May 19, 1942. R. J. OLANDER 2,283,387

RAILWAY DRAFT RIGGING

Filed Nov. 29, 1939 2 Sheets-Sheet 1

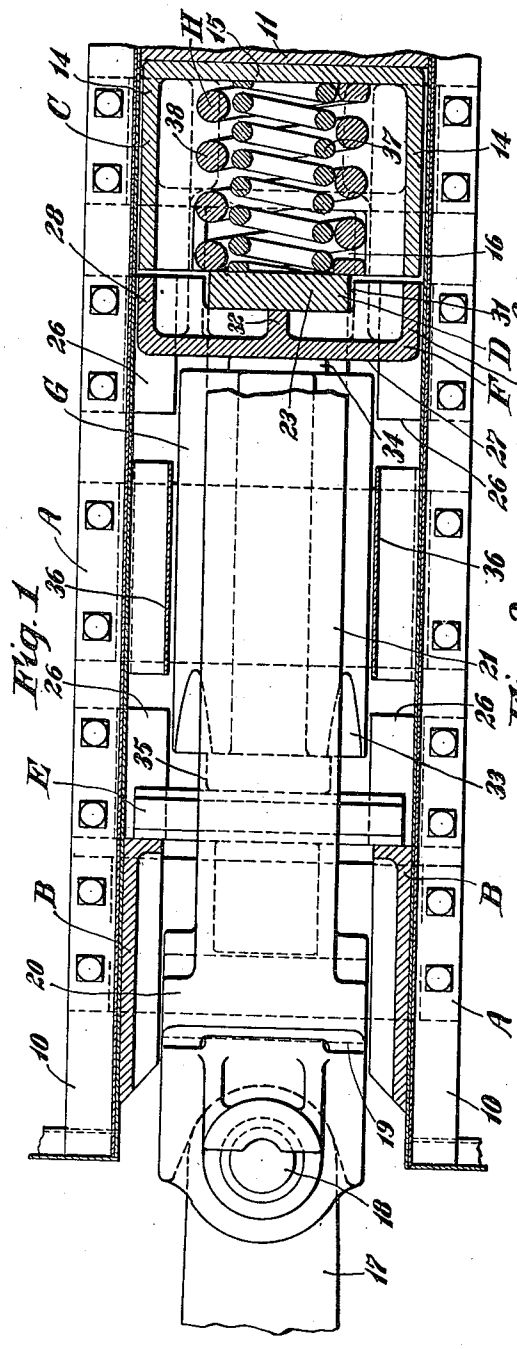


Fig. 1

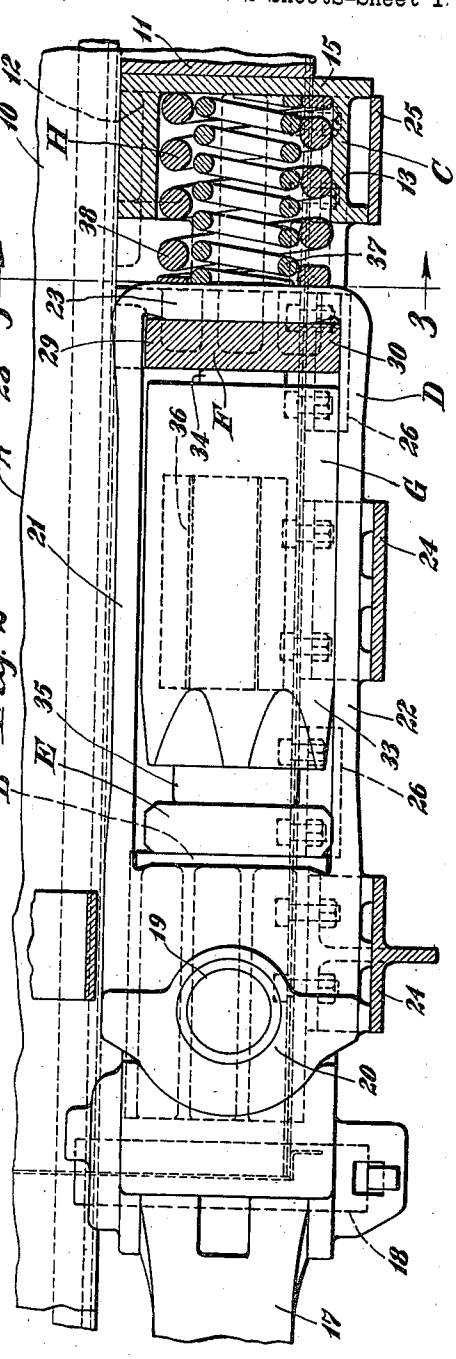


Fig. 2

Inventor
