July 14, 1953 H. H. WOLFE 2,645,361

COUPLER YOKE AND DRAFT GEAR ASSEMBLY

Filed Jan. 26, 1949 3 Sheets-Sheet 1

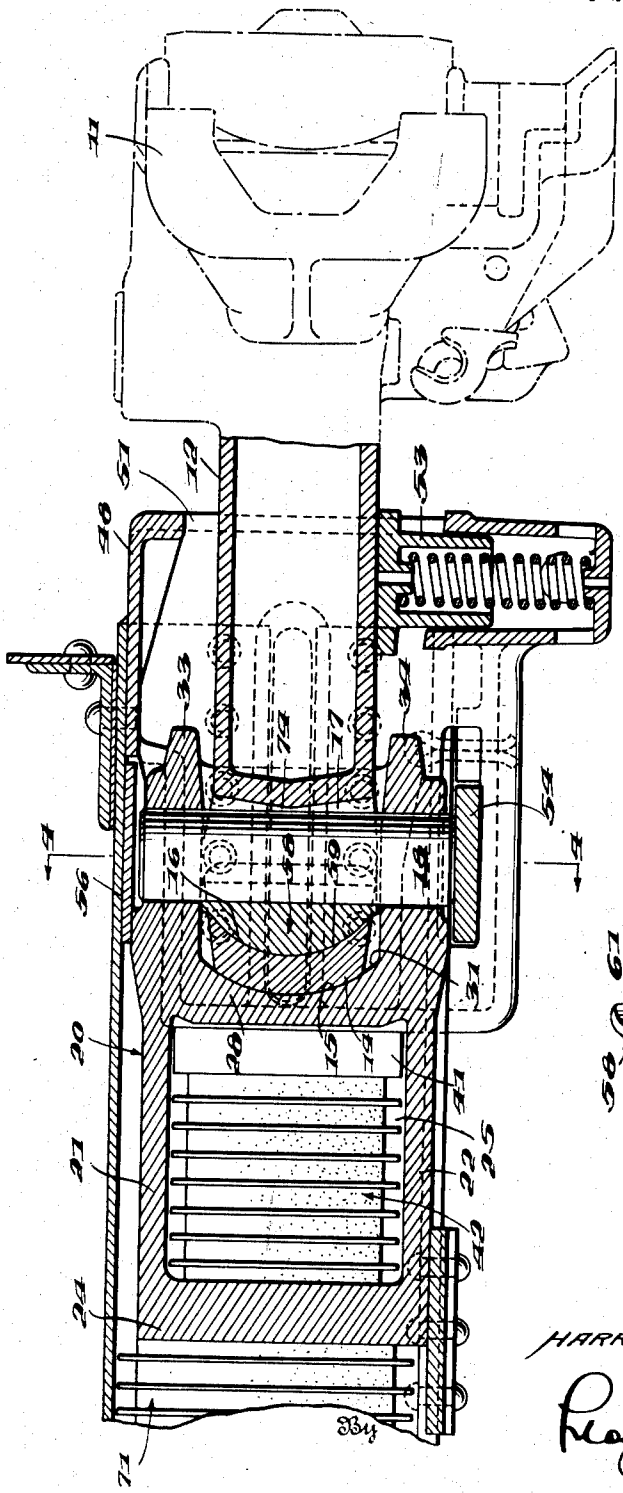


Fig. 1.

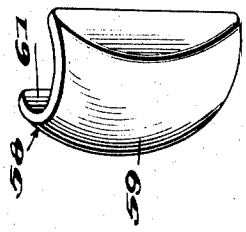


Fig. 2.

