No. 840,444. PATENTED JAN. 1, 1907.

W. ELLIOT.

SNOW THAWING MACHINE.

APPLICATION FILED MAY 25, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

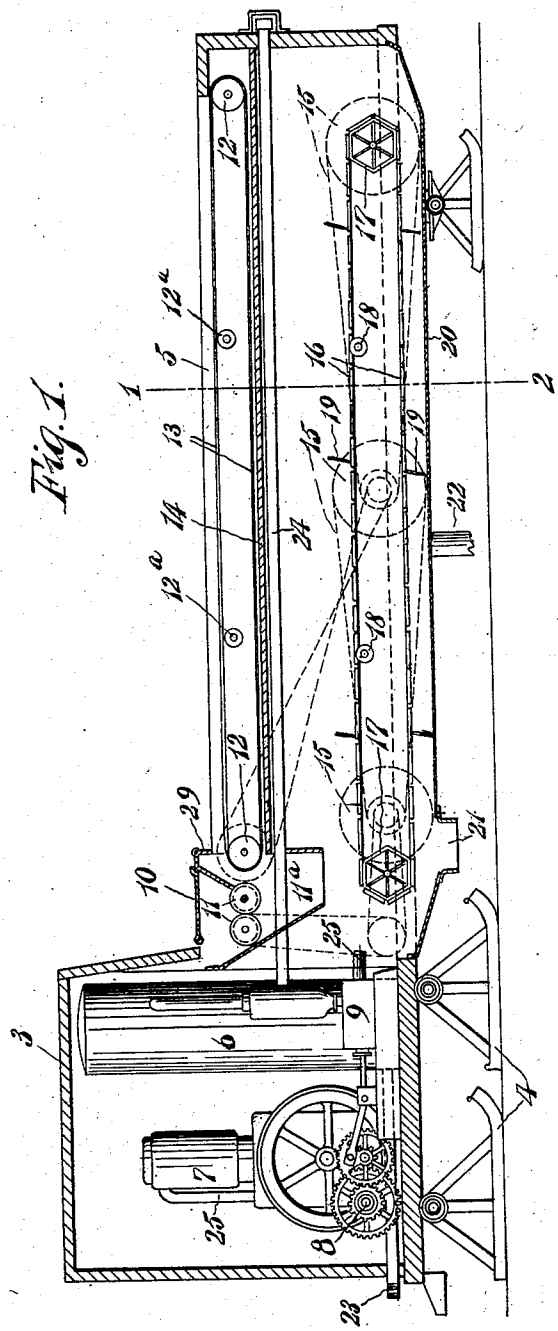
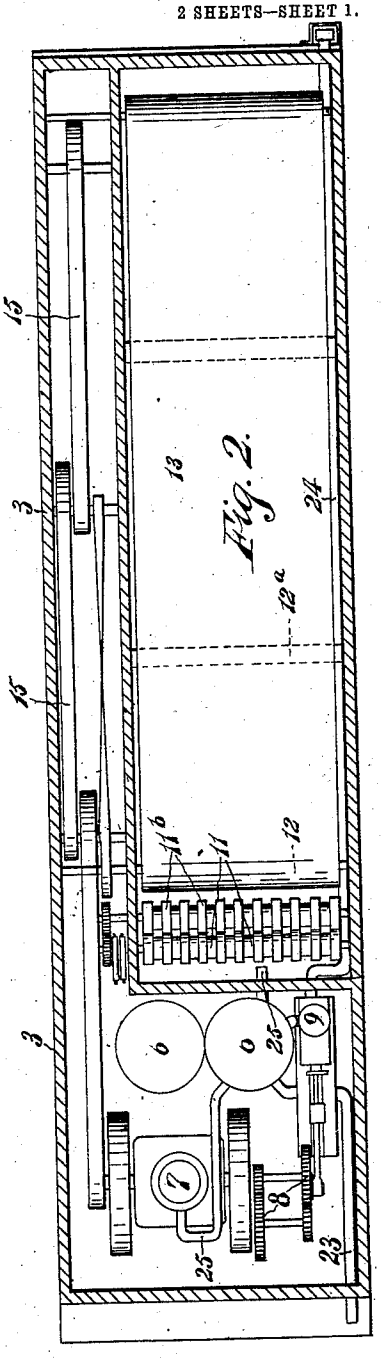


Fig. 2.



