Sept. 13, 1932. J. W. LIVINGSTON 1,877,184

TRACK RAIL CONTACTOR

Filed March 1, 1932

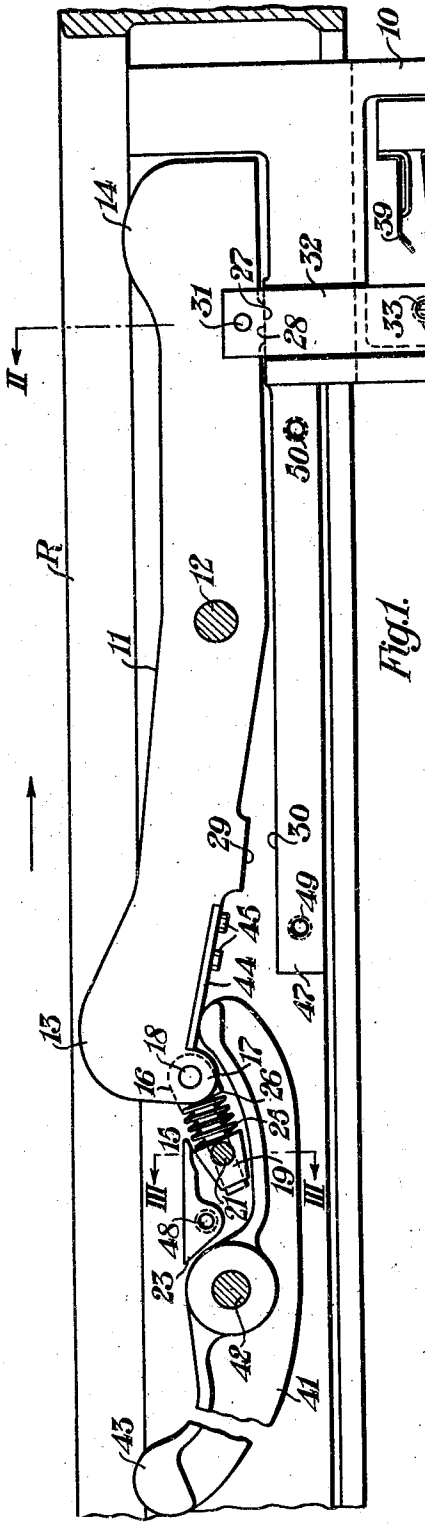


Fig.1.

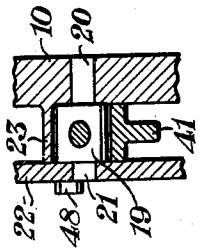


Fig.3.

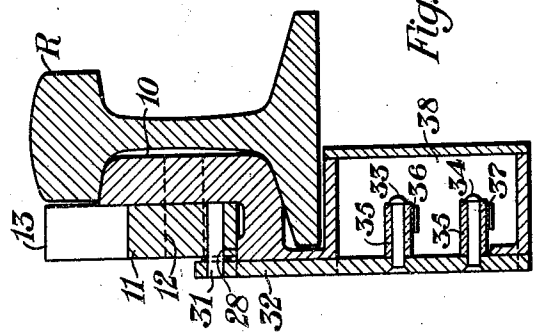


Fig.2.

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UNITED STATES PATENT OFFICE

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TRACK RAIL CONTACTOR

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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 the car as it moves along the track rails. In contactors heretofore proposed for such uses the contactor is moved upward by spring pressure and downward by pressure exerted by the flange of a car wheel. Since such a contactor is returned to its normal position by the action of a spring its operation is not positive and the time interval required for its return to its normal position may be influenced by friction and by variations in the extent to which it will be depressed due to the fact that the flanges of all car wheels are not of the same depth. An object of this invention is the provision of a novel and improved track rail contactor for operation by the wheels of a passing car that will be positive in its operation and will have a substantially uniform period of operation irrespective of differences in the depth of car wheel flanges. A further feature of a contactor embodying my invention is that it will be returned to its normal position when a car passes over it in either the normal or the reverse direction, thus assuring that any control system governed by its operation is automatically left in a normal condition after a car or locomotive has passed along the track rails in either the normal or the reverse direction. Other features of my invention will appear as the specification progresses.

I will describe one form of contactor embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawing, Fig. 1 is a view showing in side elevation, with certain parts broken away, one form of contactor embodying my invention. Fig. 2 is a sectional view on the line II—II of Fig. 1. Fig. 3 is a detail sectional view of the spring toggle latch taken substantially on the line III—III of Fig. 1.

