Sept. 6, 1966 J. J. PETLAK 3,270,741

SNOW MELTER

Filed Sept. 30, 1964 2 Sheets-Sheet 1

Fig. 1.

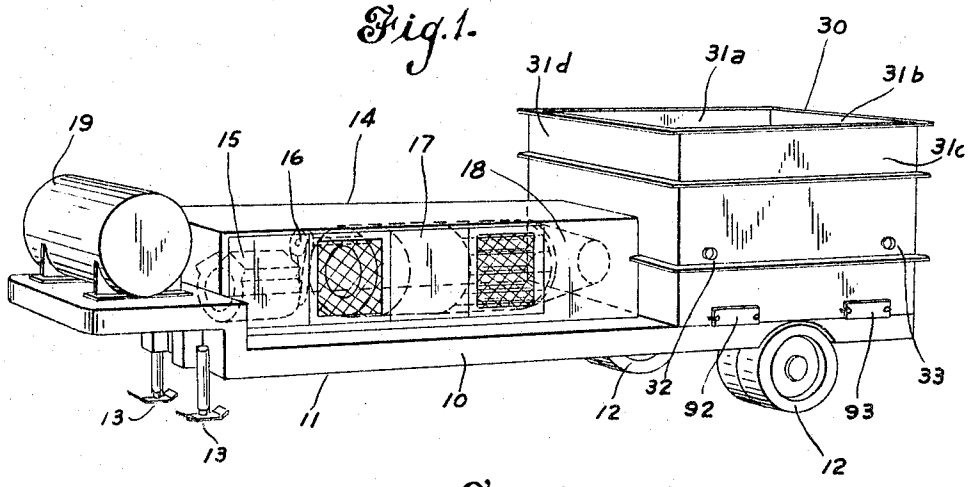
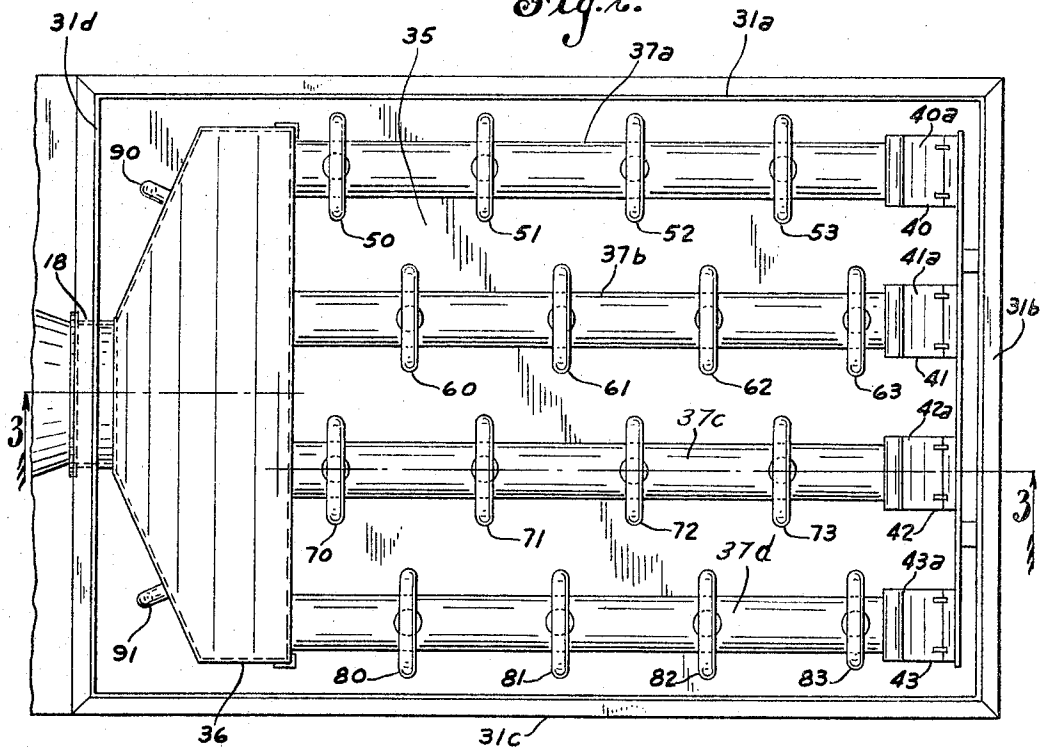



Fig. 2.




INVENTOR

JOSEPH J. PETLAK

BY STEPHEN E. ROCKWELL

ATTORNEY

Sept. 6, 1966 J. J. PETLAK 3,270,741

SNOW MELTER

Filed Sept. 30, 1964 2 Sheets-Sheet 2

Fig. 3.