Inventor
HARRY H. WOLFE,
By Floyd P. Black
Attorney

July 14, 1953 H. H. WOLFE 2,645,361

COUPLER YOKE AND DRAFT GEAR ASSEMBLY

Filed Jan. 26, 1949 3 Sheets-Sheet 2

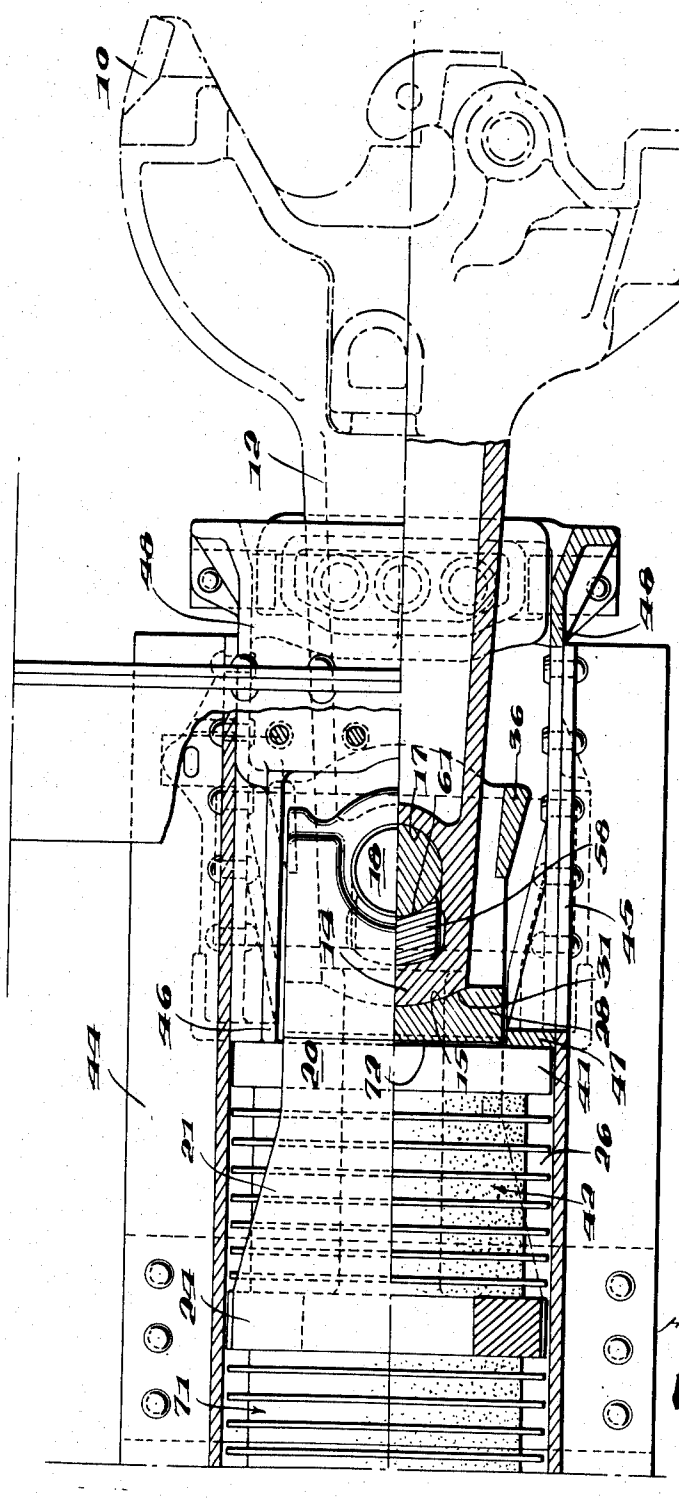


Fig. 3.

Inventor
HARRY H. WOLFE,
Roger P. Shank
Attorney

July 14, 1953 H. H. WOLFE 2,645,361

COUPLER YOKE AND DRAFT GEAR ASSEMBLY

Filed Jan. 26, 1949 3 Sheets-Sheet 3

Fig. 4.

