United States Patent

Patterson et al.

[15] **3,697,746**

[45] **Oct. 10, 1972**

[54] **RAILROAD SWITCH HEATER**

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[73] Assignee: **Vapor Corporation,** Chicago, Ill.

[22] Filed: **May 26, 1971**

[21] Appl. No.: **147,085**

[52] **U.S. Cl.** .....**246/428,** 126/271.2 B

[51] **Int. Cl.** **E01b 7/24**

[58] **Field of Search**.....246/428, 444; 126/271.2 B

[56] **References Cited**

UNITED STATES PATENTS

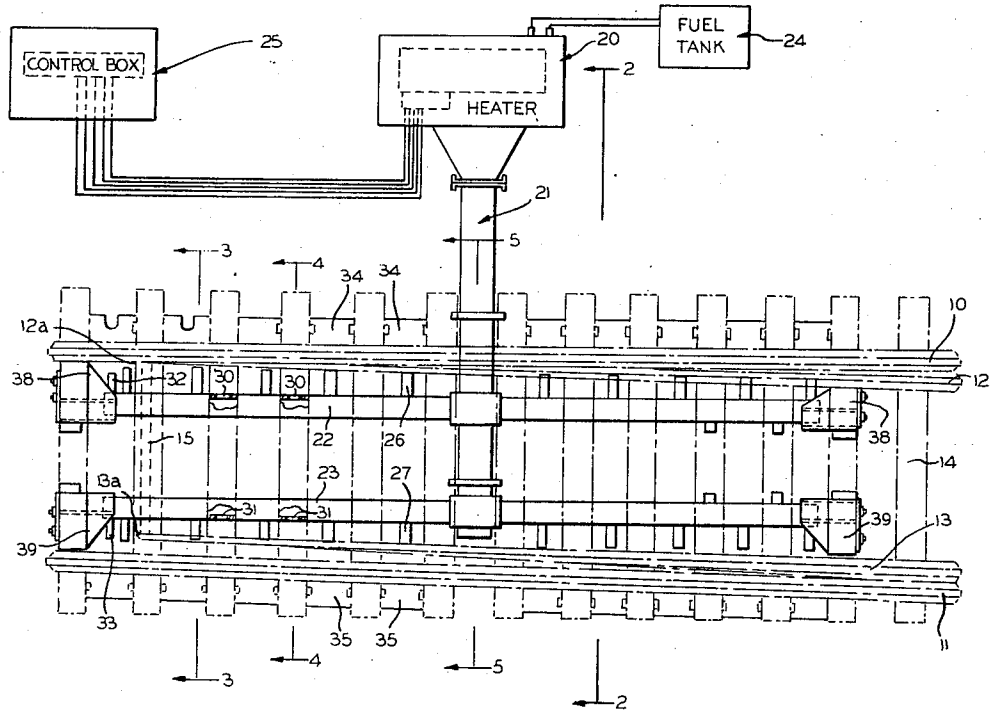
1,325,977	12/1919	Boardman	246/428
1,778,637	10/1930	Hollinger	126/271.2 B X
1,803,358	5/1931	Schumann	246/428
3,312,820	4/1967	Watkins	246/428

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Assistant Examiner—Frank E. Werner
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[57] **ABSTRACT**

A heater for a railroad track switch using forced hot air to heat the area between the moving and fixed rails to maintain the area free of ice and snow, and to heat the side plates and maintain them free of ice and snow, including duct work and distribution outlets for distributing hot air evenly over the entire switch length in the areas where the elimination of snow and ice will permit the movable rails to operate freely and easily.

