Aug. 28, 1934. H. J. LOUNSBURY 1,971,420

RAILWAY DRAFT RIGGING

Filed Feb. 27, 1928 3 Sheets-Sheet 1

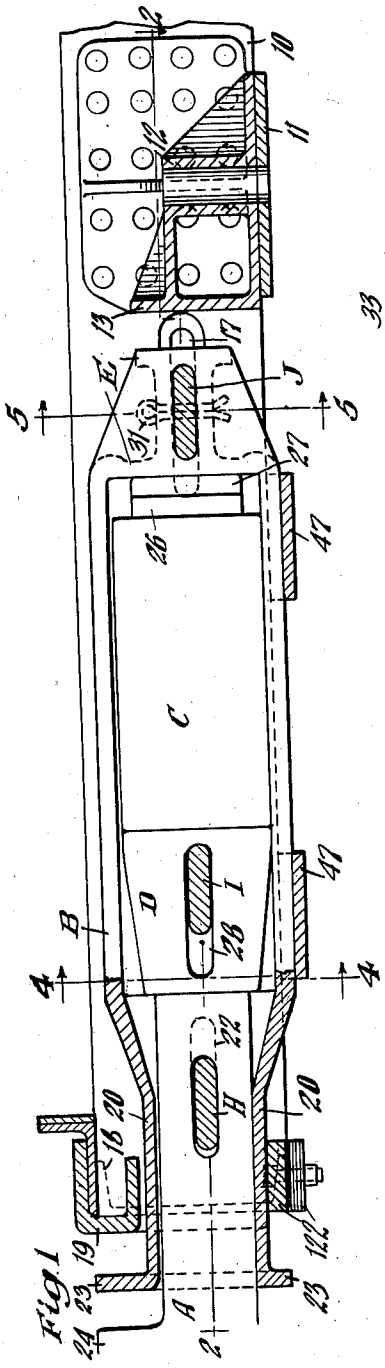


Fig. 1

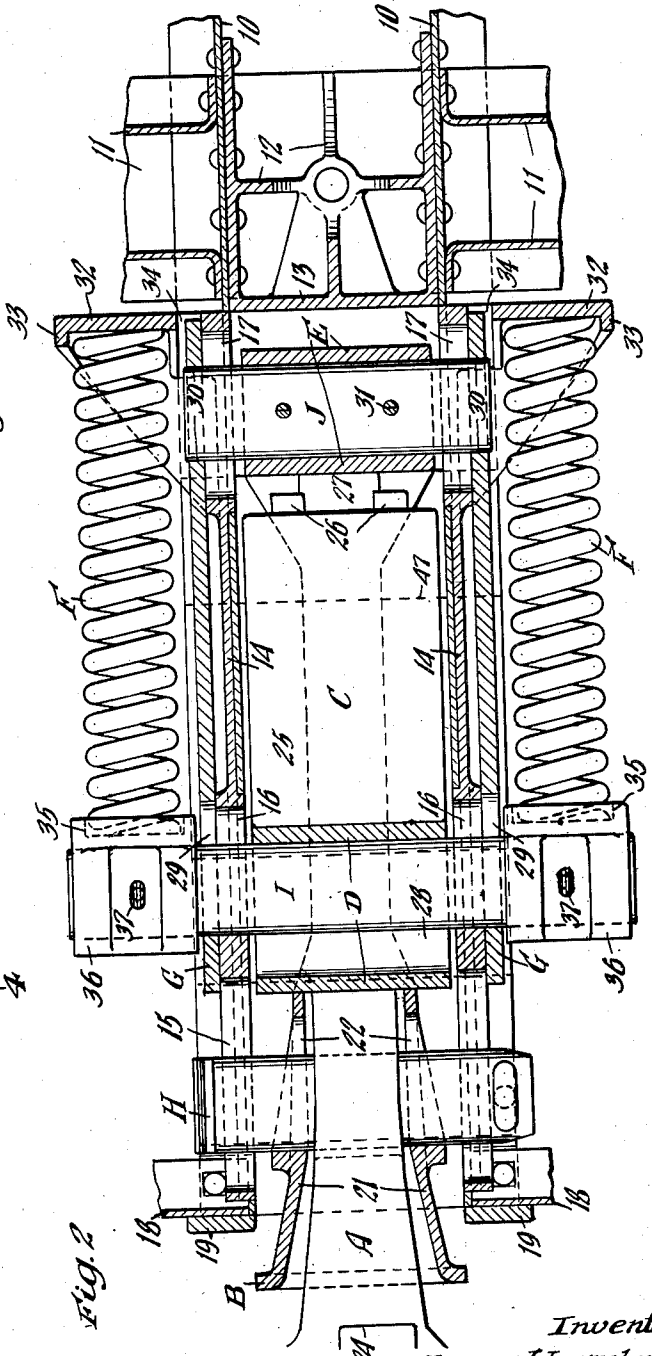


Fig. 2

Witness
Wm. Geiger

