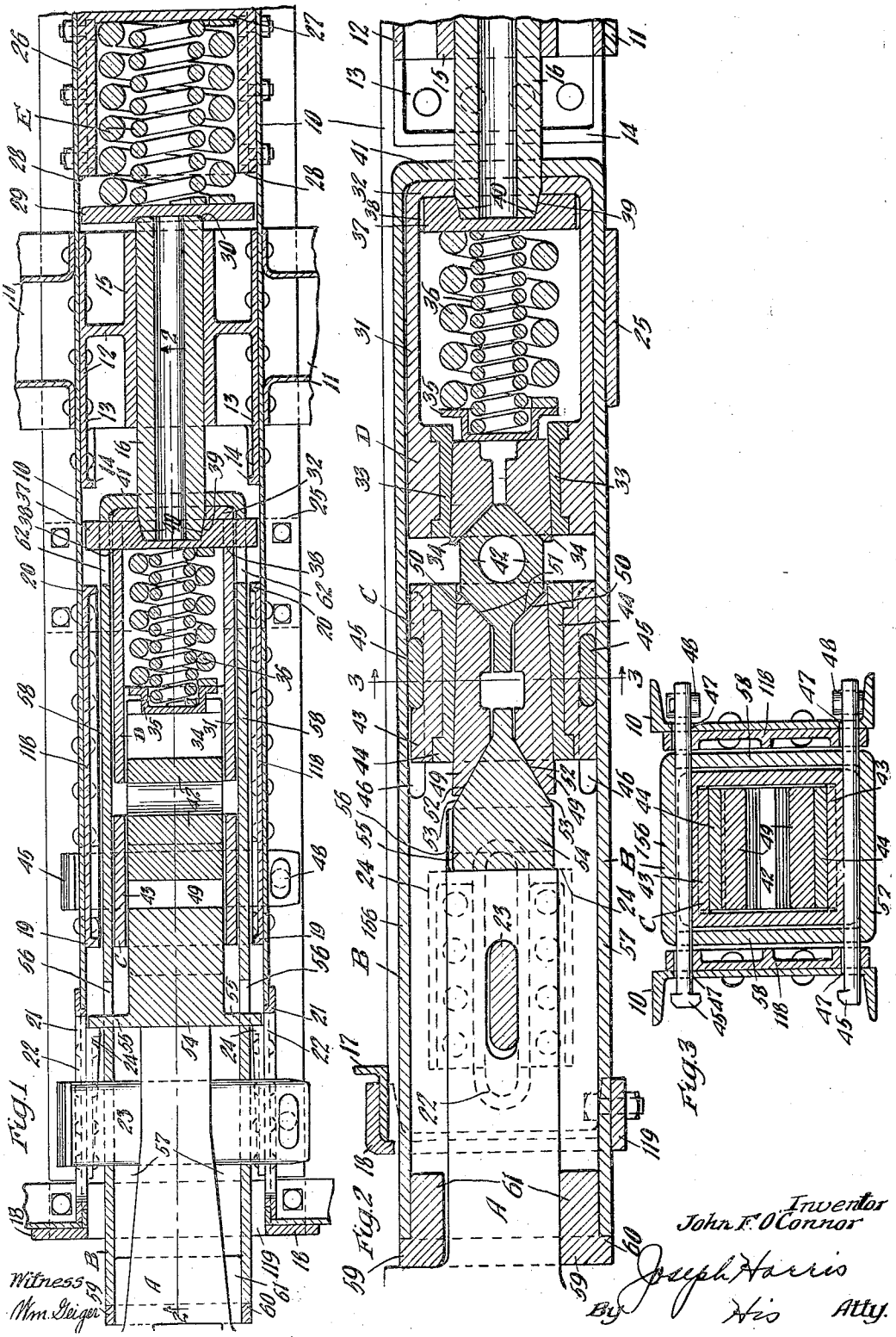
Feb. 2, 1932. J. F. O'CONNOR 1,843,694

RAILWAY DRAFT RIGGING

Filed March 10, 1928



Witness
Wm. Geiger

Inventor
John F. O'Connor
By Joseph Harris
His Atty.

