June 16, 1953 C. E. TACK ET AL 2,642,195

DRAFT ARRANGEMENT

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Fig. 1.

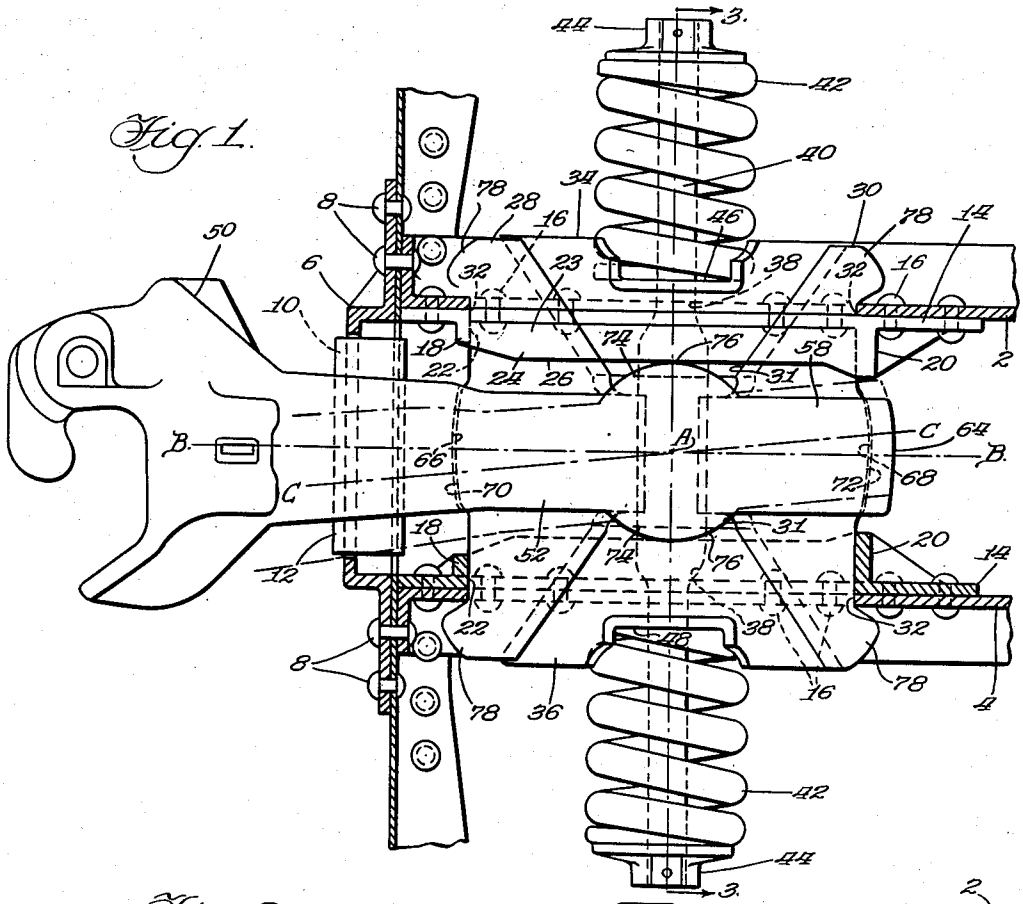


Fig. 2.

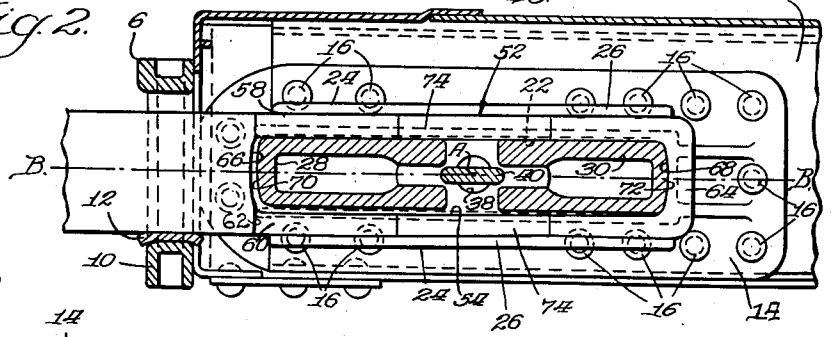
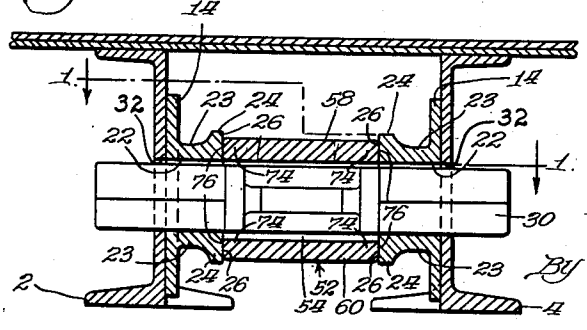


Fig. 3.



