

No. 856,184.

PATENTED JUNE 4, 1907.

F. G. SHAW.
MEANS FOR KEEPING SWITCH AND SIGNAL APPARATUS FREE FROM SNOW
AND ICE.

APPLICATION FILED NOV. 8, 1906.

2 SHEETS—SHEET 1.

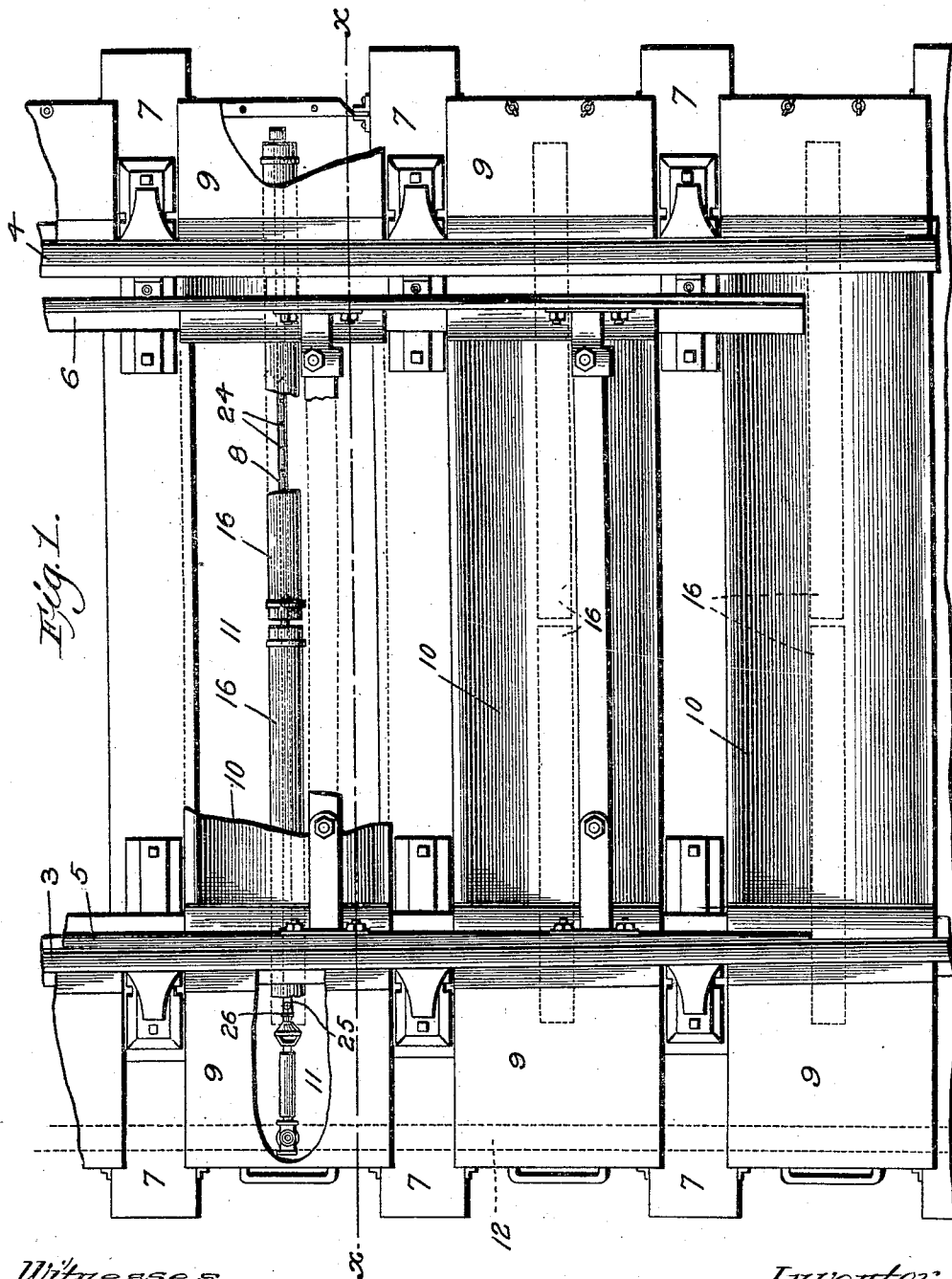


Fig. 1.

