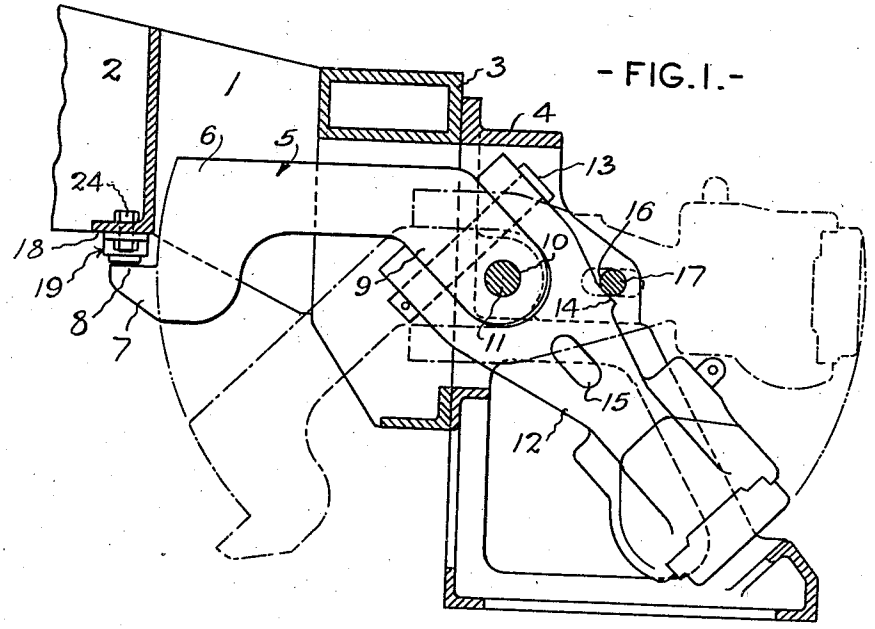
Feb. 28, 1939. C. L. REID 2,148,580

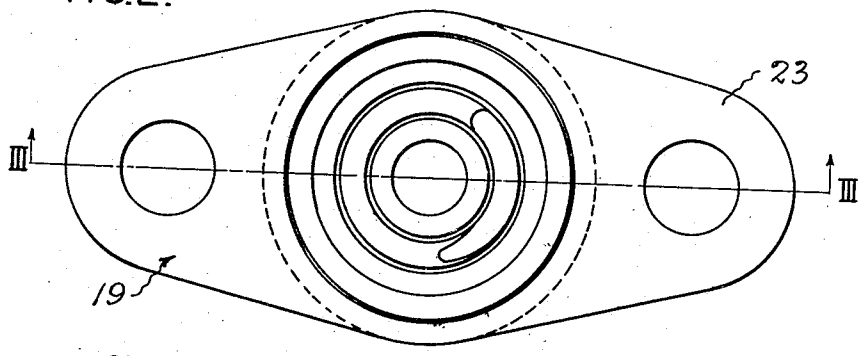
LOCOMOTIVE COUPLER STRUCTURE

Filed May 11, 1938

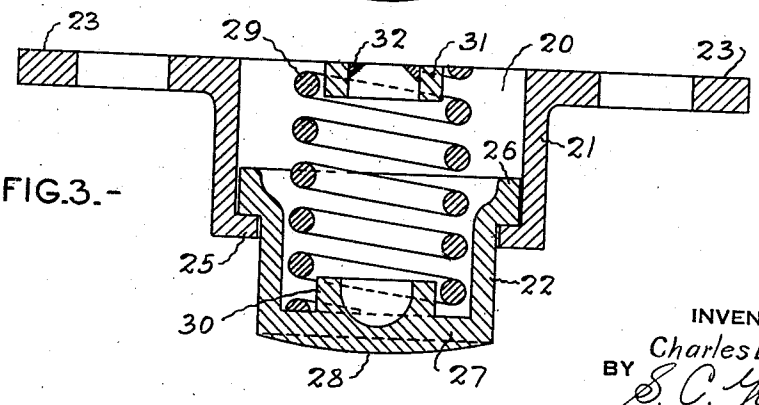
- FIG. 1. -



- FIG. 2. -



- FIG. 3. -



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LOCOMOTIVE COUPLER STRUCTURE

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1 Claim. (Cl. 213—4)

This invention relates to locomotive coupler structures of the counterbalance type, and more particularly to a device coacting to yieldingly hold a coupler device of said structure in its inactive position.