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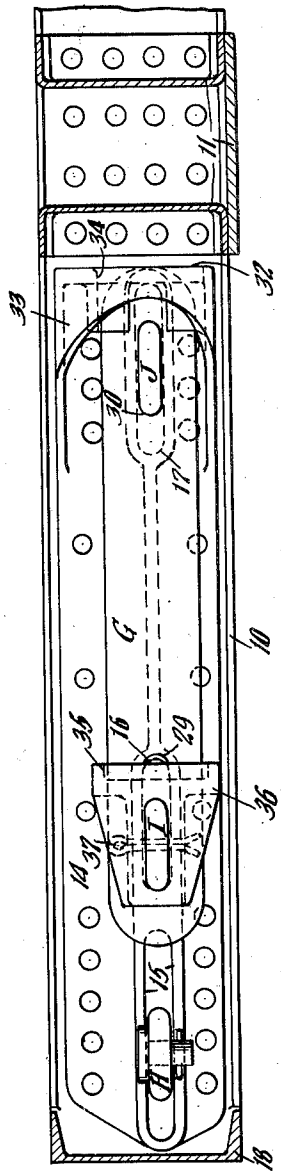


Fig. 3

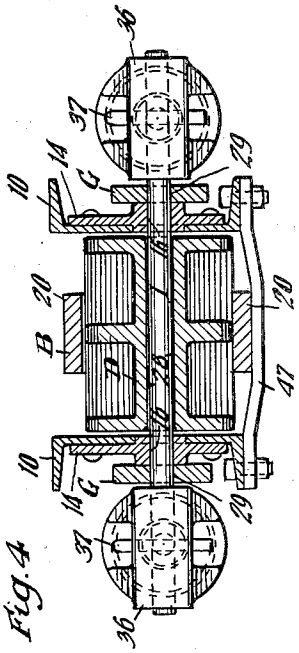


Fig. 4

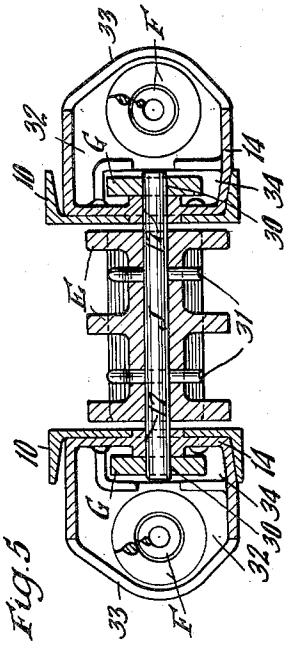


Fig. 5

Witness
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RAILWAY DRAFT RIGGING