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

Referring to the drawing, the reference character R designates one track rail of a railway track. Mounted on one side of the web of the rail R is a casting 10 which is attached to the rail in any convenient manner not shown in the drawing. 11 is a rocker arm pivoted at its center by a pin 12 having bearings in the casting 10 and in the outer plate 22 (see Fig. 3) screwed to lugs 23 and 47 on the casting 10 at points 48, 49, and 50. The two ends of the rocker arm 11 are positioned adjacent the head of the track rail R and the two ends are provided with contact surfaces 13 and 14, respectively, which are adapted to be engaged by the flange of a car wheel as it moves along the track rail, and which are spaced a predetermined distance apart, which distance, however, is less than the shortest distance between any two wheels of any car to pass along rail R. Normally the left-hand end of the rocker arm 11 is raised and the right-hand end lowered as shown by its position in Fig. 1. It follows that the flange of a car wheel which is moving on the rail in a normal direction as indicated by an arrow will first engage the contact surface 13 of the left-hand end of the rocker arm to depress the left-hand end of the rocker arm and raise the right-hand end. As the wheel moves on to the right, its flange engages the contact surface 14 depressing the right-hand end of the rocker arm and raising the left-hand end.

The eyebolt 16 is pinned to a jaw 17 at the left-hand end of the rocker arm 11 by a pin 18. As shown best in Fig. 3, a trunnion block 19 is carried by the trunnion pins 20 and 21 journalled in the casting 10 and the outer plate 22, respectively. As shown in Fig. 1, the eyebolt 16 extends through the trunnion block 19 and a spring 25 under compression is carried between the block 19 and a shoulder 26 of the eyebolt 16. It follows that as soon as the rocker arm 11 is rotated to a point where the pin 18 is above the center line of the bearing pins 20 and 21, the spring 25 will act to force the left-hand end of the arm 11 upward. The right-hand end of the rocker arm 11 is provided with a stop 27 adapted to engage a stop surface 28 on casting 10 arresting the upward thrust of the left-hand end of arm 11 by the spring 25 after a predetermined movement has been made. When the

left-hand end of the arm 11 is depressed by the flange of a car wheel to a point where the pin 18 passes below the center line of the bearing pins 20 and 21, the spring 25 acts to force the left-hand end of arm 11 downward until the stop 29 engages the stop surface 30. That is to say, the spring toggle latch indicated as a whole by the reference character 15 completes the movement of the rocker arm after it has been depressed to a given point by the flange of a car wheel and then retains the arm in the position to which it is moved until the opposite end of the rocker arm is depressed to a given point by the flange of a car wheel.

As best shown in Fig. 2, the rocker arm 11 carries by a pin 31, a plate 32 of suitable material into which are secured the pins 33 and 34 adapted to engage contact springs 36 and 37, respectively, located in a terminal compartment 38. It is clear that when the rocker arm 11 is rotated to the position where its right-hand end is lowered, the pins 33 and 34 engage the contacts 36 and 37 completing a circuit between these contacts. When the rocker arm 11 is rotated to a position where its right-hand end is raised, the contact pins 33 and 34 become disengaged from the contact springs 36 and 37 and the circuit controlled thereby is opened. It will be understood, of course, that other arrangements of circuit controllers can be arranged to be operated by the movement of the rocker arm 11 should it seem desirable to do so. For example, the pins 33 and 34 can be provided with insulating bushings indicated by the reference character 35 and the spring 36 provided with an associated contact 39 and the spring 37 provided with an associated contact 40. When the right-hand end of the rocker arm is raised, pins 33 and 34 are lifted free from the contact springs 36 and 37, respectively, and the contacts 36—39 and 37—40 are closed. When the right-hand end of the rocker arm is lowered, pins 33 and 34 engage the contact springs 36 and 37, respectively, forcing open the contacts 36—39 and 37—40. The form here shown will serve to illustrate how circuit controlling contacts can be operated by the movement of the rocker arm 11.

The contact surfaces 13 and 14 being a predetermined distance apart it is clear that the time interval between the closing of the circuit including contact springs 36 and 37 in response to a car wheel engaging the surface 13 and the opening of the circuit in response to the car wheel engaging the surface 14 is determined by the speed at which the car wheel moves from the point where it engages the surface 13 to the point where it engages the surface 14. That is to say, the circuit including these contacts can be utilized to control time measuring devices, many of which are well known to the art, that will indicate the speed at which the car wheel moves along the track rail between these two points.

