E. V. CROUSE.

SNOW DISPOSAL DEVICE.

APPLICATION FILED JULY 28, 1919.

1,418,630.

Patented June 6, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

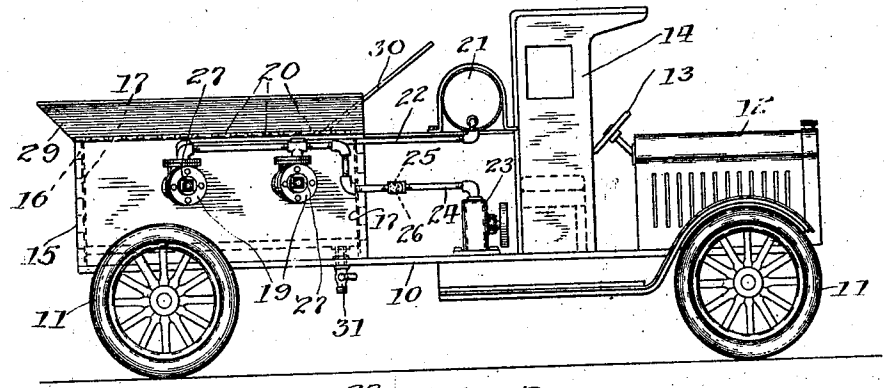


Fig. 2.

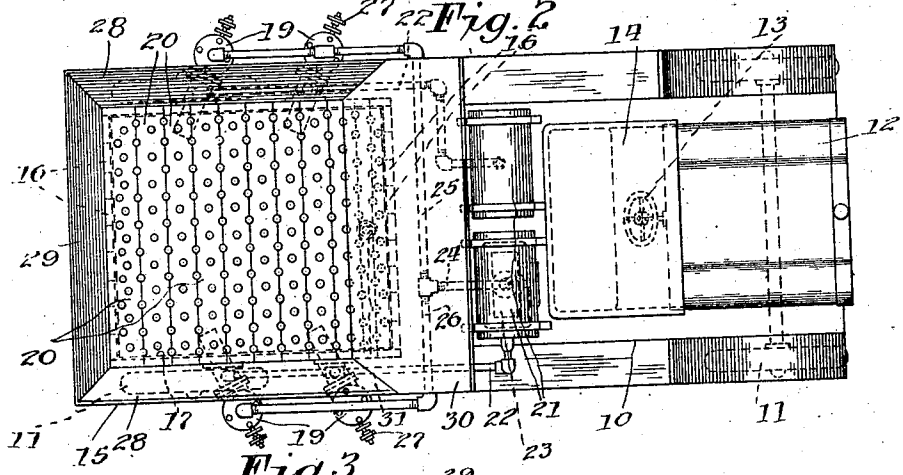
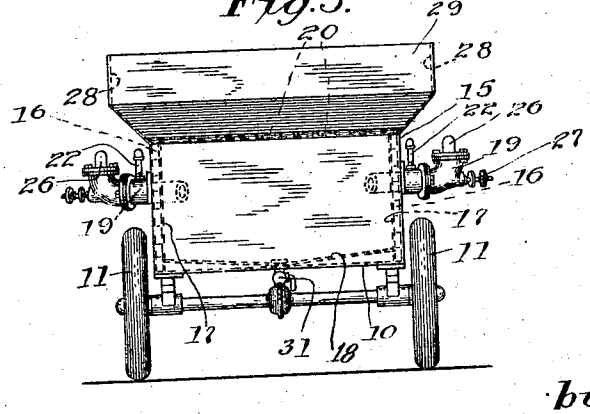


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

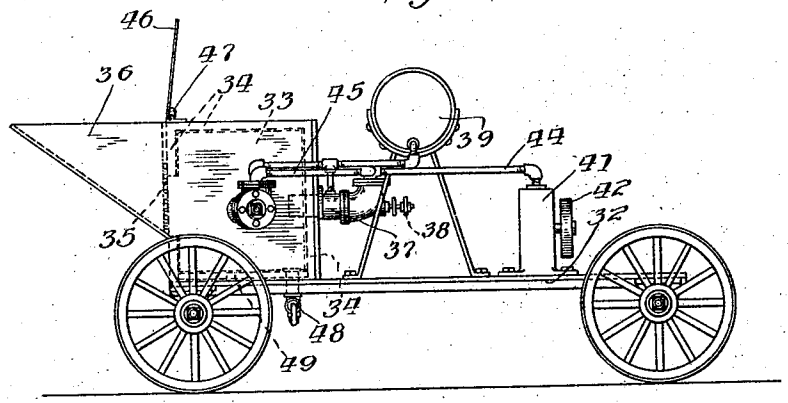


Fig. 5.