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Att'y

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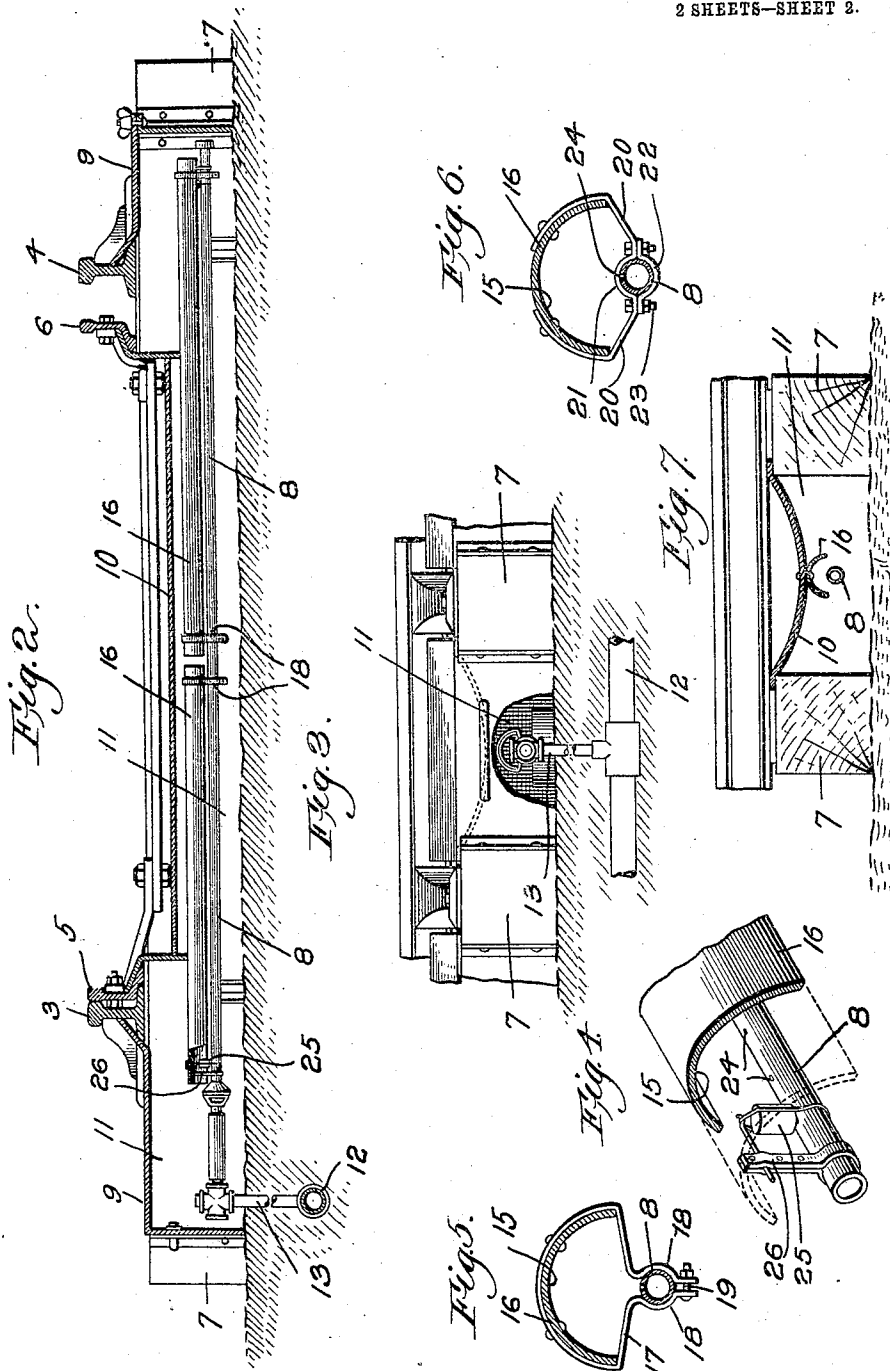
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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MEANS FOR KEEPING SWITCH AND SIGNAL APPARATUS FREE FROM SNOW AND ICE.

No. 856,184.

Specification of Letters Patent.

Patented June 4, 1907.

Application filed November 8, 1906. Serial No. 342,467.

