

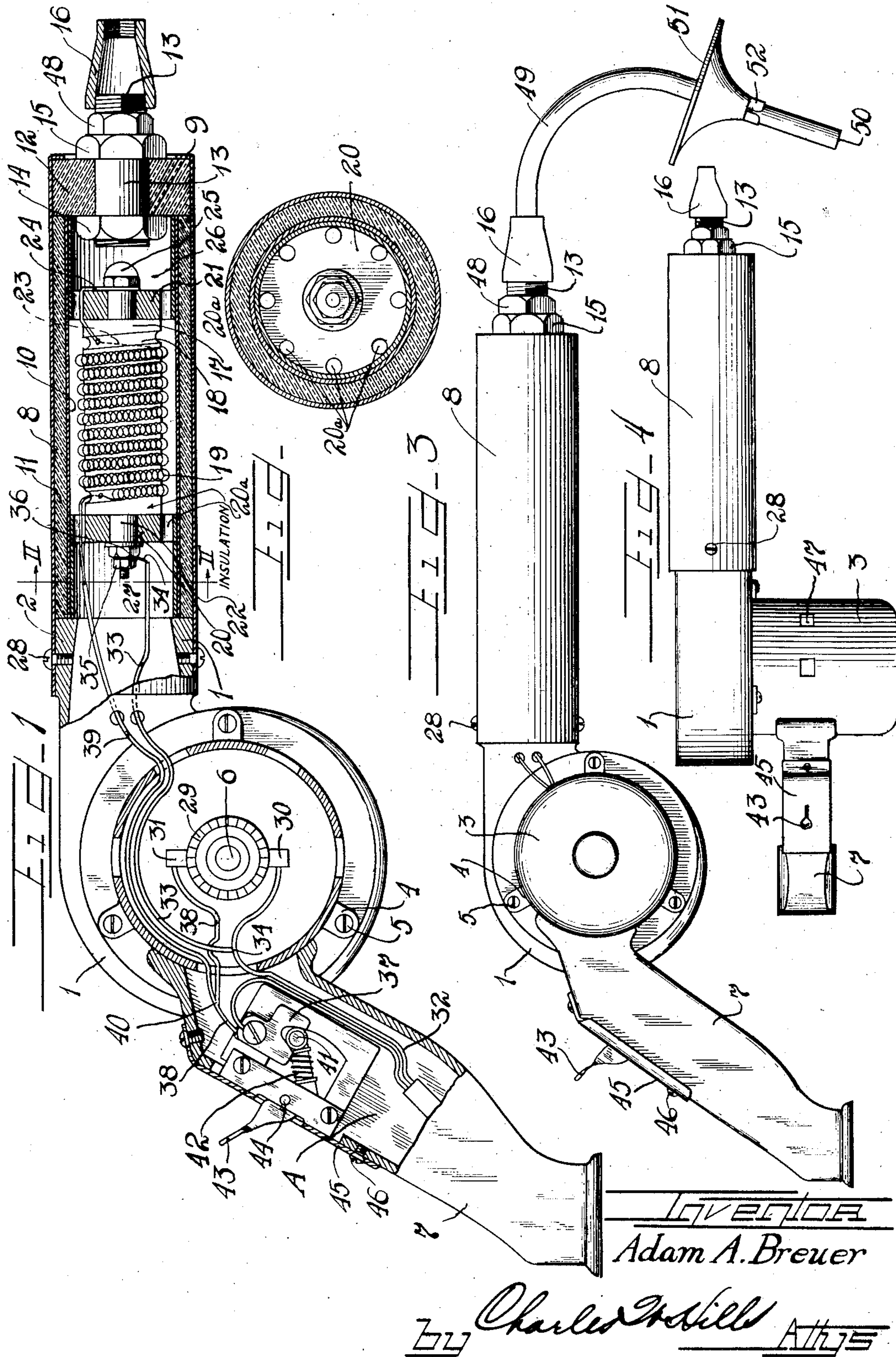
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PORTABLE HEAT BLOWER

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UNITED STATES PATENT OFFICE

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PORTABLE HEAT BLOWER

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This invention relates to a portable heat blower and particularly to a small compact blower having a hooked discharge pipe for use in thawing the solidified oils and greases in crank, transmission and differential cases of automobiles and like vehicles and is also useful in thawing radiators of such vehicles.

