casing A therewith, while the casing B is held stationary by the rear stop lugs, thereby compressing the front spring C between the front wall 19 of the casing A and the plate 33, which is held stationary by the casing B, and compressing the rear spring unit between the rear wall 20 of the rearwardly moving front casing A and the rear wall 27 of the stationary casing B. In either draft or buff, both members of the spring resistance means are thus compressed in tandem. The compression stroke will continue either until the actuating force is reduced or relative movement of the casings toward each other is arrested by engagement of the ends of the arms 28—28 of the rear casing with the shoulders 30—30 of the front casing and engagement of the shoulders formed by the front walls of the openings 23—23 of the casing A with the locking plate 33. When the actuating force is reduced in release, the spring resistance units

C—C effect restoration of the parts of the mechanism to the normal position illustrated in Figures 1 and 2, separation of the casings being limited by engagement of the locking plate 33 with the rear end walls of the openings 23—23 of the casing A and with the rear wall 20 of this casing.

Referring next to the embodiment of the invention illustrated in Figure 7, the construction and design is identical with that shown in Figures 1 to 6 inclusive, with the exception of the front and rear cushioning units, which are in the form of rubber elements, instead of coil springs. The mechanism shown in Figure 7 comprises front and rear casings identical with the casings A and B hereinbefore described. These casings are also indicated by A and B in Figure 7 and the various parts thereof are designated by the same reference characters as hereinbefore employed in connection with the mechanism shown in Figures 1 to 6 inclusive.

The cushioning units, which are in the form of rubber elements, are indicated by D—D in Figure 7. Each unit comprises a plurality of rectangular rubber mats 40 arranged in series, and a plurality of metal separating or spacing plates 41 of rectangular outline, alternated with the mats. The mats are of well-known design, each being in the form of a flat pad provided with spaced ribs on one side thereof. The rubber mats 40 and the plates 41 of each unit are made of such a size as to fit the interior contour of the corresponding casing, the mats and plates of the front casing being smaller than those of the rear casing, as clearly shown in Figure 7. The mats and plates of the front unit, which are located at the rear end of the casing A, are supported at their opposite ends between the top and bottom ledges 24—24 and 24—24 at opposite sides of the openings 23—23, resting on the lower ledge and being thus maintained in alignment with the remaining mats and plates and held against dropping into the lower opening 23.

The operation of the mechanism shown in Figure 7 is the same as that of the mechanism illustrated in Figures 1 to 6 inclusive, and the manner of assembling the parts thereof is also similar.

I claim:

1. In a tandem draft gear, the combination with front and rear pressure transmitting elements movable toward and away from each other lengthwise of the mechanism, each of said elements having a follower acting wall at its outer end and a second follower acting wall at its inner end, said second named wall of each element being engaged between the front and rear walls of the other of said elements, one of said elements having lengthwise disposed, spaced arms at the inner end thereof extending toward the other element and between which the inner end portion of said other element is slidingly telescoped for lengthwise movement, the inner end wall of said element, which is provided with the arms, being detachably connected to said arms; of a cushioning unit interposed between the wall at the outer end of each element and the wall at the inner end of the other of said elements.

2. In a tandem draft gear, the combination with front and rear casings movable lengthwise toward and away from each other, one of said casings having lengthwise disposed, spaced arms slidingly accommodating the inner end of the other casing therebetween, said casings being

closed at their outer ends, the casing which has its inner end slidingly guided between said arms having an inner end wall rigid therewith; of a locking key plate detachably connected to said arms, said key plate being interposed between the closed outer end and the wall at the inner end of the casing which has its inner end disposed between said arms; and a cushioning unit disposed within each casing, one of said cushioning units having its outer end bearing on the closed end of the casing having the lengthwise extending arms, and its inner end bearing on the wall at the inner end of the casing which is slidingly guided between said arms, and the other of said cushioning units bearing at its outer end on the closed end of said last named casing and at its inner end on said key plate.

3. In a tandem draft gear, the combination with front and rear casings closed at their outer ends, said casings being lengthwise movable toward and away from each other, one of said casings having spaced top and bottom arms extending toward the other casing and slidingly accommodating the rear end of the last named casing therebetween, said last named casing having a fixed follower acting wall at its inner end; of a follower acting locking plate fixed to said arms and disposed between said follower acting wall and the closed end of the casing which has the fixed follower acting wall at its inner end; a cushioning unit reacting between the follower acting locking plate and the closed end of the casing having the fixed follower acting wall; and a second cushioning unit reacting between the closed end of the casing having the arms and the fixed inner end wall of the casing which is guided between said arms.

4. In a tandem draft gear, the combination with a casing at one end of the mechanism; of a second casing at the other end of the mechanism, said casings being movable lengthwise toward and away from each other; spaced, lengthwise extending arms at the inner end of said first named casing embracing the inner end of the second named casing and slidingly accommodating the same for lengthwise movement therebetween, said casings being closed at their outer ends and said second named casing having a fixed follower acting wall at its inner end; and guide openings extending through the top and bottom walls thereof inwardly of said fixed follower acting wall; a detachable key plate fixed to said arms and extending through said guide openings of said second named casing; a cushioning unit reacting between the closed end of said second named casing and said key plate; and a second cushioning unit reacting between said fixed follower acting wall of said second named casing and the closed end of the first named casing.

5. In a tandem draft gear, the combination with a casing at one end of the mechanism; of a second casing at the other end of the mechanism, said casings being movable lengthwise toward and away from each other; spaced, lengthwise extending arms at the inner end of said first named casing embracing the inner end of the second named casing and slidingly accommodating the same for lengthwise movement therebetween, said casings being closed at their outer ends and said second named casing having a fixed follower acting wall at its inner end, and

guide openings extending through the top and bottom walls thereof inwardly of said fixed follower acting wall; a detachable key plate fixed to said arms and extending through said guide openings of said second named casing; a cushioning unit reacting between the closed end of said second named casing and said key plate; and a second cushioning unit reacting between said fixed follower acting wall of said second named casing and the closed end of the first named casing, each of said cushioning units including a plurality of coil springs.

6. In a tandem draft gear, the combination with a casing at one end of the mechanism; of a second casing at the other end of the mechanism, said casings being movable lengthwise toward and away from each other; spaced, lengthwise extending arms at the inner end of said first named casing embracing the inner end of the second named casing and slidingly accommodating the same for lengthwise movement therebetween, said casings being closed at their outer ends and said second named casing having a fixed follower acting wall at its inner end, and guide openings extending through the top and bottom walls thereof inwardly of said fixed follower acting wall; a detachable key plate fixed to said arms and extending through said guide openings of said second named casing; a cushioning unit reacting between the closed end of said second named casing and said key plate; and a second cushioning unit reacting between said fixed follower acting wall of said second named casing and the closed end of the first named casing, each of said cushioning units including a series of rubber mats and a series of spacing plates alternated with said mats.

7. In a tandem draft gear, the combination with a front casing having top and bottom walls, a fixed front wall, and a fixed rear wall, said casing having guide openings extending through said top and bottom walls, said openings being forwardly of said rear wall; of a rear casing having top and bottom walls, a fixed rear wall, and forwardly extending arms projecting from said top and bottom walls and embracing the rear end of the other casing, said casings being lengthwise movable toward and away from each other; a follower acting key plate forwardly of said fixed rear wall of the front casing extending through the guide openings of said first casing and having lengthwise movement therein, said key plate being fixed to the arms of said rear casing; a cushioning unit interposed between the front wall of the front casing and said key plate; and a second cushioning unit interposed between said rear wall of the front casing and the rear wall of the rear casing.

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