July 21, 1936. F. F. ZAVATKAY 2,048,533

RAILROAD SWITCH HEATER

Filed June 8, 1934 2 Sheets-Sheet 1

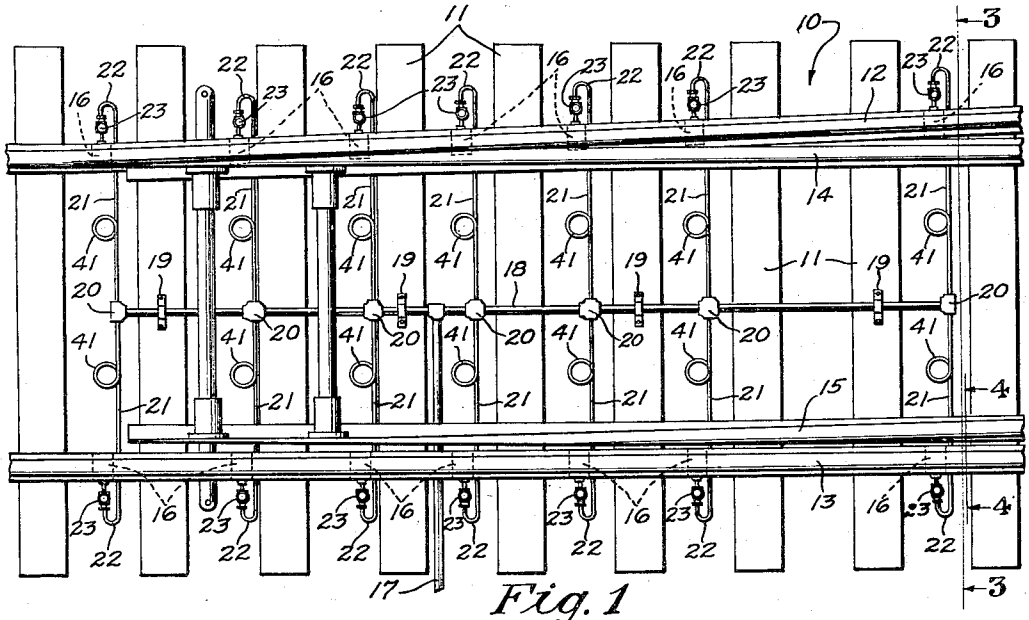


Fig. 1

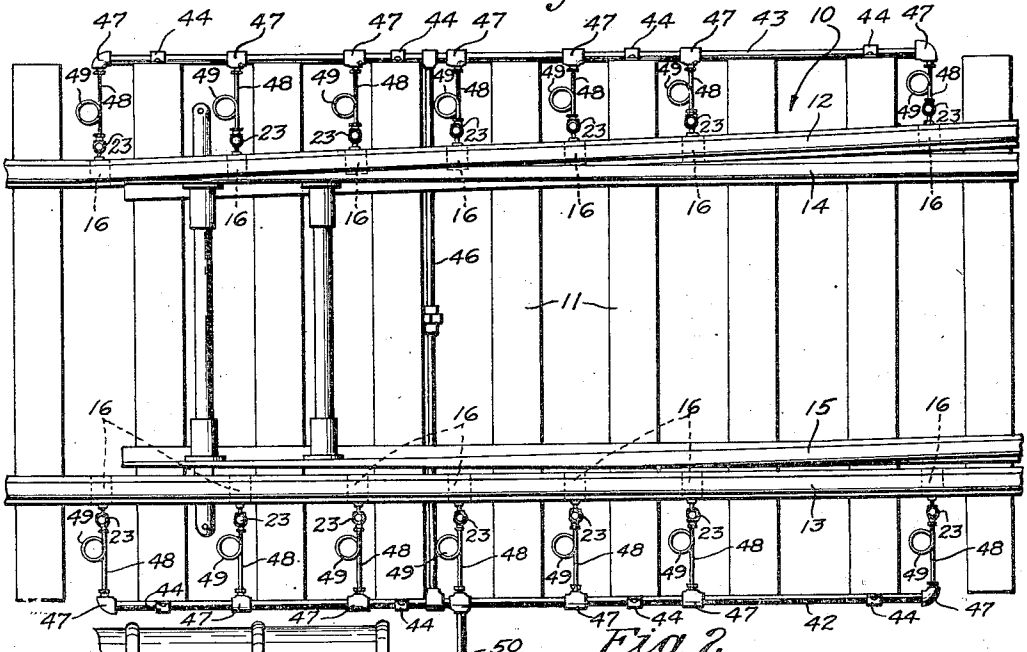