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DRAFT ARRANGEMENT

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1 Claim. (Cl. 213—38)

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This invention relates to railway draft rigging and more particularly to an arrangement of a car coupler, draft gear, and a center sill structure. This invention is an improvement upon the general arrangement illustrated in Patent No. 2,003,583, issued June 4, 1935, in the United States Patent Office to Alfred H. Oelkers.

The principal object of the invention is to provide a novel connection between coupler and draft gear for improving the efficiency of the gear by more uniformly distributing the loads among the various parts constituting the gear and at the same time providing maximum bearing areas between the coupler and draft gear both in draft and in buff.

Another object of the invention is to provide a connection between the coupler and draft gear accommodating universal angling of the former by means of spherical convex surfaces on certain members of the gear engageable with complementary spherical concave surfaces on the coupler.

This invention comprehends an improvement in the relation between the coupler and the draft gear to effect loading of the draft gear through the center thereof irrespective of any angling of the coupler.

In an arrangement of the above-described type, the gear generally includes two longitudinal wedging elements and two transverse wedging elements therebetween, the two longitudinal elements being received within a yoke for cooperation with the front and rear ends thereof on buff and draft respectively.

Heretofore, one of these longitudinal elements has been provided with a cylindrical concave bearing surface which, under draft, engaged a complementary convex surface on the rear end of the yoke. This arrangement is satisfactory as long as the coupler pulls on the center line of the gear, however, when the coupler angles to one side, all the forces are concentrated on that side of the gear. Under the high loads imposed on the gear, this action is extremely deleterious resulting not only in uneven wear of the wedging elements, but also, the misalignment of the parts, that is the wedges tend to spread out at one end and to close at the other, whereby only limited wedging action is obtained principally between the two longitudinal wedges and the transverse element on the side of the gear at which the forces are concentrated.

It is an object of this invention to provide an arrangement which eliminates such concentration of forces on one side of the gear when the coupler angles.

Still another object is to provide cooperating

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spherical surfaces on the coupler and draft gear wedges struck from a common center, and also to provide means on the coupler in the form of bearings at opposite sides thereof struck from a vertical axis through the same center, the bearings being engageable with flat surfaces on the associated center sill structure to provide means for pivoting the coupler about said center when the coupler angles horizontally thereby causing the engaged surfaces on the coupler and associated wedge to slide against each other instead of misaligning and bearing against each other in edge contact.

These and other objects of the invention will become more apparent from the specification and the drawings, wherein:

Figure 1 is a fragmentary sectional view of a draft arrangement made in accordance with the present invention, taken approximately on line 1—1 of Figure 3;

Figure 2 is a vertical longitudinal sectional view taken substantially through the center of the structure shown in Figure 1; and

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 1 with the side wedges and springs removed.

Describing the invention in detail, the draft rigging is illustrated in connection with channel-shaped center or draft sills 2 and 4 suitably secured in spaced relation to a railway car underframe. A striking casting 6 is secured to the corresponding outer ends of the draft sills 2 and 4 as by rivets 8, and includes a carrying iron 10 with a wear plate 12 thereon.

A cheek plate 14 is secured to each draft sill 2 and 4, as by rivets 16, and each cheek plate is formed with an inwardly disposed front draft lug 18 and a rear buffing lug 20 arranged at opposite ends of a horizontally elongated slot 22 formed through the cheek plate. Inwardly extending horizontal flanges 23, 23 are formed at the top and bottom margins of slot 22, each terminating at its inner end in an enlarged portion 24 providing a flat vertical bearing area at 26 for a purpose hereinafter described.

A draft gear is disposed between the center sills 2 and 4, said gear comprising identical front and rear longitudinal friction wedge members 28 and 30, each of which extends between sills 2 and 4 through the slots 22 in the cheek plates as well as through aligned slots 32 in the center sills. The front and rear wedge members 28 and 30 are aligned longitudinally of the sills and on their remote sides are adapted to seat against the stops or lugs 18 and 20, respectively, and on their adjacent edges are each formed with a pair of V-shaped surfaces which are diagonally dis-

posed, as well seen in Figures 1 and 3. These wedge members in their assembled position, as shown in Figure 1, define V-shaped spaces 31, 31 therebetween at opposite ends thereof.

Occupying these spaces 31, 31 are identical laterally movable side friction wedge members 34 and 36 which are formed with friction surfaces adapted to cooperate with the adjacent friction surfaces on the respective front and rear wedges and to move laterally relative the forward and rear wedge members. The wedge members 34 and 36 are provided with horizontal openings 38 for the reception of a spring-supporting rod 40 which extends transversely of the center sills and supports coil springs 42, these coil springs being held in position by means of lock nuts 44 and seating in spring seats 46 and 48 in friction elements 34 and 36.

