June 8, 1937. H. L. BONE 2,083,288

TRACK RAIL CONTACTOR

Filed Jan. 22, 1935 2 Sheets-Sheet 1

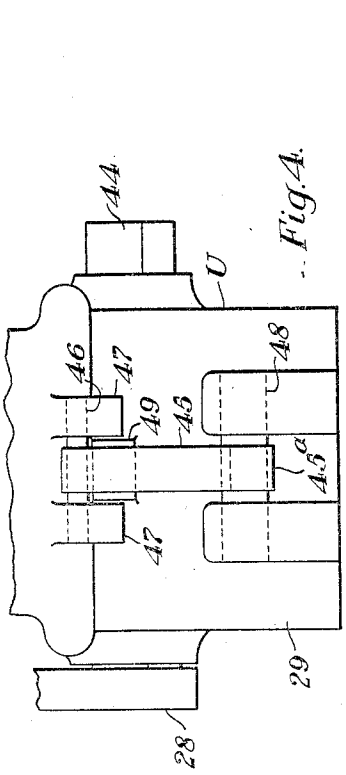


Fig. 4.

Fig. 1.

INVENTOR
Herbert L. Bone
BY
HIS ATTORNEY

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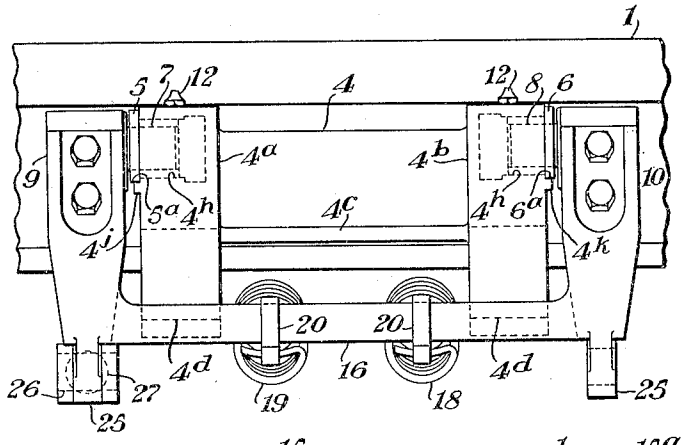


Fig. 2.

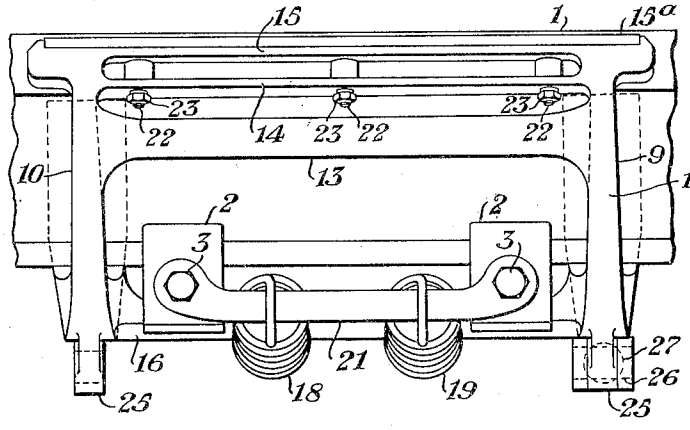


Fig. 3.