Fig. 2

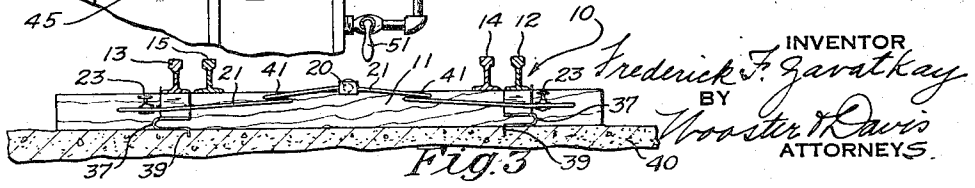


Fig. 3

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Fig. 4

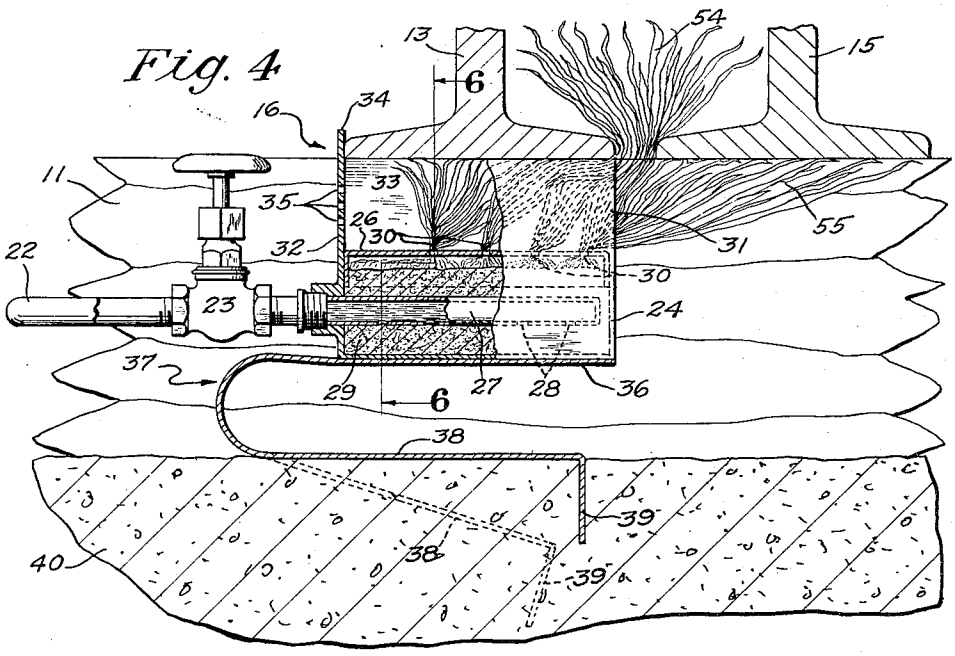
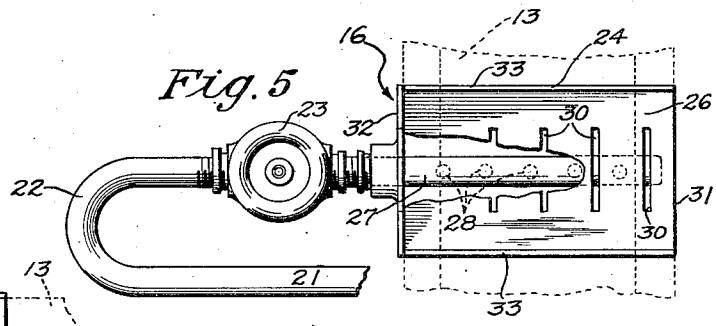


