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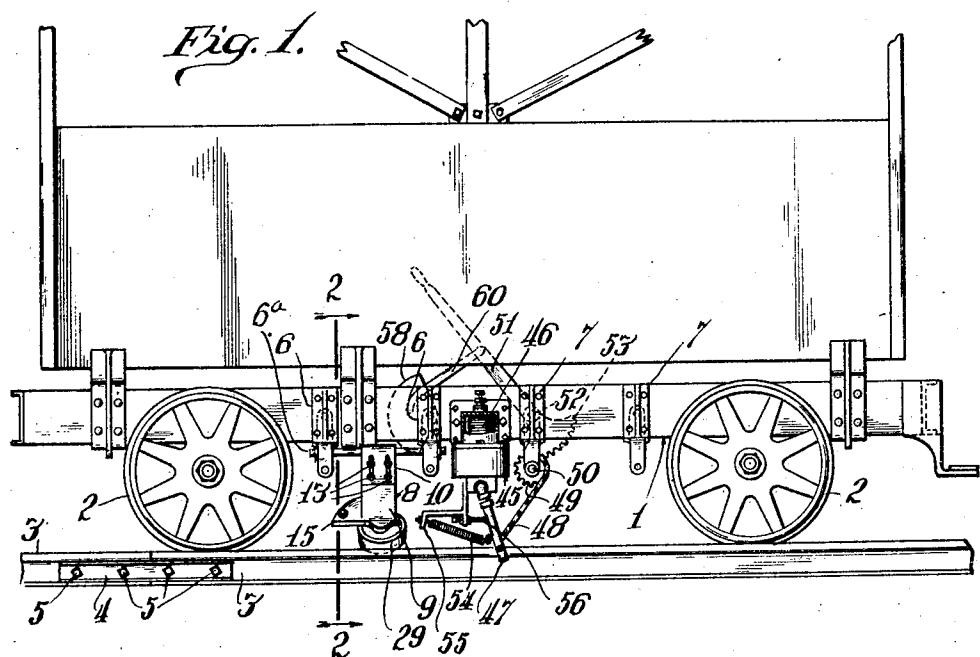
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H. W. PROTZELLER

AUTOMATIC MAKE AND BREAK CONTACTOR

Filed Feb. 23, 1927

2 Sheets-Sheet 1



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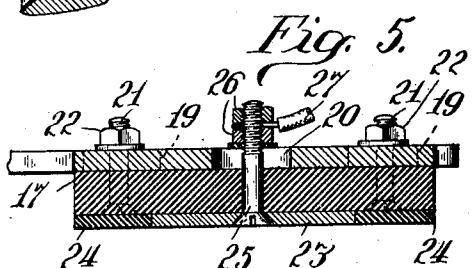
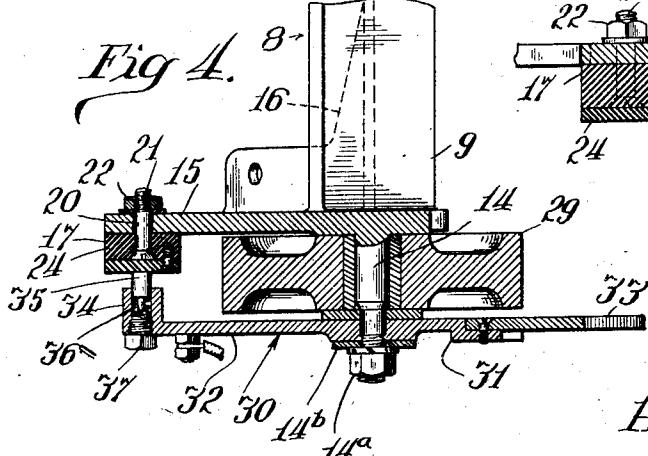
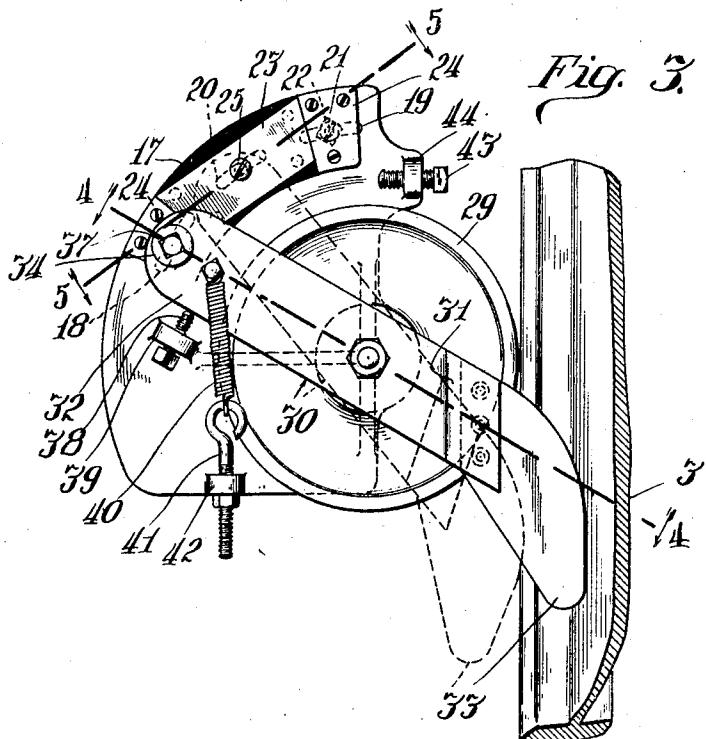
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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AUTOMATIC MAKE AND BREAK CONTACTOR.

