Jan. 30, 1934. E. H. SCHMIDT 1,945,384

COUPLER ATTACHMENT FOR RAILWAY VEHICLES

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Fig. 1.

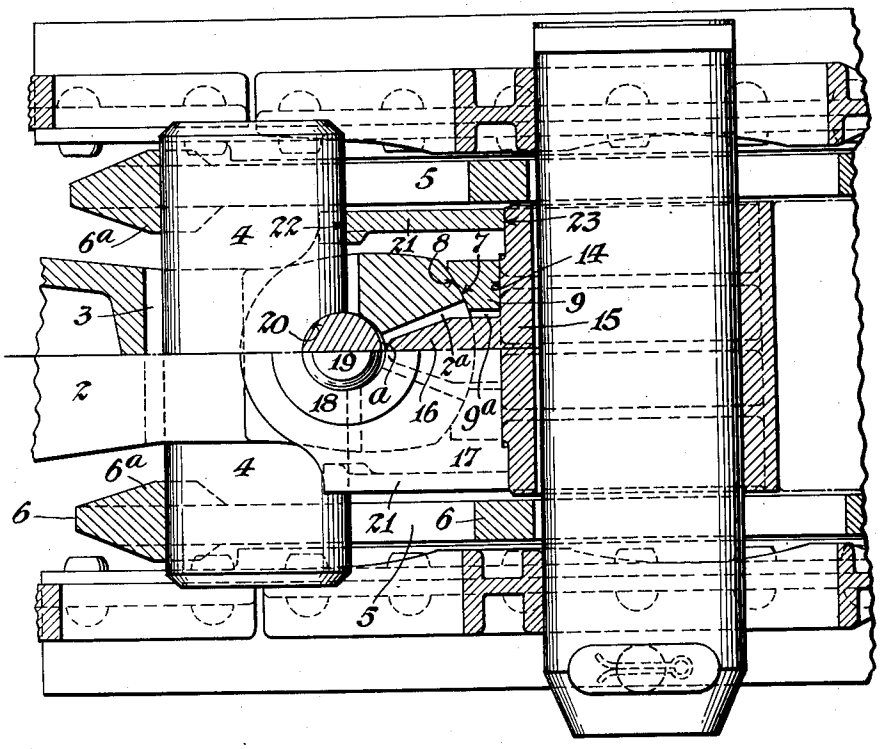

Fig. 2.

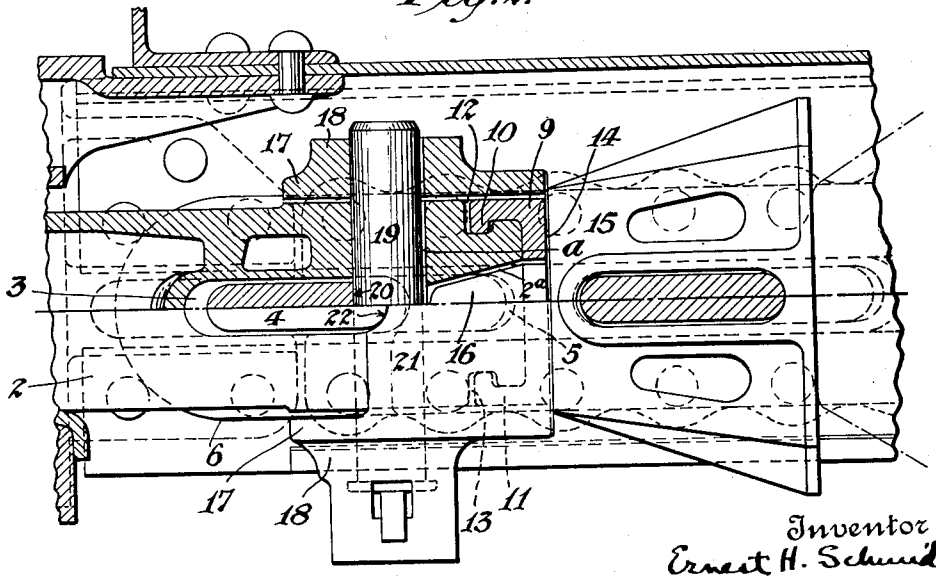

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Fig. 3.

