Aug. 3, 1937. D. S. BARROWS 2,089,012

DRAFT RIGGING

Filed May 19, 1930 2 Sheets-Sheet 1

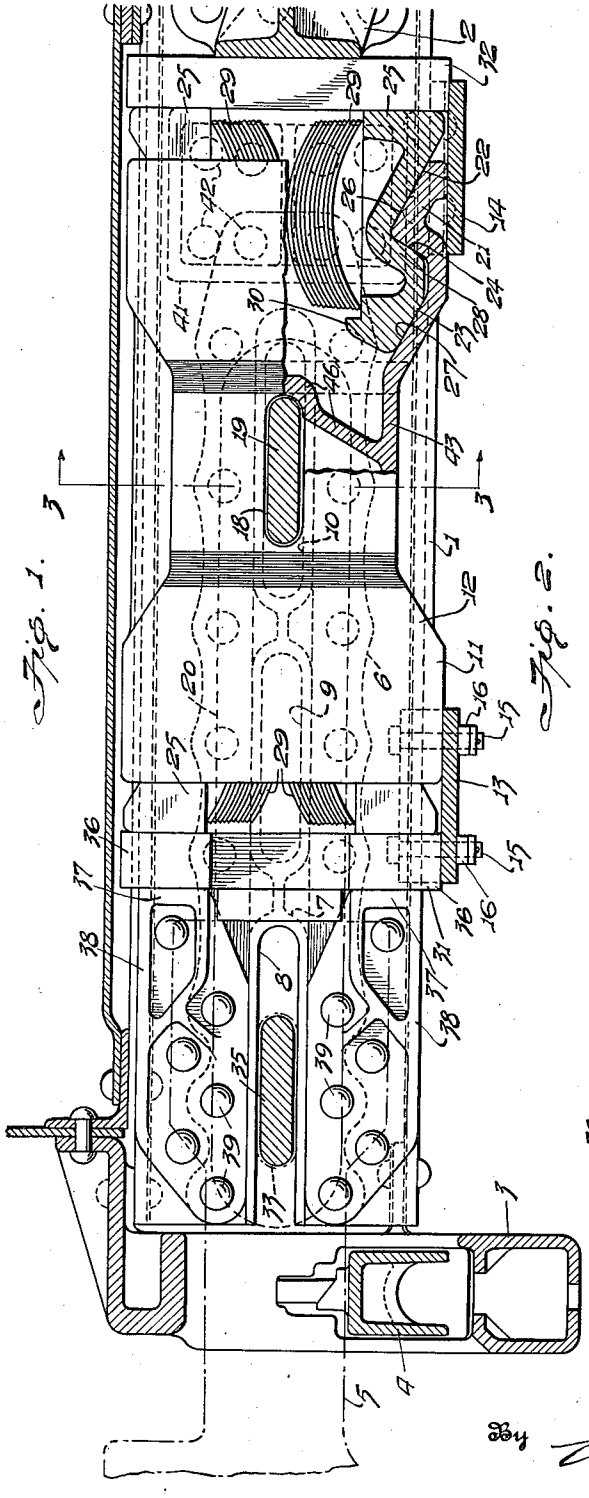

Fig. 1.

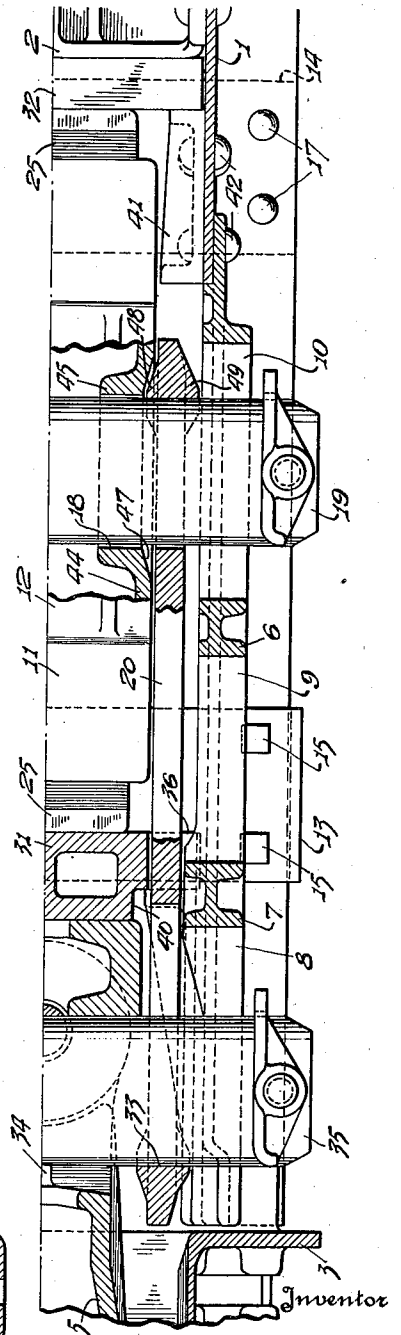

Fig. 2.

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Fig. 3.