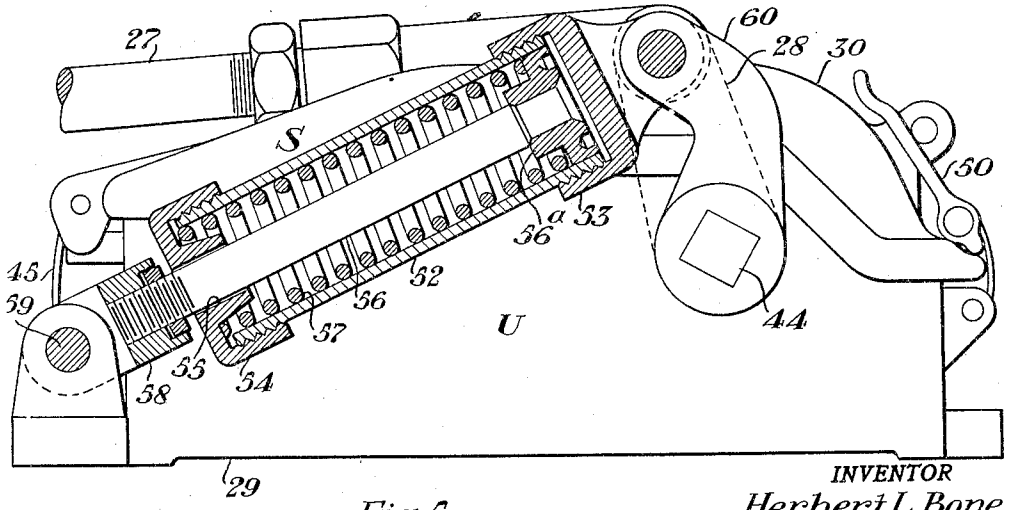


Fig. 5.

INVENTOR
Herbert L. Bone
BY
HIS ATTORNEY

Patented June 8, 1937

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UNITED STATES PATENT OFFICE

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TRACK RAIL CONTACTOR

Herbert L. Bone, Pittsburgh, Pa., assignor to The Union Switch & Signal Company, Swissvale, Pa., a corporation of Pennsylvania

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4 Claims. (Cl. 246—246)

My invention relates to track rail contactors, and particularly to track rail contactors adapted for use with apparatus for the automatic control of car retarders in accordance with the speed of a car approaching or passing through the retarder.

One object of my invention is to provide a contactor of the type described having parts which are light in weight but which are sufficiently rugged to withstand the severe service to which contactors of this type are subjected.

Another object of my invention is to provide a contactor of the type described which can be conveniently used within the limits of a car retarder without physically interfering with the satisfactory operation of the car retarder.

A further object of my invention is to provide a contactor which will return to its normal position without lag after a car wheel passes it.

A still further object of my invention is to provide a contactor of the type described which may be attached to a track rail in such manner that it may be removed from the rail without disturbing either the rail or the ties, and without objectionable delay to traffic.

I will describe two forms of rail contactors embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawings, Fig. 1 is a view, partly in elevation and partly in section, showing one form of rail contactor embodying my invention. Figs. 2 and 3 are left-hand and right-hand side views respectively of a treadle device forming a portion of the contactor shown in Fig. 1. Fig. 4 is a left-hand end view of the circuit controller U forming part of the contactor illustrated in Fig. 1. Fig. 5 is a view, partly in section and partly in elevation, showing a modified form of a portion of the contactor shown in Fig. 1.

Similar reference characters refer to similar parts in each of the several views.

Referring to the drawings, the reference character 1 designates one track rail of a railway track. Associated with the track rail 1 is a treadle device comprising a treadle support 4 which is clamped to the rail 1 by means of clamps 2 and bolts 3. The support 4 may have any preferred construction, but in the form here shown, this support comprises two spaced end members 4^a and 4^b connected together by a web 4^c. Each end member is formed with a base portion 4^d (see Fig. 1) which projects under the base flange of the rail, and with an integral upwardly extending angle bar portion 4^e which snugly fits the fishing space 1^a of the rail 1 on the outer side of the rail, and which forms with the base portion a recess 4^f which receives the base flange of the rail in the manner shown. The base portion 4^d of each end member cooperates with one of the clamps 2, and is provided with a suitable screw-threaded hole 4^g for the reception of the associated bolt 3.

The upper portion of each end member is provided with an outwardly facing circular recess 4^h (see Fig. 2) which aligns axially with the recess in the other end member, and disposed within the recesses 4^h are journals 5 and 6, respectively. These journals receive with some clearance trunnions 7 and 8 which are bolted to end members 9 and 10 forming part of a treadle 11, whereby the treadle 11 is pivotally attached to the support 4. The journals 5 and 6 have a slip fit in the recesses 4^h, so that they can easily be removed for replacement, and these journals are prevented from rotating by means of lugs 4^j and 4^k formed on the end members, which lugs engage the journals at flattened portions 5^a and 6^a in a manner which will be readily understood from an inspection of Figs. 1 and 2. The recesses 4^h are made somewhat deeper than the lengths of the journals to form a reservoir for a suitable lubricant, and grease fittings 12 are provided to enable the lubricant to be readily inserted into the reservoirs thus formed.