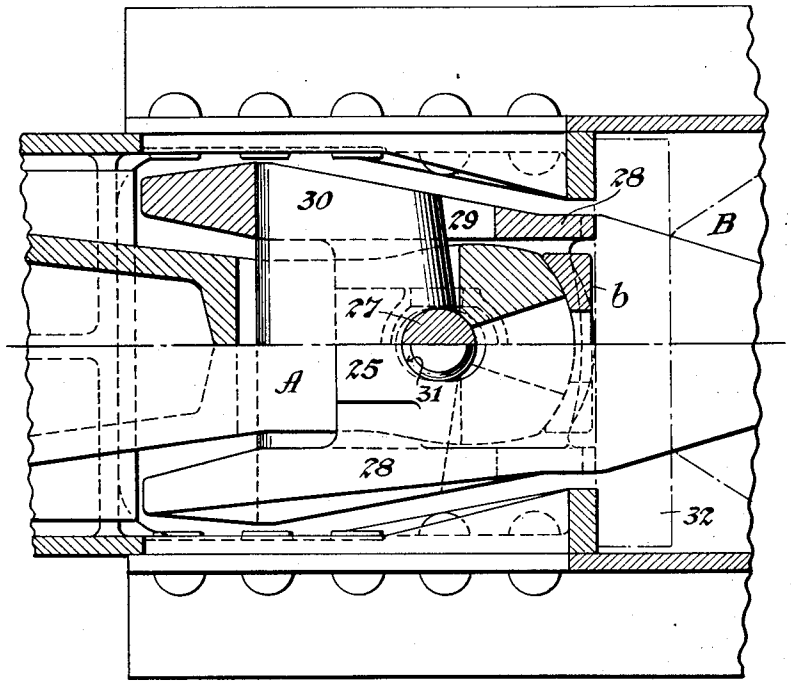
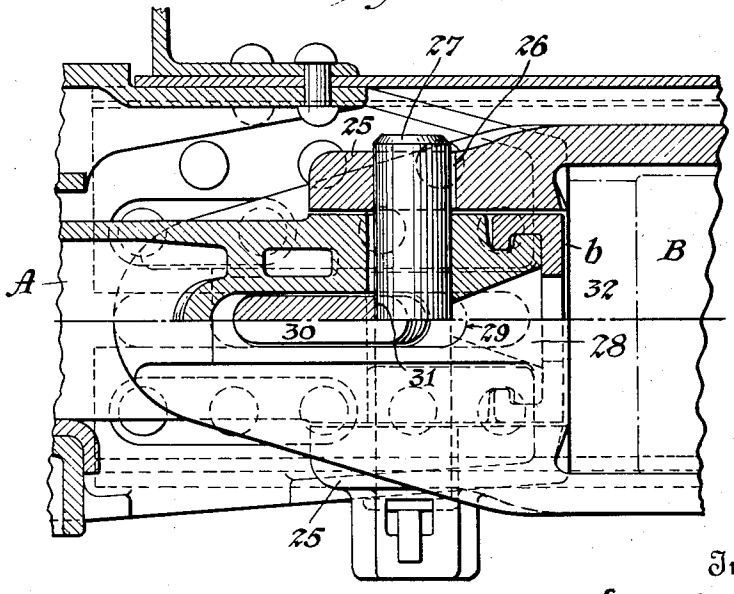


Fig. 4.



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COUPLER ATTACHMENT FOR RAILWAY VEHICLES

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Fig. 5.

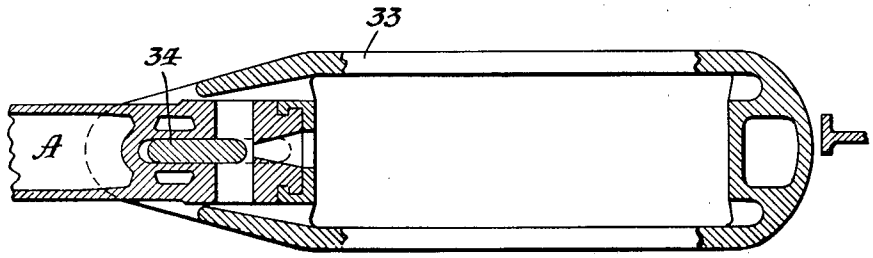
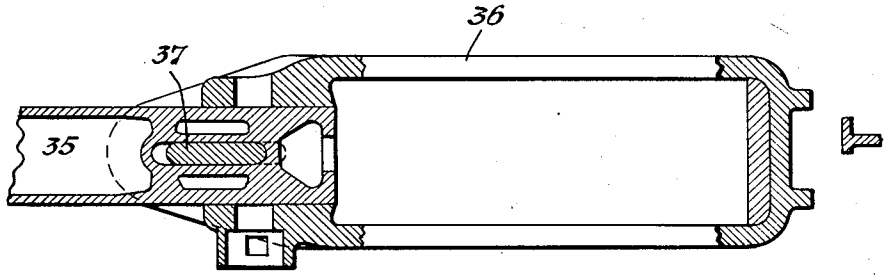


Fig. 6.