Roland J. Olander
By Henry Fuchs.
Atty.

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RAILWAY DRAFT RIGGING

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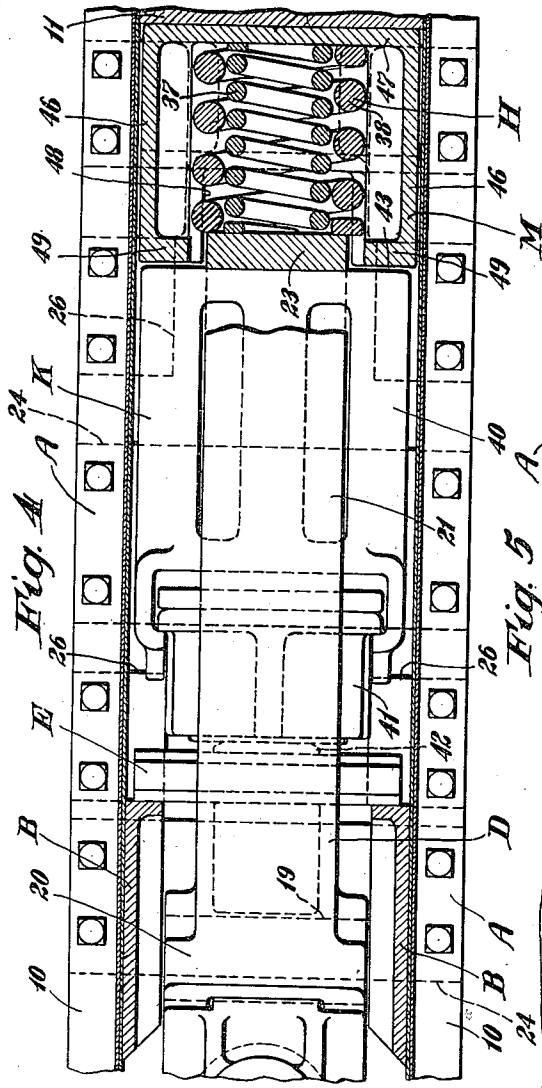