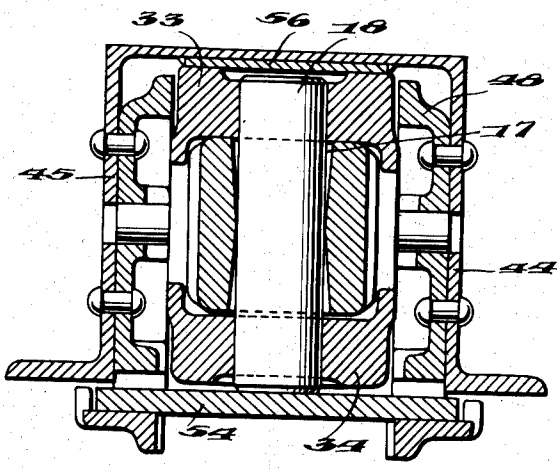


Fig. 5.

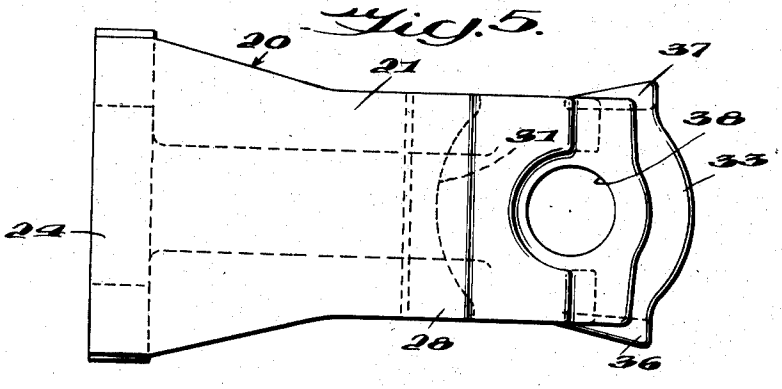
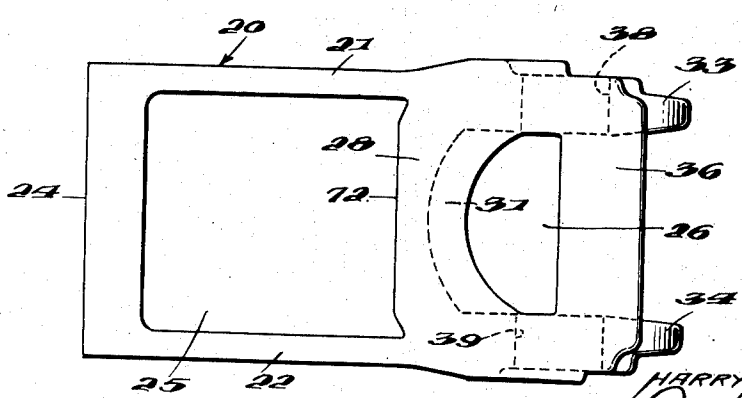


Fig. 6.



Inventor

HARRY H. WOLFE,

By Lloyd P. Adams

Attorney

Patented July 14, 1953

2,645,361

UNITED STATES PATENT OFFICE

2,645,361

COUPLER YOKE AND DRAFT GEAR ASSEMBLY

Harry H. Wolfe, Columbus, Ohio, assignor to The Buckeye Steel Castings Company, Columbus, Ohio

Application January 26, 1949, Serial No. 72,871

2 Claims. (Cl. 213—46)

1

The present invention relates to a draft gear assembly for couplers of railway vehicles and the invention more specifically pertains to the structural features of the yoke in association with an interlocking type coupler so that the forces developed during pull will be transmitted by the yoke through one set of resilient cushions and during buff transmitted by the yoke through another set of resilient elements of the draft gear.

In the railway art an automatic coupler of the interlocking type is well-known. The interlocking coupler is provided with aligning wings which prevent vertical slippage between two coupler contours and also limits the lateral angling between two engaged couplers. An interlocking coupler accordingly requires provision to be made for the coupler shanks to angle vertically and this is accomplished by the use of a universal joint between the coupler and the yoke and by providing additional clearance over the coupler shank. In the use of an interlocking coupler having aligning wings increased laterally angling is permitted by using a wider striker opening. In such an interlocking coupler the pulling forces are taken through the yoke straps onto the draft gear and the buffing forces are taken through the coupler butt onto the follower and then transmitted to the draft gear.

