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RUBBER CUSHION DRAFT GEAR FOR RAILROAD CARS

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2 Sheets—Sheet 2
This invention relates to shock absorbing mechanism and more particularly to draft gear for railroad cars of the kind in which the shocks incident to buffing or draft are cushioned by resilient elements. According to the present invention blocks of yielding non-metallic material serve as the resilient elements in the draft gear to absorb and cushion the shocks. More particularly, blocks of rubber are interposed between the vehicle frame and the draw bar to which the coupling head is secured and these blocks are retained under internal static pressure whereby the strength, resiliency and wearing qualities of the blocks are increased. The invention also resides in the construction and arrangement of the parts which will be hereinafter described and claimed.

In order that the invention may be clearly understood and readily carried into effect the same will now be described more fully with reference to the accompanying drawings illustrating preferred embodiments thereof and in which:

Figure 1 is a view in plan and partly in section of the draft gear according to the present invention as applied to the frame of a railway vehicle and looking from below. Figure 2 is a view in end elevation of the draft gear taken in a plane through the supporting frame indicated by the line 2—2 of Figure 1 and looking in the direction of the arrows.

Figure 3 is a fragmentary view somewhat similar to Figure 1 but showing a modification of the invention in which the operative parts are enclosed as a protection against foreign matter.

Figure 4 is a longitudinal sectional view of the modified construction taken on the plane indicated by the line 4—4 in Figure 3 and looking in the direction of the arrows.

Figure 5 is a view in end elevation of the modified draft gear taken in the plane through the supporting and enclosing frame indicated by the line 5—5 in Figure 4 and looking in the direction of the arrows.

In the drawings a draw bar of conventional shape may be formed at its outer end with any desired type of coupler head, a fragmentary portion of which is shown at a'. The inner end of the draw bar shank is slotted as at a" to rigidly receive a key b to which are attached at its outer ends connecting rods c. A similar key b' is disposed at the rear of the device and is adapted to be connected at its ends to the coupling rods c. In the preferred construction the coupling rods will be threaded at their ends into clevises c' whereof the bifurcated ends are apertured to receive pins b disposed in appropriate apertures in the keys b, b'. With their heads b' engaging the lower arm of the clevis and the end of their shanks which extend beyond the upper arms of the clevises secured in operative position in any convenient manner as by cotter pins b. Midway between the two coupling rods c is a third coupling rod d threaded at its rear end in a clevis c' in the same manner as that of the neighboring coupling rods but threaded at its forward end into a bifurcated yoke d' whereof the arms extend on opposite sides of the shank of the draw bar and are slotted as at d' for the reception of the key b.

Carried with the center sills e of the vehicle are slotted guides f, f', for the reception of the keys b, b', respectively. To permit limited motion in a fore and aft direction to the draw bar and its associated parts. Substantially midway between the ends of the connecting rods c and d are separators g secured in any convenient manner as by bolts to the center sills e and formed with apertures g' for the passage of the coupling rods. Also carried rigidly with the center sills e and near the ends of the coupling rods are rider plates h slotted as at k" to facilitate the assembly of the coupling rods in the device. These serve as limit stops for the connecting rods in the following manner: Carried with the coupling rods c and d are opposed caps i at the forward end of the coupling rod and j at the rear end thereof. Motion of these caps in respect to the coupling rods in one direction is prevented by means of the nuts k, k', respectively, which are threaded onto the coupling rods whereby an adjustment in their relative spaced relation may be obtained. Between the separators g and the caps i, i', are disposed blocks of yielding non-metallic material l, l', the block l between the cap i and separator g and the block l' between the separator g and the cap i'. These blocks are preferably retained between seats g" formed on the separators and seats i" formed on the caps. The nuts k, k', serve to draw the caps i, i', together after the gear is in as...
sembled relation whereby the rubber blocks may be placed under initial internal static pressure to thereby increase the resiliency, strength and wearing qualities of the rubber. The blocks of rubber are preferably formed with a central bore through which the coupling rods extend and this bore may be tapered and the blocks so disposed between the caps that the end of the bore of greater diameter is adjacent the respective caps. In each instance the tapered face serves to facilitate the distortion of the block in a regular manner whereby the effecting diameter of the bore remains uniform for the unimpeded movement of the connectors therethrough.