The solidification of the lubricants used in automotive vehicles in cold climates is a very serious event and requires thawing at frequent intervals.

The present invention has for an object the provision of a small compact portable heat blower which can be readily engaged in the usual plug openings in the crank, transmission and differential cases of automotive vehicles for thawing the hardened lubricant therein and which blower may be left in such openings with safety for the necessary time.

Another object of the invention is to provide a portable heat blower in which the motor and heating element are so connected electrically that one cannot function without the other.

A further object of the invention is to provide a portable heat blower wherein the maximum heating of the blown air is secured.

A still further object of the invention is to provide a portable heat blower for use in connection with the thawing of solidified lubricants and the like in and about automotive vehicles which will effectively thaw such solidified lubricants and at the same time be free from any danger of causing fire.

There is nothing now available for thawing solidified lubricants in the various parts of automotive vehicles which is compact, convenient, safe and easy to use and this invention seeks to provide an apparatus which may be sold at relatively low cost which is efficient in use.

The above other and further objects of the invention will be apparent from the following description, accompanying drawings and appended claims.

According to the invention a centrifugal fan is driven by an electric motor. The air blown by the fan is directed along and about a heating element in a suitable heating cham-

ber and then discharged through a small orifice at high pressure. The motor and heating element are so connected electrically that one cannot function without the other.

An embodiment of the invention is illustrated in the accompanying drawings and the views thereof as follows:

Figure 1 is a side elevational view partially in section of the illustrated form of apparatus embodying the present invention.

Figure 2 is an enlarged sectional view taken on line II—II of Figure 1.

Figure 3 is a side elevational view of the illustrated form of apparatus in its completed form showing a hooked pipe connected to the discharge end of the heating chamber.

Figure 4 is a reduced top plan view of the apparatus in Figure 3 with the pipe omitted.

Drawings will now be explained.

The illustrated form of apparatus exemplifying the present invention consists of a centrifugal fan casing 1 having a tangential discharge port 2, the interior of which port converges towards its end.

Motor casing 3 is provided with a plurality of lugs 4 through which pass screws 5 for attaching the motor casing to one side of the fan casing 1 so that the motor shaft 6 may be connected to the fan (not shown) for driving the same.

A handle 7, preferably of the pistol type, is integrally formed with or secured to the motor casing 3.

The motor casing 1, fan casing 3 and handle 7 are made of light material, preferably aluminum, so that the completed device may be as light as possible for convenience and ease in use.

A tube 8 is formed with a flange 9 at one end and with its other end continuous with the tube for engaging over the discharge port 2 of the fan casing 1.

An inner tube 10 is arranged within the tube 8 and spaced from the same by heat-insulating material 11 such as asbestos or equivalent material.

Adjacent the flanged end 9 of the tube 8 is a plug 12 of heat-insulating material which plug has an aperture therethrough for

receiving a nipple 13 which is secured in the plug by means of nuts 14 and 15 on the nipple and bearing against the opposite faces of the plug 12.

5 The nipple 13 is threaded at each end to receive the nuts and also to receive an adapter or connecting collar 16.

10 A heating element, consisting in the present instance of a porcelain 17 having a spiral groove 18 formed in the periphery thereof and a coil 19 of wire which is passed about the porcelain insulator 17 and in the groove 18 of the same, is supported within the tube 10.

15 A plate or disc 20 is fastened against one end of the insulator 17 and a spider 21 is fastened against the other end. A bolt 22 passes through the plate 20, insulator 17 and spider 21 for holding these parts together as a unit.

One end 23 of the heating coil 19 is electrically connected to the pin or bolt 22 by a connector 24 which in the present instance engages the head 25 of the pin.

