D. F. VAUGHAN.

SWITCH HEATING DEVICE.

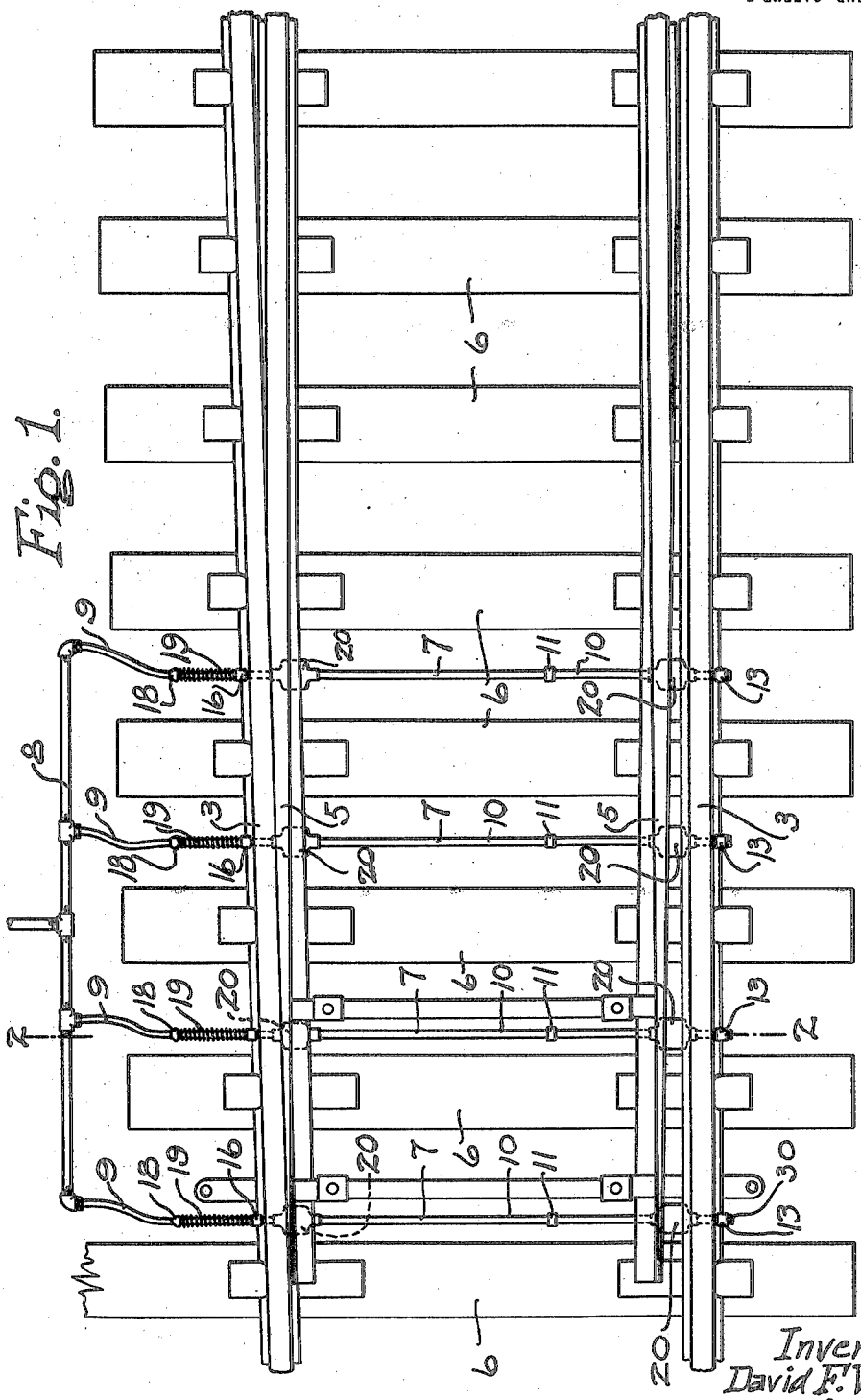
APPLICATION FILED MAR. 23, 1918.

1,273,291.