Fig. 4

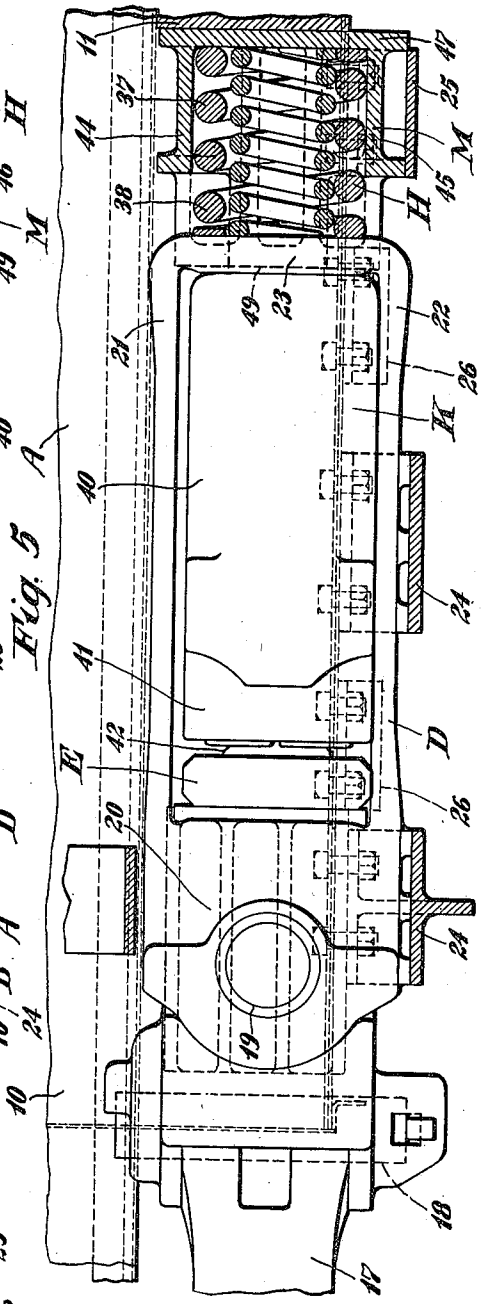


Fig. 5

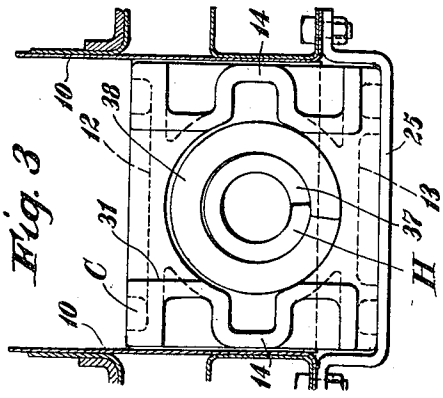


Fig. 3

Inventor
Roland J. Olander
By Henry Fuchs.
Atty.

Patented May 19, 1942 2,283,387

UNITED STATES PATENT OFFICE

2,283,387

RAILWAY DRAFT RIGGING

Roland J. Olander, Chicago, Ill., assignor to W. H. Miner, Inc., Chicago, Ill., a corporation of Delaware

Application November 29, 1939, Serial No. 306,640

7 Claims. (Cl. 213—46)

This invention relates to improvements in railway draft riggings.

One object of the invention is to provide a railway draft rigging especially adapted for passenger equipment wherein the movable parts of the draft rigging are at all times maintained in operative engagement with each other to eliminate all lost motion, thereby avoiding jars and abrupt shocks which would otherwise occur in service.

Another object of the invention is to provide a draft rigging of the character indicated, including a yoke movable both in buff and draft in unison with the coupler, and a friction shock absorbing mechanism within the yoke compressible in both buff and draft to cushion the shocks, wherein the shock absorbing capacity in buff is augmented by spring means operating in tandem with said friction shock absorbing mechanism.

A still further object of the invention is to provide a draft rigging including front stop means; a yoke movable in unison with the coupler in both buff and draft; spring means opposing rearward movement of the yoke in buff and bearing directly on the yoke; a friction shock absorbing device within the yoke and actuated thereby, the friction shock absorbing device including rear follower means bearing directly on the inner wall of the rear end of the yoke; rear stop means for the rear follower means; and spring means directly bearing on the rear end of the yoke and opposing rearward movement thereof, wherein the parts are so proportioned and arranged that the rear follower is normally slightly spaced from the rear stop means to assure constant pressure of said spring means on the yoke to maintain the yoke, shock absorbing means, and rear follower under a yielding pressure against said front stop lugs and thereby eliminate lost motion in the draft rigging.

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, Figure 1 is a longitudinal horizontal sectional view through a portion of the underframe structure of a railway car, illustrating my improvements in connection therewith, certain parts being shown in plan. Figure 2 is a longitudinal vertical sectional view of the structure shown in Figure 1, certain parts being shown in elevation. Figure 3 is a transverse vertical sectional view, corresponding substantially to the line 3—3 of Figure 2. Figure 4 is a view similar to Figure 1 illustrating another embodiment of the invention. Figure 5 is a longitudinal vertical sectional view of the structure shown in Figure 4, certain parts being shown in elevation.