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Patented Jan. 30, 1934 1,945,384

UNITED STATES PATENT OFFICE

1,945,384

COUPLER ATTACHMENT FOR RAILWAY VEHICLES

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6 Claims. (Cl. 213—69)

With the present day heavy service requirements, difficulty is had with either of the two types of draft attachments now in most common use, i. e., vertical and horizontal yokes, for the reason that neither of these attachments in its connection with the standard shank of the standard D-coupler contains any adequate provision for lateral angling of the coupler relative to the means by which it is attached to the car. While the standard coupler shank and attachments provide for a lateral movement of the coupler head of 1½ inches on either side, measured at the face line of the striking casting, the horizontal yoke and the standard vertical yoke cannot move laterally more than a fraction of an inch, with the result that on a curved track the draft stress will not be equally divided between the two sides of the yoke. This also results in a very unequal distribution of stress through the sides of the coupler shank to and through the horizontal draft key. As the rear face of the standard D-coupler shank is square, it is clear that it will have only a line bearing upon the front follower when the coupler is angled. When the coupler is angled to its fullest extent, this line bearing will be off-centered 2⅝ inches, or one-half the width of the coupler shank, with the result that the wedge or friction elements of the draft gear may be tipped by this off-centered application of force, which will prevent the gear from offering its full normal resistance to the buffing blow. As buffing shocks are more severe than draft shocks, the gear when the coupler is angled is thus at a great disadvantage and is unable fully to protect the car.

I have devised an improved coupler attachment which obviates the difficulties above referred to and gives a true equalized pulling and buffing action when the coupler is angled horizontally, and which may be used with either vertical or horizontal yokes or links, and permits just as great lateral angling as with present devices. It also provides complete interchangeability with the standard vertical and horizontal yoke attachments and permits the use of present day standards as a repair or replacement in such a way as to meet the American Railway Association standards as to strength, safety, etc., and, further, has the advantage of reducing to a minimum the additional weight as well as the cost of the additional parts required. One of the features of my invention provides a quadruple shear attachment between coupler and yoke, where either vertical or horizontal yokes are employed. By its use the tensile stress on the coupler shank is more evenly distributed, while in the case of vertical yoke assembly the stress on the yoke is distributed directly to all four walls of the yoke hood instead of to only two walls as when the standard attachments are employed. Where horizontal yoke attachments are used, the stress on the forward key is distributed in such a manner as to decrease appreciably the bending moment thereon. My invention also comprises various features which I shall hereinafter describe and claim.

In the accompanying drawings Fig. 1 is a view, partly in plan and partly in section, showing an embodiment of my invention as applied to a horizontal yoke assembly; Fig. 2 is a view, partly in elevation and partly in longitudinal central section; Fig. 3 is a view, partly in plan and partly in section, showing my invention applied to a vertical hooded yoke; Fig. 4 is a side elevation, partly in section, thereof; Fig. 5 is a longitudinal section partly in elevation showing a coupler of the type shown in Figs. 1 to 4 applied to a standard American Railway Association yoke; and Fig. 6 is a similar view of a standard American Railway Association coupler applied to the yoke of Figs. 3 and 4.

Referring more particularly to the drawings, the coupler shank 2 has the usual horizontal key slot 3 for reception of the horizontal key 4, which seats in the elongated apertures 5 in the forward ends of the horizontal yoke 6, which is also of usual design. The rear end of the shank terminates in an arc-shaped or radial face 7 against which bears the correspondingly arc-shaped forward face 8 of the buffing block 9, which is secured to the rear end of the shank by the retaining lugs 10 and 11 seating in recesses 12 and 13 in the top and bottom of the shank, respectively, to permit the block to angle laterally relative to the coupler. The block 9 also has a rear flat bearing face 14 against a follower or forward element 15 of a draft gear. The follower 15 has a forwardly projecting dowel 16 which extends into the aperture 9^a in the buffing block 9 and the recess 2^a in the rear end of the shank 2, as shown.