One of the objects of the present invention is to provide a draft assembly for a coupler of the interlocking type adapted to angle vertically and laterally and so constructed that the forces in pull will be taken through the yoke straps and imposed upon a plurality of resilient and yieldable mats housed within the yoke and applied to the draft lugs by means of the follower with the buffing forces transmitted through a strut forming a part of the yoke onto the yoke straps and through the butt of the yoke onto additional yieldable and resilient mats in back of the yoke.

A further object of the invention resides in providing a yoke for connecting a coupler to a rubber mat type draft gear so that the forces developed during pull will be applied through one portion of the draft gear and the forces developed during buff will be transmitted to another portion of the rubber mat assembly.

A more specific object of the invention pertains to the structure of the yoke which is so designed as to transmit the forces developed during buff and pull in all angled positions of the coupler shank and having all of the bearing surfaces accessible for cleaning and gauging.

A further object of the invention is to so construct the coupler shank and the yoke that vertically angling of the coupler is permitted and lateral angling is allowed and at the same time adapting the draft attachment formed in part by yieldable and resilient cushion assemblies to substantially conventional type sills.

2

Other objects and features of the invention will be more apparent to those skilled in the art as the present disclosure proceeds and upon consideration of the following detailed description and the accompanying drawings wherein a typical embodiment of the invention is disclosed.

In the drawings:

Fig. 1 is a vertical sectional view of a draft attachment embodying the invention showing the coupler in phantom lines.

Fig. 2 is a perspective view of a swivel block employed in association with the coupler shank.

Fig. 3 is a plan view of the draft attachment partly in horizontal section.

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a plan view of the yoke.

Fig. 6 is a side elevational view of the yoke.

In a draft appliance for a railway car for a standard swivel type coupler the yoke is pivotally connected to the coupler shank and no vertical angling of the coupler with respect to the yoke is permitted. Any variations in the vertical heights of the couplers is accommodated between any two couplers by slippage in the contour. Lateral angling of such a standard swiveled type coupler is made possible by means of the opening in the striker and the vertical disposition of the swivel pin connection between the coupler shank and the yoke. As distinguished therefrom the present invention is directed to an interlocking type coupler having aligning wings as indicated at 10 and 11 in Fig. 3. These aligning wings prevent vertical slippage between two coupler contours and also limit the lateral angling between two engaged couplers. The present invention is directed to a yoke and draft assembly adapting a cushion type draft gear to such couplers. The draft appliance hereinafter described makes provision for vertical and lateral angling of the coupler shank 12.

Referring to the drawings the butt end 14 of the coupler shank is provided with a spherical convex surface 15 as shown in Figs. 1 and 3. This spherical surface 15 is adapted for cooperation with a correspondingly shaped bearing surface on the yoke and the purpose thereof will be more apparent as at present disclosure proceeds.

A further spherical concave surface 16 is provided within the coupler shank as shown in Fig. 1. A pin receiving opening 17 is provided which extends vertically through the coupler shank for receiving a pin 18 and connecting the coupler to the yoke indicated generally at 20.

The yoke is more clearly shown in Figs. 5 and 6 and includes yoke straps 21 and 22 which are connected at their rear end by a butt 24. The yoke straps 21 and 22 are tied together at the forward portion of the yoke and at the front of the gear pocket 25 by means of a vertical member or strut 28. The strut 28 is provided with a spherical surface 31 which is concave and concentric with the curvature of the spherical surface 15 carried by the butt end 14 of the coupler shank. The nose portions 33 and 34 of the yoke are also tied together by vertically disposed tie members 36 and 37. These tie members are so constructed and arranged as to permit full lateral angling of the coupler during fore and aft movements of the coupler and yoke. The yoke is also provided with an opening 38 in the upper nose portion and an opening 39 in the lower nose portion. The openings 38 and 39 are in alignment for receiving the pin 18. Apertures 26 are also formed in the sides of the yoke head. These apertures permit access to the inner portion of the yoke for cleaning, or grinding the bearing surfaces of the yoke.