Associated with the rocker arm 11 is a trip arm 41 journalled by a trunnion pin 42 having bearings in the casting 10 and in the outer plate 22. The trip arm 41 is provided at its left-hand end with a contact surface 43 adapted to be raised to a position for engaging the flange of a car wheel. The right-hand end of the trip arm 41 mates with the contact plate 44 fastened by screws 45 to the rocker arm 11. The trip arm 41 is so proportioned that when the rocker arm 11 occupies its normal position, the heavier left-hand end of the trip arm 41 swings downward under the action of gravity to a point where the contact surface 43 is down out of position to be engaged by the flange of a car wheel. The trip arm 41 is arrested in its movement by its right-hand end engaging the plate 44. The contactor is provided, of course, with proper covering to house all parts against weather conditions.

Assuming a car wheel to move along the track rail R in the normal direction as indicated by the arrow, it will pass over the trip arm 41 without engagement. As the wheel reaches the point where its flange engages the surface 13, the rocker arm 11 is depressed against the action of spring 25 until the left-hand end is brought to a point where pin 18 is below the center line of the bearing pins 20 and 21 and the spring 25 becomes effective to force the arm 11 still further downward until its movement is arrested by the stop 29 coming in contact with the surface 30. The toggle spring latch 15 then holds the arm firmly in this position. This moving of the rocker arm 11 from its normal to its reverse position causes the pins 33 and 34 to open or close, as the case may be, the circuit that includes the contact springs 36 and 37. The contact surface 14 is now raised to a position where it will be engaged by the flange of a car wheel, and thus as soon as the car wheel has advanced to the right to the point where it engages the surface 14, it depresses the right-hand end of the arm 11 against the action of the spring 25 and when the arm reaches a point where the pin 18 moves above the center line of the bearing pins 20 and 21, the toggle spring 25 is effective to rotate the arm 11 until the stop 27 rests against the surface 28. That is to say, the rocker arm 11 is moved back to its normal position and the circuit controller operated to close, or open, the circuit that includes the contact springs 36 and 37 in response to the flange of the car wheel engaging the surface 14. Each car wheel moving over the contactor in the normal direction will cause the rocker arm 11 and the circuit controlled thereby to be operated in the manner just described above. It is to be noted that the flange of the car wheel needs to de-

press the respective ends of the rocker arm 11 only far enough to bring it to a point where the spring 25 becomes effective to complete the full movement of the arm and that variations in the depth of flange of different car wheels does not cause corresponding variations in the movement of the contactor. It is also to be noted that the movement of the rocker arm in each direction is positively brought about by the car wheel and that the arm is firmly held in the position to which it was last moved by the toggle spring latch 15. While the trip arm 41 will be operated in step with the rocker arm 11 as a car wheel passes over the contactor in the normal direction, the trip arm performs no useful function at this time. As stated above, the distance between the contact surfaces 13 and 14 being a fixed distance, it is apparent that the interval of time between the two operations of the circuit controlled by the movement of the arm 11 is in accordance with the speed of the car wheel.

Assuming a car wheel passes over the contactor in the reverse direction, that is, from the right to the left in Fig. 1, the contactor being in its normal position, the flange of the car wheel will pass over the surface 14 without engagement. When the wheel reaches the point where it engages the contact surface 13, the left-hand end of the arm 11 is depressed to a point where the toggle spring 25 is effective to force the arm to its full reverse position at which position it remains as the car wheel moves on away from the contactor. However, as the left-hand end of arm 11 is forced downward, the trip arm 41 is actuated to raise its left-hand end to a position to be engaged by the car wheel, and thus as the car wheel moves on to the left, its flange engages the contact surface 43 of the trip arm 41 depressing the trip arm. This depressing of the trip arm 41 causes its right-hand end to be raised forcing the rocker arm 11 to a point where the toggle spring 25 is effective to return the rocker arm to its full normal position, it being understood, that the distance between the contact surfaces 43 and 13 is made less than the shortest distance between any two wheels of the car. Thus it is clear that the contactor is left in its normal position after a car wheel has passed over the contactor in a reverse direction and any control circuit governed by the contactor is left in its normal operating position even though a car wheel has passed over the contactor in the reverse direction. The importance of having a track rail contactor automatically left in its normal position after a car wheel has passed over it in the reverse direction as well as in the normal direction will be apparent to all familiar with control systems governed by track rail contactors.

