Nov. 15, 1938. E. H. BLATTNER 2,137,152

DRAFT RIGGING

Filed Aug. 21, 1934 2 Sheets-Sheet 1

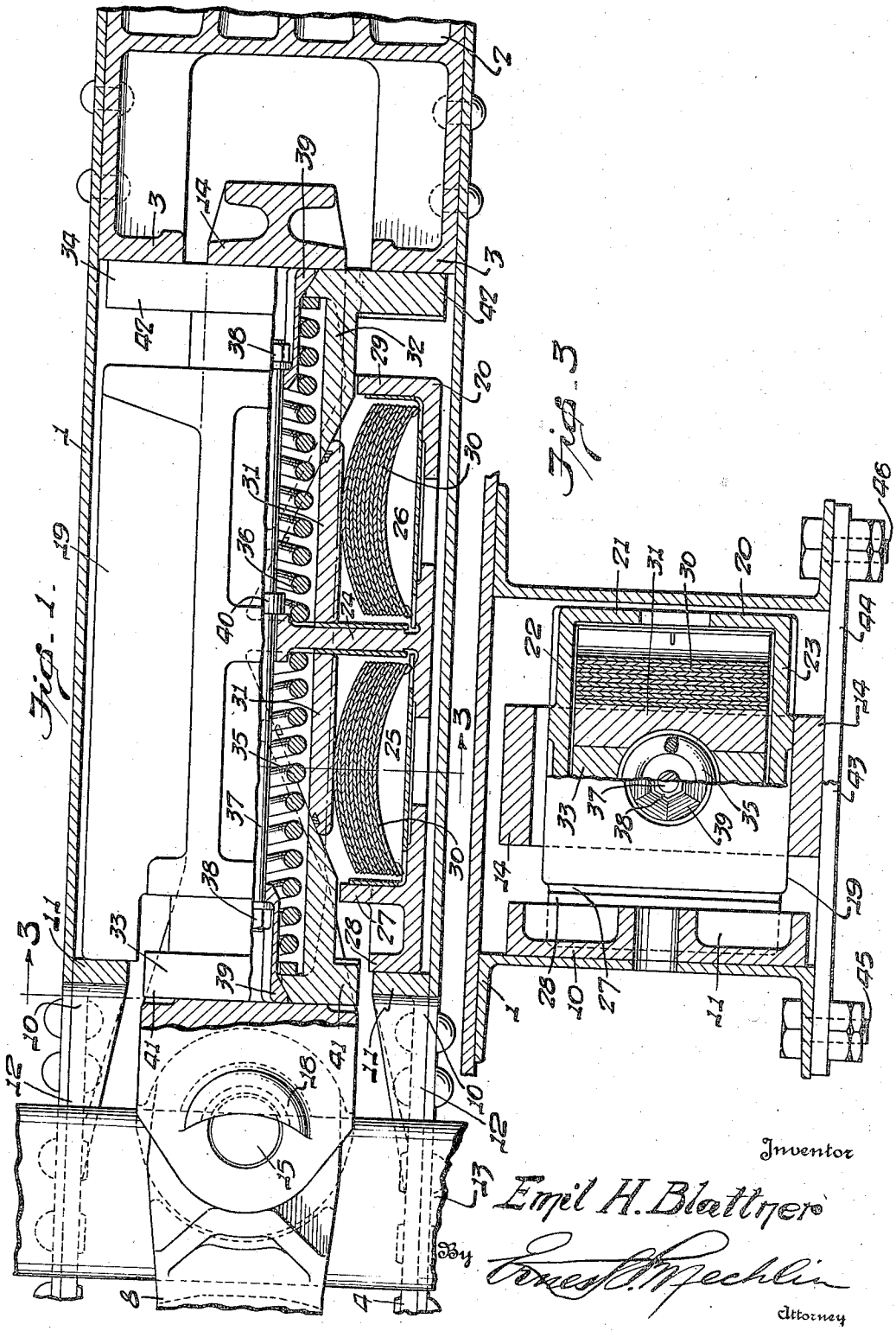


Fig. 1.