Patented July 23, 1918.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

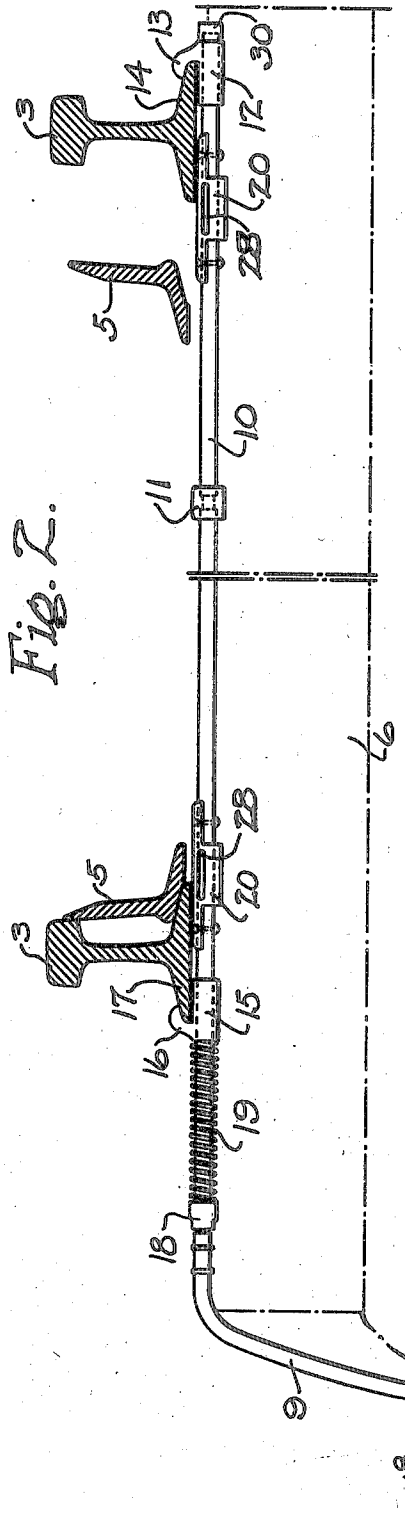


Fig. 4.

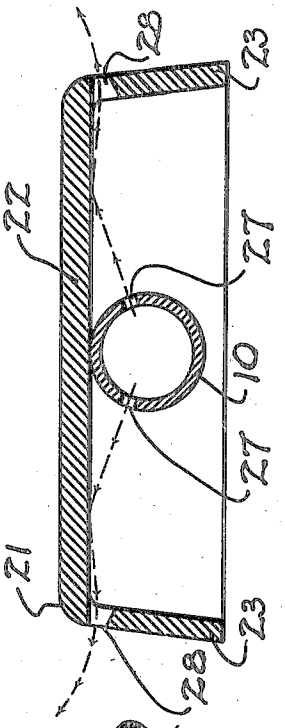
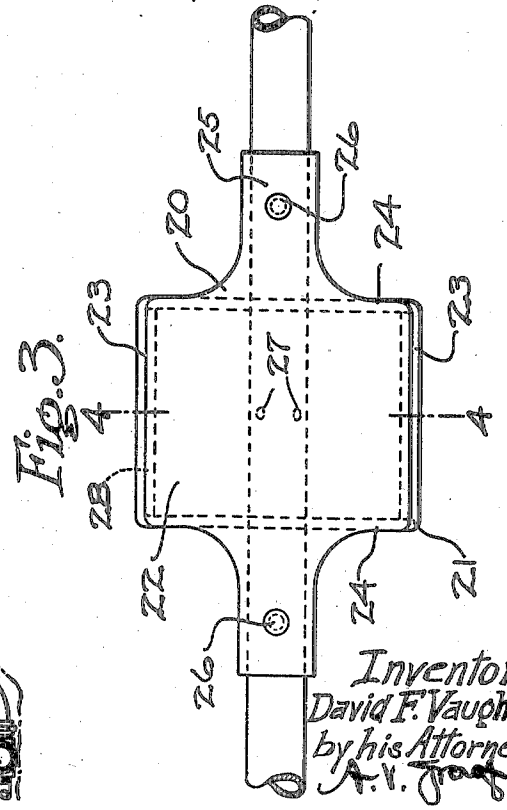


Fig. 3.



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UNITED STATES PATENT OFFICE.

DAVID F. VAUGHAN, OF RIVERTON, NEW JERSEY.

SWITCH-HEATING DEVICE.

1,273,291. Specification of Letters Patent. Patented July 23, 1918.

Application filed March 23, 1918. Serial No. 224,117.

To all whom it may concern:

Be it known that I, DAVID F. VAUGHAN, a citizen of the United States, residing at Riverton, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Switch-Heating Devices, of which the following is a specification.