25 The plate 20 is provided with several small openings 20^a for a purpose to be later explained and the connector 24 passes through one of these openings into electrical connection with the pin 22.

30 The heating element is centered lengthwise of the inner tube 10 by means of a spacing collar 26 interposed between the inner surface of the plug 12 and the plate 20 and a second spacing collar 27 interposed between the spider 21 and the front edge of the discharge port 2 of the fan casing 1.

35 The tubes 8 and 10 as well as the heating element above-described and the various parts related to the same are assembled within the tube 8 and then the tube 8 is slid over end 2 of the discharge port of the fan casing with the spacer 27 engaging the front edge of such port for securing the heating element in place within the tube 8. The tube 8 and its associated parts just described is secured to the fan casing 1 by means of screws 28 passing through the inner end of the tube and into the discharge port neck.

40 A motor is suitably supported in the motor casing 3 and in the illustrated form of the invention is provided with a commutator 29 and brushes 30, 31. The motor is a universal motor which enables the operation of the present invention on DC as well as AC.

55 Handle 7 is hollow to receive a switch A which is an ordinary snap switch of well known action.

60 The motor and the heating element are connected in parallel so that one will not operate without the other.

65 A conductor 32 leads from a plug connection (not shown) into the handle to the brush 30 while another conductor 33, connected to conductor 32 at 34, is electrically

connected to the pin 22 of the heating element by means of a terminal 34 held between the nuts 35 and 36 on the end of the pin adjacent the spider 21.

70 The switch A is provided with two similar contact plates 37 only one of which is shown as the other is immediately below and on the opposite side of the switch frame from that shown in Figure 1. A conductor 38 leads from the lower plate 37 to brush 31 of the motor. A conductor 39 is connected at 40 to the conductor 38 and at the other end is connected to the opposite end of the heating element 19 from that to which the conductor 33 is connected.

80 A conductor 40 leads from the contact plate 37 in the switch A to the other of the plug connection in the handle.

85 It will be observed that the motor and the heating element are in parallel with the switch A in circuit with one of the conductors from the source of electrical supply so that although the motor and heating element are in parallel neither can operate without the other because of the fact that neither will operate unless the switch is closed in which event both will operate because of the manner of inserting the switch in the connections between the motor and heating element.

90 Contact is established between the two plates 37 by means of the pin 41 carried on the snap arm 42 which is oscillated by means of the finger latch 43, the latch being pivoted in the switch at 44.

95 The switch A is retained in the handle by a plate 45 which is fastened to the handle by screws 46 or like attaching means.

The motor casing 3 is provided with ventilating openings 47.

100 The nipple 13 is retained in locked position in the plug 12 by means of a lock nut 48.

A hooked pipe 49 is threaded at one end to engage the adapter 16 and has its other end 50 smooth.

105 A shield 51 having frictional engagement with the pipe 49 by means of spring fingers 52 is slidable along the pipe around the bent part.

The operation of the blower is as follows:

110 Should, for instance, it be desired to thaw the lubricant in the crank case of an internal combustion engine the mechanic removes the drain plug and inserts the end 50 of the curved or hooked pipe 49 adjusting the shield 51 along the pipe so that the blower will hang properly in the opening in the crank case. The device having been connected to a suitable source of electrical supply the switch 43 is actuated to move the pin 41 into the position shown in Figure 1 whereupon the circuit of the motor and the heating element is closed and the motor rotates and current passes through the heating element. Rotation of the motor drives the fan which sets up a current of air and drives the same through the 120 125 130

spider 22 into the area and space about the heating element. The provision of the small aperture 20^a in the plate 20 tends to check the onrush of the air so that the compartment about the heating element is filled with air, the result being that the air is heated uniformly and throughout so that as the same is expelled through the openings 20^a in the plate 20 and then through the pipe 49 and discharged through the end thereof, the air will be hot and moving under pressure. The apparatus may be left in operation while the attendant is doing other work for such length of time as he believes will be necessary to thaw the particular lubricant.