It is thought that the operation of the device will be apparent from the foregoing description. It will be noted that when the gear is under draft the pull impressed upon the coupling head and draw bar will be transmitted through the key  b, coupling rods  c, d and caps i' to the blocks of rubber  i and from thence to the vehicle through the separators  g, the blocks  i' being placed under further compression to cushion and absorb the shocks and stresses incident to draft. In buffing the stresses are transmitted in the opposite direction through the coupling rods  c, d, caps i and blocks l' to the separators  g and vehicle frame. A modified construction of the draft gear is illustrated in Figures 3, 4 and 5. In the modified construction the draw bar and front and rear transverse keys  b, b', respectively, are the same as those already described. The keys are slidably supported in center sills  e formed with slots  f, f', respectively. In place of the central connecting rod  d, however, a unitary structure D is provided having forwardly extending slotted arms  d' and receive the key  b. At its rear end connector  D is secured to the rear key  b' by means of pin  b'. Upon opposite sides of the connector  D and connecting the keys are connectors C secured as in the previous example by means of the pins  b'. The three connectors are formed with rectangular openings  m, n, respectively; Telescoping seats o, o', are disposed within each of the rectangular apertures, as shown clearly in Figure 4, and a float  p having opposite seats  p' is disposed within the member  o, blocks of yielding non-metallic material  q, q' being inserted between the float  p and the telescoping elements o and o', respectively. The blocks when the gear is assembled in operative conditions are retained under internal static pressure as in the preferred construction.

The modified device is supported between upper and lower plates  r, r', respectively, secured in any convenient manner to the center sills  e and serves to enclose the gear to a degree as a protection against foreign matter. Secured to the plates and to the frame members are suitable stops  s, s', against which the telescoping elements o, o', bear and whereby their motion in the longitudinal direction of the draft gear is limited.

The operation of the modified draft gear is substantially identical with that previously discussed. The draft stresses impressed upon the draw bar are transmitted through the key  b and the connectors C and D to the rear key  b' and to the rearwardly disposed telescoping member o and from the last named member forwardly through the rubber blocks  q', float  p, rubber block  q and telescoping member o' to the stop  s carried with the frame which in turn is carried with the vehicle. In buffing the stresses are transmitted in the opposite direction through the draw bar, front key  b and connectors C and D to the telescoping member o' and from thence to the block  g, float  p, block  q' and telescoping member o to the abutment  s'.

The present draft gear is applicable in any situation, such as upon railway equipment, wherein buffing or draft stresses are to be cushioned or absorbed. By the construction described and with the yielding non-metallic blocks as illustrated a minimum fore and aft pull of 400,000 pounds or higher may be taken on the blocks before the gear closes solid, the quality and dimensions of the blocks being varied to meet conditions of load.

What I claim is:

1. In draft gear, in combination with center sills carried on the vehicle, a draw bar, a transverse key secured to the bar and slidable in the sills, a plurality of rods connected to the key, slidable and moveable pivotally in the sills, a key secured to the rods and slidable in the sills, a plurality of connecting rods between the keys slidably in the sills.

2. In draft gear, in combination with center sills carried with a vehicle, a draw bar, a transverse key secured to the draw bar and slidable in the sills, a second transverse key slidable in the sills, connectors secured at their ends to the keys, respectively, and slidable in the sills, opposed seats carried with the connectors, opposed seats carried with the sills, and blocks of yielding non-metallic material having respectively tapering bores through which the connectors extend and disposed respectively between the co-operating seats, the least diameter of the bore being adjacent the seats carried with the sills.

3. In draft gear, in combination with center sills carried with the vehicle, a draw bar having a slotted shank, a transverse key passing through the slot in the shank, a second transverse key, a plurality of connecting rods between the keys slidable in the sills.
sills, opposed adjustable seats carried with the connecting rods, opposed seats carried with the sills and disposed between said first mentioned seats, and blocks of yielding non-metallic material interposed between the respective seats on the sills and rods and formed with a tapering bore respectively through which the rods extend, the blocks being disposed with the least 10 diameter of the bore adjacent the seat on the sills.

4. In combination with a draw bar and center sills of a vehicle, keys sliding in the

sills, opposed adjustable seats carried with the connecting rods, opposed seats carried with the sills and rods through which the rods pass, and pairs of blocks of yielding non-metallic material positioned on the rods between the respective seats, the seats carried by the rods being movable with respect to the sills to provide for pivoted movement of the draw bar, keys and rods about a section through the adjacent ends of the blocks of each pair.

This specification signed this 4 day of June A. D. 1924.

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