No. 878,566. PATENTED FEB. 11, 1908.

F. G. SHAW.

MEANS FOR KEEPING SWITCHES CLEAR FROM SNOW AND ICE.

APPLICATION FILED SEPT. 16, 1907.

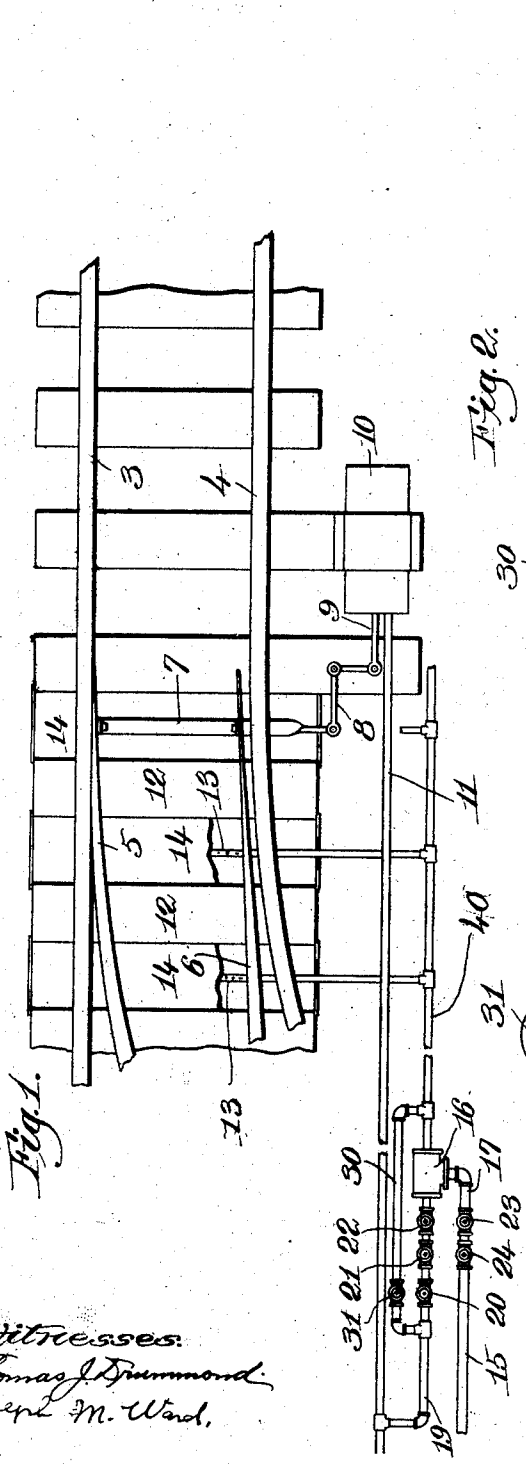

Fig. 1.

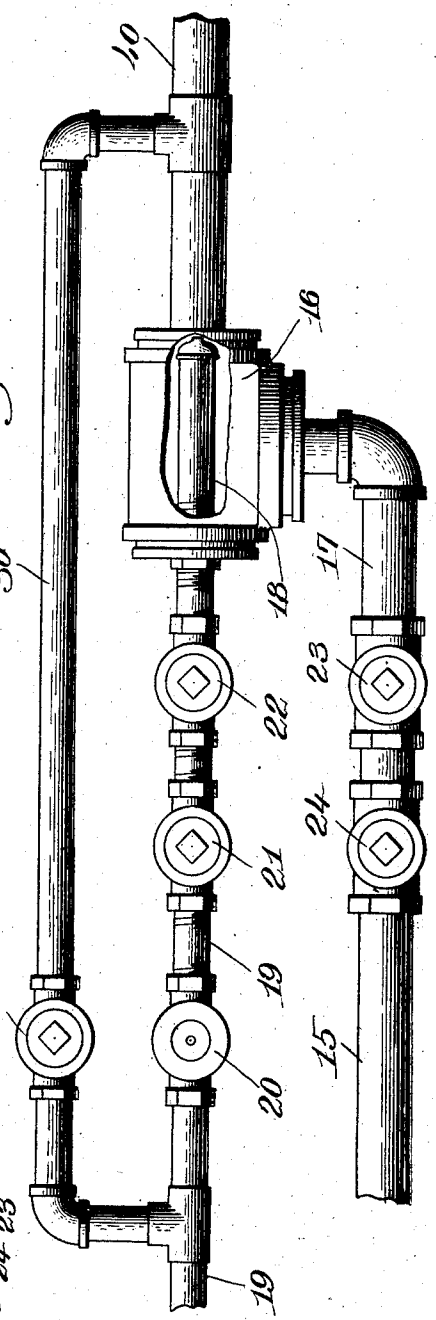

Fig. 2.

Witnesses:
Thomas J. Drummond.
Joseph M. Ward.