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 Switch and Signal Apparatus Free 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 means for keeping switch and signal apparatus free from snow and ice, and in some respects is an improvement on the apparatus shown and described in Patent No. 834440, dated October 30, 1906. In said patent is illustrated an apparatus for this purpose in which a chamber is formed adjacent to the vulnerable part of the switch and signal apparatus, that is, the part which is likely to be clogged by snow, and a burner adapted to burn gas or some other suitable fuel is located within said chamber. My present invention has the same elements, that is, the chamber adjacent to the vulnerable parts of the apparatus and the burner within the chamber, and it has for one of its objects to provide means for causing a more even distribution of the heat within the chamber than is possible with the apparatus shown in the above mentioned patent; and for another object to provide a construction whereby the comparatively long burner tubes which are used can be readily ignited from either end; and, further, to provide such a construction that the burners cannot be permanently extinguished by wind or by drafts caused by the rapid movement of a train or otherwise.

In the drawings wherein is shown some selected forms of the invention for the purpose of illustrating the principle thereof—Figure 1 is a top plan view of a switch having my improvements applied thereto; Fig. 2 is a section on the line $x-x$, Fig. 1; Fig. 3 is a side view of a portion of the switch; Fig. 4 is a perspective view on an enlarged scale of a portion of the burner tube and one form of the deflector; Figs. 5, 6 and 7 show different forms of deflectors that may be used.

The main fixed rails 3 and 4 of a railway

track, and the pivoted switch rails 5 and 6 and the ties 7 on which said rails rest are of any suitable or usual construction.

In a switch of this character the vulnerable parts or those which are liable to be clogged by snow and ice are the pivoted switch rails, and arranged adjacent to the switch rails are heating chambers within which the burners 8 are situated. In the present embodiment of my invention these chambers are formed by hoods or covers 9 and 10 which are placed between adjacent ties 7, and which form with the ties the chambers 11 within which the burners are received.

The device thus far described may have any usual or suitable construction, and for the purpose of illustrating the invention I have shown it as having substantially the same construction as that shown in the above mentioned patent, wherein a chamber is formed between each two adjacent ties beneath the rails and the burners 8 extend longitudinally of each chamber or across the track. These various burners 8 are connected to a suitable gas main or supply pipe 12 which is herein shown as buried in the ground beneath the track, and which has connected thereto branches 13 which lead to the various burners, each burner having therein a suitable valve if desired by which the gas may be turned on or off from each burner. The valves may be arranged above the ground to be readily accessible.

In the device shown in said patent the heat from the burner is apt to unduly heat the cover of the chamber along a line directly over the burners while the corners of the chamber are heated to a much less degree. Moreover, in practice it has been found that it is not necessary to have the burner apertures of the burner pipe nearer than about two inches apart, and where they are this distance apart the burner will not ignite itself from one end because the distance between the adjacent burner apertures is such that the flame will not readily jump from one to another. To avoid these objections and to render the apparatus shown in said patent more perfect in its operation I propose to interpose between the burner and the top of

the chamber and directly over the burner a deflector which deflects the intense heat of the burner from the top of the chamber and distributes said heat more evenly throughout the chamber, and I propose to give this deflector such a shape that it forms within it a sort of gas chamber and to place it sufficiently near the burner tube so that when the gas is turned on it fills this gas chamber beneath the deflector, and when the burner is ignited from one end the flame will readily flash back the full length of the burner tube to completely ignite the latter. In addition to these two functions this deflector also acts as a means of protecting the burner and the flame from any water which may drip into the chamber. This deflector may be supported above the burner pipe in various ways without departing from my invention.

In the drawings the deflector 16 is shown as having a concave under face 15, and said deflector may conveniently be formed from a plate of sheet metal bent to semi-circular shape as illustrated. This deflector may be supported either by the burner pipe or by the cover of the chamber or by the rails. In Figs. 2, 5 and 6 it is shown as being supported on the burner pipe 8, and for this purpose I have illustrated brackets or clamps which are secured to the deflector and are adapted to be clamped around the pipe.

In Fig. 5 each clamp is shown as a strap 17 which is riveted or secured to the deflector 16 and which has two arms 18 that embrace the pipe 8 and are clamped together by a suitable clamping bolt 19.

In Fig. 6 the supporting brackets have a strap 20 which is secured to the deflector 16 and which is provided with a semi-circular portion 21 to partially encircle the pipe 8, said strap being held to the pipe by a suitable clamping member 22 and clamping bolts 23.

In Fig. 7 the deflector 16 is shown as riveted or otherwise secured to the cover 10 of the chamber.