Patented Feb. 2, 1932 1,843,694

UNITED STATES PATENT OFFICE

JOHN F. O'CONNOR, OF CHICAGO, ILLINOIS, ASSIGNOR TO W. H. MINER, INC., OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

RAILWAY DRAFT RIGGING

Application filed March 10, 1928. Serial No. 260,709.

This invention relates to improvements in railway draft riggings.

In the operation of railway cars at the present time, much difficulty is experienced on account of lack of capacity, in buff, in the draft gears, when the cars are subjected to unusually severe blows. Many of the proposed solutions of this difficulty have not been entirely satisfactory.

One object of my invention is to provide an arrangement which will have ample capacity for absorbing any shock in buff that may be encountered under any normal operating conditions and at the same time provide ample capacity for a draft action without increase in train slack.

Another object of my invention is to provide a draft rigging so arranged that, during a compression stroke, the resistance afforded during the first part thereof is that of a friction gear and a spring unit combined and, during the last part of the stroke, is that of two friction units operating in tandem.

A further object of my invention is to provide a draft rigging wherein one unit is operable throughout the entire buff stroke and a second friction unit is operable during the latter part, only, of the stroke.

A more specific object of my invention is to provide a draft rigging employing three separate units arranged in tandem formation with means cooperating therewith in such manner that one of said units is operable throughout an entire compression stroke, another unit is operable during the first part, only, of the compression stroke, and the third unit is operable during the last part, only, of the compression stroke.

Another specific object of my invention is to provide a draft rigging of the type indicated in the preceding paragraph and wherein only one of said units is operable in draft, the rigging being further characterized by the fact that the compression stroke in a buff action is longer than that in draft.

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

In the drawings forming a part of this specification, Fig. 1 is a horizontal, longitudinal sectional view of a portion of a railway car, the portion of the car shown including parts inwardly of the bolster. Fig. 2 is a vertical longitudinal sectional view corresponding to the line 2—2 of Fig. 1, but being upon an enlarged scale. And Fig. 3 is a vertical transverse sectional view corresponding to the line 3—3 of Fig. 2.

In said drawings, 10—10 denote the usual channel center sills of a railway car which are extended to both sides of the bolster, indicated at 11. Said bolster is provided with a center filler casting 12, the side webs 13 of which are outwardly extended so as to provide rear limiting stop shoulders 14—14 for the purpose hereinafter described. Said casting 12 is further formed with a central sleeve 15 centrally apertured for a sliding plunger 16, the function of which will be described hereinafter. The sills 10 are secured at their forward ends to an end sill 17 in any suitable manner and the opening for the draft rigging parts is suitably reinforced by a striking casting 18, the latter having a bottom transverse section 119 which functions as the carry iron. Secured to the inner faces of the sills 10, at points intermediate the end sill and bolster, are cheek plates 118—118, each of which is provided at its front end with a front limiting stop shoulder 19, and at its rear end with a limiting stop shoulder 20. Also applied to the sills 10 are stop lug castings 21, each of which has an elongated horizontal slot 22 to accommodate the coupler key 23 and is also further provided with front stop lugs 24—24.

In carrying out my invention, in addition to the usual standard coupler A, I preferably employ a long yoke or casing B; a front relatively fixed friction shock absorbing unit indicated generally by the reference character C; a second friction shock absorbing unit indicated generally by the reference character D; and a heavy spring resistance unit E, the latter being located inwardly of the bolster. The yoke B and parts therewithin are sustained in operative position by the carry iron section 119, previously referred to, and a detachable saddle plate 25.

Referring first to the spring unit E, the

same comprises two nested coils as clearly shown in Fig. 1, the same being housed within a spring cage 26 which is bolted to the sills 10 and has a back stop wall 27. The front end of the cage 26 is spaced inwardly of the bolster and provides limiting stop shoulders 28—28, to limit the rearward or inward movement of the spring follower 29 during a buff action. Preferably, the follower 29 will be restricted to a movement of about 2½″. As clearly shown in Fig. 1, the follower 29 has a suitable recess 30 on its front face within which is seated the inner end of the plunger 16 and by which the follower 29 is adapted to be actuated, as hereinafter explained.