A coupler structure of the aforementioned type is principally for use at the front end of a locomotive and is, relatively speaking, seldom used. Therefore, for most of the time while the locomotive is running the coupler device of the structure is swung to an inactive position. The device of the conventional structure is loosely secured by a pin in this inactive position, and is supported by engagement of a rear end part of the counterbalance with a part of the structure fixed to or forming part of the locomotive frame. The counterbalance type of coupler device of the conventional structure has a serious objection that, when in inactive position and the locomotive is running, there is a continual vibration or chattering of the device, which is largely due to its balanced characteristic. This continual chattering produces excessive wear upon the relatively movable engaging surfaces of the structure, which wear results in intensifying the chattering. Any movement whatever of course is unnecessary as the coupler device is inactive in such position and should be entirely at rest.

In the conventional type, the counterbalance is provided with a face on a rear end part thereof which engages a face on a fixed part of the locomotive, and the aforementioned pin engages a face of the coupler device, during the inactive position of the device. The chattering aforementioned at times reaches an intensity that amounts to a serious hammering of the coupler device upon the locomotive and securing pin, which has been known to cause fracture of the parts subjected to this hammering action, as will later more fully appear.

It is the object of this invention to substantially prevent the chattering and hammering action of the coupler device when in inactive position and therefore the injurious consequent results.

Referring to the drawing forming part of this specification, Figure 1 is a longitudinal sectional view of a portion of the front end of a locomotive embodying the present invention and showing the coupler device in side elevation in inactive position, and in dot and dash lines in active position; Fig. 2 is a plan view of the device of the present invention; and Fig. 3 is a section of the device on the line III—III of Fig. 2.

The present invention is devised for use with locomotive front end coupler structures of the counterbalance type. It is however not limited to any particular design of coupler device of this general type. In one design of coupler device the coupler member and the counterbalance are formed together as a one-piece casting, and exemplifications of the design are shown in patents to Lentz, No. 1,753,794, granted April 8, 1930, and to Couch, No. 1,921,382, granted August 8, 1933. In the former patent the device has a decided crook, and an upper face of a part of the counterbalance engages a lower face of a fixed part of the structure. In the latter patent the device has no crook but is formed straight and accordingly an upper face of a part of the counterbalance engages a rear inclined face of a fixed part of the structure.

In another design of coupler device the coupler member is flexibly connected to the counterbalance and an exemplification of this design is shown in the patent to Hallquist, No. 1,724,194, granted August 13, 1929. The device of this patent has a crook similar to that of the aforementioned Lentz patent and a similar engagement between the counterbalance and a part of the structure.

For the purpose of illustrating an embodiment of the present invention, the design of the Hallquist patent is chosen and is shown in Fig. 1. In all three patents a removable pin is employed for holding the coupler device in active position, and the pin is also employed for holding the device in inactive position. In the present invention a pin, for a similar purpose, is also provided, and the particular type of pin construction of the Hallquist patent is shown for illustrative purposes. This pin in the present instance has an additional function which forms an important part of the present invention, as will later more fully appear.

Referring to Fig. 1, as the general design of structure there shown is conventional, only a brief description thereof is deemed necessary. Only a small portion of the locomotive is shown, and is indicated generally by the reference numeral 1. This portion shows the coupler structure and comprises a frame 2, a pilot beam 3, a pilot 4 and a coupler device, indicated generally by the reference numeral 5.