The end members 9 and 10 of the treadle 11 are substantially U-shaped (see Fig. 1) and are connected together by a plurality of cross members 13, 14, 15 and 16, the cross members 13, 14 and 15 being located adjacent the upper part of the treadle on one side of the rail 1, as shown in Fig. 3, and the cross member 16 being located near the lower part of the treadle on the other side of the rail, as shown in Fig. 2. Two compressed coil springs 18 and 19 are each fastened at one end of the cross member 16 by means of suitable clips 20, and the other end of each of these springs is hooked onto a bar 21 which is fastened at both ends to the support 4 by means of the bolts 3, whereby the treadle is biased to a position in which the upper part of the treadle on the inside of the rail is disposed near the top of the rail in such a position that the flange of each car wheel which passes the treadle will engage the treadle and rotate it through a limited angle in a clockwise direction. The springs are preferably disposed adjacent the opposite ends of the treadle to distribute the pressure on the treadle, and to eliminate any distortion which might result if the spring pressure were not properly distributed. To prevent wear on the treadle proper caused by engagement of the flanges of the car wheels with the treadle, a suitable wearing plate 15^a is bolted to the treadle by means of bolts 22 which pass through the wearing plate, and through the cross members 15 and 14, these bolts being provided at their lower ends with nuts 23. It will be apparent that, when the wearing plate 15^a becomes worn, it may readily be replaced by a new wearing plate.

A depending lug 25 is formed on the bottom of

each end member of the treadle 11, and pivotally connected at one end with the treadle by means of a pin 26 which is mounted in one of the lugs 25 is a push rod 27. This push rod is adjustable in length, and is connected at its free end with the operating crank 28 of a circuit controller, designated as a whole by the reference character U.

The circuit controller U may be of any desired type, but in the well-known form here shown, this circuit controller comprises a suitable casing 29 which is adapted to be secured to the ties or other foundation at one side of the rail 1, and which is closed at its upper end by a removable cover 30. Disposed within the casing 29 adjacent one end thereof is a transverse panel 31 of insulating material, and secured to this panel by means of terminal posts 32 and 33 which are mounted in the panel are a movable contact finger 34 and a fixed contact finger 35. The movable contact finger 34 is operatively connected, by means of links 36, with the upper end of a rocker arm 37 which is pivotally supported intermediate its ends on a pivot pin 38 mounted in a forked bracket 39. The bracket 39 is secured to the panel 31 below the terminal posts 32 and 33 by means of a bolt 40, the panel being recessed to receive the abutting portion of the bracket so that the bracket is securely held in the desired position. Two spaced rollers 41 and 42 are mounted on the rocker arm 37, and these rollers cooperate with a cam 43 secured to a transverse camshaft 44 which is journaled in the side walls of the casing 29. The cam shaft 44 projects through the side walls of the casing 29 and carries at its outer end the previously mentioned operating crank 28.

The cover 30 for the casing 29 may be secured to the casing in any suitable manner, but inasmuch as the circuit controller U may at times be located beneath car retarder apparatus where there is little room for opening a cover which is hinged to the casing in the usual manner, I prefer to secure the cover to the casing by means which will facilitate its removal from the casing. Referring now also to Fig. 4, these means comprise a spring member 45 which is secured at its upper end to the left-hand side of the cover, as viewed in Fig. 1, by means of a pin 46 mounted in spaced lugs 47 formed on the cover. The spring member 45 is curved as shown, and is bent at its lower end to form a semicircular portion 45a which is adapted to hook onto a pin 48 mounted in spaced lugs formed on the casing 29. A lug 49, which is formed on the casing 29 near the top of the casing, extends between the lugs 47 on the cover, and cooperates with these lugs to properly position the cover in a lateral direction. The lug 49 is of such length that, when the cover is closed, the outer end of this lug will cooperate with the spring member 45 to locate the cover in its proper longitudinal position. The right-hand end of the cover 30 is provided with a latch 50 of the usual and well-known type. The length of the spring member 45 is such, and the parts are so proportioned, that when the cover is latched in place sufficient downward pressure will be exerted on the cover to insure a tight seal.

