Nov. 4, 1941. W. J. O'BRIEN 2,261,732

SNOW MELTING APPARATUS

Filed May 8, 1940 3 Sheets-Sheet 1

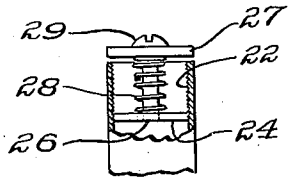


Fig. 7.

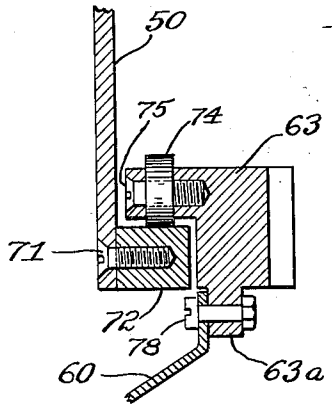


Fig. 5.

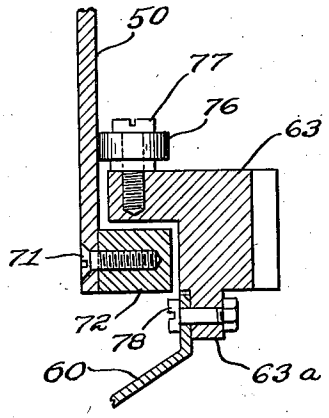
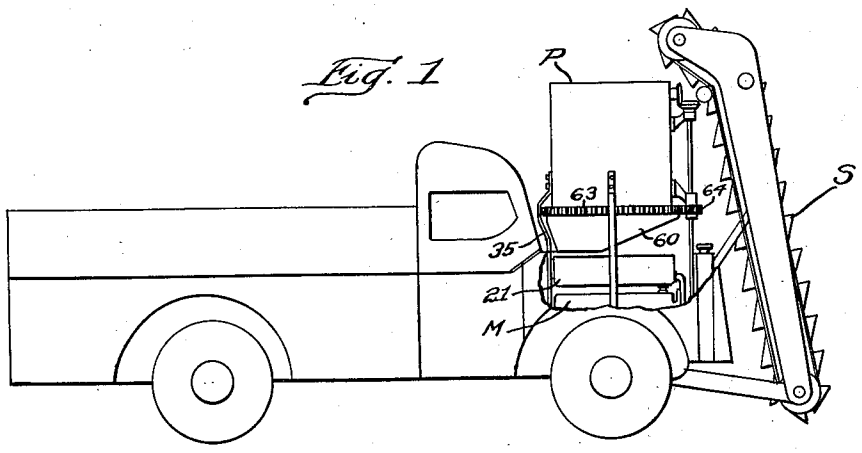


Fig. 6.