A coupler member 50 is afforded a seat on wear plate 12 and extends between the draft sills 2 and 4 and is provided with an integral yoke portion 52 formed with a horizontal pocket 54 adapted to receive the draft gear members 28 and 30 therethrough. The pocket 54 is defined by top and bottom horizontal webs or straps 58 and 60 of the yoke and by vertical forward and rear end walls 62 and 64 (Figure 2).

The adjacent or inner sides of the end walls 62 and 64 are formed with mutually facing concave spherical bearing surfaces 66 and 68, respectively, defined from a common center designated A (Figures 1 and 2), said center being disposed on the longitudinal center axis of the coupler indicated at B—B (Figures 1 and 2), that is, medially between the lateral, longitudinal and vertical sides of the pocket 54.

The surfaces 66 and 68 are arranged to engage complementary convex bearing surfaces 70 and 72 on bosses on the remote sides of the front and rear wedges respectively. Surfaces 70 and 72 are also struck from point A. It will be understood that surfaces 66 and 70 engage on buff, and surfaces 68 and 72 engage on draft, and that all of these surfaces are of substantially equal radii.

In order to effect a sliding movement between any of the pairs of cooperating spherical surfaces on horizontal angling of the coupler, the lateral edges of the horizontal webs 58 and 60 are provided with guides 74, 74 of arcuate form struck from a common vertical axis passing through center A. The curved outer sides 76 of the guides are arranged to engage the respective surfaces 26 of adjacent portions 24 of the flanges 23 for pivoting the coupler thereagainst to effect sliding movement between the pair of concave-convex spherical surfaces 68, 70 or 66, 72 engaged at the moment on horizontal angling of the coupler, whereby any tendency on the part of these surfaces to engage in edge contact is entirely eliminated and full face bearing therebetween always obtains.

It will be noted that when the coupler angles as shown in Figure 1 in phantom lines, the line of force indicated C—C (Figure 1) passes through the center of the draft gear, corresponding to line B—B (Figure 1). This has been found to have the decided advantage of distributing the forces over larger areas of wedges 28 and 30, whereby the forces are not concentrated on one side of the gear when the coupler is angled. The front and rear wedges tend to remain in alignment with each other and cooperate under approximately equal loading against both of the lateral wedges, thus obtaining substantially uniform pressure on all of these parts, thereby materially improving the working characteristics of the gear and also reducing the rate of wear on the parts.

As may be seen in Figure 2 of the drawings, the horizontal pocket 54 is wider adjacent the forward portion thereof than at its rear. This construction, as well as the structure of surfaces 68 and 72, accommodates vertical angling of the coupler without displacement of the friction elements of the gear when the coupler is pulling, and when in buff the narrow portion of the pocket is moved away from the rear wedge member 30 so that vertical angling of the coupler is also permitted on cooperating surfaces 68 and 70 on the yoke and front wedge.

In order to maintain the gear in proper position in the slots and pocket, the forward and rear wedges are provided with outwardly extending lugs, such as at 78, adapted to cooperate with the draft sills 2 and 4.

Thus it will be observed that the arrangement herein disclosed affords a compact, convenient structure which has full face bearing between the draft gear and the coupler in buff and under draft. Furthermore, the draft gear and coupler are arranged in such manner that maximum efficiency from the draft gear is obtained.

We claim:

In a draft rigging, a coupler having a yoke with a pocket, a support including cheek plates disposed at opposite sides of said yoke, a draft gear in said pocket including followers arranged one at each end of said pocket, front and rear stop lugs on said cheek plates affording seats for the respective followers, concave substantially spherical surfaces at opposite ends of said pocket aligned longitudinally of said yoke, convex substantially spherical surfaces on the respective followers of a form complemental to said concave spherical surfaces, said surfaces being defined from a common center, spring pressed side wedges aligned with and on opposite sides of said center and in wedge engagement between said followers, spaced inwardly facing flanges on the respective plates receiving said followers and wedges therebetween and presenting on their inner ends flat surfaces lying in substantially parallel planes extending longitudinally of said structure, and arcuate convex surfaces on said yoke defined from a common axis passing through said center arranged to cooperate with said flat surfaces to afford a pivot for said coupler on said axis under certain conditions, said followers being in line engagement with opposite sides of each of said wedges and along planes substantially radially disposed from said center, said pocket being deeper at its front end than at its rear end, as seen in vertical cross section, to accommodate vertical angling of the yoke along the engaged spherical surfaces of the pocket and one follower during imposition of pulling or buffing forces on the yoke.

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