Surrounding the rear end of the coupler shank 2 is a sleeve 17, which is preferably four sided and open front and rear and has reinforced top and bottom bosses 18 for reception of the vertical pin 19, which extends vertically through said bosses and coupler shank and has a bearing in a recess 20 in the rear edge of the draft key 4, the slot 3 of which it intersects. The forward

edges of the side walls 21 of the sleeve 17 are recessed at 22 for engagement with the rear edge of the draft key. It will be seen that the rear edges 23 of the vertical side walls 21 of the sleeve bear against the forward face 14 of the follower 15. The sleeve 17 thus serves as a strut or spacer between the follower 15 and horizontal key 4, and the relative dimension of the parts may be proportioned, as by clearance at *a* between the shank and vertical pin, so that the rear of the coupler shank cannot become pinched between the vertical pin 19 and the buffing block or equalizer 9. This spring action of the sleeve is particularly applicable to the case of new attachments which have not had the opportunity of developing slack, because the force exerted by the initial compression of the draft gear would normally tend to cause the pinching between the vertical pin and buffing block just referred to.

As the vertical pin 19 and sleeve 17 both have direct pulling engagement with the draft key 4 by reason of their respective engagements in the recesses 20 and 22, it is apparent that draft stresses are transmitted from the coupler shank to the vertical pin, and from the pin to the draft key directly at the center as well as through the sleeve to the draft key at points adjacent each side arm of the horizontal yoke. The pin is thus put in double shear between the coupler and key and is likewise under double shear between the coupler and sleeve. The vertical pin is accordingly in quadruple shear, and draft stresses are transmitted by the pin to the key on its rear side at the center and also by the sleeve in its recesses 22 to the draft key on either side the coupler shank.

It will also be seen that the side walls 21 of the sleeve 17 overlap (with respect to the direction of the draft) the inward projections 6^a of the yoke, and hence a portion of the draft is taken as direct compression on the draft key 4. Hence, the bending moment on the key is appreciably decreased by my improved construction.

The sleeve also acts to guide the coupler relative to the yoke, as it prevents the buffing block 9 and coupler shank 2 in return from draft from getting out of line with the front follower 15 of the draft gear.

In Figs. 3 and 4 I have shown my invention applied to a hooded vertical yoke in which the yoke gibs 25 are apertured at 26 for the vertical pin 27, and the side walls 28 are also recessed at 29 in the usual manner for the horizontally extending draft key 30. The key is recessed at 31 as in Figs. 1 and 2, on its rear edge for the vertical pin 27, but preferably slopes forwardly from the edges of the recess 31 so as to permit and facilitate radial movement between coupler shank and yoke. As the key is held from lateral movement by the vertical pin, it need extend only to the outer edges of the slots 29 in the yoke arms. In this form of my invention it will be seen that the vertical pin 27 intersects the draft key 30 and transmits directly through such intersection a portion of the draft stresses to the key 30 and thence to the side walls 28 of the yoke, while the remainder of the draft stresses are transmitted from the pin 27 directly to the top and bottom portions 25 of the yoke hood.

It will be seen that the pin 27 is placed in double shear between the coupler A and key 30 and is also under double shear between the coupler A and yoke gibs 25. It will also be seen that in the vertical yoke arrangement of Figs. 3 and 4 the draft stresses are transmitted through the vertical pin to the top and bottom walls or gibs 25 of the yoke and through the vertical pin and draft key to the side walls 28 of the yoke hood, thus giving a much more uniform distribution of stress than where the side walls must take all of the pull, as in the present standard American Railway Association arrangement. It is also to be noted that the structure will have an effective radial action in both pull and buff.

If desired, a small amount of clearance may be provided at *b* between the buffing equalizer and front follower 32 of the draft gear B when the latter is tightly pressed against the rear edges of the sides of the yoke hood under the initial compression of the draft gear, for the purpose of preventing the rear portion of the coupler shank from becoming pinched between the pin 27 and buffing block and permitting the coupler to remain free to be swung laterally by hand into position for coupling. Particularly it will be noted that as shown in Figure 4, wherein the coupler shank is in its forward position in engagement with the rear side of the pin 27, the distance from the rear of said pin to the rear of the buffing block is less than the distance from the rear of said pin to the forward face of the draft gear, as a result of which the coupler shank will not be pinched between said buffing block and pin. This relationship, moreover, is obviously present in the form of the invention shown in Fig. 2 when the coupler shank is drawn forwardly into contact with the rear side of the pin 19.