Fig. 5



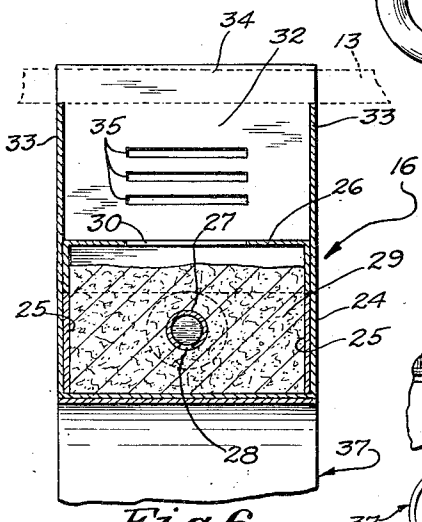


Fig. 6

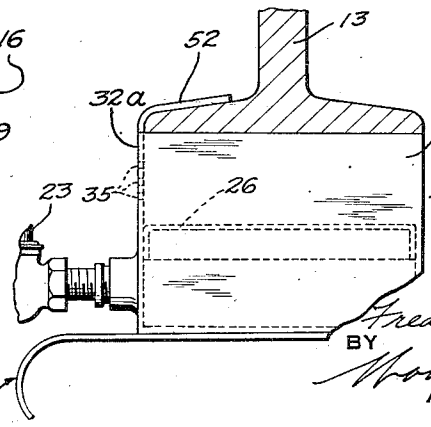


Fig. 7

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2,048,533

RAILROAD SWITCH HEATER

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Application June 8, 1934, Serial No. 729,635

9 Claims. (Cl. 246—428)

This invention relates to heater means and comprises a railroad switch heater.

An object of the invention is to provide an apparatus to be installed on a railroad road bed in association with a switch and which may be depended on to keep the switch clear of snow and ice.

Another object is to provide a means for the purpose indicated and which is of simple construction and which may be quickly and permanently installed and easily controlled after installation.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein satisfactory embodiments of the invention are shown. However, it will be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a top plan view showing an apparatus constructed according to the present invention installed on a switch;

Fig. 2 is a similar view showing a slightly different arrangement of the apparatus.

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 1;

Fig. 4 is a sectional view on an enlarged scale taken substantially along the line 4—4 of Fig. 1, a portion of the burner being broken away to show interior construction;

Fig. 5 is a top plan view on the scale of Fig. 4 and showing a single burner;

Fig. 6 is a sectional view taken substantially along the line 6—6 of Fig. 4; and

Fig. 7 is a view somewhat similar to Fig. 4 but showing a modified construction.

Referring in detail to the drawings, and at first particularly to Figs. 1, 2 and 3, at 10 is shown a railroad switch including the usual cross ties 11, stationary rails 12 and 13 and shiftable switch or split rails 14 and 15 adapted to be shifted in any or the usual manner.

According to Fig. 1 a series of similar burners, each generally designated 16, are spaced along the switch and a set of such burners is located at the under side of each of the stationary rails 12 and 13 in their portions adjacent the split rails 14 and 15. Burners 16 are preferably all fed from a common source of supply, but not necessarily so, and to this end a supply main or leader 17 extending transversely of the switch is connected to a drum or any other source of supply of low flash fuel oil, and such supply main delivers to a distributing pipe 18 extending lengthwise of the switch and located between the rails thereof and secured as by straps or brackets 19 to the ties 11.