Application filed February 23, 1927. Serial No. 170,300.

This invention relates to improvements in automatic make and break contactors and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The primary object of the invention is to provide a simple and efficient means carried by a railway car or vehicle such as a rail joint oiler and adapted to normally have a rolling support upon one of the rails of a track and to include a device adapted to engage a portion of each rail joint in said track and momentarily close a circuit to an associated device as for instance the electrically actuated valve of a rail joint oiler.

A further object of the invention is to provide such a device which includes a swingable arm for engagement with a joint plate, which arm includes a renewable contact finger at one end and a spring pressed contact member at its other end adapted to engage a normally fixed contact member which is capable of an adjustable movement toward and away from the movable contact member whereby the timing of the making and breaking of the circuit may be readily controlled.

Another object of the invention is to provide a stop for the contact arm to limit the movement thereof should the same be swung beyond the end of the fixed contact.

These objects of the invention as well as others together with the many advantages thereof will more fully appear as I proceed with my specification.

In the drawings:—

Fig. 1 is a view in side elevation of an automatic make and break contactor embodying my invention as when forming a part of a rail joint oiler.

Fig. 2 is a vertical sectional view through Fig. 1 on an enlarged scale, as taken on the line 2—2 thereof and shows the contactor in end elevation and in operative position with respect to a railroad rail.

Fig. 3 is a bottom plan view thereof on a further enlarged scale.

Fig. 4 is a vertical sectional view through the same as taken on the line 4—4 of Fig. 3.

Fig. 5 is a transverse vertical detail sectional view through the same as taken on the line 5—5 of Fig. 3.

Fig. 6 is a diagrammatical view of a circuit which will be more fully referred to later.

Referring now in detail to that embodiment of the invention illustrated in the accompanying drawings, 1 indicates one of the longitudinal side sill members of a rail joint oiler mounted on wheels 2 adapted to travel upon a railroad track, the abutting rail ends 3—3 of which are jointed together by the usual joint plates or bars 4, and bolts and nuts 5. Fixed to said side sill member and projecting laterally therefrom are front and rear pairs of brackets 6 and 7 all of a like construction. Journalled in the front brackets 6—6 of the front pair of brackets is a longitudinally extending rock shaft 6^a secured against endwise movement therein in any suitable manner, said rock shaft being arranged in a plane above and to the outside of the plane of the rail sections in the associated rail. 8 indicates a contactor arm which includes a bottom supporting member 9 in the form of a plate and a top bifurcated sleeve member 10 which is fixed to the shaft 6^a by a set screw 11. The flat top end of the supporting member 9 extends into the bifurcated part of the sleeve 10 which is slotted as at 12 and bolts 13 with associated nuts, pass through said slots and through suitable holes in said supporting member to operatively secure them together. By this construction the contactor arm may be lengthened or shortened as is necessary to secure the desired proportion.

The contactor arm 8 includes a longitudinally extending stud 14 and a segmental plate part 15 arranged concentric with said stud at a right angle to the arm 9. The connection between said arm and plate part is strengthened by a rib 16 disposed to the rear of said arm. On one peripheral portion of the underside of the plate part 15 an arcuate block of insulating material 17 is disposed in a manner making it arcuately adjustable thereon. To provide this adjustment I form in the peripheral portion of said plate part two end slots and an intermediate slot 18, 19 and 20 respectively, all concentric with the stud 14. The end parts of said arcuate block each has a bolt 21 anchored therein and these bolts pass up through the end slots 18 and 19 in the plate part and carry lock nuts 22—22. On the under face of said block between its ends is a recess in which is fixed a metallic contact member 23, the ends of said bottom surface being shod with wear plates 24 of suit-

able insulating material. The contact plate 23 carries a binding post 25 in the form of a screw or bolt which extends up through the intermediate slot 20 and has thereon two 5 nuts 26, between which the end of a suitable current conductor 27 may be attached to said binding post. This conductor leads up to an eye 28 in the sleeve 10, and from there to a suitable source of current supply as will 10 later appear. It is apparent that by loosening the nuts before mentioned the block of insulation material 17 with the contact member 23 thereon may be moved arcuately in either direction and then locked in that position by again tightening up said nuts.