5 Claims, 6 Drawing Figures

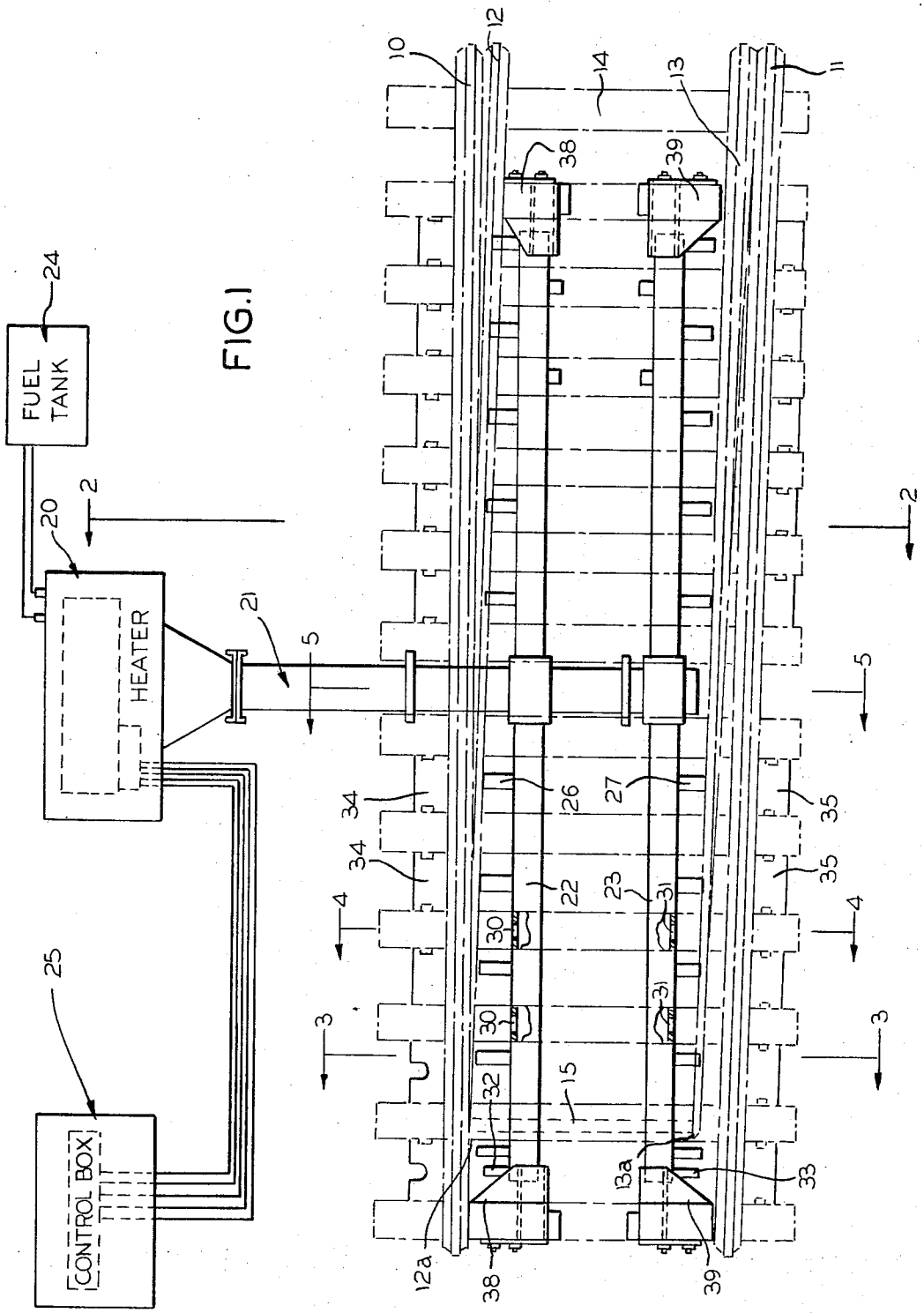


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SHEET 1 OF 2

FIG. 1



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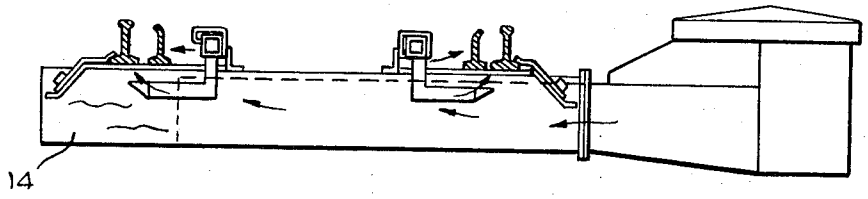