Fig. 3

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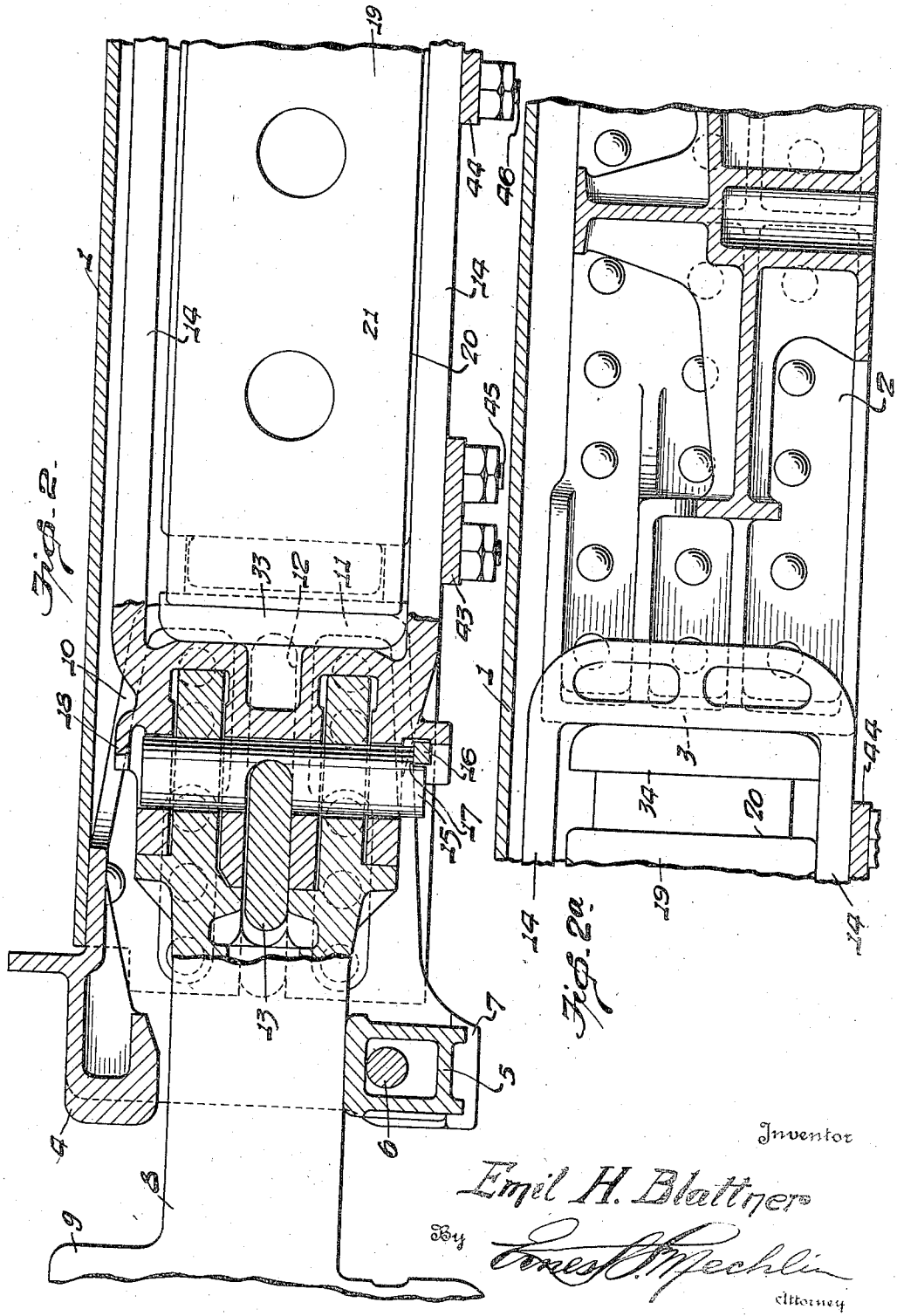



Fig. 2.

Fig. 2a.