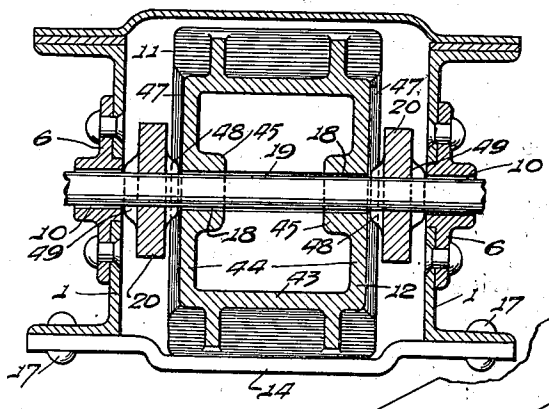


Fig. 6.

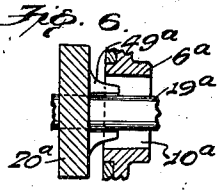


Fig. 4.

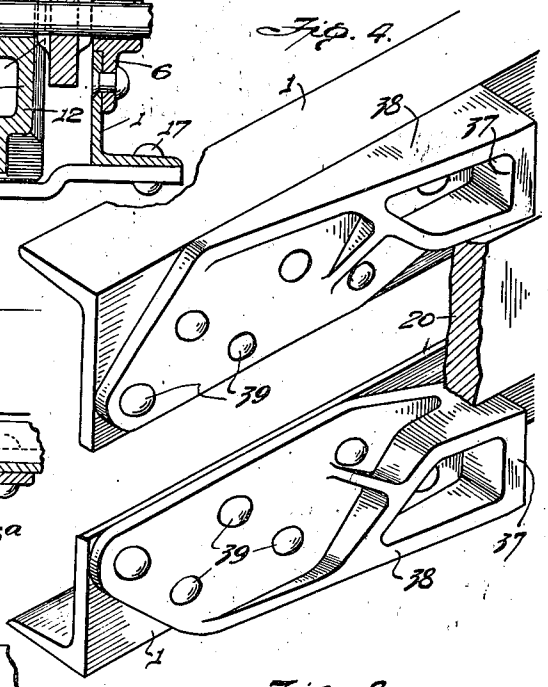


Fig. 5.

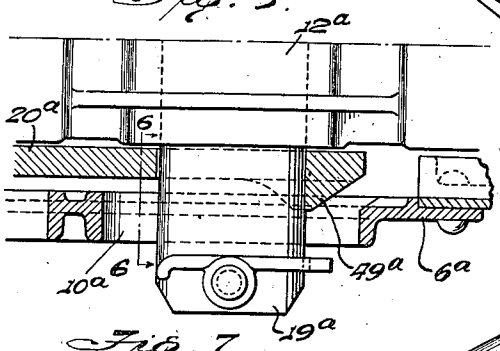


Fig. 7.

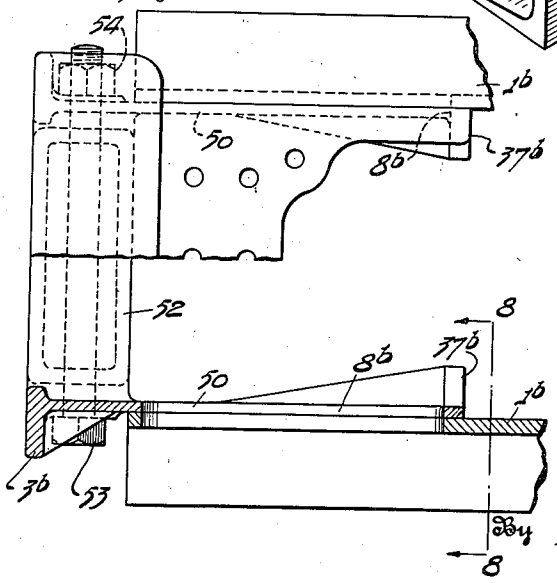
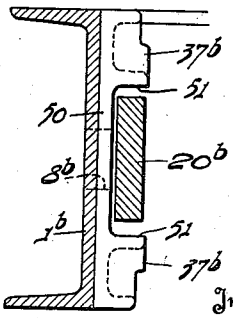


Fig. 8.



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UNITED STATES PATENT OFFICE

2,089,012

DRAFT RIGGING

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Application May 19, 1930, Serial No. 453,666

16 Claims. (Cl. 213—37)

This invention relates to railway draft rigging and the combination therewith of friction shock absorbing mechanism for providing a greater travel and greater shock absorbing capacity for the coupler or drawbar under the action of buffing forces than under the action of draft forces.

The principal object of my invention, generally considered, is to provide, in combination with a car underframe, a friction draft mechanism or gear involving elements operating in series and preferably enclosed in a housing, shell or column member having a slot for receiving a connecting draft key, the arrangement being such that the mechanism may be used with horizontal yoke-acting means and will function to provide a greater energy absorbing capacity and movement under buff than under draft and may be replaced by a standard single end gear with horizontal or vertical yoke-acting means.

Another object of my invention is the provision of draft rigging associated with the draft sills of a railway vehicle and involving friction shock absorbing or cushioning mechanism connected to the coupler or drawbar of the vehicle by means of side links and horizontal connecting keys therethrough, the draft sills being provided with means for limiting forward and rearward movement of the end elements of the shock absorbing mechanism and the connection between the side links and mechanism being preferably through the housing or shell thereof whereby, under the action of draft forces, only that portion of the mechanism adjacent the front end is stressed, while under the action of buffing forces, all of the cushioning mechanism is affected.