The coupler device comprises a counterbalance 6 provided with a rearwardly extending lug 7 having an upper face 8 and further provided with an outer end portion 9 forming a crook. This portion is provided with a horizontal orifice 10. The counterbalance (and therefore the coupler device) is mounted on a horizontal pin 11 which passes through the orifice 10 and extends through

orifices formed in the sides of the pilot 4. The coupler device is thus rotatably supported by the pilot for movement in a vertical plane to and from active and inactive positions. The coupler device further comprises a coupler member 12 which is bifurcated at its rear end, the crooked portion 9 fitting between the branches of the bifurcation, and a pivot pin 13, disposed in a vertical plane, extends through aligned orifices in the branches and crooked portion 9 thereby pivotally connecting the coupler member with the counterbalance to permit the required slight lateral movement of the coupler member when in active position.

The coupler member is provided with a face 14 and an elongated transverse hole 15, the elongation being in a direction longitudinally of the coupler member. The pilot side portions are provided each with an orifice 16 which is in alignment with the hole 15 when the coupler member is in active position as shown in dot and dash lines in Fig. 1. When in this aligned position a pin 17 is passed through the orifices 16 and hole 15 thereby supporting the coupler device in active position.

When the coupler device is to be moved to inactive position, as shown in full lines in Fig. 1, the pin 17 is withdrawn, the coupler member is lowered to inactive position, and the pin 17 then inserted in the orifices 16. The face 14 is disposed so that it engages the pin 17 when the coupler member is in inactive position as shown in Fig. 1. In this inactive position the face 8 is disposed opposite a lower face 18 formed on a fixed part of the frame 2.

As thus far described the structure is conventional, and for a fuller description thereof reference is made to the above mentioned Hallquist Patent No. 1,724,194.

In the present invention the faces 8 and 18 are spaced to a predetermined extent when the coupler device is in inactive position and the device of the present invention, indicated generally by the reference numeral 19, is disposed within this space. In the conventional type the face 8 engages the face 18 when the coupler device is in inactive position, but in order to then insert the removable pin 17 in the orifices 16 of the pilot a little play must be provided between the pin 17 and the face 14. This play gradually increases through wear of the engaging faces of the working parts, for instance between the pin 17 and face 14, and between the pins 11 and 13 and the faces with which they engage, and also between the face 8 and its engaging face. This wear is largely the result of the chattering, and as the wear increases the chattering and hammering increase followed by the injurious results produced thereby which have already been mentioned.

The device 19 is designed to coact with the pin 17 to overcome these objectionable features. When the device 19 is employed in designs similar to that shown in the aforementioned Lentz Patent No. 1,753,794 it will be located similarly as shown in the present application, but when employed in designs similar to that shown in the aforementioned Couch Patent 1,921,382 it will be located between the counterbalance and the inclined wall there shown for restricting the movement of the coupler device in an inactive direction.

In designs of structures of the counterbalance type the coupler member, when in inactive position, is suspended in mid air, so to speak, that is to say it does not rest upon the pilot and therefore is free to vibrate or chatter, which produces the excessive wear and destructive hammering previously referred to.

While preferred locations of the device 19 of the present invention have been mentioned, it will be understood that it may be disposed at other locations where it will produce the desired results. For instance it may be disposed between the pilot and the coupler member when the latter is in inactive position although this is not deemed the best location. Furthermore it may be secured to either of its engaging faces. For instance in the illustration of Fig. 1 the device 19 may be reversed and secured to the face 8 instead of the face 18. It is therefore within the contemplation of the invention to dispose the device 19 at any suitable desired location and to secure it to either of the faces with which it engages.