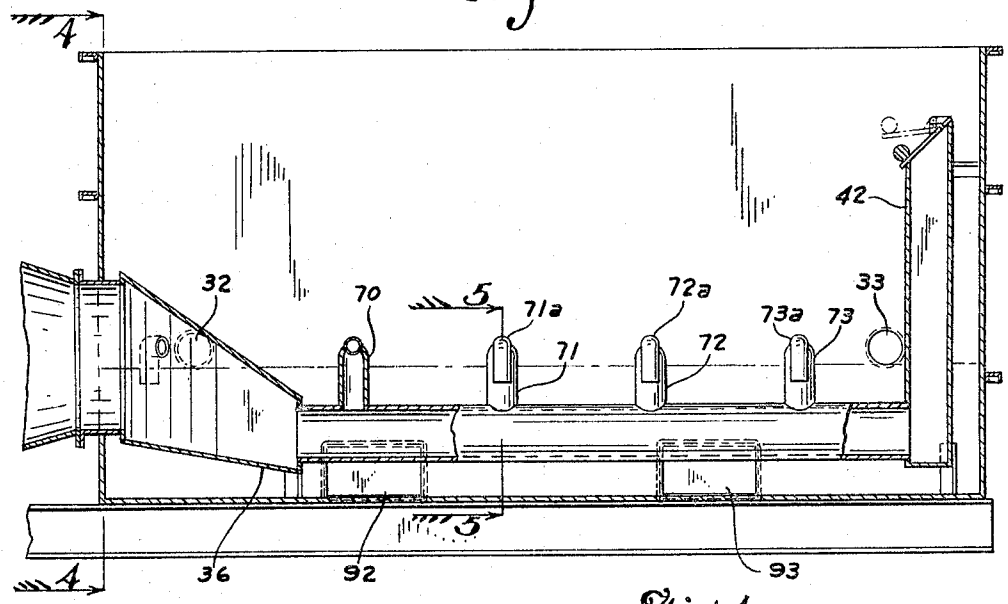



Fig. 4.

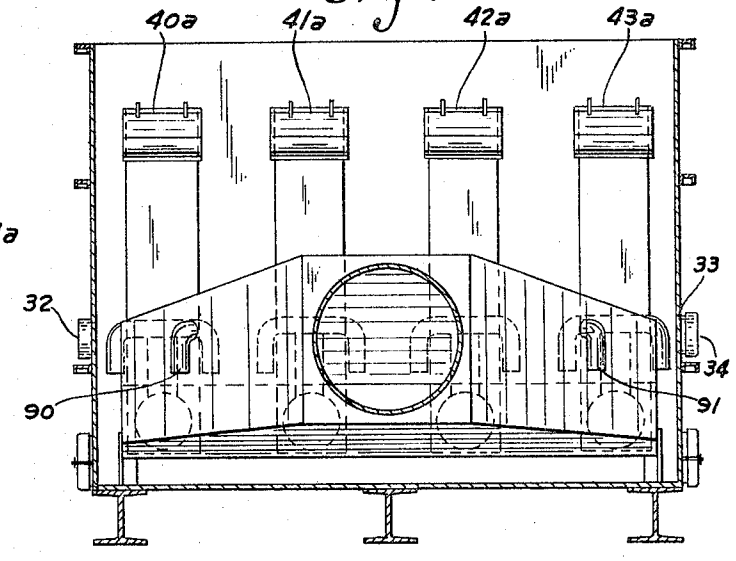
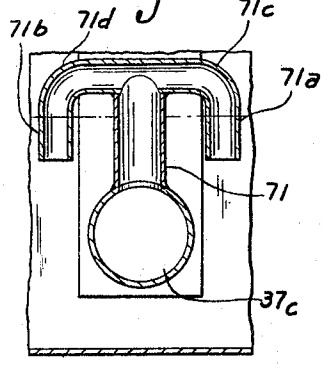



Fig. 5.




INVENTOR

JOSEPH J. PETLAK

BY STEPHEN E. ROCKWELL

ATTORNEY

United States Patent Office 3,270,741 Patented Sept. 6, 1966



3,270,741

# SNOW MELTER

Joseph J. Petlak, 3 Lincoln Drive, Wallingford, Conn.

Filed Sept. 30, 1964, Ser. No. 400,519
3 Claims. (Cl. 126—343.5)

This invention relates to snow melters and more particularly to a snow melting apparatus particularly suited for use in conjunction with snow and ice loaders to remove and melt large amounts of snow and ice accumulations.

In the past, snow melting apparatuses have included, for example a gas turbine employed in combination with a duct to heat and supply gases at high velocity to a snow melting chamber. The aforementioned duct may be arranged concentrically with a snow inlet duct in the side of the melting chamber to produce a suction effect upon the snow entering the chamber. Although snow melting is possible with the above-mentioned structure, the speed of melting with this type of system or other known systems is not as fast as usually desired. Additionally, other snow melters have used similar constructions with such modifications, for example, as deflectors, a plurality of burners in the melting chamber or hopper and torches selectively positioned within the hopper or snow-receiving tank.