I have shown in Figs. 5 and 6 the complete interchangeability of couplers and yokes embodying my invention. Thus, in Fig. 5 I have shown my improved radial coupler A secured in the ordinary hooded yoke 33 by the usual horizontal draft key 34. In this assembly provision is made for radial buff. In Fig. 6 I have shown a standard A. R. A. coupler 35 attached in a vertical hooded yoke 36 of the character shown in Figs. 3 and 4, secured therein by the horizontal draft key 37.

If desired, my radial coupler may be used with the usual horizontal yoke and draft key, but without the sleeve 17 and vertical pin 19 of Figs. 1 and 2, in which event provision is made for radial buffing.

It will thus be seen that these devices afford complete interchangeability of the parts with standard coupler shanks or standard hooded yokes.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions thereof, but recognize that various structural modifications are possible within the scope of the invention claimed.

What I claim is:

1. In a coupler attachment, yoke means for receiving a draft gear, a coupler shank having complete key slots therein and having solid portions directly rearwardly of said slots, horizontal and vertical keys in said slots, said vertical key serving to space the horizontal key from the rear end of its key slot and transmitting draft stresses to said yoke means, and means comprising another portion of said vertical key for transmitting draft stresses to the yoke means.

2. In a coupler attachment, a coupler shank having intersecting vertical and horizontal key slots, a key seating in one of said slots, means comprising a key in the other of said slots for transmitting draft stresses directly to the first

mentioned key, said shank having a portion directly to the rear of the first mentioned key and engageable with the second mentioned key for applying draft stresses thereto, and other draft transmitting members arranged about the shank and providing bearings for said keys through which draft stresses are transmitted to the cushioning mechanism.

3. In a coupler attachment, a coupler shank having intersecting vertical and horizontal key slots, a key seating in one of said slots, means comprising a key in the other of said slots for transmitting draft stresses directly to the first-mentioned key, said shank having a portion directly to the rear of the first mentioned key and engageable with the second mentioned key for applying draft stresses thereto, and other draft transmitting members arranged about the shank and providing bearings for said keys through which draft stresses are transmitted to the cushioning mechanism, and means for effecting radial movement between the coupler and draft gear.

4. In a coupler attachment, a coupler shank having intersecting vertical and horizontal key slots, a key seated in the horizontal slot, means comprising a key seated in the vertical slot for spacing the first-mentioned key from the rear end of the horizontal slot and for transmitting draft stresses from the shank directly to the horizontally disposed key, said vertical key also acting to interlock the horizontal key in its key slot, and other draft transmitting members arranged about the shank and providing bearings for said keys through which draft stresses are transmitted to the cushioning mechanism.

5. In a railway draft rigging, the combination with a coupler having a shank provided with a transverse key receiving opening and having shank portions immediately to the rear of said opening; of a yoke having aligned key receiving openings; a key extending through the openings of the coupler shank and yoke; a pivot member mounted in the coupler shank and extending transversely of the key, the key having a rounded seat on the rear edge thereof and the pivot member having a curved bearing surface fitting said seat, thereby providing a pivotal connection between the key and coupler shank and holding the key against endwise removal, said pivot member being arranged to space said key from the rear end of said transverse key receiving opening.

6. In a draft gear, a draft member for a radially acting coupler shank comprising bearings for means pivotally connecting said shank to said member, cushioning mechanism rearward of said draft member, said member abutting the forward end of said cushioning mechanism when said mechanism is in normal released position, a buffing element between said cushioning mechanism and the rear end of said shank, the distance from the rear of said connecting means to the rear end of said buffing element being less than the distance from the rear of said connecting means to the forward face of the cushioning mechanism when the coupler shank is drawn forwardly into engagement with the rear of said connecting means, whereby said shank is relieved of pressure from said cushioning means when said cushioning mechanism is in normal released position, said shank and member being so constructed and arranged that said shank is movable longitudinally relatively to said member for transmitting buffing stresses to said cushioning means through the rear end of said shank.

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