Referring first to the embodiment of the invention illustrated in Figures 1, 2, and 3 of said drawings, my improved draft rigging comprises broadly a pair of center or draft sills A—A; front stops B—B; a rear stop C; a yoke D connected to the usual coupler; a front follower E; a rear follower F; a friction shock absorbing device G; and a spring resistance H opposing rearward movement of the yoke.

The draft sills A—A which extend lengthwise of the car may be of any well-known design, and as herein illustrated are made up of a plurality of sections which are joined together. The sills A—A have laterally, outwardly projecting bottom flanges 10—10 throughout their length, as clearly shown in Figures 1 and 3.

The front stops B—B are in the form of the usual stop lugs secured to the inner sides of the sills in any suitable manner.

The rear stop C comprises a hollow boxlike casting interposed between the sills A—A and abutting the forward side of the usual body bolster, which is indicated by 11. The casting C comprises vertically spaced, horizontal top and bottom walls 12 and 13, laterally spaced vertical side walls 14—14, and a vertical back or rear wall 15. The top and bottom walls are centrally cut out at the front end of the casting C to provide vertically aligned guide openings which form a guideway 16 for the rear end of the yoke D. The front end edges of the top walls 12 and 13 and side walls 14—14 of the rear stop member C are in transverse alignment and present a stop or abutment face at the front end of said casting which cooperates with the rear follower F, as hereinafter pointed out. The hollow stop member C houses the spring resistance H and, in effect, is a combined spring chamber and rear stop casting.

The yoke D is of the usual well-known design employed in draft riggings for passenger cars and is directly connected to the standard passenger coupler and movable in unison therewith both in buff and draft, the rear end portion only of the shank of said coupler being shown in the drawings, the same being indicated by 17. As is well known to those skilled in this art, the standard passenger coupler is swiveled to the yoke for both lateral and vertical swinging movement and the usual pivotal connections which permit

such movement are indicated by 18 and 19 in Figures 1 and 2. The yoke D is headed at the forward end, as indicated at 20, and includes top and bottom, horizontally disposed arms 21 and 22, extending rearwardly from said headed end, the arms being connected at their rear ends by a vertical end section 23. The yoke is supported for sliding movement on the usual carry irons 24—24 which are secured to the underneath sides of the flanges 10—10 of the draft sills. A similar carry iron 25 at the rear end of the rigging supports the rear stop member C.

As will be evident upon reference to Figure 1, the strap member formed by the arms 21 and 22 and the end section 23 of the yoke is of such a width that it is freely slidable in the guideway 16 of the rear stop casting C. Enclosed within the strap of the yoke D is the friction shock absorbing device G and the front and rear followers E and F, the front follower E being interposed between the front end of the device G and the head of the yoke and the rear follower being interposed between the rear end of said shock absorbing device and the end section 23 of said yoke.

The front follower E is in the form of a heavy plate or block and cooperates with the front stop lugs B—B in the usual manner and is supported for sliding movements at opposite ends by carrier plates 26—26 fixed to the bottom flanges 10—10 of the sills A—A.

The rear follower F is in the form of a casting having a vertical front wall 27, spaced vertical side walls 28—28, and spaced horizontally disposed top and bottom walls 29 and 30. The rear portions of the top and bottom walls are centrally cut away to provide vertically aligned openings or seats 31—31 which accommodate the vertical rear end section 23 of the yoke. This casting F is preferably reenforced by a central vertical web or rib 32 on the inner side of the wall 27, the vertical rear face of said rib being in alignment with the vertical end faces of the inner walls of the seats 31—31 of said top and bottom walls of the follower casting F. As will be seen upon reference to Figure 1, the inner walls of the seats 31—31 and the rib 32 of the rear follower F bear directly on the inner side of the vertical end section 23 of the yoke, and the rear side proper of said follower is normally spaced slightly forwardly from the forward end of the rear stop casting C. The follower F is guided at opposite sides of the rigging for sliding movement by supporting plates similar to the plates 26—26 hereinbefore described, which are also indicated by 26—26.