The friction shock absorbing unit D, which I have chosen for illustrative purposes only, is housed within the tubular yoke B, the details of which will be hereinafter described. Said friction unit D preferably comprises a combined friction shell and spring cage casting 31 having an integral back wall 32 and provided with liners 33 at the front end of the shell section proper. Cooperable with the friction shell are a number of wedge-friction-shoes 34—34, the latter bearing at their rear ends on a spring cap 35 which in turn is engaged by the front ends of a double coil spring resistance 36, the rear end of the latter bearing on a second follower 37 which has its ends extended laterally through suitable slots 38 in the side walls of the shell casting 31, as best shown in Fig. 1. With the arrangement shown it is evident that the follower 37 will always move in unison with the shell casting 31. Said follower 37 is preferably recessed on its rear face as indicated at 39, and in which recess is adapted to be seated the preferably slightly tapered forward end 40 of the plunger 16, the latter passing through suitable alined openings in the rear wall 32 of the shell casting and in the rear wall 41 of the yoke B. Cooperable with the friction shoes 34 is a double ended wedge member 42, the latter preferably being cored to lessen the weight and save material, as shown in the drawings.

The friction unit C, which is also housed within the yoke B, preferably comprises a rectangular friction shell 43 having friction surfaces provided by removable liners 44, the friction surfaces of the latter preferably tapering inwardly of the shell, and which is also true of the friction surfaces of the liners 33 of the other unit D. Said shell 43 is held stationary at all times by any suitable means such as the upper and lower, transversely extending keys 45—45 which fit within notches in the upper and lower surfaces of said shell and are extended through elongated slots 46—46 in the side walls of the yoke B and are also extended through slots 47—47 in the sills 10, said keys 45 being held against movement lengthwise of the sills. The keys 45 are retained against accidental removal by any suitable means such as a head at one end and removable pins 48—48 at the other end. Cooperable with the friction shell 43 are a number of elongated wedge-friction-shoes 49—49, each of which has a wedge face 50 at its inner end cooperating with a corresponding wedge face 51 on the double wedge block 42, heretofore referred to. At its front end, each shoe 49 has another preferably keener wedge face 52 cooperating with a corresponding wedge face 53 on a combined follower-wedge-pressure-transmitting block 54. The latter, as best shown in Fig. 1, has laterally extended flanges or wings 55—55 which extend through slots 56 in the side walls of the yoke B and are adapted to cooperate with the front stop lugs 24. The butt end of the shank of the coupler A normally engages the wedge-follower 54 so as to directly actuate the latter in a buff stroke, said coupler being attached to the yoke B by the coupler key 23 hereinbefore referred to.

The yoke B is of elongated tubular formation and preferably square in cross section, the same having a top wall 156, bottom wall 57 and side walls 58—58. Said yoke is extended forwardly to a point closely adjacent the usual horn of the coupler and is there provided with a removable coupler-supporting sleeve 59 preferably in the form of a casting which is shouldered as indicated at 60 to engage the front end of the yoke B and has an inner extension 61. Said sleeve 59 abuts the horn of the coupler and also sustains the latter at its outer end and further restricts any vibration vertically of the coupler so as to confine it always to a horizontal position coinciding with the axis of the yoke B. The side walls 58 are slotted at 56 as previously described and the length of said slots 56 will be such as to preferably allow about 2½″ movement between the yoke and the wedge-follower 54. Said side walls are further slotted near the rear end, as indicated at 62 and through which are extended the ends of said follower 37. The length of the slots 62 will also preferably be made such as to allow for 2½″ movement between the yoke B and the follower 37. The slots 46 in the side walls of the yoke are sufficiently elongated forwardly of the keys 45 to permit the yoke B to move rearwardly preferably 5″ relative to the keys 45. Said slots 46 are also elongated rearwardly of the keys 45 sufficiently to permit the yoke B to move forwardly 2½″ relative to the keys 45.