Other ways of making this deflector than that herein shown may be adopted without departing from the invention. In every instance the deflector is interposed between the burner 8 and the top of the chamber, and thus it shields the top of the chamber from the intense heat of the burner. Its concave under face acts as a deflector for the heat, and since said deflector extends substantially the full length of the burner pipe 8 the heat generated by the burner will obviously be thoroughly distributed through the chamber 11. Furthermore, the concave face 15 of the deflector forms within it a sort of gas chamber directly over the burner pipe which becomes filled with gas when the gas is first turned on, so that by igniting the burner tube at one end the gas collected beneath this deflector will be ignited thus igniting the burner for its full length.

As stated above in practice the burner openings 24 are so far apart that without the deflector the flame would not catch from one to another and it would be necessary, therefore, to light each burner opening in order to completely light the burner. This deflector also serves to protect the burner pipe from any water or other liquid which may leak into the chamber.

In order to make a device of this class a practical success some method of automatically igniting the burners must be employed, and in the present embodiment of my invention I employ an automatic lighter which is set in operation by the gas issuing from the burner.

There is in the market at the present time a chemical compound of such a nature that it will become incandescent as soon as gas impinges on it, and this compound is used extensively in connection with mantles of burners used for lighting purposes for automatically lighting the burner when the gas is turned on. I propose to employ this chemical in connection with my burner for automatically lighting it, and in the drawings I have shown at 25 an automatic lighter which may be suspended directly over one of the burner openings 24, and which contains therein or has thereon some of this chemical compound, so that as soon as the gas is turned on the gas will impinge against said compound thus bringing it to incandescence and causing the ignition of the gas issuing from the burner opening directly beneath. As soon as this one burner opening has been ignited the whole burner tube will become ignited by reason of the presence of the gas in the gas chamber formed by the deflector 16, as above described.

I propose to use an automatic lighter 25 at each end of each burner pipe, although my invention would not be departed from if only one were used on each pipe. Each lighter may be suspended in position in any suitable way as by means of a bracket 26 secured to the burner pipe 8.

With the construction above described no harm can result even if the flame at each burner pipe were extinguished either by wind or by drafts caused by the rapidly moving train, because as soon as the gas impinges on the automatic lighter the burner pipe will immediately be relighted.

In using the apparatus herein shown the gas may be cut off from the main during warm weather and also during clear cold weather when there is no danger of the switch becoming clogged with snow. Whenever a storm arises, however, which is liable to block traffic all that is necessary to be done is to turn the gas onto the gas main, and as soon as it fills the main and begins to escape from the burners the latter will immediately be ignited thus producing the necessary heat

to keep the switch from becoming clogged or frozen.

The automatic lighters 25 are preferably detachably suspended from their brackets so that if any one becomes damaged or injured a new one can be readily put in place.

While for the sake of illustrating the invention and its operation I have shown it as used in connection with a switch, yet it will be obvious that by appropriate modifications and without departing from the invention it may be used in connection with signal apparatus or other similar apparatus which is liable to be clogged or rendered inoperative by snow or ice.

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

1. In a switch or signal apparatus, the combination with a chamber adjacent the vulnerable parts of said apparatus, and a gas burner in said chamber, of a deflector above the burner for assisting in distributing the heat throughout the chamber.

2. In a switch or signal apparatus, the combination with a chamber adjacent the vulnerable parts of said apparatus, and a gas burner within said chamber, of means within the chamber to distribute the heat evenly throughout the chamber.

3. In a switch or signal apparatus, the combination with a chamber beneath the vulnerable parts of said apparatus, and a gas burner in said chamber, of a deflector above the burner having a concaved deflecting surface.

4. In a switch or signal apparatus, the

combination with a chamber beneath the vulnerable parts of said apparatus, and a gas burner in said chamber, of a member above the burner supported thereby and having a concaved under face to deflect the heat and distribute it through the burner and to form a gas chamber for assisting in igniting the burner.

5. In a switch apparatus, the combination with a chamber beneath the vulnerable parts of said apparatus, and a gas burner in said chamber, of a deflector having a concaved under surface supported above said burner, and automatic gas-igniting means.

6. In a switch apparatus, the combination with means forming with the ties a chamber beneath the rails adjacent the ties, and a burner extending transversely of the track in each chamber, of a plate sustained above each burner and provided with a concave under face.

7. In a switch apparatus, the combination with means forming with the ties a chamber beneath the rails adjacent the ties, and a burner extending transversely of the track in each chamber, of a plate sustained above each burner and provided with a concave under face, and automatic gas-lighting means associated with each burner.

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

FRANCIS G. SHAW.

Witnesses:

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