With the means for fastening the cover to the casing constructed in the manner just described when it is desired to remove the cover, the latch 50 at the right-hand end of the casing, as viewed in Fig. 1, is released, and the cover is first rotated upwardly at its right-hand end and is then moved toward the left. This movement of the cover will cause the spring member 45 to become disengaged from the pin 48, and the cover may then be lifted away from the casing in an obvious manner. The procedure to replace the cover is exactly the reverse of that just described and will be apparent from an inspection of the drawings without further description.

The operation of the apparatus as a whole is as follows: When the treadle 11 occupies its normal position in which it is shown in the drawings, as is the case when no car wheel is engaging the treadle, the camshaft 44 is held in the position in which the cam 43 engages the roller 42 and is out of engagement with the roller 41, and under these conditions the movable contact finger 34 is firmly held in engagement with the fixed contact finger 35, thus causing the contact 34—35 formed by these fingers to be closed. When, however, the treadle is rotated away from its normal position by a car wheel, the push rod 27 moves toward the right, as viewed in Fig. 1, and rotates the operating crank 28 and camshaft 44 in a clockwise direction to the position in which the cam 43 is out of engagement with the roller 42 and is engaging the roller 41, and under these conditions the rocker arm 37 will be rotated to a position in which the contact finger 34 is moved out of engagement with the contact finger 35, thus opening the contact 34—35. As soon as a car wheel which has moved the treadle away from its normal position moves out of engagement with the treadle, the springs 18 and 19 will, of course, immediately restore the parts to the positions in which they are shown in Fig. 1. The strengths of the springs 18 and 19 are such that either spring alone will return the parts to their normal positions after the treadle has been actuated by a car wheel, and it will be apparent therefore that the device will continue to operate in the event that one of the springs breaks. The length of the treadle 11 may be varied as conditions require, but will usually be less than the distance between two car wheels of the same car truck.

Referring now to Fig. 5, I have here shown a spring assembly S which may be used in place of, or in conjunction with, the springs 18 and 19 to bias the parts to their normal positions. This spring assembly comprises a tubular casing 52, one end of which is provided with an end cap 53, and the other end of which is provided with an end plate 54 having an axially disposed hole 55. A spring rod 56 extends into the casing 52 through the hole 55, and is provided at its inner end with a cylindrical member 56a which is adapted to slide freely in the casing. Surrounding the rod 56 between the end plate 54 and the cylindrical member 56a is a compressed coil spring 57 which biases the rod and the casing to the relative positions in which the cylindrical member 56a is located contiguous to the end cap 53. The outer end of the rod 56 is secured to the casing 29 by means of a screw eye 58 and a pin 59, while the end cap 53 is pivotally connected with a crank 60 which is mounted on the camshaft 44 at the end opposite to the operating crank 28. With the spring assembly S constructed in the manner just described, it will be apparent that this spring assembly will constantly exert a force on the camshaft 44 through the medium of the end plate 54, casing 52, end cap 53 and crank 60, which force will tend to rotate the camshaft in a clockwise direction, and which will bias the treadle and associated parts to their normal positions. The operation of the apparatus as a whole when the spring S is utilized to bias the parts to their normal positions

will be obvious from the drawings without further description.

One advantage of a contactor constructed in accordance with my invention is that the treadle device may be readily removed from the rail 1. To accomplish this, the push rod 27 is first disconnected from the treadle 11, and the springs 18 and 19 are then unhooked from the cross member 16. The trunnions 7 and 8 are next unbolted from the treadle 11, whereupon the treadle may be slipped off the rail. The clips 2 are next removed from the support 4 by removing the bolts 3, and the support may then be lifted laterally away from the rail.