At points spaced apart as are the burners 16 the distributing pipe or manifold 18 is provided with fittings 20 placing the distributing pipe in communication with tubes 21 of which there is shown one such tube for each burner. It will be noted that the tubes 21 pass beneath the rails of the switch and are then doubled back on themselves as at 22 and through needle valves 23 communicate with the burners 16. With this arrangement it will be clear that each burner may be individually regulated and any particular burners may be in operation while other burners are shut off as desired. Each tube or pipe 21 also preferably includes a loop 41 which permits shifting of the burner and also acts as a spring means to retain the burner against the rail as will later be described.

The burners 16 are preferably all alike and one of them is detailed in Figs. 4, 5 and 6 and as there disclosed the burner comprises a receptacle 24 against the lower portions of the inner surfaces of the inner and outer or front and rear end walls of which are provided plates or stops 25, the upper edges of which are engaged by and limit the downward movement of a cover 26 which has a good fit in the receptacle but may be removed through the top when desired. A tube 27 extends into the lower portion of the receptacle 24 and is perforated in its under side as at 28 and each tube may contain the desired number of perforations and is connected with its valve 23 whereby to receive oil delivered to the valve by the tube 21.

In the lower portion of the receptacle 24 about the tube 28 there is provided suitable wicking which preferably comprises a mixture of sand and asbestos and the mixture may be in the ratio of one pound of sand to one ounce of asbestos although this may be varied as desired. By particular reference to Figs. 4 and 6 it will be noted that the stops 25 serve to support the cover 26 in such position that the upper or horizontal wall of the cover is spaced slightly above the wicking 29. Cover 26 is provided with suitable openings as, for example, the slots 30 and these openings are for the escape or passage of vaporized oil as will later more fully appear.

Receptacle 24 is open at its upper side above the cover 26 and is also open in its rear side

above its cover as indicated at 31 in Figs. 4 and 5. However, the front wall 32 of the receptacle extends above the side walls 33 thereof thereby providing an upwardly extending flange 34. Also, front wall 32 has air inlet openings 35 which may be in the form of the slots shown or otherwise as desired. To the underside of the receptacle there is secured as by spot welding or the like an arm 36 of a spring 37 which spring also includes an arm 38 having a downturned or bent end portion 39. Normally the arm 38 when the burner is not in position under the rail is related to the arm 36 as shown by the dotted lines in Fig. 4.

When installing the apparatus the burners are, as above suggested, located at the undersides of or beneath the stationary rails of the switch and the burners may be quickly and accurately installed since it is not necessary to bolt them into place. When installing a burner its flange 34 on its front wall is brought against or into engagement with the outer edge of the flange of the rail and the upper edges of the side walls 33 of the burner are brought against the underside of the flange of the rail. The spring 37 is tensioned by being compressed between the receptacle 24 of the burner and the ground or road bed (indicated at 40 in Figs. 3 and 4) and therefore constantly exerts a pressure forcing the said side walls of the receptacle against the flange of the rail. The downturned or bent end 39 of spring 37 is inserted into the ground or road bed as indicated so as to form an anchor.

To hold the extensions or flanges 34 of the front ends of the burners against the edges of the flanges of the stationary rails each tube 21 intermediate the distributing pipe 18 and the burner is doubled upon itself to provide a loop 41 which loop causes the tube to act as a spring constantly tending to draw the burners inwardly and therefore constantly pressing the flanges 34 against the edges of the stationary rails.

Fig. 2 discloses a slightly different arrangement of apparatus. However, in this figure the burners 16 are located as before and the only difference between the arrangement of Fig. 1 and that of Fig. 2 is in the piping. In Fig. 2 distributing pipes 42 and 43 are arranged to extend lengthwise of the switch and these pipes are located at the respective outer sides of the switch and as disclosed are secured against the ends of the ties 11 by brackets 44. From a drum or other suitable container 45 low flash fuel oil is delivered to the distributing pipe 42 and a pipe 46 extending under the switch serves to deliver oil from the distributing pipe 42 at one side of the switch to the distributing pipe 43 at the other side thereof. The supply tank 45 for either the arrangement of Fig. 1 or that of Fig. 2 may be supported at the desired elevation to feed the fuel by gravity to the burners or the fuel may be fed by pressure as by air pressure on top of the fuel in the tank created by a suitable pressure pump as is well known.