With the construction shown, and arranged as above described, the operation is as follows, during a buff stroke. Upon inward or buff movement of the coupler A, the yoke B will move simultaneously and uniformly therewith. The front wedge-follower 54 will also move in unison with the coupler, as will be obvious, thus actuating the front friction unit C since buff movement

of the wedge-follower 54 will force the wedge-shoes 49 inwardly of the stationary friction shell 43 and the action or stroke of the friction unit C will be the full permissible stroke of the coupler A, or 5″ in the example chosen. Inward or rearward movement of the friction shoes 49 in turn forces the double wedge block 42 rearwardly, the latter in fact being somewhat accelerated, due to the taper of the friction surfaces of the shell 43. Rearward movement of the wedge block 42 will, in turn, induce rearward or buff movement of the friction spring unit D, as an entirety and inasmuch as the follower 37 carried by the shell cage casting 31 thereof is compelled to move in unison with the latter, it is evident that the plunger 16 will also be forced rearwardly or inwardly, thus actuating the spring follower 29 of the rear spring unit. This action will continue until the follower 29 engages with the limiting stops 28 whereupon further compression of the spring unit E ceases and further inward movement of the plunger 16 is also terminated. The action just described preferably continues for about 2½″ as previously indicated. Thereafter, as the coupler and friction elements of the front friction unit C continue their buff movement, the friction shell 31 will be held stationary both by reason of the then held plunger 16 and the fact that the ends of the follower 37 will have come into engagement with the limiting stops 14. There is then produced during the last half of the buff compression stroke, a combined friction spring action in the unit D, inasmuch as the double wedge 42 will force the shoes 34—34 inwardly of the friction shell. During this last half of the buff compression stroke, it will be observed that the yoke B is free to move relative to the follower 37 by reason of the slots 62.

In a draft action, the wedge-follower 54 will be held stationary by the stop lugs 24 and the shell 43 of the front unit C will be held stationary, as above described, so that no friction action is set up in the unit C. As the coupler moves forward, it pulls the yoke B therewith and the latter in turn, through its rear wall 41, pulls the friction shell 31 forwardly in unison therewith and hence a friction action will be set up between the moving friction shell 31 and the friction shoes 34—34 which are held relatively stationary by the double wedge block 42 which in turn is held stationary by the wedge-shoes 49. The draft action is limited when the follower 37 engages with the stop lugs 20 and preferably also the rear walls of the slots 56 in the yoke B will engage the follower flanges 55 and the coupler key 23 will engage with the walls at the ends of the coupler key slots 22. During the draft action, it will be observed that the rear spring unit E remains idle so that the draft shock absorbing capacity is that of the intermediate spring friction unit D only and the stroke is limited to preferably 2½″.

I have herein shown and described what I now consider the preferred manner of carrying out the invention, but I am aware that a great many changes may be made not only in details of construction and arrangement of parts, but in the substitution of one form of resistance unit for another without departing from the spirit of the invention and all changes and modifications are contemplated that come within the scope of the claims appended hereto.

I claim:

1. In a draft rigging, the combination with three shock absorbing units arranged in tandem formation; of means for actuating one of said units during an entire compression stroke; means for actuating another of said units during the first part, only, of said compression stroke; and means for actuating the third unit during the last part, only, of said compression stroke.

2. In a draft rigging, the combination with three shock absorbing units; of means for actuating one of said units during an entire buff stroke; means for actuating another of said units during the first part, only, of a buff stroke; means for actuating the third of said units during the last part, only, of a buff stroke; and means for actuating one, only, of said units in a draft stroke.

3. In a draft rigging, the combination with a friction unit, a spring-friction unit, and a spring unit, arranged in tandem formation; of means for actuating said friction unit during an entire buff stroke; means for actuating said spring unit during the first part, only, of a buff stroke; means for actuating said spring-friction unit during the last part only of a buff stroke; and means for actuating said spring-friction unit, only, in a draft stroke.

4. In a draft rigging, the combination with draft sills and a bolster; of three shock absorbing units arranged in tandem formation, two in front of the bolster and one rearwardly thereof; means for actuating one of said units during an entire compression stroke; means for actuating another of said units during the first part, only, of said compression stroke; and means for actuating the third of said units during the last part, only, of said compression stroke.