Witnesses

Stuart R. W. Allen

William G. Armstrong

Inventor

William Elliot.

By Fred B. Fahnestock & Co. Attys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 840,444. PATENTED JAN. 1, 1907.

W. ELLIOT.

SNOW THAWING MACHINE.

APPLICATION FILED MAY 25, 1906.

2 SHEETS—SHEET 2.

Fig. 4.

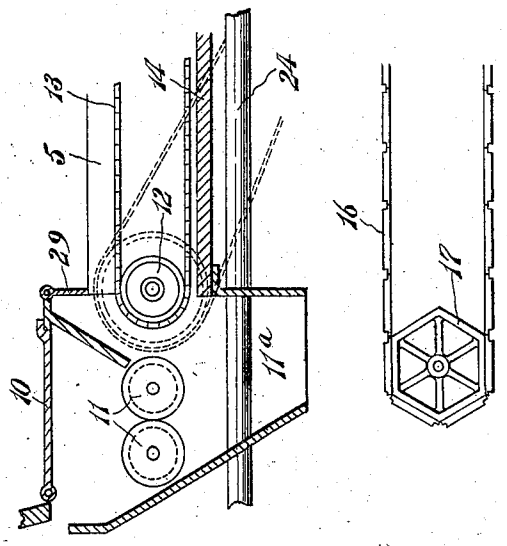


Fig. 7.

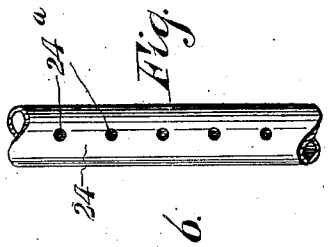


Fig. 6.

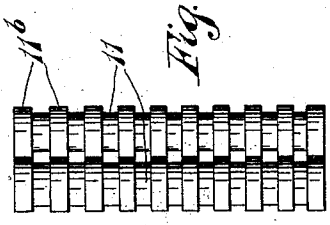


Fig. 3.

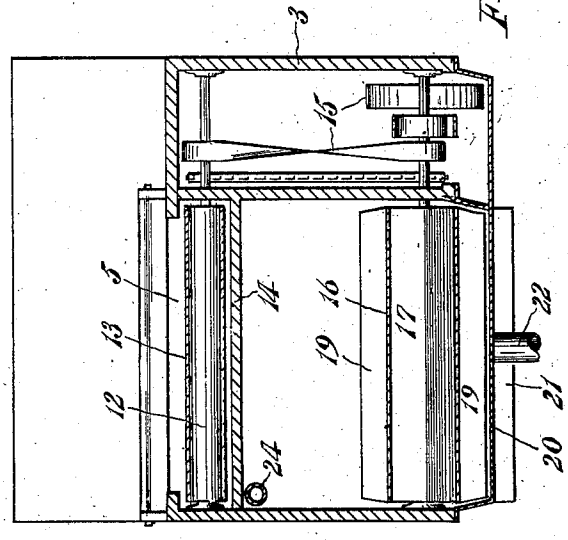
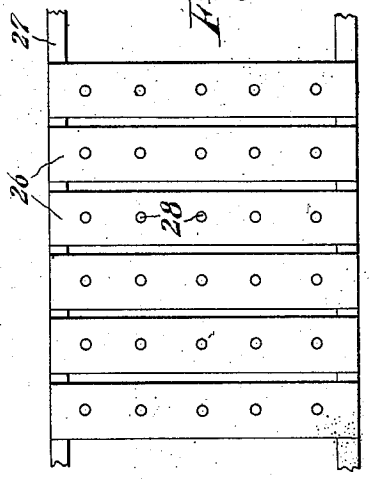


Fig. 5.



Witnesses

Stuart R. Wallace

William G. Armstrong

Inventor

William Elliot.

By Fred B. Fahnestock Atty.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM ELLIOT, OF MONTREAL, QUEBEC, CANADA.

SNOW-THAWING MACHINE.

No. 840,444. Specification of Letters Patent. Patented Jan. 1, 1907.

