

R. B. MILLER.

Steam Heating Apparatus for Preventing the Accumulation of Snow
and Ice Upon Railways and Streets.

No. 125,141.

Patented April 2, 1872.

Fig. 2

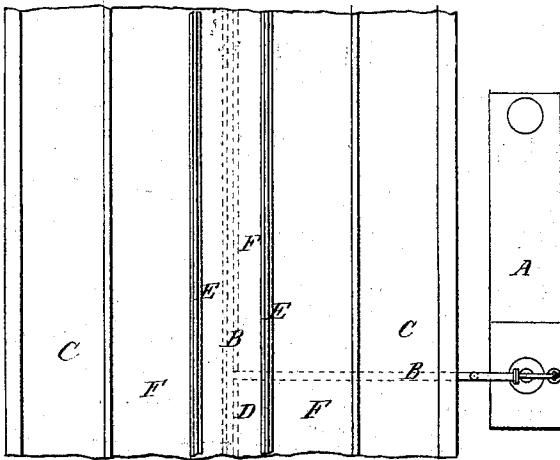


Fig. 1

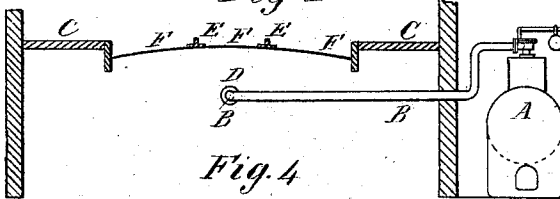


Fig. 4

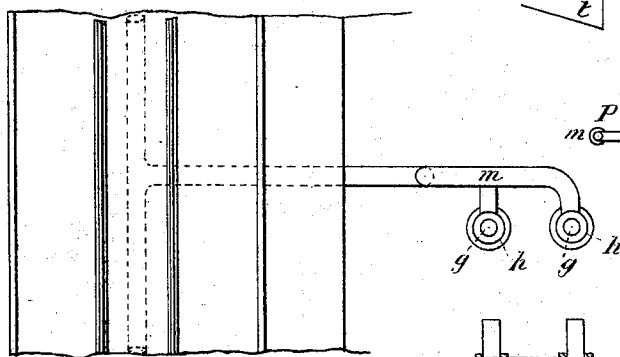


Fig. 3

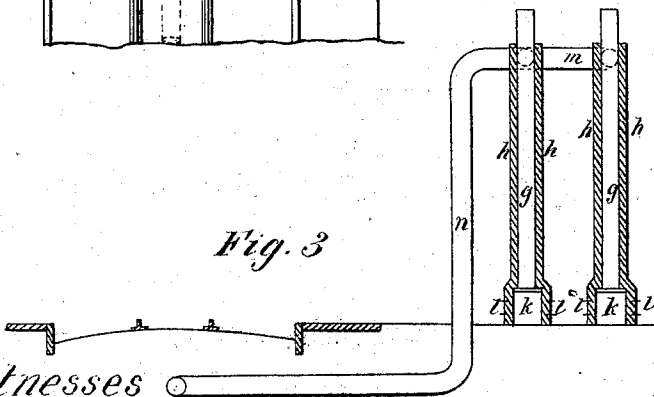
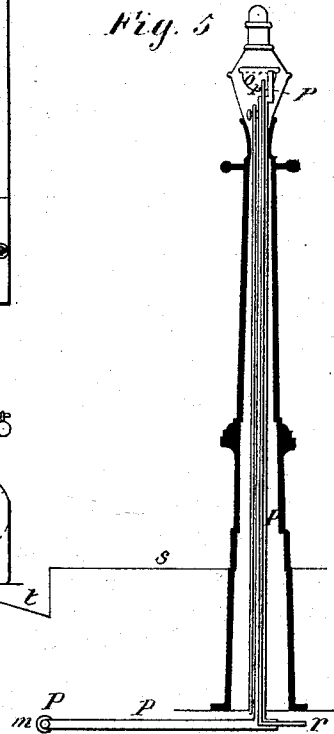


Fig. 5



Witnesses

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RUTGER B. MILLER, OF UTICA, NEW YORK.

IMPROVEMENT IN STEAM-HEATING APPARATUS FOR PREVENTING THE ACCUMULATION OF SNOW AND ICE UPON RAILWAYS AND STREETS.

Specification forming part of Letters Patent No. 125,141, dated April 2, 1872.

To all whom it may concern:

Be it known that I, RUTGER B. MILLER, of the city of Utica, in the county of Oneida and State of New York, have invented a new and useful Mode of Preventing the Accumulation of Snow and Ice upon Streets, Railways, and Sidewalks; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of the specification, in which—

Figure 1 exhibits a transverse section through the street, showing sidewalks and railway; also, steam-boiler. Fig. 2 is a plan view of the same. Figs. 3 and 4 are similar views, showing iron stacks for utilizing the waste heat of gas-works. Fig. 5 is a street-lamp.

Similar letters of reference indicate corresponding parts.