Inventor.
Francis G. Shaw,
by Crosby & Gregory
Attys.

UNITED STATES PATENT OFFICE.

FRANCIS G. SHAW, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE INTERNATIONAL SWITCH & SIGNAL COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

MEANS FOR KEEPING SWITCHES CLEAR FROM SNOW AND ICE.

No. 878,566. Specification of Letters Patent. Patented Feb. 11, 1908.

Application filed September 16, 1907. Serial No. 393,056.

To all whom it may concern:

Be it known that I, FRANCIS G. SHAW, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Means for Keeping Switches Clear from Snow and Ice, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention relates to a device for keeping railway switches free from snow and ice, and is designed as an improvement upon the devices such as are shown in my Patents No. 834,327, dated October 30, 1906, and No. 856,184 dated June 4, 1907. In the devices shown in said patents a burner chamber is arranged between the ties beneath the switch, in which burner chamber a gas burner is placed so that when the burner is lighted the heat generated thereby will keep the movable parts of the switch warm enough to prevent them from becoming clogged with snow or ice.

My present invention has for its object to provide a novel construction for handling the gas used for heating purposes and feeding it to the burner pipe, and also a novel construction for cleaning the burner pipe whenever such action is necessary.

In the embodiment of the invention herein shown an air jet is used for sucking or drawing the gas from the conduit into the burner pipe, and the air for operating said jet is preferably taken from the air pipes of the pneumatic switch-operating mechanism, provided such a switch-operating mechanism is employed. This construction has the advantage that a supply of gas may always be secured for the burner even though there is little or no gas pressure in the gas main.

In my present invention I have also provided means for blowing out the burner pipe to clean the latter by compressed air which may be taken from the air pipes of the pneumatic switch-operating mechanism.

In the drawings wherein I have illustrated one embodiment of my invention, Figure 1 is a plan view of a portion of a switch having my improvements applied thereto; Fig. 2 is an enlarged view of the piping for conducting the gas and air to the burner in accordance with my invention and for blowing out the burner when such action is necessary.

3 and 4 designate the main or stock rails of a railroad, and 5 and 6 are the movable switch rails. These switch rails are shown as being connected by a bar 7 which leads to one arm of a bell crank 8, the other arm of which is connected by a link 9 with a pneumatic switch-operating mechanism 10 of any suitable or usual construction. This pneumatic switch-operating mechanism may be of any suitable or usual construction, and is shown as connected to an air-supply pipe 11 which contains compressed air for operating the switch. The parts thus far described are or may be all as usually found in pneumatically-operated switches and form no part of my present invention.

Situated between the ties 12 that are located under the switch are a plurality of burner pipes 13 which are covered by suitable covers or hoods 14 all as shown in my said patents.

The gas which is burned in the burner pipes may be taken from a gas main 15 which may either be located above the ground or buried in the ground as desired.

In the devices shown in my said patents I have used an ordinary gas and air mixer for mixing the gas and air preparatory to delivering the mixture to the burner pipe. The mixer shown in each of said patents is of such a construction that as the gas is forced therethrough under pressure it draws in with it a sufficient quantity of air to make a proper combustible mixture. The difficulty with this kind of a gas mixer, which is very commonly used, is that no gas will be delivered to the burner pipe unless the gas is under pressure, and I have found that in equipping large railroad yards with my apparatus it is sometimes difficult to maintain sufficient pressure of gas at all of the burner pipes to cause the gas and air in proper quantities to be delivered thereto. To overcome this difficulty I make use in my present invention of an air jet for sucking or drawing the gas from the gas main and delivering the gas and air to the burner pipe. This construction has the advantage that the gas will be delivered to the burner pipe even though there is little or no pressure on the gas because said gas is sucked or drawn into the burner.

Referring to the drawings, and especially to Fig. 2, 16 is a closed suction chamber to which the gas pipe 17 is connected, said pipe leading to and connecting with the gas main

15, as shown in Fig. 1. Situated within the suction chamber 16 is a nozzle 18 which is connected to an air pipe 19, and leading from the suction chamber 16 is a distributing main 40 to which the gas burners 13 are connected. The end of the nozzle 18 is situated substantially at the outlet of the suction chamber or where the distributing main 40 joins therewith. With this arrangement whenever air under pressure is delivered from the nozzle 18 the jet of air thus delivered will create more or less suction within the suction chamber 16 and thus gas from the pipe 17 will be drawn into the chamber and mixed with the air delivered from the nozzle 18, the mixture being forced into the main 40 supplying the burner pipes 13. The air which is used for the air jet may be taken from any source, but where the switch is a pneumatically-operated one I prefer to connect the pipe 19 with the air pipe 11 of the pneumatic switch-operating mechanism so that the air which is used in the burner is drawn from the same source as that which is used to operate the switch.