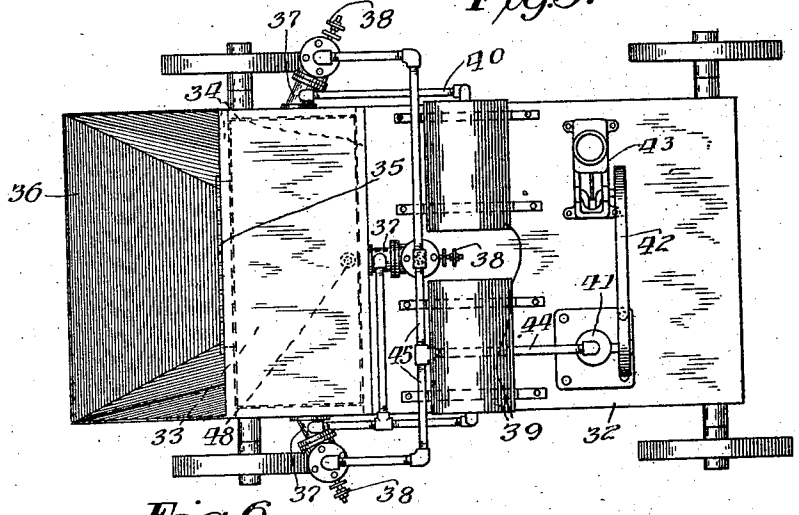
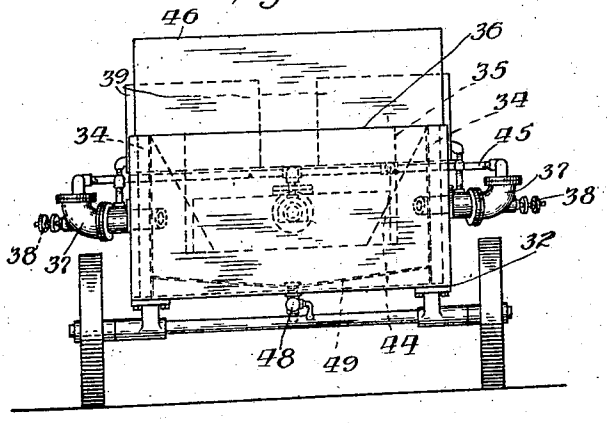


Fig 6.



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UNITED STATES PATENT OFFICE.

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SNOW-DISPOSAL DEVICE.

1,418,630. Specification of Letters Patent. Patented June 6, 1922.

Application filed July 28, 1919. Serial No. 313,857.

To all whom it may concern:

Be it known that I, EDWARD V. CROUSE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Snow-Disposal Devices, of which the following is a full, clear, and exact specification.

My invention relates to apparatus for melting and disposing of snow.

The object of the invention is to provide means for expeditiously and economically removing snow and ice from thoroughfares or streets.

A further object is to provide apparatus having a large capacity but occupying a minimum amount of space, and a device so constructed and arranged that there will be no liability of clogging from the too rapid feeding of the snow thereto.

With these and other objects in view my invention is embodied in a device preferably mounted on a wheeled truck and made portable, and having a fire box, preferably insulated, provided with means for creating an intense heat, and also having means for separating the fire box from the hopper into which the snow is shoveled.

In the accompanying drawings I have illustrated two embodiments of my invention, and in these drawings—

Figure 1 shows a side elevation of my improved apparatus;

Fig. 2 is a top plan view;

Fig. 3 is a rear elevation;

Fig. 4 shows a side elevation of a modified form of my improved apparatus;

Fig. 5 is a top plan view of the construction shown in Fig. 4; and

Fig. 6 is a rear elevation of the modified form shown in Fig. 4.

In the embodiment of my invention illustrated in Figs. 1 to 3, the improved apparatus is shown as mounted upon an automobile truck having the usual frame 10, wheels 11, hood 12, steering wheel 13 and a cab 14. Upon the rear of the truck frame I have mounted a box-like receptacle 15, preferably formed of sheet metal, and having a lining upon its four vertical walls of insulating material such as firebrick 16 interposed between the outer wall and inner wall 17, also preferably formed of sheet metal. The chamber formed by the inner walls 17 is provided with an inclined bottom 18 which slopes from the outer walls to the center of the chamber. If desired, the inner wall 17 may be dispensed with, the firebrick serving as a wall or lining. This chamber will be termed the "combustion chamber" and in order to create an intense heat in this chamber I have provided oil burners or torches 19 which operate under a forced draft in the well-known manner.