The shock absorbing device G herein illustrated is of a well-known design employed for passenger cars and is identical with the device illustrated in Patent No. 2,050,541, granted to me August 11, 1936. As disclosed in said patent, this device comprises a friction casing containing a friction clutch located at one end of said casing, resisted by spring means, and a spring cap at the other end of the casing providing for preliminary action, the friction clutch comprising a wedge and shoes, the wedge having shouldered engagement with the casing to limit outward movement of the wedge and the spring cap having its outward movement limited by shouldered engagement with the rear portion of the casing, thus maintaining the mechanism of overall uniform length in full release.

In the shock absorbing device G, the friction casing is indicated by 33, the wedge by 34, and the spring cap by 35. The casing 33 is held centered between the sills A—A by guide members 36—36 secured to the inner faces of the sills.

The spring resistance H comprises inner and outer coils 37 and 38 housed within the hollow rear stop member C and bearing at their forward ends on the rear end of the yoke D. This spring means H is under initial compression and holds the yoke in its forwardmost position pressed against the rear follower of the shock absorbing device, thus transmitting the pressure through said rear follower F, shock absorbing device G, and front follower E, to the front stop lugs B—B and holding all of these parts in intimate contact with each other, thereby entirely eliminating any possible free slack in the rigging. The capacity of the spring resistance H is less than that of the friction shock absorbing device G so that there will be no compression of the latter due to the direct action of the spring resistance H. Inasmuch as the spring resistance H yieldingly maintains the yoke and the parts contained therein pressed forwardly in full release of the rigging, the clearance shown in Figure 1 between the rear follower F and the rear stop casting C is maintained under normal conditions.

The operation of the improved mechanism illustrated in Figures 1, 2, and 3 is as follows: Assuming an inward or buffing movement being applied to the coupler, the yoke is moved rearwardly in unison therewith compressing the spring resistance H only and carrying the shock absorbing device G and the front and rear followers rearwardly therewith until the clearance between the rear follower F and the rear stop C is taken up, whereupon movement of the rear follower is arrested by engagement with said stop. When movement of the rear follower is arrested, the continued buffing action will effect compression of the shock absorbing device G and the spring resistance H in tandem, the friction shock absorbing device being compressed between the front follower E, which is moved rearwardly with the yoke, and the rear follower F, which is held stationary by the rear stop, the spring resistance H being compressed between the rearwardly moving yoke and the rear wall 15 of the stop casting C. This action continues until the friction shock absorbing device is fully compressed, whereupon movement of the yoke is stopped by engagement of the front follower E with the forward side of the casing 33 and rearward movement of the casing is arrested by engagement of the casing with the stationary rear follower F, which is held against movement at this time by the rear stop member, the front follower, casing, rear follower, and rear stop C acting as a solid column to transmit the load to the underframe of the car through the bolster 11 against which the rear stop is buttressed. Upon the actuating pressure being reduced, the expansive action of the friction shock absorbing means and the spring resistance H will restore the parts to the normal full release position shown in Figures 1 and 2, the spring resistance H acting to space the rear follower F from the rear stop C.

Upon a draft or pulling action being applied to the coupler, the yoke is pulled forwardly in unison therewith, compressing the friction shock absorbing device G between the rear follower F and front follower E, the latter at this time being held stationary by the front stop lugs B—B. Upon the actuating pressure being reduced, the parts will all be restored to the normal full release position shown in Figures 1 and 2, the fric-

tion shock absorbing device being limited in its expansion to a definite overall predetermined length by the cooperating stop means on the casing and wedge 34 and the casing and spring cap 35, thereby assuring the proper amount of clearance being maintained between the rear follower F and the rear stop casting C through the action of the spring resistance H, which, as hereinbefore pointed out, is under initial compression.

