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SNOW MELTING DEVICE

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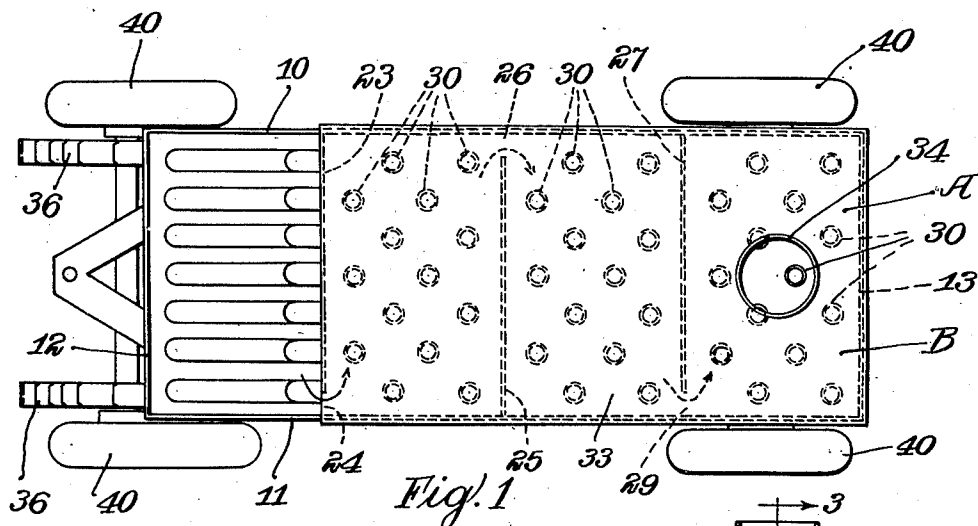


Fig. 1

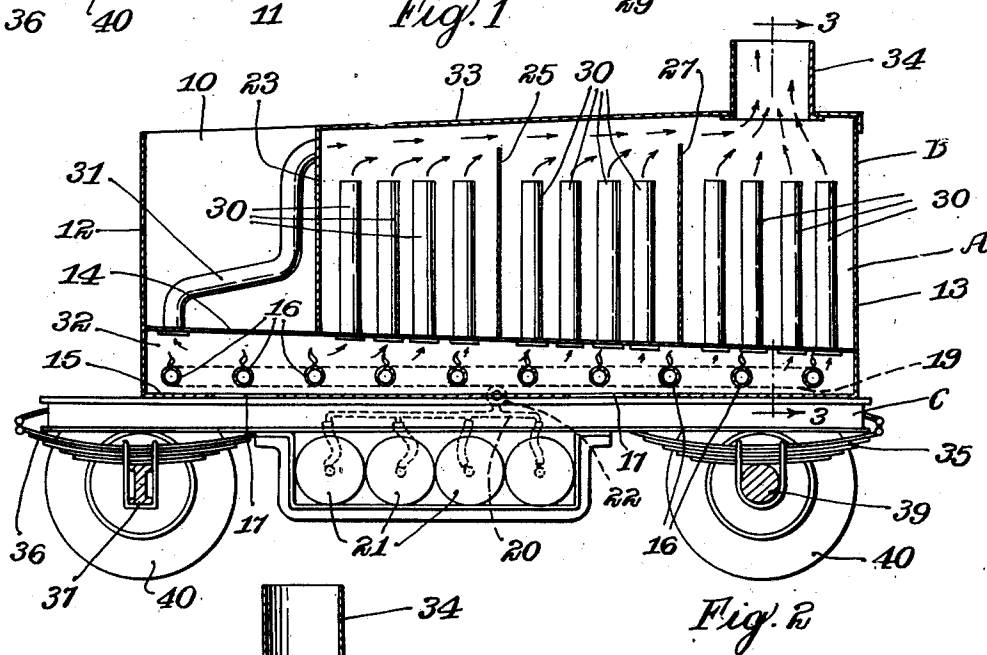


Fig. 2

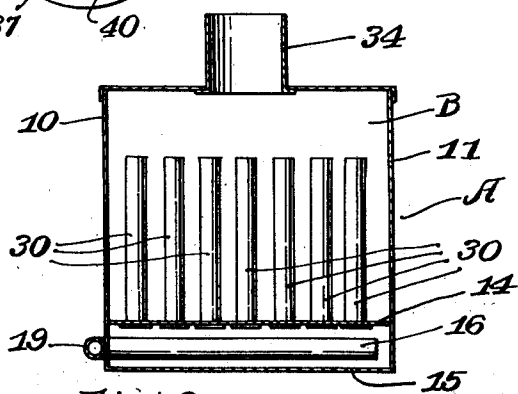


Fig. 3

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UNITED STATES PATENT OFFICE

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SNOW MELTING DEVICE

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3 Claims. (Cl. 126—343.5)

My invention relates to a snow melting device, wherein it is desired to provide a device which may be operated for the purpose of melting snow and ice in the streets of large cities.