Filed Feb. 27, 1928 3 Sheets-Sheet 3

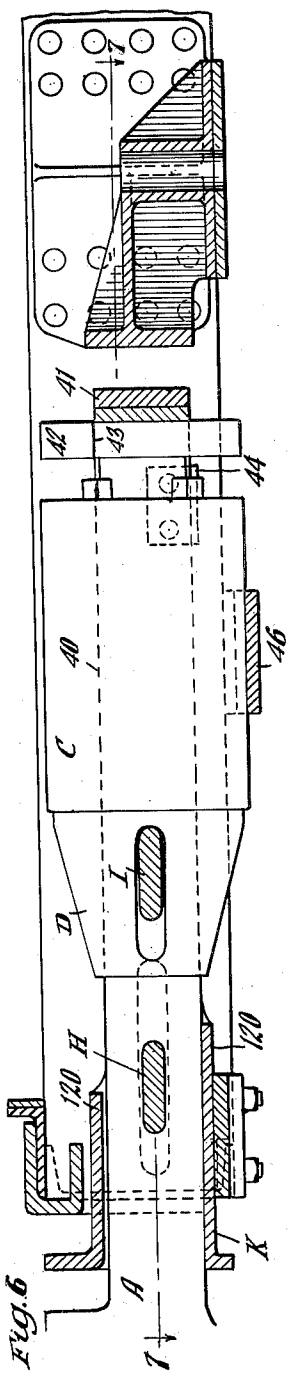


Fig.6

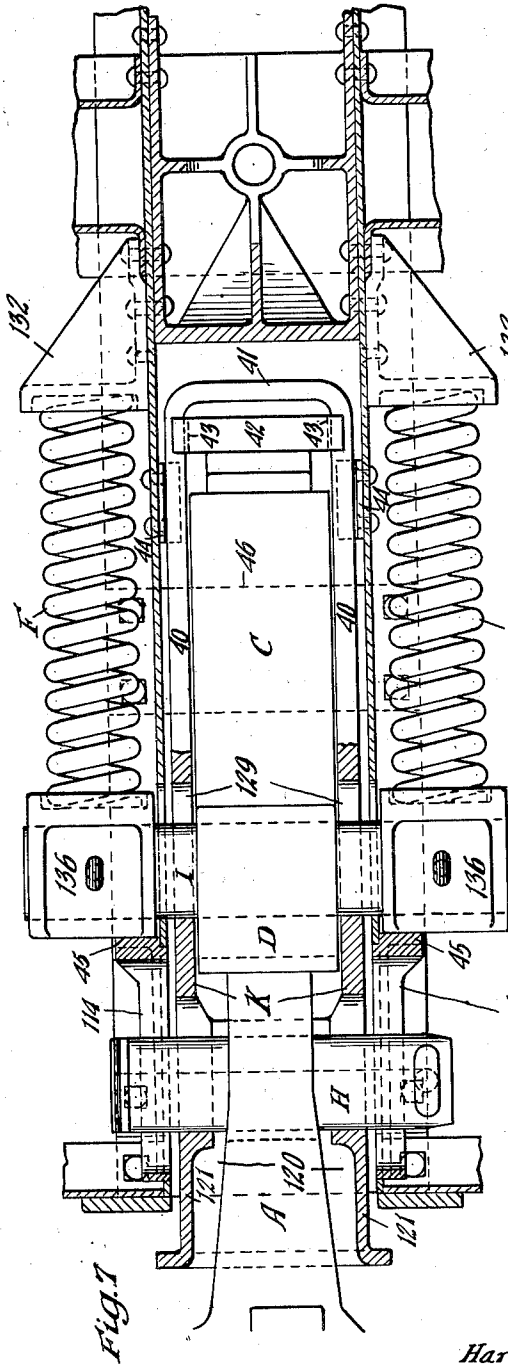


Fig.7

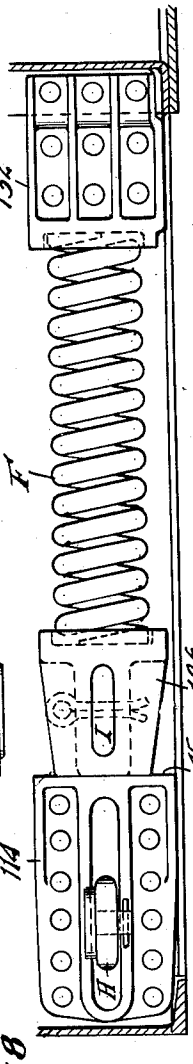


Fig.8

Witness
Wm. Geiger

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Patented Aug. 28, 1934

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UNITED STATES PATENT OFFICE

1,971,420

RAILWAY DRAFT RIGGING

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Application February 27, 1928, Serial No. 257,338

7 Claims. (Cl. 213—7)

This invention relates to improvements in railway draft riggings.

In the present day operation of railway cars, there is a constant demand for greater shock absorbing capacity in the draft gears, due to the increased lengths of trains; weight and size of individual cars, and greater locomotive tractive effort. Particularly is the demand for greater capacity present in the case of buffing shocks. It is becoming more and more difficult to satisfy the increasing demands, due to the limitations of space between draft sills and the necessity of avoiding increased train slack.

One object of my invention is to provide an improved railway draft rigging wherein greater shock absorbing capacity is obtained in the buffing strokes of the rigging, which greater capacity is made possible by providing a longer buffing stroke without increasing the usual draft stroke.