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Patented Nov. 15, 1938 2,137,152

# UNITED STATES PATENT OFFICE

2,137,152

## DRAFT RIGGING

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Application August 21, 1934, Serial No. 740,835

17 Claims. (Cl. 213—37)

This invention relates to railway draft rigging and, more particularly, to such in combination with friction cushioning mechanism for providing a greater travel and energy absorbing capacity under the action of buffing forces than when subjected to draft forces.

The principal object of my invention, generally considered, is to provide a friction draft gear comprising elements enclosed in housing means forming front and rear mechanism pockets, said housing means being unsymmetrical and being directly stopped on draft by front lugs on the draft sills, rear lugs being provided and desirably spaced from said front lugs so as to provide an American Association of Railways standard vertical yoke draft gear pocket, said rear lugs serving to stop the rear follower of the gear on buff, whereby when used with a vertical yoke and associated coupler, the rear mechanism only is actuated on draft, while the mechanism in both pockets is actuated on buff.

Another object of my invention is the provision of an economical and compact double-acting draft gear including a housing having complete friction elements at each end, the total length of the gear over projecting elements in normal position being more than the distance between the faces of the front and rear draft lugs in order to provide for the employment of such a double-acting gear in an American Association of Railways standard vertical yoke draft gear pocket.

A further object of my invention is the provision of a yoke having draft gear abutment faces at opposite ends spaced a distance equal to the normal length of an associated draft gear, and greater than the distance between the vertical stop faces of associated members defining an American Association of Railways standard draft gear pocket.

Other objects and advantages of the invention relating to the particular arrangement and construction of the various parts will become apparent as the description proceeds.

Referring to the drawings illustrating my invention, the scope whereof is defined by the appended claims:—

Figure 1 is a plan of one embodiment of my double-acting draft gear, associated rigging and sills, said sills, back-stop, stop lugs and portions of the coupler and gear being shown in horizontal section.

Figure 2 is a vertical longitudinal sectional view between the sills and showing the forward portion of the draft rigging and associated cushioning mechanism partly in side elevation.

Figure 2a is a view corresponding to and supplementing Figure 2 as showing the portion of the underframe, rigging and gear rearwardly of that shown in Figure 2.

Figure 3 is a transverse sectional view on the line 3—3 of Figure 1, looking in the direction of the arrows.

My invention is intended to provide a selective travel arrangement employing a coupler with its horn normally spaced from the associated striking casting a distance greater than with a single-acting or conventional gear in order to allow for the increased rearward movement, and pivotally connected to a yoke device which is slightly special and nearly interchangeable with a standard vertical yoke, in that it is employed with associated front and rear stops spaced to provide an American Association of Railways standard vertical yoke draft gear pocket. The double-acting draft gear in said pocket desirably includes wedges, spread by combined follower and central wedge devices, and is formed so that the housing is directly stopped on draft by the front lugs, the front follower-acting means normally projecting beyond the front wall portions of the housing, but stopped on inward movement by wall portions spaced inwardly from the housing front end, while the rear follower-acting means directly engages the rear lugs whereby said latter element is actuated on draft for energizing the rear cushioning mechanism, the mechanisms in both ends of the housing being actuated on buff through the front follower acting means moving into the front draft gear pocket and simultaneously moving the housing rearwardly over the rear follower acting means, which is stopped by the rear draft lugs.

Referring now to the drawings in detail, like parts being designated by like reference characters, there are shown portions of an underframe adapted for use with railway vehicles and comprising center or draft sills 1 connected by a backstop or combined backstop and center filler casting 2, the forward arms of which provide rear draft lugs or stop means 3. The outer ends of the sills are connected by a striking casting 4 which, in the present embodiment, is provided with a movable carrier block 5 connected to said casting by means of a normally horizontal bolt 6, the ends of said block desirably resting on inwardly extending ledges 7 for securely supporting the stem 8 of an associated coupler 9.