Fig. 1



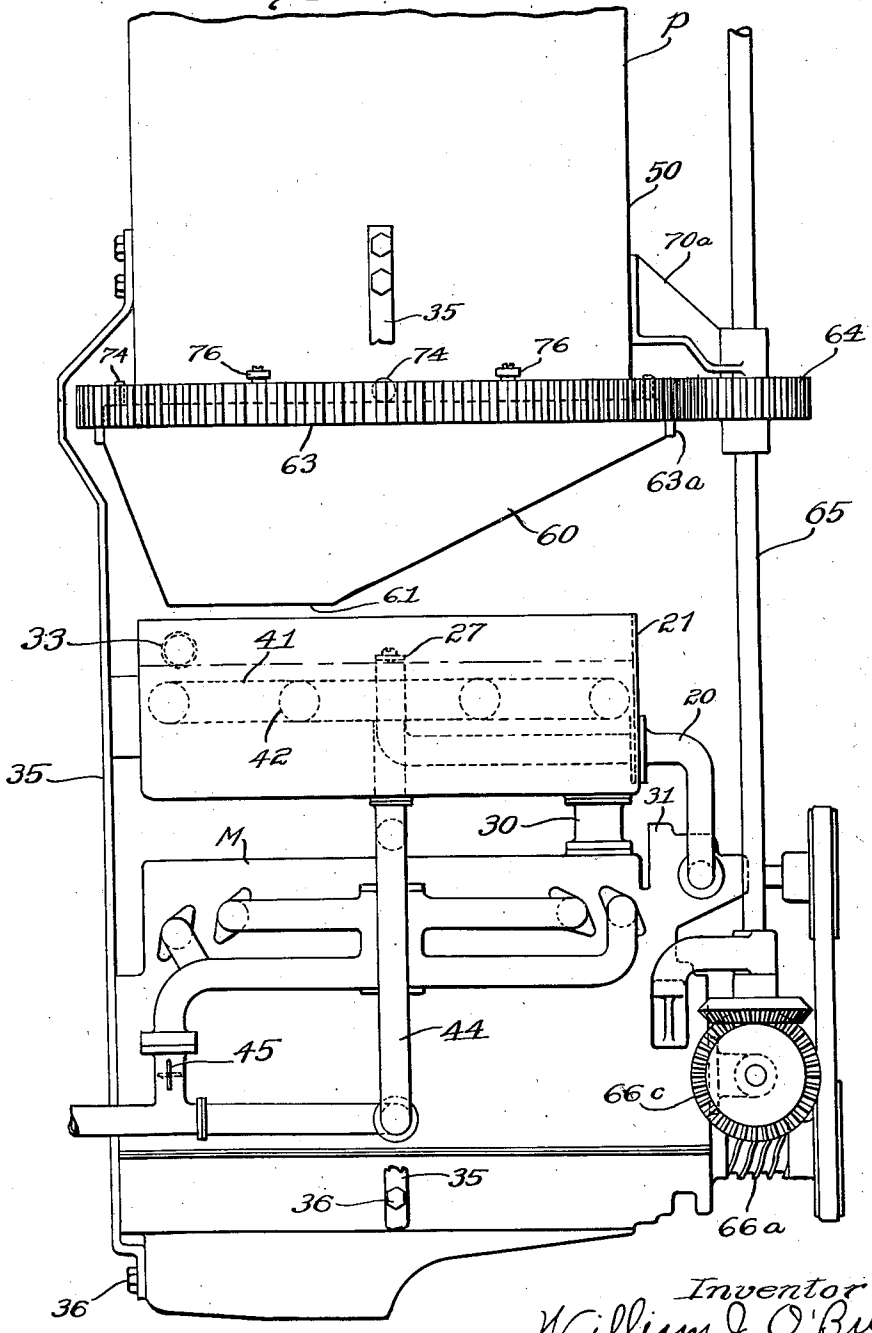
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Filed May 8, 1940 3 Sheets-Sheet 2