Another object of my invention is to provide a rigging of the character above indicated wherein additional capacity is obtained by utilizing a second or independent cushioning device located on the outside of the usual draft sills.

A more specific object of the invention is to provide a draft rigging wherein are employed two relatively independent cushioning devices so arranged that one of said devices is actuated in the first part of a buff stroke only, and another device is actuated during the latter part of the buff stroke and in draft.

A still further object of the invention is to provide a draft rigging of the character indicated in the preceding paragraph wherein one of the independent cushioning devices is located outside of the draft sills.

A still further object of the invention is to provide a draft rigging wherein two relatively independent cushioning devices or units are employed, one of said units being utilized as a pressure-transmitting member for actuating the other during the forepart of the buff stroke.

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

In the drawings forming a part of this specification, Fig. 1 is a vertical longitudinal sectional view of a portion of a railway draft rigging, showing my improvements in connection therewith. Fig. 2 is a horizontal longitudinal sectional view corresponding to the line 2—2 of Fig. 1. Fig. 3 is a view similar to Fig. 1 except that the longitudinal section is taken outside of the draft sills and the corresponding secondary spring is omitted in order to more clearly illustrate the parts. Figs. 4 and 5 are vertical transverse sectional views corresponding to the lines 4—4 and 5—5 respectively, of Fig. 1. And Figs. 6, 7 and 8 are views corresponding to Figs. 1, 2 and 3, respectively, but illustrating another embodiment of my invention.

Referring first to the construction illustrated in Figs. 1 to 5, 10—10 denote the usual channel draft sills, the same comprising portions of the center sills in the embodiment illustrated. Said sills are united to a bolster as indicated at 11, the bolster having a center filler casting 12, which is formed with a vertical transverse wall 13 adapted to act as a rear stop or abutment, as hereinafter explained. The draft sills are slotted at intervals and reinforced by suitable cheek plates or castings 14—14, each of the latter being provided with an elongated front slot 15, an intermediate slot 16 and a rear slot 17. At their outer ends, the draft sills are secured to the usual end sill 18 and the opening for the drawbar is reinforced by an end or buffer casting 19.

In carrying out my invention, in addition to the usual coupler A, I employ a yoke B; a friction draft gear C; front follower block D; two heavy springs F—F; side links G—G and keys H, I and J.

The yoke B, as shown, is preferably in the form of an integral casting having top and bottom walls 20—20 which extend parallelly at the outer end of the yoke, thence diverge in a vertical plane, then extend horizontally and are united at their rear ends by a follower block section E. At the front end, the yoke B is provided with integral side walls 21—21 which are suitably slotted, as indicated at 22 to accommodate the coupler key H and, forwardly thereof, are laterally flared, to accommodate the lateral movements of the coupler, as will be understood. The upper and lower walls 20 are extended well forward of the usual carry iron 122 which supports the yoke and coupler in position and, at the extreme outer ends, said walls are flanged as indicated at 23, the upper portion thereof being adapted to serve as an abutment for the usual horn 24 of the coupler during the latter part of the buff stroke, said flange being spaced from the horn a distance corresponding to the first part of the buff stroke which takes place on the springs, as hereinafter explained. As clearly shown in Fig. 2, the coupler key H is normally so located in the slots 15 that it may have a relatively long buff movement of approximately 5" or 6" and a shorter draft movement of approximately 2½" or 2¾".

The friction gear C may be of any suitable or

desired type, the one shown being illustrated conventionally and including a combined friction shell and spring cage casting 25; friction shoes 26 and pressure-transmitting wedge 27, the latter bearing against the follower block section E of the yoke, as best shown in Fig. 2. Said friction gear is located within the pocket of the yoke, and between the front end of the shell 25 and the butt end of the coupler A is interposed the front follower block D. The latter is formed with a horizontally elongated slot 28 through which extends the key I, the latter also extending through the sill slots 16 and through alined slots 29 provided in the outside links G. Normally, the key I occupies the rearmost position in the slot 28, as shown in Fig. 2.

The follower block section E of the yoke is horizontally slotted for the reception of the rear key J which extends through the sill slots 17 and also engages slots 30 in the links G. Said key J may be held against transverse movement by any suitable means such as the cotters 31—31 passed through it and alined openings in the follower block section E.