A further object of my invention is the provision of slotted sills or cheek plates adapted for connection with draft sills for receiving keys holding the elements of associated draft rigging in place, said sills or cheek plates each having three slots, the first one receiving the key connecting the coupler or drawbar and the yoke, the second adapted to receive the ordinary front follower key, and the third the key connecting the friction draft gear housing or shell with the yoke-acting means between it and the coupler or drawbar, whereby said sills or cheek plates may be used interchangeably with an ordinary form of single-ended draft gear and front follower or with a double-ended series draft gear without a front follower, the first and second key slots being used in the first instance, and the first and third in the second instance.

A still further object of my invention is the provision of means for securing an increased shock absorbing capacity and travel, as compared with the capacity and travel under the action of draft forces, for the drawbar or coupler of a railway vehicle under the action of buffing forces, involving the use of a double-ended friction draft gear with a slotted housing or column member containing friction elements at each end associated with followers which, in turn, engage stop members on the vehicle underframe, the coupler or drawbar of the vehicle being connected to the housing by draft links, the front ends of which are key connected to the drawbar, and the rear ends of which are key connected to the housing, the ends of said keys being received in corresponding slots in the center sills of the vehicle, said slots providing for the necessary movement of the keys and links for effecting operation of the front friction mechanism on draft and the mechanism at both ends of the gear when the drawbar is subjected to buffing forces.

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 vertical, longitudinal, sectional view between the sills of a railway vehicle underframe illustrating one embodiment of my slotted double-ended series draft gear and associated draft rigging and cheek plates, a portion of the gear housing or column member being broken away to more clearly show the interior construction.

Fig. 2 is a fragmentary, horizontal, sectional view of the rigging and associated parts of the vehicle underframe shown in Fig. 1, portions of the draft gear and associated parts being illustrated in plan.

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

Fig. 4 is a fragmentary perspective view of part of the draft sills and draft links for showing more clearly the front stop members.

Fig. 5 is a fragmentary view corresponding to Fig. 2, but showing a modification.

Fig. 6 is a fragmentary, transverse sectional view on the line 6—6 of Fig. 5, looking in the direction of the arrows.

Fig. 7 is a fragmentary plan of the front portion of the car underframe with parts shown in horizontal section and illustrating a modification.

Fig. 8 is a transverse, sectional view on the line

8—8 of Fig. 7, looking in the direction of the arrows.

Because of the present day weight of, and speed at which railway equipment travels, the limit within which the accompanying energy can be absorbed without damage to the equipment has passed beyond the conventional 2½" and 2¾" regardless of the energy absorbing capacity of a draft gear having such limits of movement. It will be understood that in a draft gear for absorbing large amounts of energy, it is desirable that the capacity thereof be greater on buff than on draft because it is under buff that the greatest amount of energy is necessarily absorbed. It is also desirable, for the same reason, that the distance the coupler and associated draft gear parts move in absorbing energy, be greater under the action of buffing forces than under the action of draft forces, whereby the slack to be taken up in starting a train is maintained relatively low, while at the same time provision is made for absorbing the requisite energy without exerting too great a resisting force.

The conventional gear travel is ample under pull or draft, but a gear or cushioning mechanism of high enough capacity to seem to absorb the normal or usual buffing shocks is too high in capacity to handle pulling shocks without unduly stressing the coupler and attachments. The desirable characteristics of a gear or cushioning mechanism have been found to be moderate travel and capacity under pull, and at least twice the travel and capacity for energy absorption under buff. Desirable results have been accomplished by using two draft gears with a yoke surrounding the outermost or front gear so that it works only under pull while both gears are closed under compression. Without making radical changes in car construction, it is impossible to accommodate a standard gear at the rear of the yoke.

In accordance with my invention, I accomplish the desired result heretofore obtained by using instead of two gears a single gear or cushioning mechanism comprising a shell, housing or column member, preferably open at both ends, and slotted adjacent the central portion for receiving a key adapted to connect said shell with the associated yoke-acting means or draft links, said shell receiving friction elements in both ends, the elements at one end only being operated on draft, and the elements at both ends being operated on buff.

Referring now to the drawings in detail, like parts being designated by like reference characters, and first considering the embodiment of my invention illustrated in Figs. 1 to 4, inclusive, 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 and a striking casting or combined striking casting and sill tie member 3. In the present embodiment, the casting 3 is shown provided with a device 4 for centering the associated coupler or drawbar 5, but it will be understood that I am not limited to such showing.

The sills 1 are slotted, as is usual, for receiving draft keys for connection with associated draft rigging and preferably have connected thereto cheek plates 6 which are correspondingly slotted with the slotted portions therein reinforced by flanges 7 for rigidifying the edges of said members adjacent the slots for the proper transmission of large forces. In the present instance, I preferably employ cheek plates 6 which are each provided with three slots designated 8, 9 and 10, respectively. Although I have shown the front slot 8 as being open forwardly, it will be understood that if desired, cheek plates 6 may be formed with three completely closed slots and that the construction, although desirably as illustrated, is not so limited. Both the striking casting 3 and cheek plates 6 are preferably riveted to the sills 1.