In the present embodiment, the striking casting 4 has rearwardly extending portions 10 secured to the sills 1 and forming front draft lugs 11, said rearwardly extending portions being slotted, as indicated at 12, to receive a horizontal draft key 13 which serves for the support of the coupler stem 8 and associated vertical yoke 14, said yoke and coupler stem being desirably pivotally connected by means of a normally vertical pin 15, so that the forward portion of the yoke forms, in effect, a swivel butt for the coupler stem, said pin being desirably supported on a retainer

16 engaging a notched portion 17 in the lower end thereof, said retainer desirably extending between depending lug portions on the bottom of the vertical yoke 14. Undesired upward movement of the pin is, in the present embodiment, limited by an overlying ledge or shelf 18 formed on the vertical yoke 14. The pivotal connection between the coupler stem and yoke, except as specifically illustrated and described, corresponds generally with that described and claimed in Patent No. 1,786,419, dated December 30, 1930.

The spacing of the lugs 3 and 11 is such that an A. A. R. standard vertical yoke draft gear pocket is provided therebetween. In other words, the arrangement allows for a conventional single-acting draft gear and associated vertical yoke and coupler to be employed. In the present embodiment, I have substituted for such a conventional arrangement an unsymmetrical draft gear or cushioning device 19 comprising a housing or housing means 20 formed by side walls 21, an upper wall 22, a lower wall 23, and a transverse partition 24 connecting said walls and forming a front draft gear pocket 25 and a rear draft gear pocket 26. The transverse partition 24 is spaced rearward of the midpoint between the front and rear ends of the housing and in order to provide cushioning mechanism pockets of equal length, the front pocket 25 is defined by transverse web or flange portions 27 spaced inwardly of the front end flanges or webs 28. The rear pocket 26 is defined by the rear flange or web portions 29 of the housing 20, whereby both pockets 25 and 26 are adapted to receive cushioning mechanism of equal capacities.

Each pocket 25 and 26 receives two sets of inwardly acting curved leaf springs 30 which engage corresponding friction shoes 31, which shoes are spread apart when the gear is compressed by central wedge portions 32 on associated follower-acting devices, the front device being designated 33, and the rear device 34. A front helical release spring 35 and a rear helical release spring 36 are provided for holding the mechanism in normally open position. The follower acting devices and associated parts are prevented from disconnection from the housing and associated parts by means of a through bolt 37, the ends of which are secured by nuts 38 to retainers 39 received in the ends of the followers 33 and 34, said bolt 37 being provided with a collar or stop device 40 normally engaging the partition 24 to prevent the front follower 33 from moving forward with the yoke and coupler when the rear follower is pushed into the housing under the action of draft forces. Except as specifically described, the construction of the gear corresponds generally with that described and claimed in application Serial No. 711,247, filed February 14, 1934, although it will be understood that I do not wish to be limited to this form of gear as certain advantages of my invention may be secured with gears of other types. The liners which are engaged by the curved plate springs 30 and wedges 31, in order to provide renewable wear surfaces on the housing, are not fully described because they are like those described in connection with said previous application.

The front follower device and central wedge member 33 has portions 41 projecting laterally and terminating short of the front end wall portions 11, the inner surfaces of said portions 41 being normally spaced from the flange or web portions 27 an amount sufficient to provide for full compression only of the mechanism in the front pocket 25.

The rear follower device 34 has portions 42 projecting laterally almost to the sills 1 in order to normally engage the rear stop lugs 3, the inner surfaces of said lateral extensions being normally spaced from the rear surface of the housing 20 a distance sufficient to allow for full compression only of the mechanism in the rear pocket 26. Carriers 43 and 44, secured to the sills by bolts or the like 45 and 46, are desirably provided to underlie the yoke device 14 and provide for the support of said device and the associated double-acting gear 19.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that under the action of draft forces the vertical yoke 14 actuates the rear follower 34 and friction elements only, the housing remaining stationary on account of its engagement with the front draft lugs 11.

Under the action of buffing forces, the coupler butt or pivotally connected front end portion of the yoke 14 engages the front follower device 33, pushing it into the front pocket 25 and simultaneously causing the housing 20 to move rearwardly over the rear follower device 34, thereby closing both the front and rear friction elements with a travel equal to the sum of the travels allowed for the cushioning means in the front and rear ends of the housing or, in the present embodiment, double the travel provided at one end of the gear.

