May 17, 1927. 1,629,160

V. I. HEERMANCE

SNOW MELTING APPARATUS

Filed Jan. 15, 1926 2 Sheets-Sheet 1

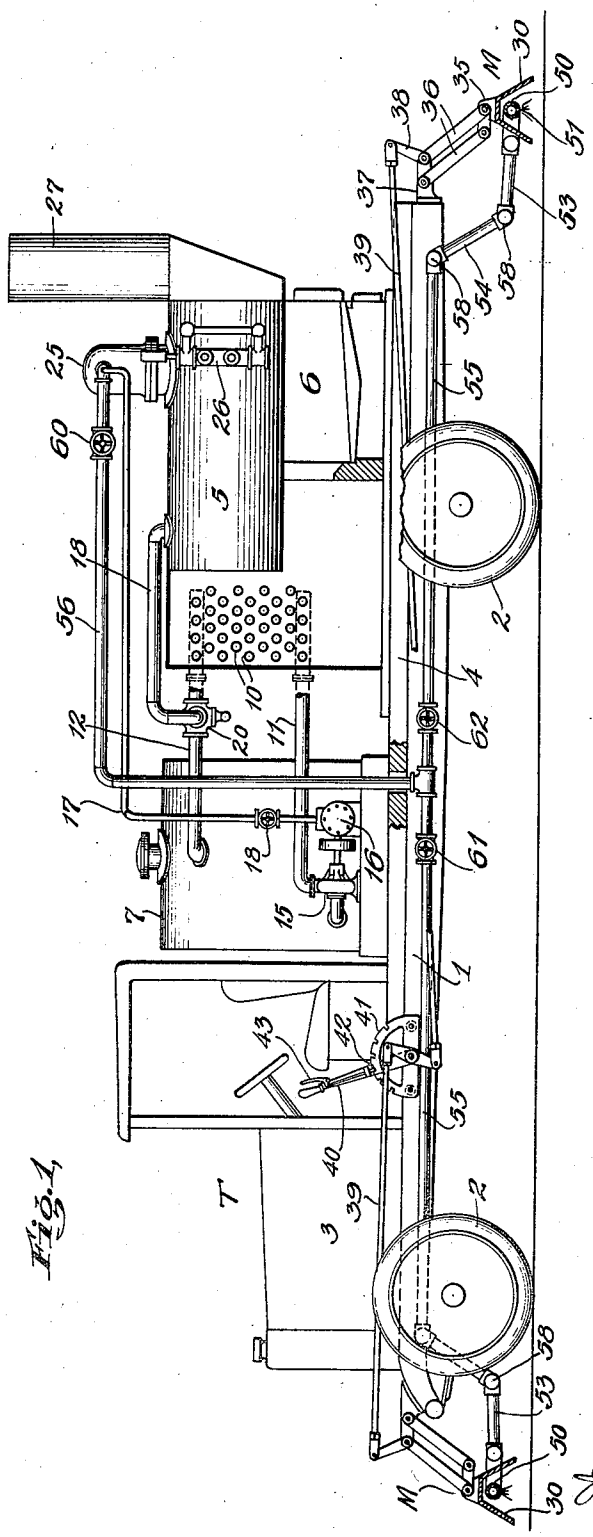


Fig. 1.