Mounted between the sills 1 is a double-ended series friction draft gear 11, the housing or column member 12 of which is preferably supported on carry irons 13 and 14 which are connected to the sills 1 in any desired manner, as by means of bolts 15 and nuts 16 or rivets 17. The gear desirably comprises the housing or shell 12 open at the front and rear ends and slotted adjacent its central portion, as indicated at 18, for receiving a horizontal key 19 serving for connecting said housing to associated yoke-acting means 20 which, in the present embodiment, take the form of draft links disposed one at each side of the gear 11 between said gear and the cheek plates and draft sills of the car. The key 19 has its ends normally received in rear slots 10 in the cheek plates, which slots are positioned and of such a length as compared with the width of the key that said key is permitted to travel forwardly a sufficient amount to allow for the full compression of the front friction elements of the gear and to travel rearwardly a sufficient amount to allow for the full compression of the rear friction elements of the gear.

Each end of the housing or shell 12 is formed, in the present embodiment, double bell-mouthed, that is, it is provided with sloping walls 21 providing outermost flaring or inclined friction surfaces 22 and inwardly disposed but preferably corresponding inclined friction surfaces 23 with a shouldered portion 24 therebetween. Cooperating with the friction surfaces and shouldered portions of the shell or housing 12 are both front and rear friction shoes or wedges 25 provided with correspondingly inclined friction surfaces 26 and 27 normally engaging the friction surfaces 22 and 23 on the shell and provided with a shouldered portion 28 therebetween for cooperating with the correspondingly shouldered portion 24 on the housing and limiting outward movement of said friction elements 25 with respect to the housing after assembly therewith.

In order to urge the friction elements 25 into engagement with the friction surfaces on the housing 12, resilient means 29, preferably in the form of curved leaf springs, are provided between the friction elements at each end of the housing, said leaf springs at each end preferably involving two sets of springs bowed or curved concavely toward the adjacent friction elements 25. In order to prevent shifting of the springs with respect to the friction elements 25, said elements are desirably formed with lugs 30 adjacent their inner ends for limiting inward movement of the springs, outward movement thereof being limited by the cooperating followers 31 and 32.

The draft gear 11 is connected to the butt or drawbar 5 of the vehicle coupler in the present embodiment by means of the draft links 20, one of which extends on either side of the drawbar and gear, the front ends of the links being slotted, as indicated at 33, to correspond with the slot 34 in the drawbar and connected to said drawbar by the horizontal key 35, the ends of which are

normally received in the slots 8 in the cheek plates 6. It will be apparent that the slots 8 in said cheek plates are of such length that the key 35 is permitted to move distances in both directions sufficient for stressing the associated gear 11 to the desired extent. Although I have illustrated conventionally the drawbar or stem 5 of the coupler as being of the type described and claimed in my Patent No. 1,431,717, dated October 10, 1922, it will be understood that I do not wish to be limited to the use of my gear with such a type of coupler which provides for swivelling or horizontal angling of the head, as my gear is adapted for use with couplers of any desired character.

Disposed between the butt or drawbar 5 of the vehicle coupler and the front friction elements 25 is the front follower 31 designed to transmit buffing forces between the butt of the coupler and the friction elements 25 to effect compression of the gear 11. In order to hold said front follower in proper relation with respect to the links 20, the ends of which respectively receive the keys 35 and 19 for connecting the coupler and draft gear, said follower is formed generally H-shaped, that is, it has arms or lug portions 36 extending above and below each link 20, which arms also extend into operative engagement with the shouldered portions 37 on the front stop members 38, which, as shown in detail in Fig. 4, are connected to the sills 1 above and below the slots therein which receive the cheek plate flanges by means of rivets 39, thereby providing increased bearing areas at said slots and forming, in effect, an increase in thickness of the sill webs adjacent said slots. These stop members have the shouldered or stop lug portions 37 thereof spaced apart a distance sufficient to guidingly receive the links 20 therebetween. In order to provide for the increased travel of the draft key 35 for permitting the closing of the mechanism at both ends of the gear, the rear ends of the slots 8 in the cheek plates are disposed rearwardly from the normal position of the rear edge of the key 35 a distance equivalent to the aggregate travel of the friction elements at both ends of the housing 12, and in order to have the stop shoulders 37 spaced rearwardly of the rear ends of the slots 8 while still maintaining the normal distance between the rear end of the drawbar slot 34 and the rear face of the coupler butt, it is desirable to notch the front follower 36, as indicated at 40, so that the front face of the front follower is disposed forwardly of the faces of the lugs 36 which engage the stop shoulders 37. It will be apparent that the front follower 31 as well as the rear follower 32 are desirably supported on the carry irons 13 and 14.

In order to retain the rear follower 32 in position when the draft gear is pulled forwardly from it by reason of its connection with the drawbar, lug members 41 are desirably provided immediately forward of the normal position of said follower 32, as shown most clearly in Figs. 1 and 2, said lug members desirably overlapping the rear ends of the cheek plates 6 so that common rivets 42 may serve to connect the front ends of the lugs 41 and the rear ends of the cheek plates 6 to the sills 1 of the vehicle.

The friction shell or housing 12, inwardly or intermediate the sloping walls 21 forming the bell-mouthed portions, is desirably constructed by connecting the innermost ends of the sloping walls by longitudinal webs 43 extending between the longitudinally extending side walls 44. Said side walls are apertured to provide for the slot 18 through the housing, as previously described, and are desirably reinforced around said slot by beading or flanges 45. Between the side walls 44 the construction is desirably rigidified by providing inclined walls 46 connecting the innermost surfaces of said side walls and joining adjacent the ends of the slot 18 to provide continuations of the ends of the slotted portions of the housing from one side wall to the other, as indicated.