FIG.2

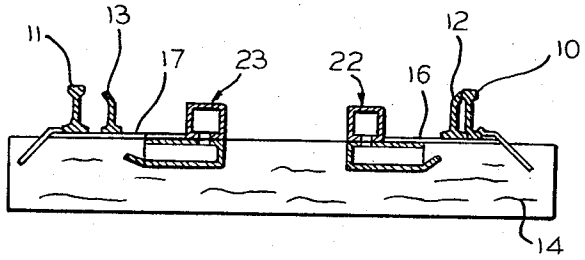


FIG.3

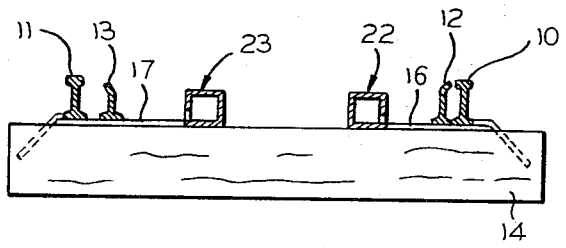


FIG.4

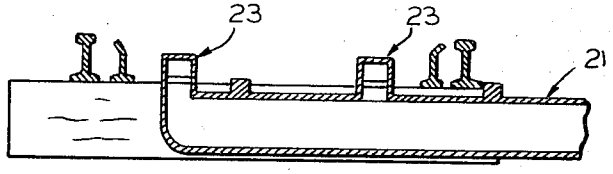


FIG.5

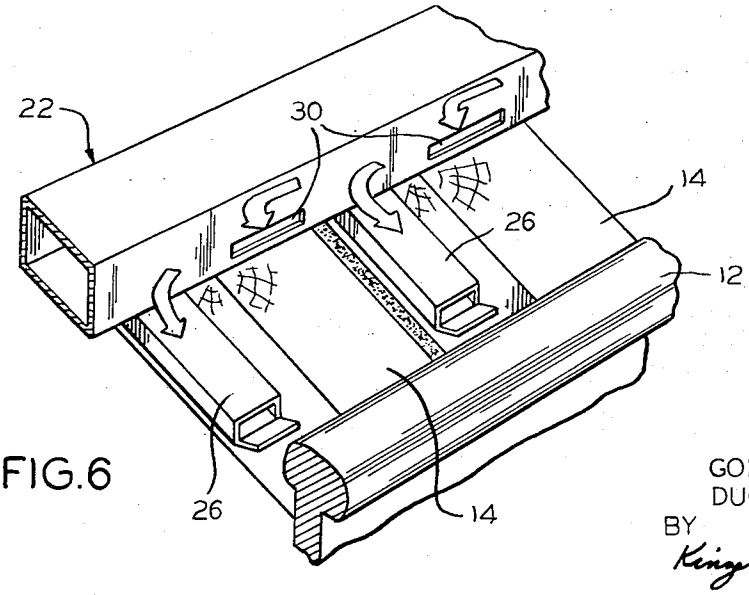


FIG.6

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RAILROAD SWITCH HEATER

This invention relates in general to a railroad switch heater, and more particularly to a switch heater capable of efficiently maintaining a switch free of ice and snow for easy operation.

Heretofore, many different types of railroad track switch heaters have been developed, such as the one disclosed in U.S. Pat. No. 3,223,835. However, none has been completely satisfactory from the standpoint of efficiency and substantially faultless operation. For example, the switch heater in the aforesaid patent includes means for heating the outer surfaces of the fixed or stock rails which constitutes a wastage of energy inasmuch as the operable problems of a switch reside in the movability of the movable rails which are arranged inside of the fixed rails. It, therefore, becomes necessary when applying heat to the outer surfaces of the fixed rails to penetrate the fixed rails before melting ice and/or snow between the fixed and movable rails.

The present invention overcomes the heretofore encountered inefficiencies in applying forced hot air directly between the fixed and movable rails and at the slide plates where the removal of ice and/or snow assures proper operation of the switch. Further, crib plates or baffles are provided between the ties at the outer sides of the switch for preventing the escape of forced hot air, thereby utilizing to the fullest extent the entire energy of the heater for maintaining the switch free of ice and snow. The switch heater of the invention includes any suitable means for producing forced hot air, a duct system for carrying the forced hot air to the proper locations for distribution, and distribution outlets, including nozzles and openings, in the duct system for directing the forced air between the movable rails and the fixed rails, and at the slide plates. Further, distribution outlets are provided for directing forced hot air to the switch points. Deflectors are provided at the opposite ends of the distribution ducts in order to deflect snow and/or debris carried by a train away from the switch track to prevent damage of the switch and distribution ducts.

It is, therefore, an object of the present invention to provide a new and improved railroad track switch heater for maintaining the switch free of ice and snow under all weather conditions.

Another object of this invention is in the provision of a railroad switch heater constructed to operate efficiently and to use forced hot air for melting snow and/or ice from the switch at the points where it is important to maintain the freedom of ice and/or snow so that the switch can operate easily and properly at all times.

Still another object of this invention is to provide a railroad switch heater capable of distributing forced hot air between the movable and fixed rails, and against the slide plates to maintain the freedom of movement of the movable rails under all weather conditions.

A further object of the invention is in the provision of a railroad switch heater that may be easily installed, which operates efficiently, and which requires little maintenance.

Other objects, features and advantages of the invention will be apparent from the following detailed disclosure, taken in conjunction with the accompanying sheets of drawings, wherein like reference numerals refer to like parts, in which:

FIG. 1 is a top plan view of a railroad track switch shown in phantom, and the switch heater according to the invention shown in solid, as applied to the switch;

FIG. 2 is a cross sectional view taken substantially along line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken substantially along line 3—3 of FIG. 1 and illustrating the hot air distribution nozzles;

FIG. 4 is a cross-sectional view taken substantially along line 4—4 of FIG. 1, and illustrating the hot air openings in the distribution ducts;

FIG. 5 is a cross-sectional view taken substantially along line 5—5 of FIG. 1 and illustrating the connections between the cross tract duct and the distribution duct; and

FIG. 6 is a fragmentary, perspective view of one side of a distribution duct showing the hot air distribution nozzles and hot air openings.