Fig. 2



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SNOW MELTING APPARATUS

Filed May 8, 1940 3 Sheets-Sheet 3

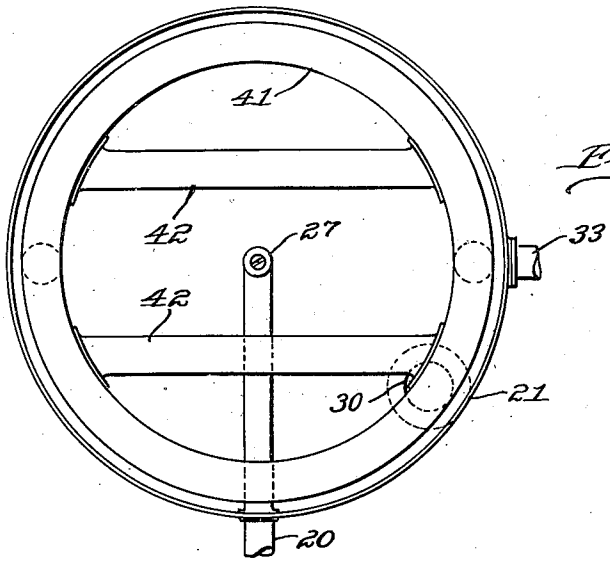


Fig. 4

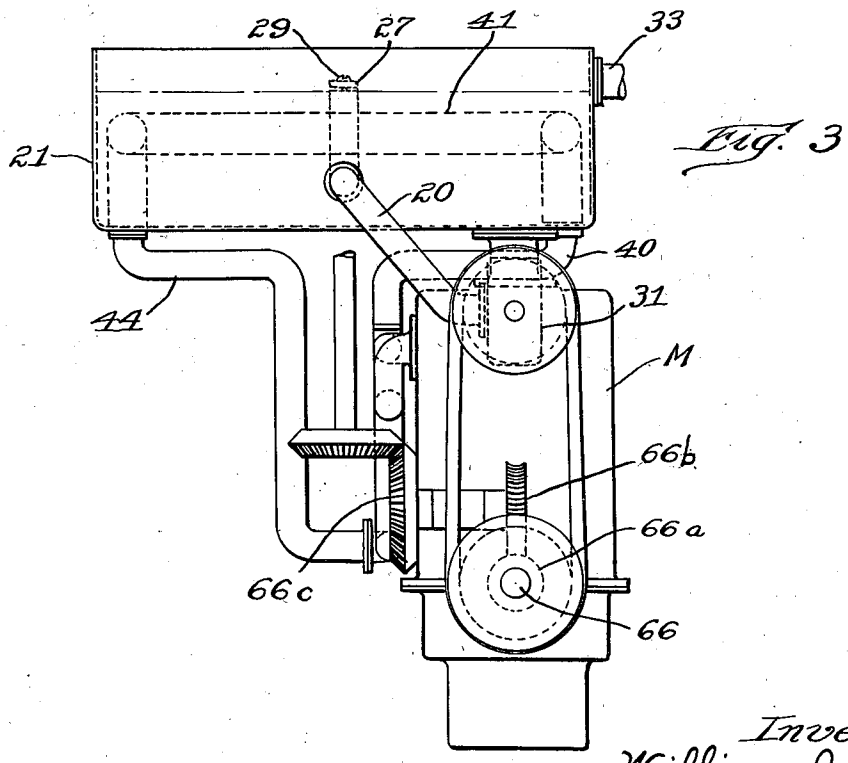


Fig. 3

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UNITED STATES PATENT OFFICE

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SNOW MELTING APPARATUS

William J. O'Brien, Boston, Mass.

Application May 8, 1940, Serial No. 334,009

6 Claims. (Cl. 126—343.5)

This invention relates to snow melting apparatus.

The principal object of my invention is to provide apparatus that can supply enough heated water to a snow melting chamber to melt snow that is steadily put into it. Another object of my invention is to provide a snow-receiving receptacle equipped with snow-pulverizing or grinding means that is adjacent said snow melting chamber, so that the snow may more readily be melted because of having been rendered finer by said pulverizing means. Another object is to provide mechanism whereby a well-known type of motor can be operably connected to said snow-pulverizing means and can also supply said snow-melting chamber with a steady supply of hot water. A further object is to provide a movable chute for the purpose of more evenly distributing snow supplied to said chamber.

The foregoing and other objects which will appear as the nature of the invention is better understood, may be accomplished by a construction, combination and operative arrangement of parts such as is disclosed by the drawings and specification. The nature of the invention is such as to render it susceptible to various changes and modifications, and, therefore, I am not to be limited to said disclosure; but am entitled to all such changes therefrom as fall within the scope of my claims.

In the drawings:

Figure 1 is a side elevational view of my apparatus attached to a well known motor vehicle truck.

Figure 2 is a side elevational view of my apparatus shown connected to an internal combustion motor.

Figure 3 is a front elevational view of my snow-melting chamber connected to the motor for heating the water supplied to it, and also showing conduits branching from the exhaust pipe extending into the snow-melting chamber, and Figure 4 is a plan view thereof.

Figure 5 is a detail sectional view showing details of the means for supporting and rotating the funnel into which the snow passes from the pulverizing receptacle, while Figure 6 is a detail sectional view, showing more details of said means, and

Figure 7 is a sectional, detail view of the water inlet spray through which hot water passes to said snow-melting chamber.