A suitably bushed roller 29 is journalled on the stud 14 for peripheral engagement with the inner corner of the head of the rail sections in each rail. Also journalled on 20 said stud at a point substantially midway between its ends is a contact lever 30. The outer end 31 of said lever which is shorter than the inner end 32 thereof is offset as best shown in Fig. 4 and removably secured 25 thereto is a wear resisting joint plate engaging finger 33. Said contact lever is secured in position upon the stud 14 by a nut 14^a and a washer 14^b is interposed between the roller 29 and lever 30 to properly space 30 them apart. On the extremity of the inner end 32 of the contact lever 30 is an upwardly extending annular boss 34 in which a yielding contact member or plug 35 is disposed. A helical spring 36 is interposed between 35 said plug and a screw 37 threaded in said annular boss from the bottom. Thus the contact member or plug is yieldingly held and urged upwardly into contact with not only one of the wearing plates 25 but also 40 into contacting engagement with the contact plate 23 when the lever is swung in one direction as will soon hereinafter appear.

The inner end of said contact lever is normally held against an adjustable stop shoulder formed by a set screw 38 threaded through a boss or lug 39 on the bottom of the plate part 15 by a spring 40, one end of which is fixed to the lever near the boss 34 and the other end of which is fixed to 45 an eyed bolt 41 threaded into a lug 42 on the bottom of the plate part 15. Another adjustable stop shoulder is provided on said plate in the form of a set screw 43 threaded into a boss or lug 44 also on the bottom of 50 the plate part 15 and this stop shoulder prevents the lever 30 from swinging so far as to clear the end of the other wear plate 24, which would permit the contact member 25 to be shot out of the boss 34 by the spring 36. The contactor arm 8 as a whole being mounted as described is of course grounded electrically to the side sill member of the vehicle frame.

Associated with the contactor and controlled thereby is an electromagnetic valve

indicated as a whole at 45 and which is fixed to the side sill member 1 in a position between the pairs of front and rear brackets 6 and 7 respectively. Said valve which includes a magnetic coil 46 has attached to it a swingable duplex spray nozzle 47 to so straddle the rail as to discharge two conical sprays, one upon each side of a rail joint as it is passed. The fluid to the nozzles is delivered to the valve casing 70 under pressure by any suitable means not shown and when the coil 46 is energized by completing the circuit thereto as when the contactor approaches and passes a rail joint, the said coil actuates a valve to permit a passage of the fluid into the nozzles. So soon as the rail joint is passed the circuit to the coil is broken and the same is de-energized thus closing off the passage of fluid to said nozzle. The nozzle being swingably connected to the valve casing may be swung upwardly away from the rail as by means of a chain 48 which is fixed to a sprocket 49 on a short transverse rock shaft 50 journalled in the frontmost bracket of the rear pair of brackets 7. Said rock shaft is actuated counterclockwise by a lever 51 pivoted at 52 to the side sill member and made integral with said lever is a segmental gear 53 meshing with a pinion 50^a (see Fig. 2) 90 fixed to said rock shaft. The nozzle is swung into operative position with respect to the rail by a spring 54 fixed at one end to the nozzle head and at its other end to a bracket 55 extending forwardly from the valve casing. A set screw 56 carried by said bracket provides an adjustable stop against which said nozzle engages to be limited as to angularity when in operative position with respect to the rail.

Preferably but not necessarily so the contactor 8 as a whole may be so connected up to the nozzle, that when said lever 51 is actuated to swing the nozzle into inoperative position, the contactor is also swung upwardly under the sill member into an out of the way position. Such means comprises a chain or other flexible means 57 connected at one end to the contactor rib 16 and at the other end to a segment 58 pivoted at 59 to the side sill member, the segment itself being connected to the lever 51 by a link 60 all as best shown in dotted lines in Fig. 1. Thus when the lever 51 is swung clockwise it rocks the shaft 50 counter clockwise to wind up the chain 48 to swing the nozzle head 47 into its inoperative position. By reason of the link connection between said lever and the segment 58 the chain 57 is likewise wound up to swing the contactor as a whole, up under the vehicle. Suitable quadrant and detent means (not shown) associated with the lever so holds the same that the nozzle head and contactor may be secured in their inoperative position.

