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TRAIN LINE SAFETY DEVICE

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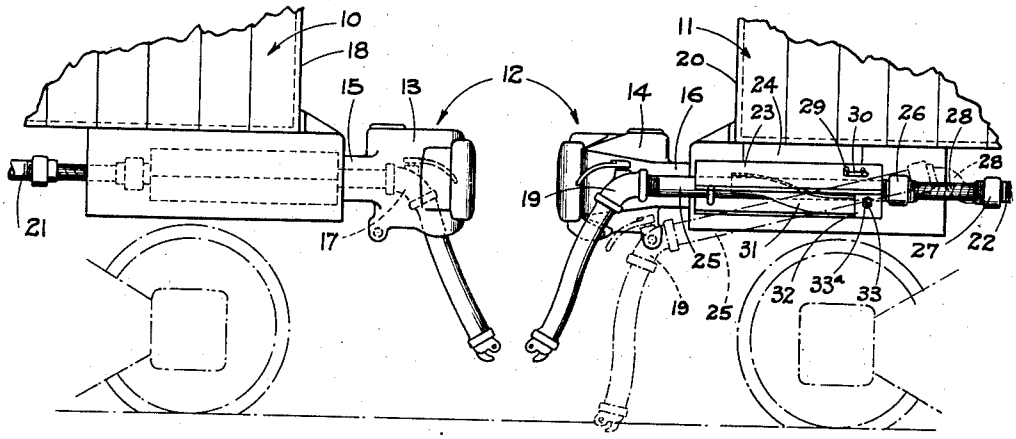


FIG. 1.

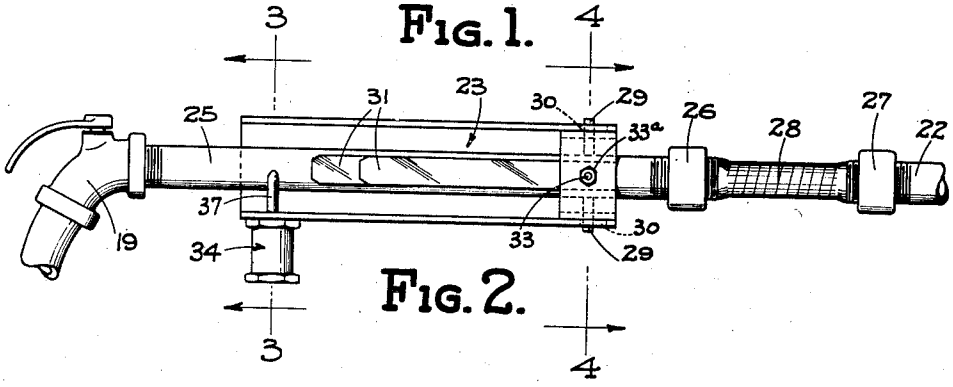


FIG. 2.

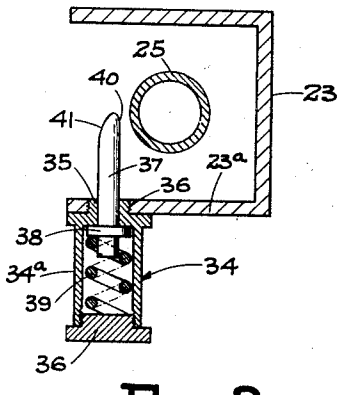


FIG. 3.

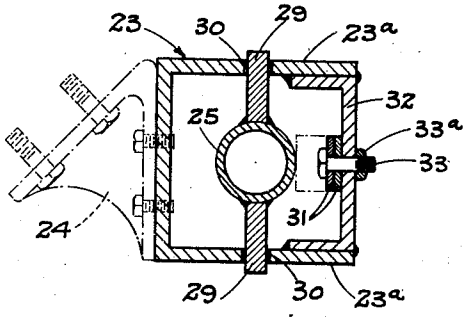


FIG. 4.