As illustrated, my apparatus is adapted to be connected to the usual internal combustion motor M such as automobiles are equipped with and which are cooled by the circulation of water. The heated water passes out of the water jacket or water circulation portions of said motor M through a conduit **20** to my snow-melting chamber **21**. The interior of the upper portion of said conduit is threaded as at **22**. A short distance below the upper end of said conduit **20** an open anchor plate **24** is screw-threadedly connected to the threaded interior portion **22** of said conduit. Said anchor plate has a threaded hole **26** in the center portion thereof. Located over and slightly above the upper outside of the discharge end of said conduit **20** is a closure plate that serves as a spray member **27** which is held in a predetermined position by a coiled spring **28** that extends between and bears against said anchor plate **24** and said spray member **27**. Said spring **28** is held in position by a screw **29** which extends through said spray member **27** and said spring **28** and screw-threadedly enters said threaded hole **26**. The hot water from the motor M passes out of the space left between the top of said conduit **20** and said spray member **27** thereby causing the water to enter said snow-melting chamber **21** in as fine and widely distributed streams or spray as is desirable. Inasmuch as the snow passes down into said chamber **21** from above, the streams of hot water will strike some of said snow before it actually enters said tank, thereby obtaining the maximum melting effect of said hot water.

A return conduit **30** from said chamber **21** to said motor M provides means for passage of sufficient water back to said motor M for the needs of the circulating system and to provide a constant supply of hot water from said motor M to said chamber **21**. A pump **31** forces the circulation of said water in said system. The water is rapidly heated by said motor M, as the usual radiator, fan and cooling means commonly used with internal combustion motors are purposely not allowed to function. As the snow melts in said chamber **21** water rapidly rises in said chamber and some passes out through the overflow outlet **33** in said chamber **21** and onto the ground below or it may be piped away to some definite place of disposal, such as a sewer.

Said chamber **21** is held in position by supporting brackets **35** fastened by bolts **36** to said motor M.

As an auxiliary heating means which is desirable, although not indispensable, I employ the exhaust gases from said motor M by connecting the exhaust gas pipe **40** to a conduit or pipe **41** that is located inside and extends around said

tank 21 and to other heating pipes 42 that extend across said tank, said pipes 41 and 42 being in communication with each other. The exhaust gases finally pass into a discharge pipe 44. A shut-off valve 45 in said exhaust pipe 40 makes it possible to divert the exhaust gases through said pipes 41 and 42.

Extending above said motor M is a pulverizing device P having a receptacle 50, that is preferably round, to receive the snow, that may be equipped with suitable pulverizing means (not shown).

Directly below said pulverizer-receptacle 50 and rotatably connected thereto is a rotatable snow-receiving funnel 60 which has an eccentric outlet 61 at one side thereof, whereby snow will pass from said receptacle 50 through said funnel 60 into said snow-melting chamber 21 near a side thereof. Said funnel 60 is rotated by means of a large driven gear 63 which is attached to a depending portion 63*a* of said gear 63, which gear meshes with a pinion gear 64 that is driven by a vertical drive shaft 65 that in turn is rotated by the crank shaft 66 of the said motor M. This is accomplished through worm 66*a* and worm wheel 66*b*, and through bevel gears 66*c*. In the event my apparatus is attached to the usual type of motor vehicle this arrangement avoids serious obstruction of the view ahead.

Said shaft 65 extends from said pinion gear 64 upwardly to a point where bevel gears 67 transmit the power from said shaft 65 to a horizontal shaft 68 and thence through bevel gears 69 to said grinder shaft 52, thereby rotating said shaft 52, which performs the grinding operation. Said horizontal shaft 68 is rotatably mounted in the outer wall of said receptacle 50 at two different places 69*a* and 70.

Fastened by screws 71 to said receptacle 50 at its lower extremity is a ring member or skirt 72 which serves as a support for said large gear 63 which latter completely encircles said receptacle 50. Said gear 63 is rotatably mounted on rollers 74 which are held in place by screws 75. Said rollers 74 travel on said skirt 72 thereby supporting said gear 63. This gear 63 is also centrally located by rollers 76 held in place by screws 77 which rollers roll against the outside periphery of said receptacle 50. This permits a rotative movement of the gear 63 with the least amount of friction. Said funnel 60 is fastened to said depending portion 63*a* of said gear 63 by bolts 78.