In the construction shown, the cheek plates or castings 14 are provided at their rear ends with laterally extended flanges 32 suitably reinforced and connected to the main portions of the castings by curved flanges 33 which thus provide pockets for the reception of the inner ends of the coil springs F. Said flanges 32 are recessed as indicated at 34, so as to accommodate the back and forth movements of the links G, as will be apparent from Fig. 2 of the drawings.

The forward ends of the springs F are seated in shallow pockets 35 provided on the rear faces of blocks 36 which are mounted upon the extended ends of the key I and secured to the latter by any suitable means, as for instance the cotters 37.

The links G are disposed on the outer sides of the sills and ride against the outer faces of the reinforcing castings 14 and are confined against lateral movement by said castings, the follower blocks 36 and the guide slots 34 in the rear portions of the castings 14.

As best shown in Fig. 2, the key I normally occupies the outermost position in the slots 16 and 29 of the cheek plates and links and the rear key J of the draft rigging normally occupies a central position in the slots 17.

In actual practice, the springs F will preferably be designed for about 2½" movement and of heavy capacity. Similarly, the friction gear will be designed for about the same compression stroke and of appreciably higher capacity than that of the springs. Under such conditions, the operation of the draft rigging is as follows.

During a buff movement of the coupler A, the pressure from the latter will be transmitted through the follower block D to the friction gear C and from the latter to the yoke B through the follower block section E thereof. This induces a rearward movement of the key J, which in turn produces a corresponding simultaneous rearward movement of the links G, so that the latter in turn pull the key I rearwardly. The rearward movement of the key I causes a corresponding rearward movement of the outside spring follower blocks 36, thus compressing the springs F against the rear stop flanges 32. This action continues until the keys I and J reach the innermost points in the slots 16 and 17, respectively, whereupon further compression of the springs F is prevented and the follower section E of the yoke acts as a rear stop or abutment for the friction gear. At the same time the key J reaches its innermost position, the section E of the yoke will preferably engage the stop wall 13 of the center filler casting. As the buff movement of the coupler continues, the front follower block D will then move relatively to the key I and force the combined friction shell and spring cage 25 rearwardly, which in turn induces an action of the friction gear, inasmuch as the wedge 27 thereof will be held stationary by the rear section E of the yoke. The coupler is thus permitted an additional movement independent of the compression of the springs F which movement may be made of about 2½" or 2¾". While I have described the compression of the springs F as taking place prior to any compression of the friction gear, it will nevertheless be understood that there will be a merging of the final spring compression with the initial friction gear action, although substantially the two cushioning devices C on the one hand and F on the other hand may be considered as operating as independent units. In a draft action, the yoke B will be pulled forwardly by the coupler key H and the friction gear C will be actuated, inasmuch as the friction shell 25 thereof will be held stationary by the front follower block D which in turn is held stationary by the key I. During the draft action, it will be observed that there is no compression of the springs F and furthermore, the draft stroke is limited by the key J engaging the front ends of the slots 17 and preferably by the coupler key H simultaneously engaging at the front end of the slots 15.

From the preceding description, it will be seen that a longer buff stroke provides for the absorption or cushioning of much heavier blows than is obtainable with the ordinary gear having the usual 2¾" stroke. Furthermore, the increased shock absorbing capacity is obtained without increase of sill spacing and without increase of the stroke of the friction gear proper so that the improved combination of shock absorbing units can be incorporated on railway cars at minimum expense.

Referring next to the construction illustrated in Figs. 6, 7 and 8, the arrangement of coupler A, front follower block D, friction gear C, springs F, coupler key H and intermediate key I is essentially the same as in the first modification described. The rear stops or abutments for the springs F are obtained by separate lug castings 132 riveted to the draft sills instead of being formed integrally with cheek plates as in the first described modification.