5. In a draft rigging, the combination with draft sills and a bolster; of a friction unit, a friction-spring unit, and a spring unit disposed between said sills, said spring unit being located inwardly of the bolster; means for actuating said spring unit during a part, only, of a compression stroke; means for actuating said spring-friction unit during a different part, only, of said compression stroke; and means for actuating said friction unit during the entire compression stroke.

6. In a draft rigging, the combination with a friction unit including, a fixed shell; of a spring-friction device including a friction shell and a spring resistance; a spring resistance unit; means for transferring pressure from said first unit to said device in buff; means for transferring pressure from said device to said spring unit in buff; and means for pulling the shell of said device in draft.

7. In a draft rigging, the combination with a friction unit including, a fixed shell; of a spring-friction device including a friction shell and a spring resistance; a spring resistance unit; means for transferring pressure from said first unit to said device in buff; means for transferring pressure from said device to said spring unit in buff; and means for pulling the shell of said device in draft, said spring resistance unit being disposed inwardly of the bolster.

8. In a draft rigging, the combination with a friction unit including a fixed shell; of a spring-friction device including a friction shell and a spring resistance; a spring resistance unit; means for transferring pressure from said first unit to said device in buff; means for transferring pressure from said device to said spring unit in buff; means for pulling the shell of said device in draft; and means for holding the friction elements of said friction unit stationary in a draft stroke.

9. In a draft rigging, the combination with a friction unit including a fixed shell; of a spring-friction device including a friction shell and a spring resistance; a spring resistance unit; means for transferring pressure from said first unit to said device in buff; means for transferring pressure from said device to said spring unit in buff; means for pulling the shell of said device in draft; and means for limiting the compression of said spring unit prior to completion of the full stroke of said friction unit.

10. In a draft rigging, the combination with draft sills and a bolster; of a front friction unit including a fixed friction shell and cooperating friction elements; a spring-friction device disposed inwardly of said unit and including a friction shell and friction elements; pressure-transmitting means interposed between said two sets of friction elements; a shock absorbing unit disposed inwardly of the bolster; and means for transmitting pressure from said device to said unit disposed inwardly of the bolster.

11. In a draft rigging, the combination with draft sills; of a yoke; a front shock absorbing device housed within said yoke; a second shock absorbing device housed within said yoke; means for transferring presure from the first named to the second named device; a third shock absorbing device located exteriorly of said yoke, said last named device being of lesser capacity than said second named device; and means for transmitting pressure from said second named device to said device located exterior to the yoke, said third device being located inwardly of the bolster and said last named means comprising a pressure-transmitting plunger extending through the bolster.

12. In a draft rigging, the combination with a front fixed friction shell; of friction elements cooperable therewith adapted to be actuated during a buff stroke, only; a spring-friction device including a shell, friction elements cooperable therewith and a spring resistance; means for transmitting pressure from said first named friction elements to said second named friction elements; a spring resistance; means for transmitting pressure from said second named device to said spring resistance; means limiting the compression of said spring resistance to an amount less than the permissible stroke of said first named friction device.

13. In a railway draft rigging, the combination with draft sills; of a friction unit including a shell fixed relatively to the sills and cooperable friction elements; a second friction unit including relatively movable friction members and a spring resistance; a pressure transmitting member interposed between the elements and certain of the friction members of said two units whereby movement in one direction of the elements of the first named unit produces actuation of the friction members of said second named unit; means for holding said elements and part of said friction members stationary relative to said shell in the opposite direction; and means for actuating said second named unit in said opposite direction to compress the spring resistance thereof.

14. In a railway draft rigging, the combination with draft sills; of a friction unit including a friction shell fixed relatively to the sills and having cooperable friction elements; a second friction unit including cooperating relatively movable friction members and a spring resistance opposing relative movement of said friction members; means for actuating said first named unit in buff; a pressure transmitting member interposed between the friction elements and certain of said members of said two units whereby actuation of the first named unit in buff will cause relative movement of the friction members of said second named unit; means for holding said elements and part of said friction members stationary in draft action; and means for actuating said second named unit in draft to compress the spring resistance thereof and effect relative movement of the friction members.

In witness that I claim the foregoing I have hereunto subscribed my name this 8th day of March, 1928.

JOHN F. O'CONNOR.