Although I have herein shown and described only two forms of track rail contactors embodying my invention, it is understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim is:

1. In combination with a track rail, a treadle support comprising two spaced end members connected together by a web, each said end member being formed with a base portion which projects under the base flange of the rail and with an integral upwardly extending angle bar portion which snugly fits the fishing space of the rail on the outer side of the rail and which forms with the base portion a pocket which receives the base flange of the rail on one side of the rail, means for securely clamping said support to the rail, two outwardly facing axially aligned journals one disposed in the upper portion of each end member of said support, each said journal being provided at its outer end with a flattened portion which cooperates with a lug on the adjacent end member to prevent the journal from turning, a treadle provided with trunnions which extend into said journals and with wheel engaging means located on the opposite side of the rail from said trunnions, and means for biasing said treadle to a position in which each car wheel which passes said treadle will engage said treadle at said wheel engaging means and cause rotation of said treadle in opposition to the bias of said biasing means.

2. In combination with a track rail, a treadle support comprising two spaced end members connected together by a web, each said end member being formed with a base portion which projects under the base flange of the rail and with an integral upwardly extending angle bar portion which snugly fits the fishing space of the rail on the outer side of the rail and which forms with the base portion a pocket which receives the base flange of the rail on one side of the rail, means for securely clamping said support to the rail, two outwardly facing axially aligned journals one disposed in the upper portion of each end member of said support, each said journal being provided at its outer end with a flattened portion which cooperates with a lug on the adjacent end member to prevent the journal from turning, a treadle provided with trunnions which extend into said journals and with wheel engaging means located on the opposite side of the rail from said trunnions, means for biasing said treadle to a position in which each car wheel which passes said treadle will engage said treadle at said wheel engaging means and cause rotation of said treadle in opposition to the bias of said biasing means, and a push rod pivotally connected with said treadle in such manner that rotation of said treadle will cause longitudinal movement of said push rod at right angles to the rail for transmitting the motion of the treadle to a device which is to be operated thereby.

3. In combination with a track rail, a treadle support comprising two spaced end members connected together by a web, each said end member being formed with a base portion which projects under the base flange of the rail and with an integral upwardly extending angle bar portion which snugly fits the fishing space of the rail on the outer side of the rail and which forms with the base portion a pocket which receives the base flange of the rail on one side of the rail, each said end member being further provided in the end of the base portion with a screw-threaded hole and in the upper portion with an outwardly facing recess, two clamps engaging the base flange of the rail on the opposite side of the rail from said end members and each provided with a hole which aligns with the hole in the associated end member, two bolts one extending through each clamp and each screwed into the hole in the associated end member whereby said support is securely clamped to the rail, two journals one disposed in the recess in each end member, and a treadle provided with removable trunnions which extend into said journals and biased to a position in which the flange of each car wheel which passes said treadle will rotate said treadle through a limited angle.

4. In combination with a track rail, a treadle support comprising two spaced end members connected together by a web, each said end member being formed with a base portion which projects under the base flange of the rail and with an integral upwardly extending angle bar portion which snugly fits the fishing space of the rail on the outer side of the rail and which forms with the base portion a pocket which receives the base flange of the rail on one side of the rail, each said end member being further provided in the end of the base portion with a screw-threaded hole and in the upper portion with an outwardly facing recess, two clamps engaging the base flange of the rail on the opposite side of the rail from said end members and each provided with a hole which aligns with the hole in the associated end member, two bolts one extending through each clamp and each screwed into the hole in the associated end member whereby said support is securely clamped to the rail, two journals one disposed in the recess in each end member, a treadle comprising two substantially U-shaped end members connected together by cross members, said treadle being disposed with the arms of each U-shaped end member extending upwardly on opposite sides of the rail, two trunnions one removably fastened to one arm of each U-shaped end member of said treadle and each extending into one of said journals whereby said treadle is pivotally attached to said support, a wearing plate secured to said treadle on the opposite side of the rail from said trunnions, and means for biasing said treadle to a position in which the flange of each car wheel which passes said treadle will engage said wearing plate and will rotate said treadle through a limited angle in opposition to its bias.

HERBERT L. BONE.