Exteriorly of the web portions 46 the housing is desirably grooved, as indicated at 47, to receive the reinforcement 48 on the inner sides of the draft links 20 whereby the rear ends of the draft links may be made uniform with the front ends and have reinforcing extensions or bosses both inwardly and outwardly thereof, as indicated at 48 and 49. The groove 47 is preferably continued from the rear to the front of the slot 18 whereby, if desired, the housing 12 may be reversed end to end.

Referring now to the embodiment of my invention illustrated in Figs. 5 and 6, a construction is there disclosed which is identical with that of the first embodiment except that the draft links 20^a are unprovided with the reinforcing portion 48 on the inner ends so that the housing 12^a need not be grooved, as indicated at 47 in the first embodiment. The reinforcement or boss 49^a is correspondingly increased to compensate for the loss of the inner reinforcement and the slots 10^a in the cheek plates 6^a which receive the outer ends of the keys 19^a desirably have their inner portions adjacent the rear ends thereof correspondingly enlarged, as illustrated, to receive the extended reinforcement 49^a.

Referring now to the embodiment of my invention illustrated in Figs. 7 and 8, a fragmentary portion of the underframe only is illustrated in which the front lugs 37^b are formed as integral extensions from the striking casting 3^b instead of being independent thereof, as in the first embodiment. In order to provide for the construction shown, the striking casting 3^b has walls or webs 50 extending along the inner sides of the sills 1^b and connected thereto in any desired manner, as by means of rivets (not shown). The lug portions 37^b provide stops for the front follower (not shown), which follower, however, may be identical with that of the first embodiment, and the webs 50 may be slotted, as indicated at 8^b, in a manner corresponding with the slots 8 of the first embodiment, to receive the front draft key (not shown) but which may correspond with the key 35 of the first embodiment. The lug or stop portions 37^b, as shown most clearly in Fig. 8, are separated or notched, as indicated at 51, to receive the front ends of the draft links 20^b. In the present embodiment, the combined casting 3^b is shown as provided with a carrier block 52 adapted to underlie the drawbar of the associated coupler (not shown) and be connected to the striking casting by a transverse bolt 53 and nut 54. As an alternate, the front portions of the cheek plates 6 may be integrally connected to the striking casting 3 instead of the lugs 37.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that under the action of draft forces the front follower 31 is held stationary against the front stop lugs 38 and the coupler stem or drawbar 5 pulls the yoke-acting means or links 20 forwardly through the connecting key 35 which, in turn, pulls the housing 12 through the connecting key 19 causing the housing to push for-

wardly over the front friction elements **25** and force them together against the resistance of the springs **29**, thereby actuating only the front cushioning mechanism, whereby the cushioning effect on draft is only one-half of the total capacity of the double-ended gear and the travel of the drawbar on draft with respect to the draft sills is only one-half of the total permissible compression of the gear. It will be understood that under the action of draft forces, the rear friction elements are pulled forwardly with the housing, leaving the rear follower **32** in normal position between the lugs **41** and the backstop **2**.

Under the action of buffing forces, however, the butt or drawbar **5** engages the front follower **31**, pushing the front friction elements **25** into the front opening of the housing **12** and simultaneously moving said housing rearwardly over the rear friction elements **25**, so that a full compression of the gear on buff is effected, thereby providing not only for increased buffing capacity, but for coupler travel equal to the sum of the travel permitted by the friction elements at each end of the gear. Although, for convenience and economy in manufacture, the gear is preferably made symmetrical so that the travel and capacity provided by each end is identical, yet this is not essential, and the capacities and travels of the two ends of the gear may be either equal or different, as desired.

In accordance with the foregoing description, it will be seen that the intermediate slots **9** in the sills or cheek plates were not used with my double-ended draft gear. Said cheek plates, however, may be used interchangeably with my draft gear and an ordinary type of single-ended gear (not shown), but such a type is shown in Fig. 2 of my co-pending application, Serial No. 362,832, filed May 13, 1929. When such a single-ended gear is used which is shorter than the double-ended gear illustrated, the front follower may be correspondingly longer and slotted to receive the second key which holds it in place and extends through the intermediate slots **9** in said cheek plates in the usual manner. When such a standard single-ended gear is employed, of course, a standard form of horizontal or vertical yoke may be employed without a slotted front follower as the housing itself of the gear may be slotted, as illustrated, for the double end gear, only at the front end, somewhat as illustrated, for example, in my Patent No. 1,979,524 of Nov. 6, 1934, to function as a front follower, and completely surround the same, the lugs **41** being adapted to have their front faces disposed so that they function as rear stop lugs, as will be understood by those skilled in the art.

It will, therefore, be apparent that the cheek plates **6** may be employed with draft rigging of the conventional horizontal yoke or Farlow type, said cheek plates being merely rearwardly extended and each having an extra slot therein which is not used except when a series or double-ended friction draft gear is employed instead. Under the action of draft forces, a normal single-ended gear used with a conventional horizontal yoke is, of course, compressed by having the front end held stationary against the usual front follower, such as shown in my application previously referred to, which front follower is held in place by a key received in the slots **9** in the cheek plates **6**. Under the action of buffing forces, the butt of the drawbar engages the front follower, thereby compressing the usual single-ended gear against the associated yoke and rear stop means.