At the desired points the distributing pipes 42 and 43 are provided with suitable fittings 47 and tubes 48 place the respective fittings in communication with the burners 16. Each tube 48 is looped intermediate its ends as at 49 whereby the tubes will function as springs constantly urging the flanges 34 on the front walls of the burners against the edges of the flanges of the stationary rails. Needle valves 23 control communication between the tubes 48 and the respective burners, and in the pipe line 50 connecting the storage tank 45 with the distributor 42 a shut-off valve 51 is provided.

Fig. 7 discloses a slightly different mounting for the burner and in this figure the burner is generally designated 16a and comprises the receptacle 24a including the wicking and other parts as previously described. However, the receptacle 24a of the burner 16a has its front wall 32a carried upwardly and then bent over to provide a relatively long flange 52 adapted to overlie and engage the flange of the rail to which the burner is to be applied. This flange 52 will act as a means to limit movement of the burner in a direction laterally of the rail as in the case of the flange 34 of the burner first described and the flange 52 further serves to support the burner 16a vertically against the underside of the rail. A spring 37 may or may not be applied to the burner 16a as desired.

From the foregoing it will be clear that a single distributing pipe may be located intermediate the rails of the switch as in Fig. 1 or that a distributing pipe may be located at the outer side of each stationary rail of the switch as in Fig. 2. Further, it will be clear that a series of adjacent switches equipped with burner apparatus as disclosed may be fed from a single tank or drum and that such tank or drum might be elevated so as to have the fuel fed by gravity or might be equipped with a small compressor or the like so that a head of air could be maintained in the tank to feed the oil. For each switch there is a cut-off valve which may be of the type of the valve 51 and in addition there is a needle valve 23 for each burner.

The burners are preferably located between cross ties as shown in the drawings and they are definitely located by bringing their flanges 34 or 52 against the outer edges of the flanges of the stationary rails. The springs 37 may be used or may be omitted if desired and other suitable supporting means may replace them. It will be clear that since each of the lateral or feed tubes is doubled upon itself to form a loop the said tubes will act as springs constantly urging the flanges (either 34 or 52) of the burners against the flanges of the rails so that the burners are held in their proper location.

Since each burner is located at the under side of a rail and preferably with the upper edges of its side walls in engagement with the undersurface of a flange of a rail it will be clear that the entrance of rain or snow into the burners, particularly when the burners are not in operation, is prevented. When a burner is in operation the control valve for the other burners of that particular switch is open and the needle valve of the various burners are adjusted as desired.

As the burner operates air to support combustion enters through the openings or slot 35 and passes through the burner across the upper side of the cover 26. Vaporized oil passing upwardly through the openings or slots 30 of said cover mixes with this air whereby a combustible mixture results and as this mixture burns (see Fig. 4) a portion 53 of the flame directly engages the flange of the rail 13 against which the burner is disposed and other portions of the flame passing out through the open upper portion of the rear end of the burner as suggested at 54 and 55 may pass upwardly between the rail 13 and the adjacent split rail 15 and also directly engages the said adjacent split rail. Due to the ability of the rails

to conduct heat they will be kept well above freezing temperature in the zone of the switch and the latter will be kept free of snow and ice. It will be appreciated that the air entering through the openings or slots 35 in the front wall of the burner sets up a draft across the upper side of the cover 26 whereby to assist in carrying the flame outwardly through the upper portion of the rear end of the burner as suggested by the flames 54 and 55. The entire burner including the wicking 29 will be heated by the flame and the oil will be vaporized.

Having thus set forth the nature of my invention, what I claim is:

1. In a railroad switch heater, a distributing pipe, burners spaced along the switch and receiving fuel oil from said pipe, each of said burners disposed at the under side of a rail of the switch and of a length equal to the width of the flange of said rail and having its entire upper side open, and means supporting said burners with their open upper sides against and closed by the flange of said switch rail whereby the flame of each burner directly engages said rail and the entrance of rain or snow into the burner through its open upper side is prevented.