In the embodiment of my invention illustrated in Figs. 1 to 3, I have shown four of these torches, two being provided on each side of the combustion chamber. The torches 19 enter the chamber at an angle as clearly illustrated in Fig. 2, thereby directing the flame toward the rear of the receptacle, the flames or blasts from the oppositely located torches being directed to a common point in substantially the center of the combustion chamber. The torches are located below the top of the combustion chamber and the heat generated thereby rises, thereby causing the temperature of a series of perforated iron bars or grids 20 located above the combustion chamber, to be raised to a high degree. The heat also escapes through perforations, thereby coming in direct contact with the snow. These grids 20 are supported on the walls of the combustion chamber and may be readily removed in order to provide access to the interior of the chamber.

The oil for the oil burners is carried in tanks 21 and is conveyed by means of pipes or conduits 22 to the nozzles of the torches. The air blast for these torches is created by means of an air pump 23 which is driven by a suitable engine, or may, if desired, be connected by suitable driving connections to the main drive shaft of the auto truck upon which the apparatus is mounted. This air blast may also be obtained from compressed air tanks if desired. This air blast is conducted to the burners by means of pipes 24, 25 and 26. A suitable valve is provided in the oil burner for controlling the spread of the blast and this valve is operated by means of a hand wheel 27 in a manner well known in the art.

The walls of the receptacle or combustion chamber support upwardly extending side walls 28 and end walls 29 and 30 of a hopper which forms a receptacle for the snow which is shoveled into the same from the street or other source. The inclined wall or shield 30 is extended upwardly from the hopper in order to prevent any snow from

being thrown over onto the frame of the truck. This chamber also forms a tank for the water which trickles through the grate bars or grids 20 as the snow is melted. An outlet nozzle or tap 31 is provided for draining water and slush from the lowest point of the combustion chamber. Nozzle 31 is provided with a suitable valve and may be connected to a hose by which the water will be conducted to a sewer or drain.

The modified form of my invention illustrated in Figs. 4 to 6, inclusive, will now be described.

The principle of operation of both forms of my improved apparatus is identical, but the operative elements are arranged in a slightly different manner in the two forms.

Referring now to the embodiment illustrated in Figs. 4 to 6, the device is mounted upon a truck frame 32 supported by suitable wheels, and this truck may be attached to any automobile as a trailer or may be propelled in any suitable manner. A receptacle 33 similar in construction to that already described is mounted upon the rear end of this truck frame 32, the walls of the receptacle being lined with firebrick 34 or other suitable insulating material as before. In this embodiment of this invention the opening for the receptacle is at the rear, and this opening is provided with a series of vertically arranged perforated metallic grate bars or grids 35, so supported that they may be readily removed if desired. These grids form the dividing wall or partition between a hopper 36, in this instance located at the rear of the machine, and the combustion chamber formed in the receptacle 33. Oil burners or torches 37 similar to those already described, are located in this instance at the sides and front of the combustion chamber, the burners at the sides being inclined in such a manner as to direct the flame or blast rearwardly against the grids 35. The flame from the front torch will also be directed rearwardly onto the grids, the burners thus creating an intense heat in order to melt the snow shoveled into the hopper 36. The heat from the torches in addition to heating the grids passes through the perforations, thus coming into direct contact with the snow. Suitable controlling means 38 is also provided as before, for controlling the spread of the blast or flame. The oil in this instance is carried in tanks 39 and is connected by means of pipes 40 to the nozzles of the torches. The air blast in this instance is generated in an air pump 41 connected by a belt 42 to an auxiliary engine 43. If desired a compressed air tank may be interposed between the pump and the torches to insure a steady supply of air or the pump may be discarded and the air be taken directly from supply tanks. This blast is conducted to the nozzles of the torches by means of suitable conduits or piping 44 and 45. A shield 46 is pivoted to the top of the combustion chamber or receptacle 33 and in its open position swings against a stop 47. In this position the member 46 serves as a front wall for the hopper and prevents the snow from being thrown over onto the top of the combustion chamber. A tap or outlet nozzle 48 is provided at the lowest point of the inclined sides 49 of the bottom of the combustion chamber and may be connected to a base as in the other embodiment.

The operation of the two forms of apparatus above described will now be briefly set forth.