Accordingly, one object of this invention is to provide a new and improved high speed snow-melting apparatus.

Another object of this invention is to provide an apparatus such as characterized above for percolating, agitating and heating a confined fluid (from melted snow) into which ice and snow are dumped.

It is an additional object of this invention to provide an escape mechanism for the heated gases when clogging of the snow melting apparatus occurs.

For a fuller understanding of a preferred form of the invention, reference is had to the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective of a snow melting apparatus embodying the invention, incorporated in a trailer;

FIG. 2 is a fragmentary top plan view of the snow-melting chamber of the melting apparatus according to the invention;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2;

FIG. 4 is a sectional view taken along line 4—4 of FIG. 3; and

FIG. 5 is a sectional view taken along line 5—5 of FIG. 3.

In the drawings, the snow melting apparatus is shown generally at **10**. In particular, FIG. 1 shows the snow melting apparatus in a trailer configuration. The trailer body **11** is shown having a plurality of wheels **12** and supports **13**. The frame or body **11** has mounted thereon a housing **14** which is utilized to cover a device for providing and delivering hot gases at high velocity to the snow melting chamber of this invention. A typical construction of said device may include an auxiliary engine **15**, such as a gasoline engine, which drives a modified jet engine **17** by way of a pulley mechanism shown at **16**. The hot gas is then expelled from the modified jet engine via the exhaust **18** into the melting chamber shown generally at **30**. The modified jet engine has its stator blades as well as its flywheel removed. By the removal of these two elements, a normal jet engine would no longer be self-sustaining. Therefore, to pump gases, the pulley system **16** drives the turbine blades at a constant speed while the quantity of fuel provided by a tank **19** shown in FIG. 1, may have its flow varied, by a valve (not shown) adjustable for the desired gas



output temperature. Furthermore, a gas tank (not shown) may be mounted on the frame **11** to provide fuel for the engine **15**.

It is to be understood that other hot air or gas mechanisms such as turbines or blowers governed by similar engines, could be utilized in place of the modified jet engine-gasoline engine combination shown in FIG. 1.

The melting chamber, bin, hopper or tank **30** comprises a plurality of side walls **31***a*, **31***b*, **31***c*, **31***d*, attached to a bottom **35**. Positioned near the bottom of the tank **30** is an exhaust chamber or duct **36**. This exhaust is coupled to the exhaust duct **18** previously mentioned. Also coupled to the exhaust duct **36** are a plurality of substantially parallel manifold ducts **37***a*, **37***b*, **37***c*, **37***d*. These ducts are positioned in such a manner as to provide substantially an even distribution of gases through the rearward portion of the melting chamber **30**. At the end or terminus of each of these ducts are pressure relief ducts **40**, **41**, **42** and **43**, containing hinged lids or flapper valves **40***a*, **41***a*, **42***a*, and **43***a*, respectively. On each of the manifold ducts **37***a*–**37***d*, there is shown a plurality of pipes for expelling hot gases into the bottom **35** of the melting chamber **30**.

Duct **37***a* includes pipes **50**, **51**, **52**, and **53**, duct **37***b* includes spaced pipes **60**, **61**, **62** and **63**, duct **37***c* has mounted thereon expelling pipes **70**, **71**, **72** and **73**, and duct **37***d* has expelling pipes mounted thereon noted as **80**, **81**, **82**, **83**. The particular configuration of these expelling pipes is best shown in FIG. 5. Expelling pipe **71**, which is typical, is shown in a T-configuration having two downward-turned or bent ends noted as **71***a* and **71***b*. Thus, gases are expelled from the expelling tubes in a downward direction toward the bottom **35** of the melting chamber **30**.

Further, the duct **36** is shown as having two downward-pointing expelling pipes **90** and **91** to provide hot gases to clear the region of snow and ice in the vicinity of the sidewall **31***d* and the compartment **36**.

Also shown in the drawings are a plurality of fluid outlet holes **32** and **33** in the side **31***c* of the melting chamber **30**. These holes are positioned in such manner with relation to the bottom of the downwardly turned expelling pipes as to set the fluid level within the pipe at a height greater than the height of the outlet ends of the downwardly turned expelling pipes from the bottom **35**. Thus, the gases entering the chamber **30** are below the fluid level, thereby providing a percolating and agitating action of the fluid to melt the snow and ice loaded into tank **30**.