2. In a railroad switch heater, a distributing pipe, burners spaced along the switch and receiving fuel oil from said pipe, each of said burners disposed at the under side of a rail of the switch and of a length equal to the width of the flange of said rail and having its entire upper side open, means supporting said burners with their open upper sides against and closed by the flange of said switch rail whereby the flame of each burner directly engages said rail and the entrance of rain or snow into the burner through its open upper side is prevented, said supporting means comprising a spring at the under side of each burner and constantly pressing the same in the direction of the rail, and each of said springs of U-shape and having one arm secured to the burner and having its other arm bearing against the road bed beneath the burner.

3. In a railroad switch heater, a burner disposed at the under side of and against a rail of the switch, a U-shaped spring having one arm secured to said burner and having its other arm pressing against the road bed beneath the burner whereby the spring is constantly urging the burner against said rail, and an anchoring extension on said other arm of the spring and embedded in the road bed beneath the burner.

4. In a railroad switch heater, a distributing pipe, burners spaced along the switch, tubes connecting the burners with said pipe for the supply of fuel oil to the burners, each of said burners including a portion engaging a rail of the switch and a shoulder engaging the edge of the rail flange, a loop in each of said tubes whereby the latter form spring means yieldingly holding the shoulder against the rail, and a U-shaped spring under each burner having one arm resting on the road bed and supporting the burner against the underside of the rail.

5. In a railroad switch heater, a distributing pipe extending lengthwise of a switch between the rails thereof, spaced burners at the outer sides of the rails of the switch, tubes connecting said burners with the pipe for supplying fuel oil to the burners, each of said burners including a shoulder engaging an edge of the flange of a rail of the switch, a loop in each of said tubes whereby the latter form spring means yieldingly holding the shoulder against the rail, and a U-shaped spring under each burner having one arm resting on a support under the burner for supporting it against the underside of the rail.

6. In a railroad switch heater, a pair of distributing pipes extending lengthwise of the switch and arranged at the opposite outer sides thereof, burners spaced along the opposite outer sides of the switch tubes connecting the burners at the respective sides of the switch with the pipes at such sides of the switch, each of said burners including a shoulder engaging an edge of the flange of a rail of the switch, a loop in each of said tubes whereby the latter form spring means yieldingly holding the burner against the rail, and a U-shaped spring support under each burner having one arm resting on the road bed to support the burner against the under side of the rail.

7. In a burner for a railroad switch heater, a receptacle having side and end walls and open at the top so that it may be mounted with the top edges of the side walls engaging the underside of the rail flange, wicking in the lower portion of said receptacle, means for supplying fuel oil to said wicking, and said receptacle being open above the wicking through its rear end, the front end wall being extended above the side walls to engage an edge of the rail flange and having an air inlet opening below said flange so that the flame impinges on the rail flange and passes out said rear opening.

8. In a burner for a railroad switch heater, a receptacle open at its upper side and the upper portion of its rear end, means for supporting the burner with the upper edges of the side walls against the underside of a rail, wicking in the lower portion of said receptacle, means supplying fuel oil to said wicking, a cover over and spaced from said wicking and also spaced below the rail, said cover having openings therein for the escape of vaporized oil from the wicking, and the front wall of said receptacle extending above the side walls to engage an edge of the rail flange and having an air inlet opening in its upper portion above said cover.

9. In a railroad switch heater, a distributing pipe, burners spaced along the switch, tubes connecting the burners with said pipe for the supply of fuel oil to the burners, each of said burners including a flange portion overlying and engaging on the upper surface of the flange of a rail of the switch, a loop in each of said tubes whereby the latter form spring means yieldingly holding the burner flange against the rail with said flange overlying the rail flange and supporting the burner, and a U-shaped spring under the burner having one arm resting on the road bed to support the spring against the underside of the rail.

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