It will, therefore, be seen that with the double-ended gear shown in the figures of the present drawings, the travel on buff is greater or twice that of the travel on draft, whereas with a single-ended gear the travel on buff is equal to the travel on draft. A similar comparison may be made as to the capacities provided under buff and draft.

In order to clearly show how the sills or plates **6** are constructed so as to be adapted for use with either my double-ended series draft gear or a conventional single-ended gear, or one acting the same on buff and draft, I will now give a concrete example which should be understood, however, as being for purposes of illustration only, and not as limiting. Assume that my double-ended series draft gear illustrated has a permissible travel of the mechanism at each end of 2". The rigging illustrated in Fig. 1 would, therefore, permit a pulling action of 2" forward from normal position and a buffing action of 4" rearward from normal position. Under such circumstances, the horn of the coupler is desirably normally positioned approximately 4¼" forward of the striking face of the combined casting **3**.

Let it be assumed that the single-ended gear, such as shown in Fig. 2 of my co-pending application previously referred to, provides for a travel of 2½". Then the horn of the coupler for use with such a gear is normally positioned preferably about 3" forward of the striking face of the combined casting **3**. In other words, with the arrangement shown in Fig. 1, the horn of the coupler in normal position is disposed forwardly of the striking face of the combined casting a distance greater than when used with a conventional draft gear having the same travel on buff and draft, the increase in the normal distance from the striking face of the casting corresponding approximately to the increase in buffing motion permitted by my double-ended series draft gear. In order, therefore, to design the cheek plates **6** so that they are adapted for use with either type of gear, the front slots **8** must be constructed so that they provide for the desired amount of travel of the draft key **35** when used with either rigging and should, therefore, permit a rearward movement of the drawbar **5** of at least 4" to provide for the full closing of the gear **11**. Inasmuch as some clearance is provided for the key **35** in the drawbar **5**, it is sufficient if 4" clearance is provided between the rear edge of the key **35** and the rear end of the slots **8** when said key is in normal position, as shown in Fig. 1.

When substituting a conventional form of single-end draft gear and a conventional form of front follower, or a slotted housing single end gear, it will be seen that the normal position of the coupler or drawbar thereof is 1¼" rearward of the normal position of the coupler, as shown in Fig. 1, so that the normal position of the key **35** is 1¼" closer to the rear ends of the slots **8**, allowing a clearance of 2¾" instead of 4", which clearance is sufficient to provide for the full closing of a conventional single-end gear. From this, it will be seen that in accordance with the present example, the rear ends of the slots **8** in the cheek plates may be disposed at almost normal position, that is, ¼" rearwardly from normal to allow for 1½" extra rearward travel of the drawbar.

The position of the front ends of the slots **8** is determined in a similar manner, that is, said slots must extend forwardly a sufficient distance from the normal position of the key **25**, as shown in

Fig. 1, to permit a 2" travel of the drawbar, and allowing ½" clearance, the front ends of said slots may desirably be positioned 2½" forward of the normal position of the key 35. Inasmuch as said key is normally disposed 1¼" forward from normal, this construction of the slots would allow 2¾" clearance for the key when used with a single-ended gear which would, therefore, provide for ample motion of said key. It will, therefore, be seen that the cheek plates 6 are so designed to provide front slots 8 which extend rearwardly from normal a small distance and forwardly from normal a relatively greater distance to allow for the extra travel provided by the gear 11, and a normal forward positioning of the coupler, as compared with the conventional form of single-ended gear.

Inasmuch as the second or intermediate slots 9 are not used with the double-ended draft gear 12, their position and length may be normal or correspond entirely with the single-ended gear. The position and size of the rear slots 10 are likewise governed entirely by the construction of the double-ended gear 11 shown, and particularly the housing or shell 12 thereof. If the slot 18 of the housing is disposed midway of the ends thereof, then the normal position of the center line of the key 19 will be midway between the normal position of the rear face of the front follower and the front face of the rear follower, said followers being so designed that the slots 9 and 10 will not extend too close to each other to reduce the length of the metal between adjacent ends thereof below a reasonably substantial amount. The slots 10, in the embodiment illustrated, extend from a point both forward and rearward from the mid point referred to a distance equal to half the width of the key 19 plus 2", or plus a distance corresponding to the travel permitted by the cushioning mechanism at each end. From the foregoing concrete illustration, it will be clear how to calculate the position of slots in the triple slotted cheek plates of my invention.

From the foregoing description, taken in connection with the accompanying drawings, it will be apparent that I have devised a form of draft rigging using triple slotted cheek plates which is universal in that it is adapted for use with either a form of double-ended series gear or with a conventional form of single-end gear and associated Farlow rigging or a slotted-housing single end gear, with a horizontal or vertical yoke. When a slotted-housing single end gear is used, the follower 32 may be disposed with its rear face normally in engagement with the front ends of the draft lugs, the carrier 14 being moved ahead to suit. Although I have shown slotted cheek plates attached to the draft sills, it will be obvious that such plates may be omitted, if desired, and the sills or walls of the draft gear pocket correspondingly slotted. Although the two ends of the housing are illustrated as being similar, it will be understood that I am not limited to this showing.

I have illustrated certain preferred embodiments of my invention, but it will be understood that modifications may be made within the spirit and scope of the appended claims.