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TRAIN LINE SAFETY DEVICE

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7 Claims. (Cl. 248—53)

This invention relates generally to improvements in the air brake lines of railway cars and more particularly to mechanism for preventing damage to such air lines when the draw bar coupler heads fail to properly meet.

In railway equipment, it is the conventional practice to provide each car with an air brake line, or train line, as it is more frequently designated, which extends longitudinally from end to end of the car and which includes an angle cock at each end thereof for closing the line at either end of the car. These angle cocks are generally located adjacent to one side of the draw bar coupler head at each end of the car and between substantially horizontal planes extending through the tops and bottoms of the said coupler heads, and in the past have been subjected to considerable damage through their engagement by the coupler heads when the latter fail to couple properly. This failure occurs most frequently on curved tracks because of the angular relation which the track curvature imposes upon the coupler heads. For instance, due to not unusual conditions of track curvature and unevenness, the coupler head on one car may not be properly positioned to receive or gather the meeting coupler head on the car being connected thereto. Under such conditions, the coupler head of one car may strike the angle cock of the adjacent car with such impact of force as to render it useless. This not only necessitates removing from the train any car having its train line thus damaged, but requires the replacement of the angle cock on any such car before the latter can be again put into service. This replacement of the angle cocks, as well as the temporary loss of service of the cars occasions considerable expense to railways each year.

The primary object of the present invention is to reduce to a minimum the possibility of damage to train lines of railway cars by reason of the coupler heads passing one another and striking the angle cocks under the conditions pointed out above.

In accordance with the preferred form of the present invention, the train line of each railway car is provided with means, desirably arranged to permit outward and downward movement of the angle cocks and short end sections of the train line, in the event that the angle cocks should be struck by the coupler heads of adjacent cars during coupling operations, the said means being preferably used in conjunction with a yielding and resilient connection between the end sections of the train line and the main section of the train line.

Another object of the present invention is to provide means for automatically returning the angle cocks and their associated parts of the train line to their normal positions when the cars are separated, in the event that the said angle cocks and parts should have been previously moved out of such normal positions by the failure of the coupler head of an adjacent car to have been properly gathered.

Still further objects of the invention are to provide safety means for train lines which are mechanically suited to the rigorous requirements of train service in respect to durability, dependability and freedom from the necessity of frequent repairs, and which safety means may be economically manufactured and installed on present railway equipment.

Further and more limited objects of the invention will appear as the description proceeds, and by reference to the accompanying drawing, wherein Fig. 1 is a fragmentary side elevation of the meeting ends of a pair of uncoupled railway freight cars equipped with devices embodying the present invention, the positions which one of the end sections and the parts associated therewith assume when the angle cock is subjected to a hard or sudden blow being shown in dotted lines; Fig. 2 is an enlarged view in elevation illustrating the essential parts of the invention and showing their association with an angle cock and a train line; Fig. 3 is a still further enlarged view in vertical cross section, taken on a plane indicated by the line 3—3 of Fig. 2 and illustrating the latch for the end section of the train line; and Fig. 4 is a similar vertical cross sectional view taken on a plane indicated by the line 4—4 of Fig. 2 to illustrate the trunnions for the train-line end section.

Referring now to Fig. 1 of the drawing, the reference numerals 10 and 11 designate the meeting ends of a pair of railway cars which may be coupled together by the usual draft couplings 12, the interlocking heads 13 and 14 of which are mounted on and carried by draw bars 15 and 16 respectively. These draw bars are usually mounted to swing horizontally upon vertical pins or suitable guides (not shown) thereby to provide a loosely pivoted mounting therefor below the cars 10 and 11, as is well known to those skilled in the art.

As above pointed out, misalignment of the heads 13 and 14, if sufficiently great, will cause them to miss and pass each other and, in some instances, to be carried as far as the end sills of the opposite cars. When this occurs, the angle

cock on the end of one of the cars is apt to be damaged by the coupler head on the other car, due to the location of the angle cocks adjacent to the sides of the coupler heads and intermediate the tops and bottoms of the latter.