Application filed May 25, 1906. Serial No. 318,635.

To all whom it may concern:

Be it known that I, WILLIAM ELLIOT, of the city of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Snow-Thawing Machines, of which the following is a full, clear, and exact description.

My invention relates to snow-thawing machines, and is particularly adapted for removing the accumulation of snow from city streets.

In localities where the snow-fall is heavy, and especially on streets traversed by car-lines, large quantities of snow are banked at the sides of the streets and have to be carted to the outskirts of the city. In large cities the hauling distance is very considerable, and, furthermore, it is often difficult to obtain suitable dumping-grounds. These considerations make the cost of removing the snow very expensive.

The object of my invention is to provide a simple and economical machine adapted to receive snow or ice upon a traveling conveyer, together with means for melting the snow and delivering the product to the gutter at the side of the street.

A further object is to provide means for maintaining the snow in thin layers, whereby a large melting-surface will be presented to the heating apparatus, thus consuming the snow as rapidly as possible.

A still further object is to provide means whereby the snow or ice may, if necessary, be broken up before being conveyed into the heating-chamber.

A still further object is to provide means for cleaning the melting-chamber and keeping it free from mud or other substances.

To accomplish these objects, I provide a machine mounted, preferably, upon runners and having an endless conveyer running horizontally throughout almost the entire length of the machine. Snow is deposited upon the conveyer and may be distributed evenly upon the surface thereof and is then transferred through an adjustable gateway onto a second traveling belt located within the heating-chamber. The snow is distributed as evenly as possible upon the surface of the second belt and is while traveling over the latter subjected to the influence of hot water or hot gases or any other suitable means. An engine and boiler or any other suitable motive-power is located at one end of the machine and is provided with suitable heating and driving means for the conveyers and the heating-chamber.

In the drawings which illustrate my invention Figure 1 is a side elevation of the machine with the casing removed. Fig. 2 is a plan view of the machine. Fig. 3 is a cross-section on the line 1 2 of Fig. 1. Fig. 4 is an enlarged detail view of the feeding-chute and conveyer-belts. Fig. 5 is an enlarged plan view of the melting-belt. Fig. 6 is a plan view of the crusher-rolls. Fig. 7 is a plan view of the hot-water pipe.

Referring to the parts, 3 designates a frame or casing mounted upon the runners 4.

5 represents the opening at the top of the machine where any snow may be shoveled onto the conveyer-belt.

6 represents one or more heaters or boilers of any preferred construction, and 7 an engine for supplying motive power to the machine.

8 designates the pump-gears for operating the pump 9.

10 designates the hopper for receiving snow or ice when it is necessary for the material to be crushed. The ice falls from the hopper 10 and is carried between the crusher-rolls 11 and drops onto the chute 11^a, where it is carried to the melting-belt. The crushers are provided with raised collars 11^b, adapted to crush hard lumps of snow or ice. Driving-pulleys 12 are mounted at opposite ends of the feed-openings 5 and carry thereto the conveyer-belt 13, which may be termed the "snow belt." The belt 13 passes over the idler-bars 12^a, mounted between the pulleys 12.

14 designates a transverse diaphragm beneath the belt 13 for the purpose of inclosing the melting-chamber.

15 designates a suitable belt-gearing for driving the conveyer-belt 16, which may be termed the "melting-belt." The belt 16 is mounted to travel within the heating-chamber and is adapted to receive the snow from the conveyer-belt 13, carrying it over the heater-chamber in a thin layer and traveling in the opposite direction to the conveyer 13. The belt 16 is slightly longer than the belt 13 and is adapted to travel over the driving-pulleys

17 and the idlers 18. This conveyer is also provided with scrapers 19, adapted to scrape the mud and other foreign substances out of the pan 20, located at the bottom of the machine.

21 designates the opening through which the mud falls from the pan. 22 designates a water-port at the bottom of the machine, adapted to carry off the water into the sewers.

23 designates a pipe which may be connected to a hydrant or any other suitable source of supply for the purpose of filling the boiler. One or more hot-water pipes 24 are connected to the heater 6 and extend along the top of the heater-chamber beneath the diaphragm 14. These pipes are provided with a plurality of perforations 24ª, adapted to distribute the hot water over the layer of snow carried upon the conveyer 16.