I claim:—

1. In railway draft rigging, in combination with draft sills, a drawbar and yoke-acting means, a friction draft gear comprising a column member, a set of friction elements cooperating with said column member at each end, resilient means acting transversely on said friction elements to urge them into engagement with said column member, a follower engaging said friction elements at each end of the gear, front stop means extending inwardly from the inner faces of said sills and normally engaged by the front face of said front follower for preventing forward movement while permitting rearward movement thereof, and back stop means preventing rearward movement of the rear follower, said yoke-acting means being connected to said column member for actuating the front elements on draft, said drawbar engaging the front follower directly on buff for actuating both front and rear friction elements.

2. In railway draft rigging, in combination with draft sills, a drawbar, and yoke-acting means comprising side links, a friction draft gear comprising a column member, friction elements cooperating with said member at each end, resilient means disposed between associated friction elements at each end of the gear for urging them into engagement with said member, front draft lugs extending inwardly from the inner faces of said sills for preventing forward movement of said front friction elements on draft while permitting rearward movement thereof, back stop means for preventing rearward movement of said rear friction elements on buff, and means connecting said yoke-acting means to said column member and to said drawbar, whereby the forward friction elements are actuated upon the application of draft forces, while all the friction elements are actuated under the action of buffing forces.

3. In railway draft rigging, in combination with draft sills, a drawbar and yoke-acting means, a friction draft gear comprising a housing open at front and rear ends, a set of friction elements cooperating with said housing at each end, resilient means disposed between associated friction elements at each end of the gear for urging them apart and into engagement with said housing, a follower engaging said friction elements at each end of the gear, front stop means extending inwardly from the inner faces of said sills and overlapping the sides of said follower for preventing forward movement thereof from normal position, back stop means preventing rearward movement of the rear follower from normal position, and means connecting said yoke-acting means to said housing for moving the housing forwardly when the drawbar is subjected to draft forces.

4. In railway draft rigging, in combination with draft sills, a drawbar, yoke-acting means comprising side links, a draft key connecting said drawbar and yoke-acting means, a friction draft gear disposed between said side links and comprising a housing open at front and rear ends, friction elements received in said housing at each end, resilient means disposed between associated friction elements at each end of the gear for urging them into engagement with said housing, a front follower disposed between said drawbar and front friction elements, said follower extending close to the sills and provided with notches in its sides to receive said links, front draft lugs respectively disposed above and below said side links for preventing forward movement of the front follower from normal position when the drawbar is subjected to draft forces, back stop means for preventing rearward movement of the rear friction elements from normal position when the drawbar is subjected to buffing forces, and a draft key extending through correspondingly slotted portions in the housing and side links

whereby said housing is pulled over the forward friction elements upon forward movement of the housing when draft forces are applied to the drawbar.

5. In railway draft rigging, in combination with draft sills, a drawbar and draft links, front draft lug means connected to said sills and provided with stop shoulders disposed above and below said links, a friction draft gear comprising housing means open at front and rear ends, a set of friction elements cooperating with said housing means at each end, resilient means acting transversely on said friction elements to urge them into engagement with said housing means, said draft links extending on each side of said housing means and friction elements, and a key extending through slots in said links and housing means for the actuation of the front elements of the gear held against forward movement by said lug means when the drawbar is subjected to draft forces.

6. In railway draft rigging, in combination with draft sills, a drawbar and yoke-acting means, a friction draft gear comprising a housing open at both ends, friction elements cooperating with said housing at each end, curved plate springs, at each end, disposed between said friction elements for urging them into engagement with said housing, front draft lug means connected to said sills and provided with stop shoulder portions extending inwardly above and below said yoke-acting means, said yoke-acting means extending on either side of said housing, and a key received in a slot in said housing and slots in said yoke-acting means whereby when the yoke-acting means is pulled forwardly the friction elements in the front end of said housing only are actuated, the ends of said key being received in slots in said sills, said slots being elongated forwardly and rearwardly from the normal position of said key to permit forward and rearward movement thereof for the actuation of the front friction elements on draft and the rear friction elements under the action of buffing forces.

7. In railway draft rigging, in combination with draft sills, a drawbar, draft links, a draft key connecting said drawbar and links, cheek plates connected to said sills and slotted for receiving the ends of said key, a friction draft gear disposed between said links comprising a housing receiving friction elements in each end acted on transversely by springs therebetween, said housing being slotted, a second key extending through the slot in said housing and registering slots in said links, the cheek plates being correspondingly slotted to receive the ends of said second key, the slotted portions of said links having outwardly extending reinforcing bosses, said cheek plate slots being correspondingly increased in size to receive said bosses.

8. In railway draft rigging, in combination with draft sills, cheek plates connected to said sills, a drawbar and yoke-acting means, a key connecting said drawbar and yoke-acting means and with its ends received in slots in said cheek plates, a friction draft gear comprising a housing, friction elements and associated laterally acting springs received therein, a generally rectangular rear follower engaging said elements and forming a wear member on which said elements slide, means connecting said yoke-acting means and housing, a back stop normally engaged by said rear follower for limiting rearward movement thereof and stop lugs connected to said sills forwardly of said follower for holding the same in place.