My invention relates to improvements in means to protect railroad structures from ice and snow at desired points to insure the proper functioning of switches, movable point frogs and other mobile or stationary parts necessary in the operation of railroads.

The object of my invention is: first, to provide a novel, simple and efficient device, including a fuel burner or burners which may be readily applied to and removed from railroad structures and which when in service will melt snow as rapidly at it reaches and tends to accumulate in the regions protected by the device and which will prevent the formation of ice in the protected regions; second, to provide a novel means to prevent wind or the draft induced by rapidly moving trains from extinguishing the flame at the burner or burners; third, to provide a novel device constructed of relatively movable units connected by flexible parts to a common source of fuel supply so that the units may be properly distributed throughout switches of varying lengths, and so that the units may be supported by the track rails while the source of fuel supply is supported independently of the rails without detriment to the connections occasioned by the vibrations of the track rails; fourth, to provide a device having electrically insulated end portions adapted to be supported by the track rails to avoid short-circuiting where rails are used as conductors for use in connection with signals or for other purposes.

With the above and related objects in view, my invention consists in the novel construction, arrangement and combination of parts hereinafter described and claimed.

In the accompanying drawings, illustrating my invention,

Figure 1 is a plan of a portion of a railroad structure showing a switch provided with a protecting device embodying my invention.

Fig. 2 is a transverse section of the railroad structure and protecting device, enlarged and partly broken away, on line 2—2 of Fig. 1.

Fig. 3 is a plan of one of the burners and adjuncts.

Fig. 4 is a transverse section of one of the burners, on line 4—4 of Fig. 3.

Referring to the drawings, 3 designates the track rails, 5 the movable switch rails and 6 the cross ties supporting the rails of a railroad switch, the construction and operation of which are well known to persons skilled in this art.

My improved device, as herein illustrated, comprises a series of heating units 7, a common pipe or source of fuel supply 8 for the units, and flexible connections 9 between the units 7 and the source of fuel supply 8. The units 7 extend transversely of the railroad track between the ties 6 and through and between the spaces beneath the respective track and switch rails 3 and 5.

The body portion of each unit 7 is formed by a fuel pipe 10 made in two sections which are arranged end to end and connected by a suitable insulating coupling 11, to electrically insulate the two sections, the whole forming, in effect, a continuous pipe. One end portion of the fuel pipe 10 has a collar 12 fixed thereon and provided with a jaw 13 adapted to extend over and embrace the outer base flange 14 of one track rail 3; and the other end portion of the fuel pipe 10 has a collar 15 which is slidable longitudinally thereon and provided with a jaw 16 adapted to extend over and embrace the outer base flange 17 of the other track rail 3. The fuel pipe 10 extends outwardly from the collar 15 and has a collar 18 fixed thereon. Encircling the outwardly extending end of the pipe 10 between the collars 15 and 18 is a spring 19 which forces the collar 15 and its jaw 16 toward the collar 12 and its jaw 13 and thereby causes the jaws 13 and 16 to grip the rail base flanges 14 and 17, respectively, in a manner to cause the track rails 3 to support the unit and to prevent its displacement thereon. When the unit is applied to the rails 3, the jaw 13 is first hooked over the base flange 14, the collar 15 and its jaw 16 are then drawn back against the action of the spring 19 to permit the jaw 16 to be raised into position to engage the base flange 17. The collar 15 and its jaw 16 are then released and the spring 19 forces the

jaws 13 and 16 toward each other and into firm engagement with the rail base flanges 14 and 17. The unit may be easily and quickly removed from the track rails by a reversal of the operation just described.

Each pipe 10 is provided with two fuel burners 20 each of which is constructed as follows: Embracing the pipe 10 is a box-like guard 21 having a top wall 22, side walls 23 and end walls 24 and having an open bottom. The top wall 22 has outwardly projecting arms 25 which rest upon the pipe 10 and are secured thereto in any convenient manner. The means herein illustrated for this purpose consists of rivets 26 which penetrate the arms 25 and pipe 10. The respective sides of the pipe 10, within the guard 21 have upwardly and outwardly diverging fuel discharging openings 27, each of which is arranged to direct a fuel burning flame therefrom toward the top wall 22 of the guard 21 in a manner to cause the flame to impinge against the wall 22 and to be thereby deflected toward the adjacent side wall 23 and through a flame discharging slot or opening 28 therein, so that a flame of burning fuel will be projected from the respective sides of the burner 20.