In Fig. 6 is shown diagrammatically the electrical connections between the contactor and magnetic valve and such connections are as follows: One terminal of the coil 46 is 5 electrically connected to the contact 23 by the conductor 27 as before mentioned, while the other terminal of the coil is connected by a conductor 27^a to one side of a battery B the other side of which is grounded as 10 shown in Fig. 6. The contactor lever 30 is grounded as before mentioned to the vehicle frame.

When the spray nozzle and contactor are 15 in their operative positions as shown in Fig. 1 they operate as follows: As the vehicle is travelling over the rails, the roller 29 of the contactor will roll along the inner top corner of the head of the rail, with the contact finger 33 in position just below the head 20 of the rail as best shown in Fig. 2. As a rail joint is approached, said finger will engage the advancing end of the inner plate of the joint and will ride in engagement with the side of said plate thus swinging 25 the lever 30 about its axis as provided by the stud 14 against the action of the spring 40. This will swing the arm 32 of the lever over the contact plate 23 so as to bring the contact plug 35 into engagement with said 30 plate as best shown in dotted lines in Fig. 2.

The circuit is thus completed or closed to the magnetic valve which opens to permit the passage or spraying fluid under pressure to the nozzles. So long as the contact finger 35 engages the joint plate or bar, the circuit is held closed and the valve is held open. However, so soon as said finger leaves the joint plate, the spring 40 acts to return the lever 30 to its normal position against the 40 set screw 38 wherein the contact plug is removed from the contact plate 23 and the circuit is broken, permitting the valve to close and shut off the passage of spraying fluid to said nozzles.

45 By loosening the set screw 11 and moving the bifurcated sleeve 10 on the shaft 6^a toward or away from the magnetic valve and by adjusting the block 17 and contact plate 23 thereon, arcuately in the proper direction, the timing of the opening and closing of the circuit to the magnetic valve bars may be readily determined with respect to the rail joint.

50 My improved contactor is simple in construction and is quiet and positive in operation. It embodies only a few parts which are not only strong and rigid but which are readily adjustable and also easily accessible for inspection and repair.

55 While in describing my invention I have referred to many details of construction as well as form and arrangement of the parts thereof, the same is to be considered as by way of illustration only so that I do not 60 wish to be limited thereto except as may

be pointed out in the appended claims.

I claim as my invention:

1. A contactor of the kind described embodying therein a supporting member, a roller journaled on one end thereof for 70 guiding engagement with a rail, means at the other end of said member for supporting the same from above to maintain said roller in engagement with said rail by gravity, a stationary contact member on said supporting member, a double arm lever pivoted on said member, a contact member movable with one arm thereof into and out of engagement with said stationary contact member, a joint plate contact finger removably 80 secured to the other arm of said lever and means so connected to said lever as to hold the contact finger movable therewith out of engagement with said stationary contact member. 85

2. A contactor of the kind described comprising a lengthwise adjustable arm, means providing a pivotal connection for one end of said arm, a plate on the other end of said arm extending at a right angle thereto, a rail engaging roller on said last mentioned end of said arm, a two arm lever pivoted for a swinging movement parallel with the plate, one of said arms constituting a rail joint engaging member, a contact plate carried by said plate, a contact member carried by the other arm of said lever for engagement with the first contact member, a spring engaging parts of said plate and lever for holding said contacts out of engagement and 90 adjustable stop shoulders on the plate for limiting the movements of the lever. 95

3. In a contactor of the kind described, the combination of a swingable arm with a plate at one end thereof, a two arm lever pivoted thereto, a contact member carried by one of said arms, an arcuately adjustable contact member on said plate, adjustable stops on the plate for said last mentioned arm of said lever and spring means 105 connecting parts of said plate and lever respectively for holding said lever against one of said stops with said contact members out of engagement. 110

4. In a contactor of the kind described, the combination of a swingable arm with a plate at one end thereof, a two arm lever pivoted thereto, a contact member carried by one of said arms, slots in said plate concentric with the axis of said lever, a block 120 of insulation with bolts passing through some of said slots, a contact plate on said block and having a binding post passing through the other of said slots, adjustable stops on said plate for said lever and a spring for holding said lever against one of said stops with said contact members out of engagement. 125

5. In a contactor of the kind described, the combination of a supporting member 130

with a plate at one end, a lever pivoted to said plate, an arcuately adjustable contact member on said plate, stop shoulders for said lever, a spring for holding said lever against one of said shoulders, said lever having an annular boss on one end thereof and a spring pressed contact member yield-

able in said boss for engaging said arcuately adjustable contact member when said lever is swung toward the same against the action ¹⁰ of said spring.

In testimony whereof, I have hereunto set my hand, this 15 day of February, 1927.

HARRY W. PROTZELLER.