Should this apparatus be used for thawing a radiator of an automotive vehicle, then the end 50 of the pipe 49 might be moved back and forth in front of the radiator with the apparatus in operation or if desired the pipe 49 might be unscrewed from the adapter 16 and the adapted held adjacent the frozen part of the radiator to direct hot air against that portion.

The provision of the heat insulating material 11 between the tubes 8 and 10 prevents dissipation of heat from the interior of the tube 10, that is, from the area surrounding the heating element, and at the same time tends to cool the tube 8 so that the blower may be readily manipulated.

Devices embodying the present invention have met with very ready sale and have been especially useful in thawing lubricants in various portions of automotive vehicles in such parts of the country where there is extreme cold.

The invention has been described herein more or less precisely as to details yet it is to be understood that changes may be made in arrangement and proportion of parts and that equivalents may be substituted without departing from the spirit and scope of the invention.

The invention is claimed as follows:

1. A portable heat blower including a fan, a motor for driving said fan, a heating chamber in front of the fan, a heating element within said chamber, a line conductor connected to one side of said motor and one end of said element, another line conductor connected to the other side of said motor and the other end of said element, and a switch interposed in one of said conductors whereby said motor and element are connected in circuit when said switch is closed.

2. A portable heat blower including a motor and a fan casing, a handle connected to the motor casing, a tubular heating chamber connected to the outlet of said fan casing, a spirally wound heating element in said chamber, a pair of supports for said element, a pin passing through said supports and heating element, an end of said element being connected to said pin, a line conductor connected

to said pin and also to one side of said motor, a switch in said handle, and a conductor leading from said switch to the other end of said heating element, said conductor being connected to said motor, and the other line conductor being connected to said switch.

3. A portable heat blower including a motor and motor casing, a fan and fan casing, and a handle connected to said motor casing, said fan casing having a tangential outlet, a tube secured to said outlet, a heating element within said tube, a member supporting said element at one end near the fan casing, an apertured plate supporting the element at the other end of the tube, spacers engaging said member and plate to center said heating element in said tube, a plug closing the outer end of said tube and having a discharge outlet therein, a hooked pipe connected to said outlet, a shield slidable on said pipe, a switch in said handle, a conductor connected to one side of said motor and to one end of said heating element, another conductor leading to said switch, and a third conductor leading from said switch to the other end of said heating element and connected to other side of said motor.

4. A portable hot air blower including in combination, a fan casing, a motor casing, a fan, a motor, a heating chamber communicating with fan casing, an electric heating element in said chamber, said motor having two brushes, a switch, a line conductor connected to one brush of said motor and also to one end of said heating element, the other line conductor leading to said switch, and a conductor leading from said switch and connected to the other brush of the motor and the other end of said heating element whereby said motor and said element are each in circuit while said switch is closed.

5. A heat blower including a motor and a fan casing, a heating chamber member removably connected by one end to the outlet of said fan casing, the other end of said chamber member having an air outlet, a heating element loose in said chamber, a spacer between said other end of said chamber and the adjacent end of said element, and another spacer between the other end of said element and the fan casing, said element and spacers being retained within said chamber by endwise pressure thereon when said chamber member is attached to said fan casing.

6. A heat blower including a motor and a fan casing, a heating chamber member removably connected by one end to the outlet of said fan casing, the other end of said chamber member having an air outlet, a heating element loose in said chamber, said element being maintained in endwise spaced relation with respect to the ends of said chamber member by spacers interposed between the ends of the element and adjacent

ends of the chamber member, and said element being readily removable when said chamber member is disconnected from said casing.

- 5 7. A heat blower including a motor casing and a fan casing, a heating chamber member removably connected by one end to the outlet of said fan casing, a heating element within said chamber member, said heating element being retained solely within said chamber member by endwise pressure thereon imposed by application of said chamber member to said fan casing.
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15 In testimony whereof I have hereunto subscribed my name at Chicago, Cook county, Illinois.

ADAM A. BREUER.