It will be seen that by virtue of my improved construction I have provided for a selective travel series draft gear arrangement for use in a conventional or single-ended draft gear pocket, and with a vertical yoke interchangeable with the standard vertical yoke for use in said pocket. It will also be understood that the details of the cushioning mechanism disclosed are merely illustrative and not limiting.

Although I have illustrated a preferred embodiment of my invention, it will be understood that modifications may be made within the spirit and scope of my invention as defined by the claims.

I claim:—

1. Railway draft rigging comprising spaced center sills, stop members connected thereto, said stop members being spaced apart so as to provide an American Association of Railways standard vertical yoke draft gear pocket, housing means positioned within said pocket, normally engaging the front stop members, and having web portions adjacent said front end but spaced rearwardly therefrom, the rear of said housing means being spaced from said rear stop members, cushioning means located within said housing means at the opposite ends thereof, said means operating independently of each other, and follower-acting means cooperating with each cushioning means, the said follower-acting means located at the forward end of said housing means normally extending forwardly of the vertical faces of said front stop members, having portions adapted to abut said web portions to limit compression of the front cushioning means, and adapted to be actuated by a coupler upon inward movement thereof.

2. Railway draft rigging comprising draft sills, stop members connected thereto and spaced apart so as to provide an American Association of Railways standard vertical yoke draft gear pocket, a housing positioned within said pocket and normally engaging the front stop members, the rear of said housing being spaced from said rear stop

members, cushioning means at each end of the housing and comprising a follower, a portion of which is located within said housing, said means operating independently of each other, and a bolt extending longitudinally through said followers and housing for holding the parts assembled, said bolt having a stop portion engaging a corresponding stop portion on said housing for holding the parts of the front cushioning means assembled in normal relation when the associated coupler moves forwardly for actuating the rear cushioning means, the follower located at the forward end of the housing normally extending forwardly of the vertical faces of the front stop members for actuation by said coupler upon inward movement thereof.

3. In a railway draft rigging, in combination with draft sills, a coupler, a vertical yoke pivotally connected thereto, front and rear stop means mounted on said sills and positioned for use with a conventional single-acting draft gear, and a double-acting draft gear mounted between said sills and the arms of said yoke rearwardly of said coupler, said gear comprising a housing having an opening and receiving cushioning mechanism in each end, said mechanism comprising front and rear followers, the front end of said housing normally engaging the front stop means and clearance being provided between the rear end of said housing and the rear stop means for effecting full compression of the rear cushioning mechanism, the front follower normally extending forward of the front of the housing for actuation on buff, the front of said housing having an opening large enough to permit the front follower to move rearwardly of the front and stop-engaging portions of said housing, and the rear follower being normally engaged by the rear stop means and rear end portion of the yoke, so that when the yoke is pulled forwardly by the coupler under the action of draft forces, the rear cushioning mechanism only is actuated, while under buffing forces the front follower is moved rearwardly with respect to the housing and the housing moved rearwardly with respect to the rear follower for simultaneously actuating the cushioning mechanism in both ends of the housing.

4. In railway draft rigging, in combination with draft sills, a coupler and vertical yoke mounted between said sills, and connected to each other, front draft lugs mounted on said sills and positioned so as to form front stops for a conventional single-acting draft gear, rear lugs mounted on said sills and positioned so as to form rear stops for said gear, and a double-acting draft gear mounted between said sills and the arms of said yoke, rearwardly of said coupler, said gear comprising a housing formed with a mechanism pocket in each end, the front end of said housing normally engaging the front stops and the rear end normally spaced from said rear stops, and cushioning mechanism in each pocket of said housing, said mechanism in the front pocket comprising a follower and central friction element and an associated spring, the front end portion of said spring being housed in said friction element, said element normally extending forwardly beyond the front of the housing for actuation by the coupler on buff, the mechanism in the rear end comprising a similar follower and central friction element laterally extended to provide portions normally engaging the rear draft lugs and from which the rear end of the housing is normally spaced an amount corresponding with the full compressive movement of the rear mechanism, the rear portion of the yoke normally engaging said follower and friction element, whereby under the action of draft forces the rear cushioning mechanism only is actuated, and under the action of buffing forces the front cushioning mechanism is actuated by the coupler and yoke, and the housing simultaneously moved rearward to actuate the rear friction elements, thereby providing increased cushioning effect for buffing forces in the same space necessary for a conventional single-acting gear.