The switch heater of the invention is illustrated in the drawings in mounted relation with respect to a railroad track switch which includes outer fixed or stock rails **10, 11** and inner movable rails **12,13**, mounted on a plurality of ties **14** in the usual manner. Switch rod **15** extends between the movable rails **12, 13** adjacent the points **12a, 13a**, and are suitably connected to a switch actuator (not shown) for moving the switch points. Slide plates **16, 17** are mounted on the ties upon which the movable rails slide.

The switch heater of the invention includes generally a heater **20** capable of generating forced hot air and delivering same to a cross track duct **21** that extends beneath the switch at about the central area of its longitudinal dimension. Longitudinally extending distribution ducts **22, 23** arranged at the inner sides of the movable rails **11**, and extending substantially the entire length of the switch are connected to the cross tract duct **21** as seen in FIG. **5**. Accordingly, forced hot air flows first through the cross duct **21** and then into the distribution ducts **22, 23**. Fuel is delivered to the heater from fuel tank **24**, and electric power together with controls is supplied through a control box **25**.

Forced hot air is distributed evenly along the switch track, and hot air distribution nozzles **26, 27** are provided in spaced relation along ducts **22, 23**, between adjacent ties and below the top surfaces thereof to direct forced hot air from below upwardly into the area between the movable rails **12, 13** and the stock rails **10, 11** to melt snow and ice there or prevent the accumulation of same. The volume of heated air is such that it will evaporate the moisture in this area and keep the area clear so that the switch is easily movable.

Further, hot air distribution outlets **30, 31** are provided in the distribution ducts at the upper surface of each tie for the purpose of directing forced hot air outward against the slide plates **16, 17** of the switch, thereby keeping these plates free of ice and snow to further assure easy movement of the movable rails, while point end nozzles **32, 33** are mounted at the ends of the ducts **22, 23** to direct forced hot air against the switch points. Further, the switch rod is maintained free of ice and snow.

In order to prevent the escape of heated air to the outside of the stock rails, crib plates or baffles **34, 35** are provided between the ties at the outside of the fixed rails effectively blocking the forced air from travelling

between the ties and outside of the fixed rails. These crib plates further assure efficiency of operation and full utilization of the forced hot air.

Since trains often carry large deposits of snow and other debris, which ma fall upon the track switch, deflectors **38, 39** are provided at the opposite ends of the switch and the distribution ducts **22, 23** to reduce the possibility of snow and/or debris from being carried onto the switch which might damage the switch and/or the distribution ducts.

The heater **20** for generating forced hot air may be of any suitable type, manually or automatically operable, and preferably mounted remotely or laterally of the switch, as illustrated. The heater may be oil or gas fired and would utilize a blower to force hot air or combustion gases into the duct system. Should it be desired that the heater operate automatically, it may respond to a snow detector so that when moisture and a temperature below 35° is detected, the heater will automatically operate to maintain the areas between the movable and stock rails free of ice, snow and moisture to facilitate switch operation. If the heater be manually operable, the controls may be remotely located or mounted directly on the heater.

From the foregoing, it will be appreciated that the switch heater of the present invention is constructed to maintain a switch free from ice and snow so that it can easily and properly function during all weather conditions, it being appreciated that the heater does not function to heat the stock or moving rails but only the areas where the collection of ice and snow would impair the operation of the switch.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention, but it is understood that this application is to be limited only by the scope of the appended claims.

This invention is hereby claimed as follows:

1. A heater for a railroad switch having a pair of fixed outer stock rails and a pair of inner movable rails therebetween mounted on a series of ties and slide plates on said ties upon which the movable rails slide, said heater comprising means mounted adjacent the switch for producing forced hot air, a cross track duct extending from said heater beneath said switch and between a pair of adjacent ties, longitudinally extending distribution ducts mounted on the ties between and adjacent to the movable rails, means connecting said distribution ducts to said cross track duct, and a plurality of hot air distribution nozzles extending outwardly from said distribution ducts between adjacent ties and below the upper surface thereof, distributing hot air under the movable rails and between the movable rails and the stock rails.

2. The combination as defined in claim **1**, and a plurality of hot air distribution openings in said distribution ducts distributing hot air outwardly to the slide plates.

3. The combination as defined in claim **2**, and point end nozzles extending outwardly from the ends in said distribution ducts at the switch points distributing hot air to the points.

4. The combination as defined in claim **3**, and deflectors at each of the ends of the distribution ducts for deflecting snow and/or debris carried by a train away from the switch.

5. The combination as defined in claim **3**, and crib plates between the ties at the outside of the fixed rails to prevent hot air from escaping.

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