To eliminate this possible damage to the angle cocks 17 and 19, as well as to the train line of the cars 10 and 11, respectively, when the heads 13 and 14 pass each other, I provide yieldable means which will permit not only a short axial movement of the end sections of the train lines which carry the angle cocks, but which will also permit said sections and the angle cocks thereon to swing in a direction outwardly and downwardly away from the heads which collide therewith, thereby avoiding injury to the said angle cocks and to the main train-line sections 21 and 22.

As each end of each railway car is preferably supplied with one of my improved yieldable train-line safety devices, and as all of such devices are identical in construction, a description of one of said devices will suffice for all.

In Fig. 2, one of these devices is illustrated in detail, the same being the one shown as applied to the end 20 of the car 11. In this view, 23 designates an elongated channeled casing which is affixed to the underside of the car in any suitable manner as, for example, by an angle bracket 24, shown by dot-and-dash lines in Fig. 4. The bracket 24 is designed to support the channeled casing 23 below the car with its open side directed downwardly and outwardly away from the head 14, the sides 23a forming an angle of approximately 45° with a horizontal plane, as illustrated in Fig. 1. The major portion of the short train-line end section 25 is normally housed within the casing 23 and has its outer end threaded to receive one end of the angle cock 19. The inner end of said section 25 is also threaded to receive a coupling 26 which cooperates with a similar coupling 27 to join the ends of a flexible train line section 28 with the section 25 and with the main train-line section 22. The section 25 is so mounted as to have a short sliding movement within the casing 23 as by opposed pins 29, 29, welded or otherwise connected to said section, as best shown in Fig. 4. These pins extend through slots 30, 30 in the flanges 23a, 23a of the casing 23, as clearly illustrated in Figs. 2 and 4.

It will be noted from Fig. 1 that the slots 30 are located near the rear end of the casing 23 and that the pins 29 are attached to the train-line section 25 adjacent to the inner end thereof so as to allow the said section 25 to swing outwardly, through the open side of the channeled casing, on the pivot pins 29, 29. The train-line section 25, however, is normally held in nested position within the casing 23 by the spring 31 the leaves of which are secured to the channeled plate 32, as by a bolt 33 and nut 33a, said plate being welded or otherwise connected to the rear end of the casing 23, as shown.

It has just been described how the train line section 25 is normally held in operative position within the channel 23 by the spring 31, and it is normally retained in this position by means of a latch comprising a spring-pressed plunger pin. the latch being designated as a whole by the reference numeral 34. This plunger is so designed that the train-line section 25 can be swung out of the casing 23 only by a hard, sudden jolt or blow and is prevented from being displaced otherwise, as by being stepped upon or kicked by a brakeman. The preferred form of the latch is illustrated in Fig. 3 and, as there shown, comprises a casing 34a, one end of which is provided with an externally threaded neck 35 which is received by a threaded hole 36 provided in one of the flanges 23a of the casing 23. The outer end of the casing 34a is shown as internally threaded to receive the externally threaded closure cap 35. The neck 35 is bored to receive the plunger pin 37, the outward movement of said pin being limited by an internally formed shoulder 38, said shoulder also serving as one seat for a coiled spring 39, the spring being held under tension by the closure cap 36. It will, therefore, be apparent that the plunger pin 37 is normally held in the position shown in Fig. 3 and that it is of such length as to prevent accidental displacement of the train-line section 25. It will also be noted that the upper end of the pin 37 is slightly below the longitudinal center of the train-line section 25 (see Fig. 3) and that it is provided immediately below such end with a short slight cam surface 40. Should the section 25 be displaced from its normal position (as by collision of a coupler head with the angle cock), it may be automatically restored to its original position by the spring 31, due to the length and inclination of the cam surface 41 which is on the opposite side of the plunger 37 from the short cam surface 40.