5. A double-acting draft gear comprising a housing having an opening in each end and divided by a transverse partition to provide forwardly and rearwardly opening pockets, said rearwardly opening pocket receiving rear cushioning mechanism comprising spring-actuated friction elements and a central wedge portion of a rear follower which engages said elements, said rear follower having lateral extensions the front surfaces of which are spaced from the rear ends of the housing a distance corresponding with the movement of said follower for full compression of said rear cushioning mechanism, said extension being adapted for engagement with rear stop means, the forwardly opening pocket being defined by transverse wall portions spaced inwardly from the front end of the housing and said pocket receiving front cushioning mechanism comprising spring-actuated friction elements and a central wedge portion of a front follower which engages said elements, said front follower extending forwardly beyond the end of the housing and terminating in lateral extensions short of end wall portions of said housing, the latter being formed for engagement with front stop means, the inner surfaces of said lateral extensions being spaced from said inwardly spaced transverse wall portions an amount sufficient to allow for full compression of the front cushioning mechanism.

6. A double-acting draft gear comprising housing means having an opening in each end and divided by a transverse partition to provide front and rear pockets, said rear pocket receiving rear cushioning mechanism comprising spring-actuated friction elements and a central wedge portion of a rear follower which engages said elements, said rear follower having portions extending laterally and the front surfaces of which are spaced from the rear end of the housing a distance corresponding with the movement of said follower for full compression of said rear cushioning mechanism, said extensions being adapted for engagement with rear stop means, the forward pocket being defined by transversely extending wall portions spaced inwardly from the front end of the housing means and said pocket receiving front cushioning mechanism comprising spring-actuated friction elements and a central wedge portion of a front follower which engages said elements, said front follower extending forwardly beyond the end of the housing and having portions extending laterally and terminating short of front end portions of said housing, the latter being formed for engagement with front stop means, the inner surfaces of the lateral extensions being spaced from said inwardly spaced wall portions an amount sufficient to allow for full compression of the front cushioning mechanism, and a bolt extending longitudinally through said gear and the front and rear followers for holding said followers assembled with

the housing, said bolt having a collar engaging the transverse partition in said housing for holding said front follower in normal position when the associated coupler moves forwardly under the action of draft forces.

7. A double-acting draft gear comprising housing means having an opening in each end and divided by a transverse partition to provide front and rear pockets, said rear pocket receiving rear cushioning mechanism comprising spring-actuated friction elements and a central wedge portion of a rear follower which engages said elements, said rear follower having portions extending laterally, and the front surfaces of which are spaced from the rear end of the housing means a distance corresponding with the movement of said follower for full compression of said rear cushioning mechanism, said extensions being adapted for engagement with rear stop means, the forward pocket being defined by transversely extending wall portions spaced inwardly from the front end of the housing means, and said pocket receiving front cushioning mechanism comprising spring-actuated friction elements and a central wedge portion of a front follower which engages said elements, said front follower extending forwardly beyond the end of the housing means, when in normal position, and having laterally extending portions adapted to abut the inwardly spaced wall portions as stops, and be housed between the front end portions of the housing means, when the front cushioning mechanism is fully compressed, said front end portions of the housing means being constructed for engagement with front stop means, and means for holding said followers assembled with the housing means.