The preferred construction of the device 19 is shown in Figs. 2 and 3. It comprises a housing 20 formed of telescoping sections 21 and 22. The section 21 is provided with orificed laterally extending lugs 23 for securing the device in place. In Fig. 1 the device is secured to the face 18. This part of the locomotive is orificed in line with the orifices of the lugs 23 and bolts 24 are disposed in the aligned orifices for securing the device rigidly to the locomotive. An inwardly directed flange 25 is formed on the section 21 providing an opening through which the section 22 extends. An outwardly directed flange 26 is formed on the section 22 within the housing portion of the section 21, the two flanges coming into engagement when the sections are fully extended thereby limiting the degree of the extension thereof, as shown in Fig. 3. The section 22 is provided with an outer wall 27 having an outer convex face 28.

A compression helical spring 29 is disposed in the housing and the end of the section 21 opposite the flanged end thereof is left open to permit the installation of the section 22 and spring 29. The spring, at an end thereof, seats upon the wall 27 and at its opposite end seats upon the face 18. To better hold the spring in erect position bosses are provided fitting within the ends of the spring, one such boss 30 being integrally formed on the wall 27 and the other boss 31 being of ring shape and welded to the face 18 at the interior face of the ring, the weld being indicated at 32 in Fig. 3.

Referring to Fig. 1, when the coupler device is in active position as shown in dot and dash lines, and it is desired to move it to inactive position, the pin 17 is withdrawn and the device moved to inactive position as shown in full lines. It is highly desirable that, when the face 8 first comes into contact with the face 28 of the device 19, the face 14 will not have reached its final position. To move the face 14 to its final position manual force is applied to further swing the coupler member. This forces the face 8 upwardly, which results in compressing the spring 29, and after sufficient movement the face 14 clears the circular orifices 16 formed in the pilot side portions. The pin 17 is then inserted in place. The amount of this movement and consequent tensioning of the spring may vary in different structures but it should be sufficient to produce a yielding pressure of the spring upon the counterbalance sufficient to prevent or minimize chattering and hammering, as aforementioned.

Obviously the spring may be placed under any desired degree of normal tension and may be of any desired size and strength. These factors will

enter into the functioning of the device 19 and the amount of forced movement and consequent tensioning of the spring in any instance, and these factors will be given due consideration as best practice will dictate in any particular case.

When the coupler device is thus held in inactive position the counterbalance will be held in yielding pressure engagement with the face 28, and the pin 17 will be held in yielding pressure engagement with the face 14 of the coupler member. Thus by providing the proper amount of force exerted by the spring 29, chattering and the resulting excessive wear and possible fracture will be avoided or reduced to a minimum.

The invention has been described in connection with a counterbalance coupler device where when the coupler device is moved to an inactive position the coupler member is lowered and the counterbalance is raised respectively from their active positions. The invention is applicable also to types where the movements are the reverse of these, namely where the coupler member is raised and the counterbalance is lowered in moving from active to inactive positions.

While there has been hereinbefore described an approved embodiment of this invention, it will be understood that many and various changes and modifications in form, arrangement of parts and details of construction thereof may be made without departing from the spirit of the invention and that all such changes and modifications as fall within the scope of the appended claim are contemplated as a part of this invention.

The invention claimed and desired to be secured by Letters Patent is:

A locomotive coupler structure comprising a coupler having a head part and a counterbalance part extending inwardly from said head part; means disposed between said parts pivotally connecting said coupler to a fixed part of the locomotive for swinging in a vertical plane from coupler-active to coupler-inactive position; stop means including an energizable resilient member disposed between one of said coupler parts and a fixed part of said locomotive adjacent thereto when said coupler is in said inactive position, said stop means being secured to one of said adjacent parts and said resilient member being in operable engagement with the other of said adjacent parts, said resilient member, when in said operable engagement, being adapted to be energized by forced movement of said coupler in a direction away from said active position; and detachable means adapted for engagement with a fixed part of said locomotive and with said coupler when in said inactive position, but only when said resilient member has been energized by said forced movement to a predetermined amount, in extent sufficient to hold said coupler when said detachable means is in said engagement in pressure engagement against said detachable means with a force sufficient to substantially prevent vibration of said coupler when said locomotive is running.

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