25 designates the engine exhaust-pipe and is adapted to convey hot air or gas from this chamber into the heating-chamber to assist in melting snow. The exhaust-pipe 25 may, however, be connected with the heater 6 for the purpose of utilizing the waste gases in heating the contents of the boiler.

The conveyer-belt 16 comprises a plurality of cross-bars or perforated trays 26, connected together in such a manner as to leave sufficient space for the melting snow to escape between them. The cross-bars 26 are united in flexible relation by any suitable means, such as the links 27, and are provided with apertures 28 to permit the free escape of the water. A gate 29 is hinged or otherwise adjustably fastened to the framework above the end of the conveyer 13 to permit the snow to pass thereunder and onto the belt 16 in layers of varying thickness. The gate 29 may be raised or lowered, as desired, to admit various quantities of snow into the melting-chamber, the one requirement being that the snow shall be deposited on the melting-belt evenly, and preferably in thin layers.

The operation of the device is as follows: The machine being drawn along the bank of snow, is loaded by means of shovels or in any other preferred manner, it being desirable to distribute the snow as evenly as possible over the upper surface of the belt 13. The snow is then carried under the gate 29 and falls onto the melting-belt 16, where it is distributed in thin layers and is subjected to a sprinkling of hot water from the pipe 24 and also to the influence of gas (hot gas) from the pipe 25. As the snow melts the water escapes through the perforations in the belt 16 into the discharge-pipe 22. Mud or other foreign substances will be scraped into the discharge-port 21. When it is desired to remove ice or hard snow, the hopper 10 is opened and the ice shoveled into said hopper, passing between the crushers 11 and onto the chute 11ª, from whence it falls onto the conveyer-belt 16 and is treated as above described.

Having thus described my invention, so that the same may be readily understood by those skilled in the art to which it appertains, what I claim, and desire to secure by Letters Patent, is—

1. In a device of the class described, a conveyer adapted to receive the snow, an endless belt mounted beneath said conveyer, and means for delivering the snow from the conveyer to the endless belt in thin layers.

2. In a device of the class described, a snow-receiving conveyer, a belt mounted beneath said conveyer and traveling in the opposite direction thereto, means for delivering the snow from the conveyer to the belt in thin layers, and means for melting the snow during its travel upon said belt.

3. In a device of the class described, a snow-receiving conveyer, a melting-belt mounted beneath said conveyer, means for delivering the snow from the conveyer to the belt in thin layers, and means for discharging a plurality of streams of hot water on the snow during its travel upon said melting-belt.

4. In a device of the class described, a snow-receiving conveyer, ice-crushing rolls mounted adjacent one end of said conveyer, a melting-belt mounted beneath said conveyer, means for delivering snow and ice from the conveyer and crushing-rolls to the belt in thin layers, means for discharging a plurality of streams of hot water on the snow during its travel upon said melting-belt, and means for discharging heated gases to the snow during its travel upon said melting-belt.

5. In a device of the class described, a snow-receiving conveyer, ice-crushing rolls mounted adjacent one end of said conveyer, a melting-belt mounted beneath said conveyer, means for delivering snow and ice from the conveyer and crushing-rolls to the belt in thin layers, a water-heater, a pump for discharging a plurality of streams of hot water on the snow during its travel upon said melting-belt, a motor driving said pump, means for discharging heated gases to the snow during its travel upon said melting-belt, and means for discharging water and mud from the device.

6. In a device of the class described, a snow-receiving conveyer, ice-crushing rolls mounted adjacent one end of said conveyer, an apertured melting-belt mounted beneath said conveyer, means for delivering snow and ice from the conveyer and crushing-rolls to the belt in thin layers, means for regulating the amount of snow delivered by said conveyer, a water-heater, a pump for discharg-

ing a plurality of streams of hot water on the snow during its travel upon said melting-belt, a motor driving said pump, means for discharging heated gases to the snow during its travel upon said melting-belt, means for discharging the water of melted snow, and means for discharging mud from the device.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

WILLIAM ELLIOT.

Witnesses:
STUART R. W. ALLEN,
E. R. MCKENZIE.