The burners 20 are arranged beneath the main and switch rails 3 and 5, respectively, in such position that when one switch rail 5 is closed against one main rail 3 and the other switch rail 5 is open or spaced from the other main rail 3, the tongues of flame from the respective sides of the burners 20 will be projected against the bottom of the closed switch rail 5 and the adjacent main rail 3, and up through the space between the open switch rail 5 and the adjacent main rail 3, thereby heating the main and switch rails 3 and 5 and the space between the open switch rail 5 and the adjacent main rail 3, and thus melting any snow that may fall upon the rails or within the space between the open switch rail and adjacent main rail, and preventing the formation of ice in the heated regions. When the units 7 of a series are arranged between each two adjacent ties at the pointed end portions of the switch rails 5, as clearly shown in Fig. 1, the entire region between each two adjacent burners 20 and for some distance beyond the burners of the outer units 7 of the series, in the direction of the rails 3 and 5, will be heated sufficiently to keep the switch free from ice and snow in the parts thereof which are, in the absence of the heat, crippled or rendered inoperative when snow falls or ice tends to form upon and about the parts of the switch.

I have discovered that a burner constructed as hereinbefore described will not only effectually keep the switch free from ice and snow sufficiently to preserve the proper functioning thereof in all kinds of weather, but also that it will successfully resist the tendency of wind and draft induced by rapidly moving trains from extinguishing the flame of burning fuel.

The end of each pipe 10 adjacent to its jaw 13 is closed by a suitable head 30, and the other end thereof is suitably connected to the inner end of the connection 9 which is a flexible pipe. The outer ends of the flexible pipes 9 are connected to the fuel supply pipe 8 which is common to the units 7 of the series and through which fuel, preferably gas under pressure, may be supplied to the units 7 and the burners 20 thereof.

The pipe 8 may be supported in any convenient manner independently of the rails, and, when so supported, the flexible connections 9 will permit the rails 3 and 5 to vibrate as usual under the influence of passing trains without disturbing the connection between the units 7 and the source of fuel supply.

The employment of the insulating connection 11 between the two sections of the pipe 10 prevents short-circuiting when the rails 3 are used as electrical conductors for any useful purpose. When the rails are not used as electrical conductors the insulating coupling 11 may be omitted.

The side walls 23 of the box-like guard 21 are set at an incline, as illustrated, to direct the wind, blowing horizontally, upwardly past the openings 28 and thus prevent the force of the wind from accumulating in the region of the openings 28 as would otherwise occur if the walls 23 were vertical; and I preferably incline the walls 23 downwardly and outwardly from the top of the guard 21 to direct the wind upwardly from the open bottom thereof, all for the purpose of preventing the flame of burning fuel from being extinguished.

I claim:—

1. In a device of the character described, the combination with a railroad structure including a rail, of a fuel pipe adjacent to said rail, a fuel burner communicating with said pipe and carried thereby adjacent to said rail, and means supported by said rail and supporting said pipe.

2. In a device of the character described, the combination with railroad rails and cross ties supporting the same, a fuel pipe extending between adjacent ties and transversely beneath said rails, a fuel burner communicating with said pipe and carried thereby adjacent to one of said rails and means for clamping said pipe to said rails.

3. In a device of the character described, the combination with railroad rails and cross ties supporting the same, a fuel pipe extending between adjacent ties and transversely beneath said rails, a fuel burner communicating with said pipe and carried thereby adjacent to one of said rails, clamp-

ing jaws carried by said pipe and adapted to engage said rails, and means operative to move said jaws relatively to each other to clamp the device to said rails.

4. In a device of the character described, the combination with railroad rails and cross ties supporting the same, a fuel pipe extending between adjacent ties and transversely beneath said rails, a fuel burner communicating with said pipe and carried thereby adjacent to one of said rails, a jaw fixed on said pipe and adapted to engage one of said rails, a jaw movable on said pipe toward and from the other jaw and adapted to engage the other of said rails, and means operative to move said jaws relatively to each other to clamp the device to said rails.

5. In a device of the character described, the combination with railroad rails and cross ties supporting the same, a fuel pipe extending between adjacent ties and transversely beneath said rails, a fuel burner communicating with said pipe and carried thereby adjacent to one of said rails, a jaw fixed on said pipe and adapted to engage one of said rails, a jaw movable on said pipe toward and from the other jaw and adapted to engage the other of said rails, a collar fixed on said pipe in spaced relation to said movable jaw, and a spring interposed between said movable jaw and said collar and operative to move said jaws relatively to each other to clamp the device to said rails.