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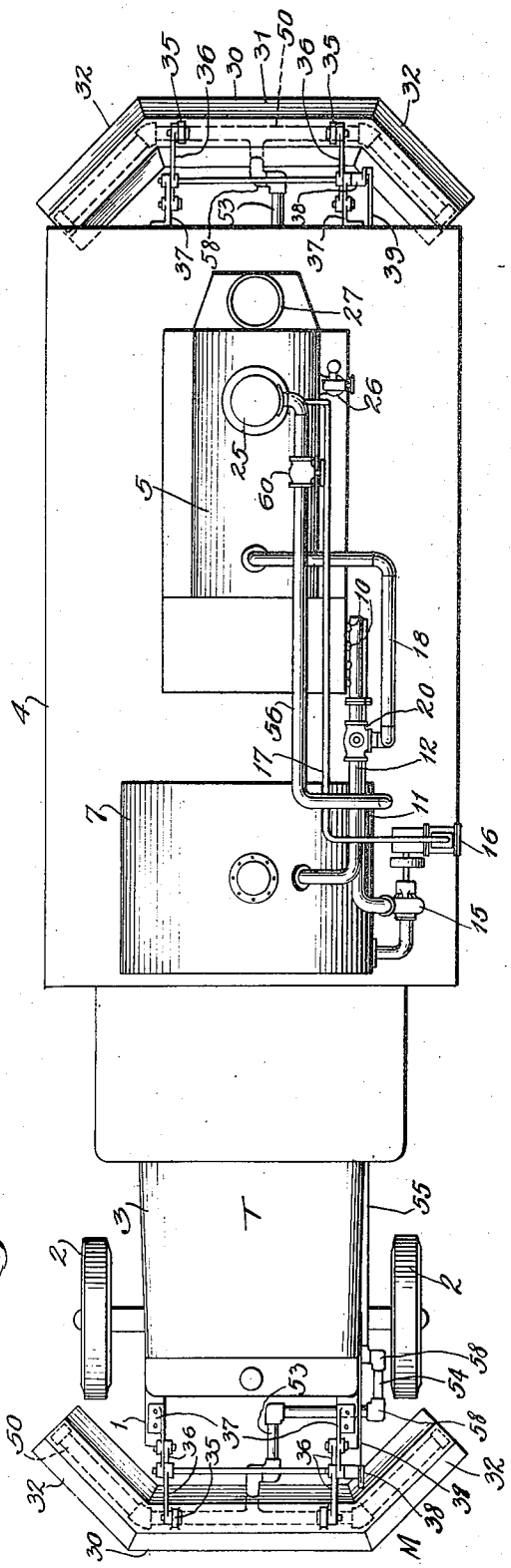


Fig. 2.

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UNITED STATES PATENT OFFICE.

VERNARD IRVING HEERMANCE, OF MONTROSE, NEW YORK.

SNOW-MELTING APPARATUS.

Application filed January 15, 1926. Serial No. 81,507.

My invention relates to a machine, or apparatus, for efficiently melting snow, for the principal purpose of rapidly and efficiently clearing streets or highways of this obstruction to traffic, which is a serious disadvantage under modern traffic conditions, involving immense money loss, as well as inconvenience and danger.

For this purpose I provide mobile apparatus, in the form of a vehicle, which may in some cases be a rail vehicle, but is in many cases preferably a road vehicle of the automobile type, capable of quick movement to any location and also readily movable under its own power along the street or road as melting progresses. This vehicle is provided with suitable melting apparatus, preferably a steam plant for generating steam, which is conducted, under suitable valve control, to melting "shields" or "heads" which are mounted, preferably adjustably, at suitable points on the vehicle, usually at each end thereof, so that the apparatus will not only melt snow rapidly and efficiently to clear the street or highway, but will at the same time, clear its own path for easy movement in either direction.

The invention as embodied in preferred physical form includes the above features, as well as others sufficiently referred to in the following detail description. After considering this example, skilled persons will understand that many variations may be made within the limits of the invention as expressed in the appended claim.

In the drawing:

Fig. 1 is a view mainly in side elevation, with some parts broken away or sectioned, of a mobile snow melter, embodying the invention in one form.

Fig. 2 is a top plan.

The apparatus is desirably mounted on an automotive vehicle, such as the truck T represented in the drawings, this including the usual frame 1, wheels 2, power plant 3 and other parts or accessories. In some cases the motive power may be derived from the steam plant mounted on the vehicle, but in many cases it is preferred to provide distinct propelling power so that all the available heat energy of the steam plant may be used for snow melting. In the broader aspect of the invention the vehicle T represents any vehicle or movable mounting for the melting apparatus proper, such as a rail car, with or without motive power.

On the frame 1 or a platform 4 thereon, is mounted the steam plant including the boiler 5 with its fire box 6, and a feed water storage tank 7. At either end, and preferably both ends of the vehicle, as shown, is a melting appliance M for applying hot steam directly to snow lying on a road or street, this being explained in detail hereafter.

Desirably, the boiler is provided with an "economizer" or feed water heater 10, consisting of suitable pipe coils located in the rear of the fire box and exposed to hot flue gases. This economizer is connected by pipes 11 and 12 to the feed water tank 7. Natural or gravity circulation may be depended on in some cases to circulate water from the tank to the economizer and back again, so that a large part of the heat in the flue gases is utilized and saved in heating the feed water, and especially this is important because otherwise, working practically always in low temperatures, the feed water would be chilled and would have an injurious effect upon the boiler when supplied thereto, or would even freeze and put the entire apparatus out of action.