In many parts of the country the removal of snow and ice from the streets is an extremely important and expensive operation. If the snow and ice are permitted to remain on the streets travel is impeded to such an extent that driving is slow and difficult. It has, therefore, been found necessary to remove the snow from the streets so that travel may proceed in an orderly manner and vehicles may park along the curbs in the usual manner.

In most cities it is common practice to lift the snow, either manually or by conveyer belts and to dump the snow into trucks and to haul the snow to a dumping ground. Not only is this hauling of the snow a costly operation, but it is also difficult to dispose of the snow in the vicinity where it is removed, often making long hauls necessary, and therefore requiring considerable equipment. Attempts have been made to melt the snow and to allow the water to drain into the gutters of the street or into the sewer system. Because of the low temperature which usually prevails after a snow storm, this method of disposal is often inconvenient, as the water freezes as quickly as it is released from the heating chamber. As the water is hauled to sewers considerable time is wasted and considerable expense is involved in hauling the water and in maintaining the same heated until it can be drained into the sewer.

It is the object of the present invention to provide a device for melting snow and ice, which not only melts the snow and ice, but transforms the same into steam and water vapor which is dispelled into the air. This device not only disposes of the snow and ice, but renders unnecessary the problem of disposing of the water thus formed. I have found that while considerable heat is necessary to transform snow into water vapor and steam, this cost is often times not as great as the cost of hauling or otherwise disposing of the snow.

It is a feature of my invention to provide a container which may be self-propelled, or it may be drawn through the streets of a city, and in general is in the form of a tank to receive the snow and ice. This snow and ice is inserted into the tank at one end thereof, and the tank is provided with a series of baffles which direct the movement of the water moving from one end of the tank toward the other. As the tank is heated

to a high temperature, this long period of time, during which the water contacts the heated surface of the tank, transforms the water into steam and water vapor.

It is a further feature of my invention to provide a tank or container for receiving snow and ice to be melted, which includes a series of outwardly extending pipes or tubes through which heated air may pass. These tubes are positioned in the path of movement of the liquid and greatly increase the area of metal with which the snow, ice, and water contact during their movement from one end of the tank to the other.

It is a further feature of my invention to provide a tank for melting snow and the like, the base of which is preferably on a slight angle to the horizontal so that the snow and water will travel slowly from one end to the other. The upper end of the tank is designed to be the inlet end thereof, while the lower end of the tank is the outlet end thereof. The inlet to the tank is through the top of the tank so that snow and ice may be placed therein. Most of the tank is covered and the outlet end of the tank is provided with a stack or vent through which the steam and water vapor together with the heated air issuing from the heating elements is dispelled.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claims.

In the drawing forming a part of my specification:

Figure 1 is a top plan view of my snow melting device.

Figure 2 is a sectional view through my snow melting device longitudinally of its axis.

Figure 3 is a transverse section through the body of the snow melting device, the position of the section being indicated by the line 3—3 of Figure 2.

The snow removing device A comprises a tank B which preferably rests upon a supporting frame C, which in turn is mounted upon wheels or other suitable means, so that the tank may be moved from place to place. The tank B includes opposed side walls 10 and 11, opposed end walls 12 and 13, a false bottom wall 14, and a bottom wall 15 spaced below the false bottom wall 14. The false bottom wall 14 is preferably inclined from the end wall 12 downwardly toward the other end wall 13, so that liquid will tend to flow toward the end wall 13.

Positioned between the false bottom 14 and the bottom wall 15, I provide a heating element,

which in the form illustrated, comprises a series of parallel pipes 16 having perforations therein to act as gas burners. Suitable openings 17 are formed in the bottom wall 15 to admit air between the bottom walls 14 and 15, and to support combustion of gas flowing through the gas pipes 16.

The gas pipes 16 are illustrated as connected by a supply manifold 19, which is connected by a pipe line 20 to any one of a series of gas supply tanks 21. A valve 22 may control the flow of gas to the gas pipes 16, which when ignited heat the false bottom 14 to a high temperature.

A baffle 23 extends transversely or substantially parallel to the end walls 12 and 13 from the side wall 10 to a point spaced from the side wall 11 allowing a passage 24 through which liquid may flow. A baffle 25 extends substantially parallel to the end walls 12 and 13 from the side wall 11 to a point spaced from the side wall 10 to provide a passage 26 through which liquid may flow. An additional baffle 27 extends substantially parallel to the previous baffle from the side wall 10 to a point spaced from the side wall 11 to provide a passage 29 through which liquid may flow. Thus as the liquid travels down the inclined bottom 14, it must flow from one side of the side of the tank B to the other so that the distance of travel of the flow of liquid is greatly increased.