In the modification of Figs. 6, 7 and 8, I employ a horizontal type of yoke designated generally by the reference character K and eliminate the use of separate side links G. Said yoke K is of hollow box-like section at the front end thereof, having top and bottom walls 120—120 which are integrally united with side walls 121—121, the latter being extended so as to form a horizontal yoke having side arms 40—40 connected by a rear section 41. A separate rear follower 42 is employed, the same being suitably notched or recessed on its sides as indicated at 43, so as to fit over the arms 40 of the yoke and be sustained thereby. The horizontal yoke is sustained in proper position at its rear end by suitable supporting and guide lugs 44—44 secured to the insides of the draft sills. The side arms 40 of the yoke are suitably slotted as indicated at 129 to accommodate the key I which is also extended through corresponding slots in the draft sills. Further, in this modification, the front spring fol-

lower blocks 136 bear against front stops or lugs 45 disposed on the outer sides of the sills and preferably made integral with the reinforcing plate or casting 114, which defines the coupler key opening. In this modification, the draft gear is sustained directly by a removable saddle plate 46, whereas in the first described modification, the friction gear is sustained by the yoke and the latter in turn supported by two detachable saddle plate 47—47.

The operation of the rigging shown in Figs. 6 to 8 is the same as that of the first described modification, it being evident that, as the coupler A moves rearwardly in a buff stroke, the pressure is transmitted through the block D, friction gear C, to the rear end 41 of the horizontal yoke and the latter in turn directly pulls the key I rearwardly, thus compressing the springs F, as will be understood. In a draft action, the shell of the friction gear is held by the follower block D and key I and the friction gear actuated by the horizontal yoke which moves forwardly, thus applying the pressure through the rear follower 42 to the wedge of the gear, it being observed that the yoke will move forwardly relatively to the key I on account of the elongated slots 129.

I have herein shown and described what I now consider the preferred manner of carrying out my invention, but the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In a draft rigging, the combination with draft sills; of a cushioning device disposed between the sills; a relatively independent cushioning device located outside of the sills; means interposed between said first named device and the second named device for actuating the latter through the former during the first part of a buff stroke; and means for actuating said first named device only in a draft stroke.

2. In a draft rigging, the combination with draft sills and a coupler; of springs disposed on the outer sides of said sills lengthwise of the latter; a cushioning device disposed between the sills and adapted to be directly moved bodily by the coupler during part of a buff action; and means interposed between said cushioning device and the forward ends of said springs for compressing the latter during bodily movement of said cushioning device, said cushioning device being compressed during another part of the buffing action.

3. In a draft rigging, the combination with draft sills and coupler; of a yoke operatively connected to said coupler; a friction gear within said yoke; springs on the outer sides of said sills and extending lengthwise thereof fixed rear stop means on which the springs continuously bear; and means engaging the forward ends of said springs and adapted to be rearwardly moved through the intermediary of said friction device, upon a buff movement of said coupler.

4. A draft rigging in accordance with claim 3 wherein said last named means include links disposed on the outer sides of the sills.

5. In a draft rigging, the combination with draft sills and a coupler; of a yoke operatively connected to the coupler; a friction gear within said yoke; springs on the outer sides of said sills; fixed rear stop means for said springs on which the springs bear continuously; follower means engaging the forward ends of said springs; and links for transmitting buffing shocks from the friction gear to the follower means upon a buffing movement of said coupler, said links having a lost motion connection with said follower means, permitting relative movement between the links and follower means during a draft action of the rigging.

6. In a railway draft rigging the combination with draft sills; of a coupler; a friction shock absorbing mechanism; follower means interposed between the said coupler and the friction shock absorbing mechanism to actuate the latter in buff; a yoke connected to the coupler for actuating the friction shock absorbing mechanism in draft; springs on the outer sides of said sills; follower members engaging the forward ends of said springs; a lost motion connection between the yoke and said follower members, permitting relative movement of the yoke and follower members in draft only, said lost motion connection including a key connected to the follower members, said key having a lost motion connection with the follower means whereby said follower means, during a buffing action, is movable inwardly of the mechanism relatively to the key.

7. In a draft rigging for railway cars, the combination with draft sills; of a friction shock absorbing device disposed between the sills; a spring resistance disposed on the outer side of the sills, said spring resistance being of lesser capacity than said friction shock absorbing device; permanently fixed stop means on which the inner end of said spring resistance bears for maintaining the inner end in fixed position in both buff and draft; follower means for the front end of said spring resistance; follower means at the inner end of said friction shock absorbing device engaged by the latter and actuated by bodily movement of said device in buff while said device is in expanded condition; and means connecting said first named and second named follower means for movement in unison in buff, said connecting means being fixed to said second named follower means for movement therewith in both buff and draft and having a lost motion connection with the first named follower means to provide free movement of the connecting means with respect to said first named follower means in draft.

HARVEY J. LOUNSBURY.