The nature of my invention consists in providing heated air or steam or water from a furnace or boiler, or any source whatever, which air or steam or water is conducted through pipes of whatever material laid under the streets or railways or sidewalks, thus warming the surface thereof sufficiently to melt the snow as it falls thereon during a snow-storm, or drifts thereon after a storm.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the principal streets of large cities a large portion of the heat required may be derived from the furnaces, steam-boilers, gas-works, and lamps along the streets without the expense of fuel, the waste heat of which may thus be utilized at small expense. Independently of these sources of heat construct a boiler of, say, sixty-horse power, as represented at A in Fig. 1, which will supply at least a mile of pipe if placed midway between the two extremes, the pipe being laid three feet below the surface. From said boiler pipe B (two or three inches in diameter) is carried three feet below surface of sidewalk C C to a pipe, D, running lengthwise under street, between the railway tracks E E, thus conveying the steam through the whole length of the street, thereby warming the surface of the track F F sufficiently to melt the snow as fast as it falls thereon. Air and steam may

both be used by laying the steam-pipes B and B inside of an earthen pipe, D, say nine inches in diameter. Figs. 3 and 4 show the method of concentrating the waste heat of the gas-works and the manner of applying the same. By substituting, in place of brick-chimneys, flues *g g*, made of one-fourth inch boiler-iron twelve inches diameter by eighteen feet high, inclose the same by an outer casing, *h h*, of sheet-iron, covered with felt jacket, with a space of five inches between the two, forming a chamber to receive the cold air from the base *k k* of the stack through openings *b b* and driving the hot air up to within two or three feet of the top; then connecting the several chambers to one horizontal receiving-pipe, *m m*, covered with felt jacket twelve inches in diameter, and connect the same to a perpendicular jacketed pipe, *n*, descending three feet below the surface of the ground, and thus distributing the hot air through a continuation of the pipe for the purpose intended. Independently of the heated air which may be derived from gas-works and other large furnaces, the boiler A, Fig. 2, may be placed at the lower extremity of the earthen tube D, which may be used as a chimney, by being eighteen or twenty-four inches, instead of nine inches diameter. Let the furnace and boiler be placed under ground and so jacketed as to retain all the heat in a tight chamber, and let the steam-pipe B enter the chimney D, at the further extremity of which chimney D construct a suction-fan driven by a small engine, say two or three horse power, thus producing a draught of sufficient force to exhaust the heated air of the furnace and air-chamber in which it is incased. This volume of heat will pass with great velocity through D for a great distance computed by miles, as is demonstrated in London and elsewhere, and will furnish heat enough in its passage to clear streets, sidewalks, and railways of snow falling upon the surface and melting as it falls, the heat being distributed in three or more earthen tubes running parallel with D, and laid one under each sidewalk, as well as under each railway-track. If the carriage-way is to be cleared let the tubes be placed under them also. No snow will lie within several feet of the pipe, and the surface will be kept as dry as in summer. The

heat from the gas-lamps may be utilized so as to clear the sidewalks and gutters of the streets by steam or warm air by means of a small boiler placed in the top of the lamp over the burner supplied with water from the hydrant in the street by a pipe running up the lamp-post inside of a larger pipe, through which the steam or boiling water descends into a pipe laid under the gutter, the pipe running up the lamp-post (inside thereof) being one-fourth of an inch in diameter, the pipe inside of which it runs and through which the steam descends being one-half inch diameter, and the pipe under the gutter being two inches diameter laid three feet below the surface. No snow will lie within four feet on either side of such a pipe so laid and heated. The surface will dry after a snow-storm as in summer. Fig. 5 is a sectional view of a lamp-post. O represents the boiler. P, the pipe, for conducting off the boiling water or steam. r is the supply-pipe from the hydrant. s is the sidewalk, and t the gutter. Heated air derived from the gas-lamps or furnaces or stoves along the streets may be thus utilized for the same purpose, the pipe P representing an air-tube (jacketed) running inside the lamp-post and conducting heated air three feet under the surface of the sidewalk, connecting with a main, M, at right angles, the main running parallel with the street and

receiving heat as above described. So heated air may be derived from the furnaces, kitchen-cellars, and other sources of heat, and applied in the same way and for the same purpose. To create the necessary draught, the main may be connected with the chimneys along the street, and suction-fans may be used as in ordinary cases. So in Fig. 3 let a suction-fan be used at the extremity of pipe n to increase the draught. A small engine of two or three horse power would thus produce a circulation so rapid and powerful as to render the effect calculable as to distance and intensity by continued experiment alone.

The sidewalk may be kept clear from snow and ice by this process, the heat being derived from the gas-burners, furnace, or stove of the adjacent building where steam cannot be procured.

What I claim as my invention, and desire to secure by Letters Patent, is—

The application of heat in the manner above specified, or in any other substantially the same, and which will produce the intended effect upon streets and sidewalks and railways of every kind, whether operated by steam or other mechanical or animal power, in city or country.

RUTGER B. MILLER.

Witnesses:

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D. C. STODDARD.