The draft appliance includes a follower 41 as shown particularly in Figs. 1 and 3. A resilient mat type draft gear is housed within the yoke 20 between the follower 41 and the butt 24 of the yoke. This resilient assembly is of the type comprising rubber mats laminated with metal and is indicated generally at 42. The draft sills 44 and 45 are of a conventional type and the front draft lugs 46 and 47 are attached to the striker 48 in the usual manner. The striker is provided with a relatively large opening 51 permitting lateral and vertical angling of the coupler. The follower 41 is adapted to engage the front draft lugs 46 and 47 and transmit the pulling force to the draft sills of the railway car.

The striker 48 is provided with a spring supported coupler carrier 53 which permits vertical angling of the coupler shank. A yoke carrier 54 is also provided with supports and retains the pin 18 in operative association with the yoke and the rear end of the coupler shank. A wear plate 56 may be provided over the yoke as shown in Figs. 1 and 4.

The connection between the coupler shank 12 and the yoke 20 includes a swivel block 58 which is provided with a spherical convex surface 59. This spherical surface is concentric with the spherical bearing surface 16 provided within the rear end of the coupler shank. A hemi-cylindrical shaped surface 61 is formed in the forward portion of the swivel block 58 and this arcuate surface is adapted to engage and partially embrace the pin 18 in a manner as shown in Fig. 3. Thus during the development of pulling forces the coupler shank 12 tends to move forwardly and the spherical surface 16 engages the convex spherical surface 59 on the swivel block 58 and moves this block member forwardly. The forward concave hemi-cylindrical surface 61 on the swivel block then bears on the pin 18. The forces developed during pull are then transmitted through the pin 18 onto the yoke 20 and through the yoke straps 21 and 22 to the butt 24. The rubber mat assembly 42 is interposed between the butt end 24 and the follower 41 so that the pulling forces are thereby applied to the rubber type mat gear and impressed on the follower 41. The follower 41 engages the draft lugs 46 and 47 to thereby transmit the pulling forces to the railway car. It will be observed that the pulling forces are transferred to the pin 18 regardless of any angled position of the coupler shank since the concave spherical surface 16 within the coupler shank constantly cooperates with the convex spherical surface 59 on the swivel block 58.

A draft appliance exhibiting the invention includes a further assembly of laminated rubber mats indicated generally at 71 arranged at the back of the yoke and bearing on the rear surface of the butt 24. The other end of the yieldable and resilient cushion assembly 71 (not shown) engages a fixed portion of the draft appliance. During buffing action the coupler shank 12 tends to move rearwardly. The convex spherical surface 15 provided on the butt end 14 of the coupler shank engages the concave spherical surface 31 provided on the strut 28 of the yoke. Since the bearing surfaces at the rear end of the coupler shank are spherical the forces developed during buff are evenly distributed onto the strut 28 regardless of the angle of the coupler shank within the confines of the striker opening 51. The buffing forces are thereby transmitted through the strut 28 onto the yoke straps 21 and 22, through the butt 24 onto the six laminated rubber mats arranged rearwardly of the yoke. The laminated resilient mat assembly 42 housed within the gear pocket 25 of the yoke 20 accordingly does not function during buff. It will be observed that the rear surface 72 on the strut 28 is so positioned as to be slightly forward of the draft lugs 46 and 47 in the normal position so that the rubber draft gear assembly 42 may expand slightly when the yoke 20 moves rearwardly during buffing action.

It will be further observed that none of the buffing forces are taken or transmitted through the pin 18. This advantageous feature is accomplished by relieving the forward end of the pin opening 17 in the coupler shank 12 as indicated at 74 in Fig. 1, and by boring the pin receiving openings 38 and 39 in the yoke with particular reference to the spherical bearing surface 31 on the strut 28.