6. In a device of the character described, the combination with railroad rails and cross ties supporting the same, a fuel pipe extending between adjacent ties and transversely beneath said rails, a fuel burner communicating with said pipe and carried thereby adjacent to one of said rails, and means for clamping said pipe to said rails, said pipe being formed in two sections electrically insulated from each other.

7. In a device of the character described, the combination with railroad rails and cross ties supporting the same, a plurality of fuel pipe units extending separately between adjacent ties and transversely beneath said rails, fuel burners communicating with said units and carried thereby adjacent to said rails, means for clamping said units to said rails, and a common fuel supply pipe connected to said units for supplying fuel thereto.

8. In a device of the character described, the combination with railroad rails and cross ties supporting the same, a plurality of fuel pipe units extending separately between adjacent ties and transversely beneath said rails, fuel burners communicating with said units and carried thereby adjacent to said rails, means for clamping said units to said rails in different positions relatively to each other, a fuel supply pipe common to said units for supplying fuel thereto, and flexible pipes connecting said supply pipe and said units.

9. In a device of the character described, the combination with a railroad structure including a rail, of a fuel burner supported adjacent to said rail and comprising a pipe having a fuel discharging opening therein, and a guard intersecting the axis of said opening and spaced therefrom in such close relation thereto that the flame from said opening will impinge against said guard.

10. In a device of the character described, the combination with a railroad structure including a rail, of a fuel burner supported adjacent to said rail and comprising a pipe having a fuel discharging opening therein, and a guard extending adjacent to said opening and having a flame discharging opening therein out of alinement with said fuel discharging opening, said guard having a wall spaced from said fuel discharging opening and extending at an angle to the axis thereof and in such close relation thereto as to cause a flame from the fuel discharging opening to impinge against said wall and to be thereby directed to and through the flame discharging opening.

11. In a device of the character described, the combination with a railroad structure including a rail, a fuel pipe supported below said rail and having a fuel discharging opening therein, and a box-like guard having an open bottom and inclosing said pipe and the opening therein and having a flame discharging opening, said guard having a wall spaced from said fuel discharging opening and extending at an angle to the axis thereof and in such close relation thereto as to cause a flame from the fuel discharging opening to impinge against said wall and to be thereby directed to and through the flame discharging opening.

12. In a device of the character described, the combination with railroad rails and cross ties supporting the same, a fuel pipe extending between adjacent ties and transversely beneath said rails and having fuel discharging openings therein, a jaw fixed on said pipe and adapted to engage one of said rails, a jaw movable on said pipe toward and from the other jaw and adapted to engage the other of said rails, a collar fixed on said pipe in spaced relation to said movable jaw, a spring interposed between said movable jaw and said collar and operative to move said jaws relatively to each other to clamp the device to said rails, and box-like guards having open bottoms and inclosing said pipe and the openings therein, said guards having flame-discharging opening therein.

13. In a device of the character described, the combination with a railroad structure including a rail, of a fuel pipe adjacent to said rail, a fuel burner communicating with

said pipe and carried thereby adjacent to said rail, means supported by said rail and supporting said pipe, a fuel supply pipe supported adjacent to said rail, and a flexible connection between said pipes.

14. In a device of the character described, the combination with railroad rails and cross ties supporting the same, an element extending from one to the other of said rails, means for clamping said element to said rails, and a heating device carried by said element.

15. In a device of the character described, the combination with railroad rails and cross ties supporting the same, an element extending from one to the other of said rails, yielding means for clamping said element to said rails, and a heating device carried by said element.

16. In a device of the character described, the combination with a railroad structure, including a rail, of a fuel burner supported adjacent to said rail and comprising a pipe having a fuel discharging opening therein, and a box-like guard, having an open bottom and inclosing said pipe and the opening therein, said guard having a top wall and an inclined side wall having a flame discharging opening therein and extending downwardly from the top wall.

17. In a device of the character described, the combination with a railroad structure, including a rail, of a fuel burner supported adjacent to said rail and comprising a pipe, having a fuel discharging opening therein, and a box-like guard, having an open bottom and inclosing said pipe and the opening therein, said guard having a top wall and an inclined side wall extending downwardly and outwardly from the top wall.

In testimony whereof I affix my signature hereto.

DAVID F. VAUGHAN.