8. Railway draft rigging comprising spaced center sills, stop members connected thereto and spaced apart so as to be used with a conventional single-acting draft gear, housing means positioned between said sills and stop members and normally engaging the front stop members, the rear of said housing means being spaced from said rear stop members, cushioning means located within said housing means at the opposite ends thereof, said means operating independently of each other, follower-acting means for operating with said cushioning means, said follower-acting means, at the forward end of the housing means, normally extending forwardly of the abutment faces of said front stop members and adapted to be actuated by a coupler upon inward movement thereof, and a bolt extending longitudinally through said follower-acting means and housing means for holding the parts assembled, said bolt having a collar on an intermediate portion thereof, and said housing means having a partition through which said bolt passes and which forms an abutment for said collar for limiting movement of said bolt in one direction.

9. In railway draft rigging, in combination with draft sills, a coupler and vertical yoke mounted between said sills and connected to each other, front draft lugs mounted on said sills and positioned so as to form stops for use with a conventional single-acting draft gear, rear lugs mounted on said sills and positioned for use as rear stops for such a gear, and a double-acting draft gear mounted between said sills, lugs and the arms of said yoke rearwardly of said coupler, said gear comprising a housing formed with one mechanism pocket at the rear end and another spaced rearwardly from the front end, the front end of said housing normally engaging the front lugs and the rear end normally spaced from said rear lugs, and cushioning mechanism in each pocket of said housing, said mechanism in the front pocket comprising a central friction element with the outer portion extended and enlarged to function as a front follower, said element normally extending forwardly beyond the front of the housing and adapted to be pushed rearwardly until it engages the portions of said housing defining the front of said last-mentioned pocket, with its front face disposed inwardly of the front edge of said housing, the mechanism in the rear end comprising a similar central friction element with outer portions extended to provide shoulders normally engaging the rear draft lugs, and from which the rear end of the housing is normally spaced an amount corresponding with the full compressive movement of the rear mechanism, the rear portion of the yoke normally engaging said friction element, whereby, under the action of draft forces, the rear cushioning element only is actuated, and, under the action of buffing forces, the front cushioning mechanism is actuated by the coupler, and the housing simultaneously moved rearward to actuate the rear friction elements, thereby providing increased cushioning effect for buffing forces as compared with the cushioning effect for draft forces.

10. Railway draft rigging comprising sills, front and rear stop members connected thereto and spaced to provide a draft gear pocket, a housing positioned in said pocket and normally engaging the front stop members, the rear of said housing being normally spaced from said rear stop members, said housing having an inwardly extending web adjacent the front portion thereof, cushioning means including a follower received in each end of said housing operating independently of each other, the follower located at the forward end of the housing normally extending forwardly of the abutment faces of the front stop members for actuation by an associated coupler upon inward movement thereof and adapted to engage said web to limit the compressive movement of the front cushioning means, and a device extending from one follower to the other for holding the parts of the front cushioning means assembled in normal relation to said housing and preventing expansion thereof when the coupler moves forwardly for actuating the rear cushioning means.

11. A double-acting draft gear comprising a housing, cushioning means including a follower received in each end of said housing and operating independently of each other, the follower located at the forward end of the housing normally extending forwardly of the front end of said housing for actuation by an associated coupler upon inward movement thereof, said front follower having lateral extensions, a transverse web spaced inwardly of the housing and adjacent said front end, said web being in overlapping relation with said extensions and being spaced from said adjacent follower extensions an amount sufficient to permit a full compressive movement of the associated cushioning means and a bolt extending longitudinally through both followers and housing for holding the parts assembled, said bolt having a stop portion engaging a corresponding stop portion on said housing for holding the parts of the front cushioning means assembled in normal relation and preventing expansion of the front cushioning means when the

coupler moves forwardly for actuating the rear cushioning means.

12. A double-acting draft gear comprising a housing open at both ends, cushioning means including a follower received in each end of said housing and operating independently of each other, said housing having a transverse wall intermediate the ends thereof and an inwardly extending web adjacent one end portion thereof, the follower located at said one end of the housing normally extending outwardly of the adjacent housing end, said follower being adapted to engage said inwardly extending web to limit the compressive movement of the cushioning means at said one end, and a bolt connecting the followers and having a stop means intermediate the ends thereof, said stop means engaging said transverse wall for preventing expansion of the said cushioning means at said one end when the other cushioning means is compressed.