To remove any accumulation of sludge, dirt, leaves, etc., clean-out doors **92** and **93** are shown. Additionally, in FIG. 4, overflow pipe **33** is shown having a plug **34** therein. In this configuration the overflow or fluid egress hole **32** can be coupled to a pipe or hose so as to expel the melted fluid obtained by the melting of snow and ice into an auxiliary water truck down a drain, or other means of disposal.

In operation, snow is loaded into tank **30** and falls in the vicinity of the manifold ducts and the expelling pipes previously disclosed. Hot gases are pumped into the duct **36** and subsequently flow through the ducts **37***a*, **37***b*, **37***c* and **37***d* and out through the respective expelling pipes. The water level in the tank is then set by the height of the overflow fluid outlets **32** and **33**. During operation, the water level is above the gas-expelling level with relation to the height of the tank **30**. It is to be specially noted that the duct configuration including substantially parallel laterally-spaced exhaust manifolds distributes the flow and amounts of gases to efficiently and speedily melt any snow and ice accumulations.

Further, the use of a plurality of expelling pipes posi-

tioned along laterally and parallel spaced ducts provides equalizing agitation of the fluids within the bottom of the tank so as to tend to prevent any large accumulations of snow and ice in the tank **30**. In this manner, efficient and continuous melting is achieved without the requirement of manual shoveling for distribution of snow in the bottom of the melter.

Furthermore, if any accumulation does occur within the bottom of the tank **30** and gases cannot be expelled rapidly enough from the exhaust manifolds and the expelling pipes, the escape mechanisms shown at **40**, **41**, **42** and **43** having weighted covers **40***a*, **41***a* and **43***a* would open to permit the gases to escape and therefore reduce the pressure within the system to prevent any damage to the apparatus.

It is to be particularly noted that the water level is kept below the elbow of the downwardly pointing T-ends of the expelling pipes. The elbows for expelling pipe **71** are indicated at **71***c* and **71***d*. By keeping the water level below the start of the elbow and above the outlet end or tip of the expelling pipe, continuous percolating action and heating of the fluid on the bottom of the tank will take place while, at the same time, fluids will be prevented from entering the exhaust manifolds or ducts, the exhaust compartment **36** or even backing up into the hot-gas-providing apparatus.

While only one form of the invention has been shown herein and described, it will be apparent to those versed in the art that the snow melter may take other forms, and is susceptible of changes in details without departing from the principles of the invention and the scope of the appended claims.

What is claimed is:

**1.** In a snow and ice melting machine, a chamber having side and bottom surfaces, a plurality of manifold ducts supported near the bottom surface of the chamber, said ducts being arranged substantially parallel to each other, means positioned within said chamber for distributing gases to each of said ducts, a plurality of gas-expelling pipes coupled to each of said ducts, each of said pipes being constructed in a T configuration with the vertical portion of the T coupled to respective duct and the cross-bar portion of the T having open ends, said cross-bar portion further being bent downward at regions in proximity to the respective open ends to point said open ends toward said bottom surface, at least one



fluid outlet in said side surface, a portion of the outlet being located in the chamber at a level between the open ends of the last-mentioned pipe and the bent regions thereof for inhibiting any fluid in said chamber from entering the corresponding duct, and pressure-relief ducts coupled to said manifold ducts, said relief ducts extending at least partially up to the height of said side surface and having weighted covers hinged to provide flap valves.

**2.** In a melting machine according to claim **1** wherein said chamber side surface is in the form of a rectangle and said manifold ducts are parallel to at least one side of said rectangular side surface.

**3.** In a snow and ice melting machine having means for providing hot gases, a melting chamber having a bottom and four sides, at least three manifold ducts supported near the bottom of said chamber, said manifold ducts being substantially parallel to each other and to two sides of said chamber, an exhaust chamber mounted in said chamber and coupled to each of said ducts for distributing hot gases to said ducts, at least three gaseous expelling pipes coupled to each of said ducts, said pipes each comprising a first section extending vertically from said ducts, a second section coupled to said first section, said second section being in part perpendicular to said first section, and said second section further having two bent portions and two open-ended portions which are parallel to said first section and facing said bottom, at least one fluid outlet which is positioned in one of said sides and is at a height from said bottom to set a fluid level within the chamber between the bent portions and the open-ended portions of said pipes, and at least one pressure relief duct coupled to each of said manifold ducts.


**References Cited by the Examiner**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 663,718 | 12/1900 | Beatty | 126—343.5 |
| 1,572,414 | 2/1926 | Wilbert. | |
| 2,375,840 | 5/1945 | Ekstrom | 126—360 |
| 3,052,231 | 9/1962 | West et al. | 126—360 X |
| 3,140,708 | 7/1964 | Petlak et al. | 126—343.5 |
| 3,171,405 | 3/1965 | Miller | 126—360 X |
| 3,187,743 | 6/1965 | Primas | 126—343.5 |


CHARLES J. MYHRE, *Primary Examiner.*