Referring again to Figs. 1 to 3, the truck is conveyed under its own power to the locality from which it is desired to remove the snow and ice, and the snow is shoveled into the hopper above the combustion chamber, settling on the perforated grids or bars 20. These grids have been heated to a high degree of temperature by means of the blasts directed inwardly by the burners 19, and therefore, as the snow touches the grids it is melted and trickles through the perforations into the combustion chamber which also forms a tank. The flame passing through the perforations in the grids also melts the snow in the hopper. Owing to the intense heat created in this chamber and also on the iron or metallic grids, the snow is melted in a very short space of time, either before or as soon as it touches the grids. For this reason the capacity of the machine is greatly increased. By interposing between the hopper and the combustion chamber the partition formed of the metallic perforated grids, the snow is prevented from coming into contact with the oil burners and the liability of cooling or putting out the flame is thereby eliminated.

By directing the blast inwardly at an angle as shown in Fig. 2, the center of the blast is substantially at the longitudinal center of the chamber, and the blasts from the opposing torches meet at the center, thereby creating the most intense heat at the longitudinal center.

It will be readily understood that the snow shovelers operating at the sides and rear of the apparatus will deposit more snow at the center than at the sides, and for this reason it is desirable to have the zone of most intense heat at the longitudinal center.

Referring now to the invention as illustrated in Figs. 4 to 6, the operation of this embodiment is substantially the same as that already described. In this instance the snow is shoveled into the hopper 36 at the rear of the device and is melted as soon as or before it comes into contact with the grids 35 which are brought to an intense heat by the torches 37 at the sides and front of the combustion chamber. As the snow is melted the water

passes through the perforations in the grids 35 into the combustion chamber and settles to the lowest point and may be drawn out of the tap 48 when a sufficient quantity has accumulated, or the valve may be opened to allow the water to drain continually.

In both of these modifications the firebrick or insulating material provided in the walls and in the combustion chamber keeps the heat in the chamber and prevents it from being radiated to the outer atmosphere.

While I have in the above specification described two embodiments of my invention, it will be understood that the same is capable of many modifications and that other modifications may be employed without departing from the spirit and scope of the invention as expressed by the following claims:

1. In a snow melting apparatus, a hopper, a combustion chamber having the side walls thereof insulated, a substantially horizontal perforated metallic partition disposed between said combustion chamber and said hopper, and means for creating an intense heat in said combustion chamber.

2. In a snow melting apparatus, a hopper, an insulated combustion chamber, a perforated metallic partition therebetween, and means for creating an intense heat in said combustion chamber below said perforated partition the heat being greatest at the longitudinal center of said chamber.

3. In a snow melting apparatus, a hopper, an insulated combustion chamber, a perforated partition between said hopper and said chamber, and means including forced draft torches inclined to the side walls of said chamber for creating an intense heat in said chamber.

4. In a snow melting apparatus, a hopper, a combustion chamber, a plurality of perforated metallic grids for separating the hopper from said combustion chamber, and means carried by the side walls of said combustion chamber for creating an intense heat therein, said heat passing upwardly through said perforations.

5. In a snow melting apparatus, a hopper, a combustion chamber, means including a plurality of readily detachable perforated metallic grids for separating the hopper from the combustion chamber, and means for creating an intense heat in said combustion chamber, the heat being most intense at the longitudinal center of said chamber.

6. In a snow melting apparatus, a hopper, a combustion chamber, a perforated partition between said hopper and said chamber, said hopper having a metallic inner lining and being provided with insulating material between said inner lining and the outer walls thereof, the bottom of said hopper being inclined downwardly from the side walls to the center and having an outlet opening at the lower portion thereof.

7. In a snow melting apparatus, a hopper, a combustion chamber, a perforated partition therebetween, and means including a plurality of oil torches for directing a blast of flame against said perforated partition.

8. In a snow melting apparatus, a hopper, a perforated metallic partition therebetween, the side walls of said hopper being inclined in such a manner as to direct the snow downwardly against said partition, oil torches disposed at the side walls of said combustion chamber and inclined in such a manner as to direct their flame against said partition.

9. In a snow melting apparatus, a hopper, a combustion chamber, a perforated metallic partition therebetween, and a plurality of oil torches disposed at the sides and front of said combustion chamber for directing their blasts against said perforated metallic partition.

10. In a snow melting apparatus, a hopper, an insulated combustion chamber, a perforated metallic partition between said hopper and said chamber, and oil torches disposed at the sides of said combustion chamber and inclined toward the rear thereof to direct their flames against said metallic partition, the bottom of said combustion chamber being inclined downwardly from the side walls to the center and said chamber having an outlet opening located at the lower portion of the bottom thereof.

In testimony whereof I affix my signature.

EDWARD V. CROUSE.