With the parts constructed and arranged as described, assuming, for instance, that the coupler head 13 of the car 10 fails to properly meet and couple with the coupler head 14 of the car 11 and that the said heads pass each other, the angle cock 17 would be in the path of and subject to damage by the head 14, whereas the angle cock 19 would be in the path of and subject to damage by the head 13. Should this condition prevail, when either of the coupler heads strikes an angle cock, the short train-line section to which the angle cock is attached will be permitted a longitudinal movement by virtue of the slots 30 and the flexible section 28 until the pins 29, 29 engage the rear ends of such slots 30. Should either of the coupler heads pass the other a distance greater than the length of the slots 30, the angle cock and the train-line section on the opposite car will then be forced outwardly and downwardly, if the impact of the coupler head on the angle cock is sufficient to cam the plunger pin 37 downwardly out of the path of said train-line section thereby avoiding damage to the angle cock and the main train-line section 22. Assuming that a train-line section 25 and the angle cock thereon have been forced from their normal position by the passing of one coupler head beyond the other, when the cars 10 and 11 are separated, the spring 31 will function to return the said train-line section 25 to its normal position within the casing 23, and the section 25 will be moved forwardly by the flexible section 28 so that the pins 29 will again occupy the forward ends of the slots 30.

It will be evident, from the foregoing, that I have provided a practical, simple, but efficient construction for realizing the objects of my invention.

Having thus described my invention, what I claim is:

1. The combination, with a car provided with a coupler head, of a train line comprising a main section and an end section provided with an angle cock, means connecting said main and end sections for permitting the end section to be moved longitudinally with respect to the main section and for supporting said end section for movement laterally with respect to the coupler head,

and means independent of said coupler head for normally holding said end section in position to locate the angle cock adjacent to one side of the coupler head and between substantially horizontal planes extending through the top and bottom of said coupler head.

2. The combination, with a car provided with a coupler head, of a train line comprising a main section, an end section provided with an angle cock and an intermediate flexible section connecting the main and end sections, means independent of said coupler head for pivotally and slidably supporting the said end section, and means for yieldably holding the said end section in position to locate the angle cock adjacent to one side of the coupler head and between substantially horizontal planes extending through the top and bottom of said coupler head.

3. In the combination set forth in claim 1, means for restoring said end section and the angle cock thereof to their operative relation to the coupler head following their displacement from said relation.

4. The combination, with a car provided with a coupler head, of a train line comprising a main section and an end section provided with an angle cock, a channeled casing supported by said car adjacent to one side of the said coupler head and having its open side directed away from the said head, and means pivotally supporting the said end section in said casing, with its outer end and the angle cock located outside the casing and with the angle cock located between substantially horizontal planes extending through the top and bottom of said coupler head.

5. The combination, with a car provided with a coupler head, of a train line comprising a main section, an end section provided with an angle cock and an intermediate flexible section connecting the main and end sections, a channeled casing supported by said car adjacent to one side of the said coupler head and having its open side directed away from said head, opposed trunnion pins carried by the inner end portion of said end section and extending into slots extending longitudinally of opposed sides of said casing, and means yieldably retaining the end section within the casing with its outer end and the angle cock located outside the casing and with the angle cock located between substantially horizontal planes extending through the top and bottom of said coupler head.

6. The combination, with a car provided with a coupler head, of a train line comprising a main section, an end section provided with an angle cock and an intermediate flexible section connecting the main and end sections, a channeled casing supported by said car adjacent to one side of the said coupler head and having its open side directed away from said head, opposed trunnion pins carried by the inner end portion of said end section and extending into slots extending longitudinally of opposed sides of said casing, means yieldably retaining the end section within the casing with its outer end and the angle cock located outside the casing and with the angle cock located between substantially horizontal planes extending through the top and bottom of said coupler head, and means for restoring said end section to its operative position within the casing after having been displaced therefrom.

7. In the combination set forth in claim 6, the means for yieldably retaining the end section within the casing comprising a yieldable plunger pin engaging one side of said section near the outer end portion thereof and having opposed cam surfaces one of which surfaces is adapted to be engaged by one of the sides of said section as the outer portion thereof is swung out of the casing and the other of which surfaces is adapted to be engaged by the opposite side of said section as its outer portion is returned to its operative position within the casing.

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