Referring next to the embodiment of the invention illustrated in Figures 4 and 5, the draft rigging is substantially the same as that disclosed in Figures 1, 2, and 3, with the exception that a different type of friction shock absorbing device, which is indicated by K, is substituted for the device G, that the rear follower F is omitted, the rear wall of the friction casing acting as the rear follower means, and that a rear stop casting M of a different design is substituted for the rear stop casting C of Figures 1, 2, and 3. Corresponding like parts of the construction shown in Figures 4 and 5 are designated by the same reference characters as employed for those parts in Figures 1, 2, and 3.

The friction shock absorbing device K is of a well-known design employed in passenger equipment and is identical with the friction shock absorbing device illustrated in Patent No. 1,877,329, granted to George A. Johnson, September 13, 1932. The shock absorbing device of this Johnson patent comprises a spring cage having a friction shell anchored thereto, the shell and casing having limited relative movement resisted by spring means disposed within the casing to produce preliminary spring action, and the friction resistance being produced by a friction clutch cooperating with the friction shell and having its movement with respect to the shell opposed by the same spring means which resists movement of the friction shell and casing, the clutch being composed of a wedge block surrounded by friction shoes. The spring cage of the shock absorbing device K, which corresponds to the cage of the Johnson patent, is indicated by 40, the friction shell by 41, and the wedge by 42. The wedge 42 bears directly on the front follower E and the rear end of the spring cage 40 bears on the inner side of the vertical end section 23 of the strap of the yoke D. As shown in Figure 4, the cage 40 is relatively wide and occupies substantially the entire space between the draft sills A—A and thus presents a rear or back wall 43 which projects laterally beyond the opposite sides of the yoke and acts as a rear follower for the rigging. Inasmuch as the spring cage 40 occupies substantially the entire space between the sills A—A, the guide members 36—36 shown in Figures 1, 2, and 3 are unnecessary and are therefore omitted in the design shown in Figures 4 and 5.

The rear stop casting M is in the form of a hollow boxlike member having horizontally disposed, spaced, top and bottom walls 44 and 45, vertically disposed, spaced, side walls 46—46, and a vertical, transversely disposed rear or back wall 47. The top and bottom walls are centrally cut out at the forward ends to provide vertically aligned openings which form a guideway 48 similar to the guideway 16 of the stop casting C, hereinbefore described, to accommodate the rear end of the yoke for movement in buff. The front ends of the side walls 46—46 are flanged inwardly, as indicated at 49—49, thereby providing relatively wide stop shoulders which are in alignment and continuous with the front end edges of the top and bottom walls 44 and 45. As will be seen upon reference to Figures 4 and 5, the stop casting M is longer than the stop casting C and the guideway 48 of the former is longer than the guideway 16 of the latter casting, whereby the front end of the stop casting M extends forwardly of the rear end of the yoke to properly cooperate with the rear wall 43 which forms the follower section of the spring cage 40 of the shock absorbing mechanism K, said rear wall 43 being in the transverse plane of the front face of the vertical section 23 of the yoke D. The friction shock absorbing mechanism K is held of uniform overall length in release in the same manner as the mechanism of the Johnson patent, hereinbefore referred to, a retainer bolt being employed in said Johnson patent as clearly shown and described therein.

The yoke D is normally held in the forward position by the spring resistance H, which is disposed within the stop casting M, in the same manner as described in connection with Figures 1, 2, and 3, thereby providing clearance between the spring follower acting rear end of the spring cage 40 of the friction shock absorbing mechanism K and the rear stop M for the same purpose that the clearance is provided between the rear follower F and the rear stop C of the rigging disclosed in Figures 1, 2, and 3.

The operation of the rigging shown in Figures 4 and 5 is substantially the same as the rigging shown in Figures 1, 2, and 3 and it functions in the same manner.