9. In railway draft rigging, in combination with draft sills, a drawbar and yoke-acting means, a double end friction draft gear comprising a column member, friction elements actuated by associated springs engaging each end of said column member, a rear follower engaging the rear friction elements, means connecting said yoke-acting means and column member, a back stop normally engaged by said rear follower for limiting rearward movement thereof, and lugs with front and rear stop faces connected to said sills forwardly of said follower for holding the same in place, the front faces of said stop lugs being positioned so as to serve as means for performing the additional function of limiting rearward movement of said follower when a standard length single end gear is substituted for the double end gear and the follower moved to a position forward of said stop lugs.

10. In railway draft rigging, in combination with draft sills with slots, cheek plates disposed in engagement with the outer faces thereof and provided with front slots and flanges bordering said slots, said flanges being received in the draft sill slots and serving to effect registry of the cheek plate slots therewith, and front draft lugs engaging the inner faces of said sills and connected thereto by rivets which also extend through and serve to connect the cheek plates to the sills, said stop lugs being disposed one above and one below each sill slot in engagement with the slot-received cheek plate flanges.

11. In railway draft rigging, in combination with draft sills, an integral triple slotted cheek plate and front draft lug connected to each sill, each draft lug means being rigid with and extending from the associated cheek plate means toward the lug means on the other sill, a front follower overlapped by said lug means, a draft key extending through the front slots in said cheek plate means, a drawbar and associated yoke-acting means connected by said draft key, double-ended friction draft gear housing means, with cushioning mechanism in each end, disposed between said sills, a key extending through said housing means and with its ends received in said rear slots and corresponding slots in said yoke-acting means, the intermediate slots in said cheek plate means being positioned, so that they may receive the end portions of a front follower supporting key when draft rigging involving a drawbar, yoke, key-supported from follower and conventional form of draft gear is substituted for the drawbar, yoke-acting means, double-ended draft gear housing means connected to the yoke acting means by means of a horizontal key, and associated follower means, the rear slots in said cheek plate means being elongated, forwardly and rearwardly of the normal position of the associated key, to permit corresponding movement of said key for stressing the mechanism at the front end of the double-ended gear under the action of draft forces, and at the rear end of the gear under the action of buffing forces.

12. A car coupler mechanism comprising a coupler shank, yoke side links, a key connecting the shank and side links and movable in the links on buff, a double-acting draft gear extending between the links and comprising a housing having front and rear yielding elements including means for retaining certain of said elements in assembled relation, draft sills, front follower stops connected to said sills, a front follower between

said stops and the front yielding elements, a backstop joining said sills, and a key connecting the links and draft gear and movable with the gear on buff, the last-mentioned key, in cooperation with the side links and front follower stops, operating only the front yielding elements of the draft gear during pull.

13. A car coupler mechanism comprising a coupler shank, yoke side links, a key connecting the shank and side links and movable in the links on buff, a double-acting gear extending between the links and having front and rear yielding elements including means for retaining certain of said elements in assembled relation, draft sills, front follower stops connected to said sills, a front follower between said stops and the front yielding elements, a backstop joining said sills, and a key connecting the links and draft gear and movable with the gear on buff, the last-mentioned key, in cooperation with the side links and front follower stops, operating only the front yielding elements of the draft gear during pull, the front follower having notched side edges to accommodate said links.

14. A car coupler mechanism comprising a coupler shank, yoke side links, a key connecting the shank and side links and movable in the links on buff, a double-acting draft gear extending between the links and having front and rear yielding elements including means for retaining certain of said yielding elements in assembled relation, draft sills, front follower stops connected to said sills, a front follower between said stops and the front yielding elements, a backstop joining said sills, a key connecting the links and draft gear and movable with the gear on buff, the last-mentioned key, in cooperation with the side links and front follower stops, operating only the front yielding elements of the draft gear during pull, and carriers bolted to the side sills and supporting the draft gear and front follower.

15. In railway draft rigging, in combination with a draft sill having a slot, a cheek plate disposed in engagement with one face of said sill and provided with a flange received in said slot, and a stop lug engaging the other face of said sill and connected thereto by rivets also serving to connect the cheek plate to said sill, said stop lug being disposed in engagement with the slot-received cheek-plate flange.

16. In railway draft rigging, in combination with draft sills, slotted cheek plates connected to the outer surfaces of said sills, a drawbar, draft links disposed at the sides of said drawbar, a horizontal draft key connecting said drawbar and links and with its ends received in front slots in said cheek plates and front slots in said links, a friction draft gear comprising a movable column member, a set of friction elements cooperating with said column member at each end, a follower at each end of the gear engaging corresponding friction elements, front stop means for preventing forward movement of the front follower, said stop means comprising elements vertically spaced to agree with said front slots and receive the ends of said draft key therebetween, a horizontal draft key intermediate the ends of said column member, passing through corresponding slots in the rear end portions of said links, and with its ends received in rear slots in said cheek plates, for transmitting draft force from said drawbar to said column member, so that only the friction elements at the front of said column member are actuated on draft, said rear slots being extended rearwardly of the normal position of the rear edge of said key for allowing inward movement of said column member for the actuation of the friction elements at both ends on buff, the rear end of said drawbar, in normal position, lying forward of the stop face plane of said front stop means, said front follower being notched where it engages the front stop means to permit the front face thereof to normally extend forwardly of said stop means and the rear ends of the front slots in said links into engagement with the drawbar, and backstop means for preventing rearward movement of the rear follower and forming an abutment for the compression of the entire draft gear on buff.

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