While gravity circulation may be depended on as above stated in some cases, in many cases it is preferred to provide a pump 15 with a suitable driving engine 16 supplied with steam from the boiler by a pipe 17 under control of a valve 18. The pump is arranged to circulate water from the bottom of the feed tank 7, through pipe 11 to the bottom of the economizer 10 and from the top of the economizer through pipe 12 back to the tank. Another pipe 18 is desirably provided, connected to the boiler and to pipe 12 by means of a multi-way valve 20. By properly setting this valve the feed water may be caused to circulate, as above stated, or by repositioning the valve, water may be forced to the boiler after passing through the preheater 10. The fire box 6, as shown, is designed for coal burning, but evidently it may be suitably modified for oil firing if desired, and in that case, a suitable oil storage tank and fuel feed mechanism will be provided.

The boiler has any usual or necessary appurtenances, such as the steam dome 25, gauge 26, stack 27, etc.

Each melting "head" or apparatus M includes a shield 30, of inverted trough form, and this may be variously contoured in the horizontal plane, the object being to embrace a strip of road surface of substantial width, usually at least somewhat greater than that of the vehicle. In the particular form shown, the shield includes a central, straight, transverse portion 31 and end portions 32, directed somewhat forward or rearward, with respect to the vehicle, as clearly shown in plan view, Fig. 2. Each shield has brackets 35 connected by parallel links 36 to brackets 37 on the chassis frame. One of the links 36 of each pair has an arm 38 connected by a rod 39 to suitable controlling or adjusting means, such as the lever 40, conveniently located for operation by the driver (although, of course, this controlling device may be otherwise located when necessary or desirable). The lever has a notched sector 41 and is provided with a latch 42 and releasing means 43, so that the lever can be readily moved to vertically position the shields 30, as desired, with reference to the depth of snow or for other reasons, and the lever is then easily locked and retains the shields in adjusted position. In the arrangement shown, both shields are controlled by one lever, but evidently separate levers or other adjusting means may be provided for the individual shields. The parallel linkage above mentioned, insures that the shields will retain their proper horizontal positions, with the open face of the trough formations always confronting and parallel to the road surface, in whatever vertical position the shields are placed.

Within each shield is located a steam pipe or head 50, provided on its under side with perforations or nozzles 51 for discharge of a multiplicity of jets of hot steam directly on or into the snow body. For each of these steam heads there is at least one connection to the boiler, including pipe sections 53, 54 and 55, also the main pipe 56 leading from the steam dome 25 to pipes 55.

Of the pipe lines mentioned, the parts 54 have articulated connections by means of steam tight joints at 58, with the pipe sections 53 and 55, so that the steam heads 50 will easily conform to the vertical positioning of the shields without the necessity of providing hose connections in the steam lines, which would soon deteriorate under heat and require frequent replacing.

Valves may be provided where necessary in the steam lines. As shown, the main steam pipe 56 has a main valve 60 and the individual steam lines going to the front and rear shields or steam heads have individual valves as at 61 and 62.

These valves are controlled in an obvious way to regulate the amount of steam supplied to the respective shields or steam heads.

In operation the vehicle is moved under its own power to the scene of action and where conditions are especially bad, will melt its own pathway, and therefore cannot be put out of commission even by a very heavy snow fall. As it progresses along a street or road, it clears its own path and leaves the path cleared for other vehicles, and by the employment of an adequate fleet of these melters, principal streets or highways can be quickly and efficiently cleared of snow, sufficient to permit a great percentage of normal traffic to move under nearly normal conditions, very soon after any average snowfall. The provision of a melting shield or head at each end of the vehicle is desirable in many cases, because normally the vehicle will run forward, but if forward movement is blocked for any reason, it may be easily moved backward and will then melt its own path in the backward direction, until properly positioned for resumption of forward progress.

I claim:

In a snow burner including a truck and a boiler, spray pipes at each end of the truck and connected with the boiler, said pipes extending transversely of the truck, a deflector above each spray pipe for deflecting the steam downward, said deflectors supporting the spray pipes, pairs of parallel links connecting each deflector to the truck, arms connected with corresponding links of the pairs, connections between the arms at each end of the truck, a lever, and connections between the arms at each end of the truck and the lever for enabling the lever to simultaneously raise and lower the deflectors.

Signed at Montrose, in the county of Westchester and State of New York, this 2nd day of January A. D. 1926.

VERNARD IRVING HEERMANCE.