Extending upwardly from the false bottom 14, I provide a series of pipes or tubes 30 which are open at both ends and which preferably terminate short of the upper extremity of the side and end walls of the tank B. These pipes 30 are positioned between the baffles 23 and 25, between the baffles 25 and 27, and the end wall 13. As the liquid flows over the surface of the false bottom 14 it comes in contact with these pipes or tubes 30, which are formed of metal in preferred form, and which are heated by the connection with the false bottom 14 and also by the passage of heated air passing therethrough.

A series of inclined pipes or tubes 31 is positioned between the end wall 12 and the baffle 23. The tubes 31 are open at both ends and extend through the false bottom 14 and through the baffle 23 to conduct heated air from the compartment 32 between the bottom 15 and the false bottom 14 into the body of the tank to prevent waste of the heated air.

A top 33 extends over the tank B. The top 33 extends between the side walls 10 and 11 and from the baffle 23 to the end wall 13. The baffle 23 extends to the full height of the side walls 10 and 11 and forms a closure for the tank, except through the passage 24. The baffles 25 and 27 terminate short of the cover or top 33 permitting air to flow above these baffles toward the end 13 of the tank.

The top 33 preferably slopes upwardly from the baffle 23 toward the end wall 13 and a stack or vent 34 is positioned in the top 33 near the end wall 13.

The frame C is illustrated as supported by springs 35 and 36 connecting the frame C to the axles 37 and 39 of the wheels 40. Thus the device A may be moved about from place to place.

In operation, the gas supplied from one or more of the tanks 21 is fed through the valve 22 and the manifold pipe 19 to the gas pipes 16 and the gas issuing from these pipes is ignited. The false bottom 14 is heated to a high temperature and the gas or air heated by the flame passes through the tubes 30 and 31 heating these pipes and

maintaining the interior of the tank B at a higher temperature.

Snow and ice are shoveled into the tank 10 between the side walls 10 and 11, the end wall 12 and the baffle 23. This snow and ice falls upon the false bottom 14 and on the pipes 31 causing most of the snow and ice to melt and the remainder thereof, to be carried by the water through the passage 24 to the surface between the baffles 23 and 25.

Passage of the water over the false bottom and in contact with the pipes 30 tends to vaporize the water and change the same into steam. This steam and water vapor is expelled together with the hot air and gas through the stack 34 mingling with the surrounding air. Thus all of the ice and snow is disposed of before the same is expelled from the tank B.

The tank B may be insulated in any suitable manner if it is so desired and the number and position of the pipes 30 may be changed if it is so desired.

The means of placing the snow and ice into the tank is not important as the snow and ice may be shoveled into the tank manually or may be fed into the same by a mechanical elevator or conveyer belt designed for this purpose.

In accordance with the patent statutes I have described the principles of construction and operation of my snow melting device, and while I have endeavored to set forth the best embodiments thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A snow melting and evaporating device comprising an elongated heating compartment having heating means therein, opposed side walls and opposed end walls extending upwardly from said heating compartment, a baffle projecting from one side wall toward the opposite side wall, said walls, end walls, and baffle defining two virtually separate compartments, one of said compartments having an open top and a series of heating pipes extending therethrough, the other of said compartments comprising an evaporating compartment, a cover on said evaporating compartment, and a series of heating pipes from said heating compartment extending upwardly into said evaporating compartment and terminating at a point spaced from the top thereof.

2. A snow melting and evaporating machine comprising a heating compartment having a top, opposed end walls, and opposed side walls, said side walls and end walls extending above said top to define a body, a baffle having an opening therethrough extending substantially parallel to said end walls dividing said body into two additional compartments, one of said compartments being an evaporating compartment, said evaporating compartment being defined by one end wall, said side walls, said baffle, and a cover, the other of said compartments comprising a snow melting compartment which is defined by the other end wall, said side walls, and said baffle, and heating pipes extending from said heating compartment through said snow melting compartment, and passing through said baffle, said heating pipes transferring heat from said heating compartment through said snow melting compartment and into said evaporating compartment.

3. A snow removing and evaporating machine comprising a substantially rectangular body in-

cluding rectangularly arranged side and end walls, a bottom panel spaced upwardly from the lower extremity of said side walls, the space below said bottom panel forming a heating compartment, a heating means for heating said compartment, a transverse partition between two opposed side walls dividing the body above said panel into two compartments, said baffle providing opening through which water may pass, a cover on one of said compartments extending 10

from one end of said body to said baffle, a stack in said cover, the other of said compartments between said baffle and the other end of said body having an open top, and heating pipes in said open topped compartment, said pipes extending through said bottom panel and said baffle to convey heat from said heating compartment through said open topped compartment and into said covered compartment.

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