13. Railway draft rigging comprising spaced center sills, front and rear stop members connected to said sills and spaced apart to provide a draft gear pocket, housing means positioned within said pocket normally engaging the front stop member and having web portions adjacent the front portion thereof, the rear of said housing means being spaced from said rear stop means, cushioning means at the front and rear ends of the housing each comprising spring-actuated friction elements and a central wedge portion of a follower which engages said elements, said web portions guidingly receiving said front central wedge therebetween said rear follower extending laterally of the housing for substantially the same width thereof and spaced from the rear end of the housing a distance corresponding with the movement of said follower for full compression of said rear cushioning means, said rear follower extension normally engaging said rear stop member, said front follower extending forwardly beyond the end of the housing and the wedge portion being provided with a lateral extension terminating short of end wall portions of said housing, the inner surface of said lateral extension being spaced from said web portions an amount sufficient to allow for full compression of the front cushioning means.

14. A double-acting draft gear comprising a housing means having an opening at each end and an inwardly extending web adjacent the one end thereof, cushioning means at both ends of said housing comprising spring-actuated friction elements and a central wedge portion of a follower which engages said elements, one of said followers having a portion extending laterally substantially equal to the width of the housing and spaced longitudinally from the adjacent end of the housing a distance corresponding with the full compressive movement of the associated cushioning means, said other follower having a lateral extending portion terminating short of end wall portions of said housing and spaced outwardly of the housing from said web an amount sufficient to allow for full compression of the associated cushioning means, said other follower being adapted to cooperate with said web to limit the compressive movement of said associated cushioning means.

15. A double-acting draft gear comprising a housing means having an intermediate transverse wall to form pockets at each end thereof and an inwardly extending web adjacent one end of said housing, cushioning means positioned in each pocket of said housing comprising spring-actuated friction elements and a central wedge portion of a follower which engages said elements, one of said followers having a portion extending laterally of the housing substantially equal to the width of the housing and spaced longitudinally from the adjacent end of the housing a distance corresponding with the full compressive movement of the associated cushioning means, said other follower having a lateral extending portion terminating short of end wall portions of said housing and spaced longitudinally from said web an amount sufficient to allow for full compression of the associated cushioning means, said web forming an abutment to limit the inward movement of said other follower, and a device extending from one follower to the other having means intermediate the ends thereof and adapted to engage said intermediate transverse wall for limiting the outward movement of one of the cushioning means when the other cushioning means is compressed.

16. A double-acting draft gear comprising a housing having an intermediate transverse wall forming pockets at both ends thereof, an inwardly extending web adjacent the one end of the housing, cushioning means in said pockets comprising friction elements actuated by spring means interposed between said elements and housing, and a central wedge portion of a follower engaging said elements and actuated by additional spring means interposed between said transverse wall and followers, one of said followers having a portion extending laterally of said housing for substantially the width thereof and adapted to engage a rear stop means, said follower being spaced from the adjacent end of the housing a distance corresponding with the full compressive movement of the associated cushioning means, said other follower having a lateral extending portion terminating short of end wall portions of said housing and in overlapping relation with said web, said end wall portions being adapted to engage a front stop means, and said other follower being spaced from said web an amount sufficient to allow for full compression of the associated cushioning means.

17. In a railway draft rigging, in combination with draft sills, front and rear stop members connected to the inner faces of said sills and having vertical stop faces, those of the front being spaced from those of the rear a distance equal to the length of the American Association of Railways standard draft gear pocket, a draft gear within said pocket comprising a housing normally engaging the front stop member, a rear follower associated with said draft gear in spaced relation with said housing and normally engaging said rear stop member, a front follower cooperating with said draft gear, the forward face of said front follower being normally positioned forwardly of the vertical stop faces of the adjacent members, a yoke for cooperation with said draft gear and normally engaging said followers at both ends, the abutment faces of said yoke at opposite ends being spaced a distance equal to the normal length of the draft gear and greater than the distance between the vertical stop faces of the members.

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