A track rail contactor embodying my invention is rugged in construction and is fully protected from weather conditions and is positive in its action. Furthermore, the extent of its movement is always the same for all car wheels although there may be decided variations in the depth of flange of different car wheels. Another advantage of a contactor constructed in accordance with my invention, is that it is always positively returned to its normal position regardless of the direction in which a car wheel may pass over it.

Although I have herein shown and described only one form of track rail contactor 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. A track rail contactor comprising a member having a normal position and a reverse position adapted to be moved from its normal position to its reverse position and then back to its normal position in response to a car wheel moving on the track rail in a normal direction and to be moved from its normal position to its reverse position only in response to a car wheel moving on the track rail in a reverse direction, a circuit controlling contact actuated by said member having a normal and a reverse position corresponding to the normal and reverse positions of said member, and a second member actuated by a car wheel moving on the track rail in the reverse direction to restore the first mentioned member to its normal position.

2. A track rail contactor comprising a member having a normal position and a reverse position adapted to be moved from its normal position to its reverse position and then back to its normal position in response to a car wheel moving a predetermined distance on the track rail in a normal direction, and to be moved from its normal position to its reverse position only in response to a car wheel moving on the track rail in a reverse direction, a circuit controlling contact actuated by said member and having a normal and a reverse position corresponding to the normal and reverse positions of the member, and a second member actuated by a car wheel moving on the track rail in the reverse direction to restore the first mentioned member to its normal position.

3. A track rail contactor comprising a member having a normal position and a reverse position adapted to be actuated from its normal position to its reverse position and then back to its normal position in response to a car wheel moving on the track rail in a normal direction, a circuit controlling contact actuated by the member having a normal and a reverse position corresponding to the normal and reverse positions of the member, and a trip arm actuated by a car wheel mov-

ng on the track rail in the reverse direction away from said member to restore the member to its normal position and thereby reestablish the normal position of said contact member after a car wheel has moved along the rail in a reverse direction.

4. A track rail contactor comprising a rocker arm normally positioned with respect to a traffic rail to have first a given end and then the opposite end depressed as a car wheel moves along the traffic rail in a normal direction, a latch to retain the rocker arm in the position to which it is moved when either end is depressed by a car wheel, a trip arm adapted to be engaged by a car wheel moving away from the given end of the rocker arm in the reverse direction to restore said arm to its normal position and a control device operated by the rocker arm.

5. A track rail contactor comprising a rocker arm mounted adjacent a traffic rail having a normal position in which a given end is raised to a position to be engaged by a car wheel and the opposite end lowered out of engaging position and adapted to have first its given end depressed and the opposite end raised and then the opposite end depressed and the given end raised by a car wheel moving on the traffic rail in a normal direction, and to have its given end depressed and the opposite end raised only by a car wheel moving in the reverse direction, a trip arm adapted to be engaged by a car wheel moving away from the given end of the rocker arm in the reverse direction to restore the rocker arm to its normal position, and a control device operated by the rocker arm.

6. A track rail contactor comprising a rocker arm located at the side of a track rail and adapted to be oscillated to a normal position or to a reverse position, a toggle spring latch to force the rocker arm to its normal position in response to a car wheel depressing one end of the rocker arm below a given point and to force the rocker arm to its reverse position in response to a car wheel depressing the opposite end of the rocker arm below a given point, and a circuit controlling contact actuated by the rocker arm.

7. A track rail contactor comprising a circuit controlling rocker arm located at the side of a track rail and adapted to be oscillated to a normal position or to a reverse position, a toggle to force the rocker arm to its normal position in response to a car wheel depressing one end of the rocker arm below a given point and to force the rocker arm to its reverse position in response to a car wheel depressing the opposite end of the rocker arm below a given point, and a trip arm having a position where it is engaged by a car wheel arranged for at times to move said rocker arm from its reverse position to the point where said toggle forces said arm to its normal position.

8. A track rail contactor comprising a rocker arm each end of which is provided with a contact surface with a predetermined distance between said surfaces, said arm adapted to be moved from a normal position to a reverse position in response to a car wheel engaging the surface of one end of said arm and to be moved from the reverse position back to the normal position in response to the car wheel engaging the surface of the opposite end of the arm, a latch to retain the arm in the position to which it has been moved until it is again moved by a car wheel, and a controlling means having a normal and a reverse position actuated by said rocker arm in step with its movements to thereby determine the interval required by the car wheel to move the predetermined distance between the two contact surfaces of said rocker arm.

In testimony whereof I affix my signature.

JOHN W. LIVINGSTON.