While it is not absolutely necessary to rotate said funnel 60, and it could be an integral part of said receptacle 50 in the event it was stationary, nevertheless its rotation is helpful inasmuch as it insures fairly even distribution of the snow falling into said snow-melting chamber 21, thereby avoiding the piling up of the snow in one place.

Said pulverizer-receptacle 50 may be fed by manually shoveling snow into it, or a snow loader S may be associated therewith to unload the snow into it, as illustrated in Figure 1 of the drawings.

My apparatus may also be built into a motor vehicle, or it can be made separately as an attachment for a motor vehicle, preferably mounting the principal parts of it to one side of the motor.

What I claim is:

1. Snow melting apparatus in combination with an internal combustion motor having means for circulating water through the cooling jacket thereof, said apparatus comprising a snow-melting chamber, conduits in communication with said water circulating means and extending to said chamber whereby heated water passes from said means to said chamber and thence to said means, a snow-receiving receptacle embodying movable grinding means within it, power-transmitting means operably extending from said motor to said grinding means, funnel means to receive snow from said receptacle and means to support said receptacle, funnel and chamber which are so positioned relative to each other that snow will pass respectively from said receptacle to said funnel and thence to said chamber.

2. Snow melting apparatus in combination with an internal combustion motor having means for circulating water through the cooling jacket thereof, said apparatus comprising a snow-melting chamber, conduits in communication with said water circulating means and extending to said chamber whereby heated water passes from said means to said chamber and thence to said means, a snow-receiving receptacle embodying movable grinding means within it, power transmitting means operably extending from said motor to said grinding means, a rotatable funnel below said receptacle, power transmitting means operably connected to said motor and to said funnel whereby said funnel is rotated, and means to support said chamber, said receptacle and said funnel, said receptacle, funnel and chamber being so positioned relative to each other that snow will pass respectively from said receptacle to said funnel and thence to said chamber.

3. Snow melting apparatus in combination with an internal combustion motor having means for circulating water through the cooling jacket thereof and a pipe for the escape of exhaust gases, said apparatus comprising a snow-melting chamber, conduits in communication with said water circulating means and extending to said chamber whereby heated water passes from said means to said chamber and thence to said means, a snow-receiving receptacle embodying movable grinding means within it, power-transmitting means operably extending from said motor to said grinding means, conduits in communication with said exhaust pipe extending into said chamber, and supporting means for said chamber and receptacle, said receptacle and chamber being so positioned relative to each other that snow will pass from said receptacle to said chamber.

4. Snow melting apparatus in combination with an internal combustion motor having means for circulating water through the cooling jacket thereof, said apparatus comprising a snow-melting chamber, conduits in communication with said water circulating means and extending to said chamber whereby heated water passes from said means to said chamber and thence to said means, a snow-receiving receptacle embodying movable grinding means, power-transmitting means operably extending from said motor to said grinding means, and means to support said chamber and receptacle, said receptacle and chamber being so positioned relative to each other that ground snow in said receptacle will pass to said chamber.

5. Snow melting apparatus in combination with an internal combustion motor having means for circulating water through the cooling jacket thereof, and having an exhaust pipe extending therefrom, said apparatus comprising a snow-melting chamber embodying a bottom and side

structure and being adapted to hold water and having an opening at the top with a connection to receive heated water from such water jacket, and having an outlet opening below said top to permit the passage of water out of said chamber, and conduits in communication with said chamber at said top and with said outlet opening for the passage of water therethrough, said chamber having other openings therein, and conduit pipes extending from said exhaust pipe through a latter-mentioned opening into said chamber and through another latter-mentioned opening out of said chamber.

6. Snow melting apparatus in combination with an internal combustion motor having means for circulating water through the cooling jacket thereof, said apparatus comprising a snow-melting chamber, a conduit in communication with said water circulating means and extending to and over said chamber whereby heated water passes from said means to said chamber, a conduit in communication with said means and extending to said chamber at a point below the top thereof, a snow-receiving receptacle embodying movable grinding means within it, power-transmitting means operably extending from said motor to said grinding means, and means mounted on said motor to support said chamber and receptacle, said receptacle and chamber being so positioned relative to each other that ground snow in said receptacle will pass to said chamber.

WILLIAM J. O'BRIEN.