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 railway draft rigging, the combination with front and rear stops; of a friction device including front and rear follower means engageable directly with said front and rear stops, the overall length of said friction device including said front and rear follower means being, in full release condition, less than the space between said front and rear stops; a yoke enclosing said device including the front and rear follower means; and spring means bearing on the rear end of the yoke and opposing movement thereof during the entire buffing stroke of said yoke.

2. In a railway draft rigging, the combination with front and rear stops; of front and rear followers engageable directly with said front and rear stops; a friction shock absorbing unit between said followers, the assembled overall length of said unit, in full release, together with said followers being less than the spacing between said front and rear stops; a yoke movable in both buff and draft enclosing said friction shock absorbing unit and followers; and a spring shock absorbing device bearing on the rear end of the yoke and opposing rearward movement thereof during the entire buffing stroke of the same, said spring shock absorbing device yieldingly pressing the yoke forwardly and normally holding said rear follower spaced slightly from the rear stop.

3. In a railway draft rigging, the combination with front stop means; of a combined rear stop and spring cage having a stop face; a yoke movable in both buff and draft, said yoke being movable rearwardly beyond said stop face; a friction shock absorbing mechanism including front and rear follower means within the yoke engage-

able respectively with said front stop means and combined rear stop and spring cage; and a spring resistance within the spring cage opposing rearward movement of said yoke and normally pressing the yoke forwardly to hold said rear follower means normally out of contact with the stop face of said combined rear stop and spring cage.

4. In a railway draft rigging, the combination with a front stop; of a yoke movable in both buff and draft; a combined rear stop and spring cage, said combined rear stop and cage being recessed to accommodate said yoke for movement in buff; a spring within said cage bearing on the rear end of said yoke; and a shock absorbing mechanism within the yoke including front and rear follower means, said rear follower means being engageable with said combined rear stop and cage, said rear follower bearing on the inner side of the rear end of the yoke and being normally held spaced forwardly from said rear stop by the pressure of said spring on the yoke.

5. In a railway draft rigging, the combination with a yoke movable in both buff and draft, said yoke including a loop-shaped strap portion; of a friction shock absorbing means including a friction column and a cooperating sliding friction clutch disposed within said loop-shaped strap of the yoke, and actuated by said yoke in both buff and draft; front stop means against which said friction shock absorbing means is compressed in draft; rear stop means against which said friction shock absorbing means is compresed in buff; and means engaged by the rear end of said yoke yieldingly opposing buffing movement of said yoke and normally forcing said friction shock absorbing mechanism against said front stop means, said column limiting rearward movement of the yoke in buff, thereby limiting compression of said yielding means to a predetermined extent.

6. In a railway draft rigging, the combination with front and rear stops; of a friction shock absorbing mechanism including a friction casing and a cooperating spring resisted friction clutch cooperating with said stops, clearance being provided between said friction shock absorbing mechanism and rear stop during normal full release of said friction mechanism; a yoke actuated during the entire buffing and draft movement of the rigging, said yoke including a loop-shaped strap enclosing said shock absorbing mechanism, said yoke actuating the friction shock absorbing mechanism in both buff and draft; and means engaged by the rear end of said yoke yieldingly opposing rearward movement of said yoke during the entire buffing stroke of the same, said last named means being under initial compression and yieldingly forcing said friction shock absorbing mechanism toward said front stop and thereby normally holding the same spaced from said rear stop to provide said clearance.

7. In a railway draft rigging, the combination with front and rear stops; of a yoke movable in both buff and draft, said yoke including a loop-shaped strap portion; a friction shock absorbing mechanism within the yoke including front and rear follower means engageable directly with said front and rear stops, and a friction casing and cooperating spring resisted friction clutch interposed between said followers, clearance being provided between said rear follower and rear stop in full release of the mechanism; and spring means bearing on the rear end of the yoke and opposing rearward movement of said yoke during the entire buffing stroke of the latter, said spring means pressing the yoke forwardly against the rear follower means to maintain the latter normally slightly spaced from said rear stop to provide said clearance in full release of the mechanism.

ROLAND J. OLANDER.