While the invention has been described with reference to specific structural features of the various elements of the draft appliance, it is apparent that changes may be made in a number of these members. Such modifications and alterations in the general organization may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim and desire to secure by Letters Patent is:

1. In a railway draft appliance, a yoke including a butt and yoke straps extending forwardly from the butt, a vertically disposed strut rigidly connected to the forward ends of the yoke straps, a resilient front draft gear between said yoke straps abutting said yoke butt at its rear end, sills and front draft lugs carried thereby adjacent the strut with rear surfaces of the lugs slightly rearward of a rear face of said strut, a follower engaging a forward end of said front draft gear and overlapping said front draft lugs, nose portions integral with the yoke extending forwardly of said strut, each of said nose portions having a vertically disposed opening therethrough, a spherical concave surface in a for-

ward central portion of the strut, a coupler shank having a vertically disposed opening therethrough, a spherical convex butt end surface on the coupler shank concentric with and adapted to bear on the spherical concave surface on said strut, a vertically arranged pin extending through the openings in said nose portions and the opening in said coupler shank, a concave spherical surface within the butt end of the coupler rearward of the opening in the coupler shank and forwardly of the convex butt end surface, a bearing block having a convex spherical surface concentric with the concave spherical surface within the end of the coupler shank, a hemi-cylindrical surface on the forward portion of the bearing block partly embracing said pin whereby the coupler may angle horizontally and vertically and draft forces are transmitted onto the bearing block and the pin and the yoke straps and the front draft gear and the follower onto the front draft lugs in all horizontal and vertical angled positions of the coupler shank, said opening in the coupler shank being relieved forwardly of the pin to permit rearward movement of the coupler shank relating to the yoke and bearing engagement of the spherical convex butt end on the coupler shank with the spherical concave surface on the strut, a resilient rear draft gear having its forward end in abutting relationship with said yoke butt whereby buffing forces are transmitted onto the strut and through the yoke straps onto the rear draft gear to relieve said pin of buffing forces in horizontal and vertical angled positions of the coupler shank.

2. In a railway draft appliance, a yoke including a butt and yoke straps extending forwardly from the butt, a rigid vertically disposed strut connecting the forward ends of the yoke straps and integral therewith, a resilient front draft gear between said yoke straps abutting said yoke butt at its rear end, sills and front draft lugs carried thereby adjacent a rear face of said strut, a follower in back of the strut engaging a forward end of said front draft gear for contacting said front draft lugs, nose portions integral with the yoke extending forwardly of said strut, each of said nose portions having a vertically

disposed opening therethrough, a spherical concave surface in a forward portion of the strut, a coupler shank having a vertically disposed opening therethrough, a spherical convex butt end surface on the coupler shank concentric with and adapted to engage said spherical concave surface on said strut, a vertically arranged pin extending through the openings in said nose portions and the opening in said coupler shank, a forward facing concave spherical surface within the butt end of the coupler defining a rear wall of a cavity rearwardly of the opening in the coupler shank, a bearing block having a rearwardly facing convex spherical surface concentric with the concave spherical surface within the end of the coupler shank, a concave hemi-cylindrical front surface on the bearing block partly embracing said pin whereby the coupler may angle horizontally and vertically and draft forces are transmitted onto the bearing block and the pin and the yoke straps and said front draft gear and the follower onto the front draft lugs in all horizontal and vertical angled positions of the coupler shank, said opening in the coupler shank being relieved forwardly of the pin to permit rearward movement of the coupler shank in relation to the yoke and bearing engagement of the spherical convex butt end surface on the coupler shank with the spherical concave surface on the strut, a resilient rear draft gear having its forward end in abutting relationship with the yoke butt whereby buffing forces are transmitted onto the strut and through the yoke straps onto the rear draft gear to relieve said pin of buffing forces in horizontal and vertical angled positions of the coupler shank.

HARRY H. WOLFE.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,186,267	Page	Jan. 9, 1940
2,240,363	Barrows et al.	Apr. 29, 1941
2,241,353	Kinne et al.	May 6, 1941
2,454,514	Kayler	Nov. 23, 1948