With my arrangement as above described, the suction chamber 16 is what I have termed a closed chamber, that is, it has no air inlet beside the air supply pipe 19 and nozzle 18, and therefore all the air which is used for mixing with the gas to produce combustion enters the chamber through the nozzle 18 and is taken from the source of air supply which in this instance is the air pipe 11 by which the switch is operated.

Usually the air in the piping of the pneumatic switch-operating mechanism is under considerable pressure, and if such pressure is too great I propose to introduce in the pipe 19 a reducing valve 20 of any suitable or usual construction which will reduce the pressure to the desired point. Said pipe 19 may also have a shut off valve 21, and if desired another valve 22 of any suitable construction for regulating the amount of air to be delivered.

I have also shown a regulating cock or valve 23 in the gas pipe 17 by which the amount of gas delivered can be regulated, and if desired a shut off valve 24 may be used in the gas pipe in addition to the regulating valve 23. Said shut-off valve 24 is not essential however. With this construction a proper supply of air and gas properly mixed can always be maintained for the burner pipes regardless of the pressure of the gas, and this is an important feature because the efficacy of my device depends to some extent upon keeping the burners going continuously when it is necessary that the rails should be kept warm.

In order to clean the burner pipes and the burner apertures therein I have provided a by-pass 30 which connects at one end with the distributing pipe 40 and at the other end with the air pipe 19 at a point beyond the reducing valve 20, said by-pass having any suitable valve 31 therein.

By opening the valve 31 air under full pressure from the pipe 19 may be admitted to the distributing pipe 40 and thus to the several burner pipes 13 connected thereto, and such pressure will be sufficient to blow out any foreign matter which may be in the burner pipe or the burner apertures.

I propose to mount the nozzle 18 so that it will be capable of adjustment longitudinally of the chamber 16 whereby the discharge end of the nozzle can be moved nearer to or further from the outlet of the chamber. For this purpose the nozzle is shown as screw threaded into one end of the chamber 16 and as having an ordinary swivel connection with the valve 22.

In practice I consider one air and gas mixing device such as shown in Fig. 2 sufficient to supply several burner pipes 13 as seen in Fig. 1.

It is not essential to my invention that the air for operating the burner should be taken from the air pipes of the pneumatic switch-operating mechanism.

I have shown herein one embodiment only of my invention and have not attempted to illustrate all forms that it may assume.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a device for keeping railway tracks free from snow and ice, the combination with such track, of a burner pipe adjacent thereto, a closed suction chamber communicating with said burner pipe, a gas pipe communicating with the suction chamber, a source of air supply under pressure, and a continuous unbroken pipe connected to such source and leading into the suction chamber, said pipe terminating in a nozzle located within said suction chamber.

2. In a device of the class described, a switch and pneumatic switch-operating mechanism therefor, in combination with burner pipes placed between the ties, a suction chamber communicating with said burner pipes, a gas pipe communicating with the suction chamber, and a nozzle within the suction chamber communicating with the air pipe of the pneumatic switch-operating mechanism.

3. In a device of the class described, a switch and pneumatic switch-operating mechanism therefor in combination with burner pipes placed between the ties, a distributing pipe connected to said burner pipes, a suction chamber connected to said distributing pipe, a gas pipe communicating with the suction chamber, and a nozzle within the suction chamber communicating with the air pipe of the pneumatic switch-operating mechanism, the end of said nozzle being

situated adjacent the outlet of the suction chamber.

4. In a device of the class described, a switch and pneumatic switch-operating mechanism therefor in combination with burner pipes placed between the ties, a distributing pipe connected to said burner pipes, a suction chamber connected to said distributing pipe, a gas pipe communicating with the suction chamber, a nozzle within the suction chamber, a pipe connecting said nozzle with the air pipe of the pneumatic switch-operating mechanism, and a reducing valve in said pipe.

5. In a device of the class described, the combination with a distributing pipe and burner pipes connected thereto, of a suction chamber connected to said distributing pipe, a gas pipe leading to the suction chamber, an air jet nozzle within the suction chamber, an air supply pipe communicating with said nozzle, and a by-pass connecting said air supply pipe with the distributing pipe.

6. In a device of the class described, a switch and its pneumatic operating mechanism, in combination with burner pipes adjacent the movable parts of the switch, means to deliver gas and air to the burner pipes, and means connected with the air pipes of the pneumatic switch-operating mechanism to introduce air to the burner pipes for cleaning the latter.

7. In a device for keeping switches clear from snow and ice, the combination with a switch and pneumatic means for operating the same, of a burner pipe adjacent said switch, a suction chamber communicating with said pipe, means to deliver gas to the suction chamber, and a pipe connected with said pneumatic means and leading into said chamber, said pipe terminating in a nozzle.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

FRANCIS G. SHAW.

Witnesses:
LOUIS C. SMITH,
MARGARET A. DUNN.