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UTILIZATION OF GAS FLOW

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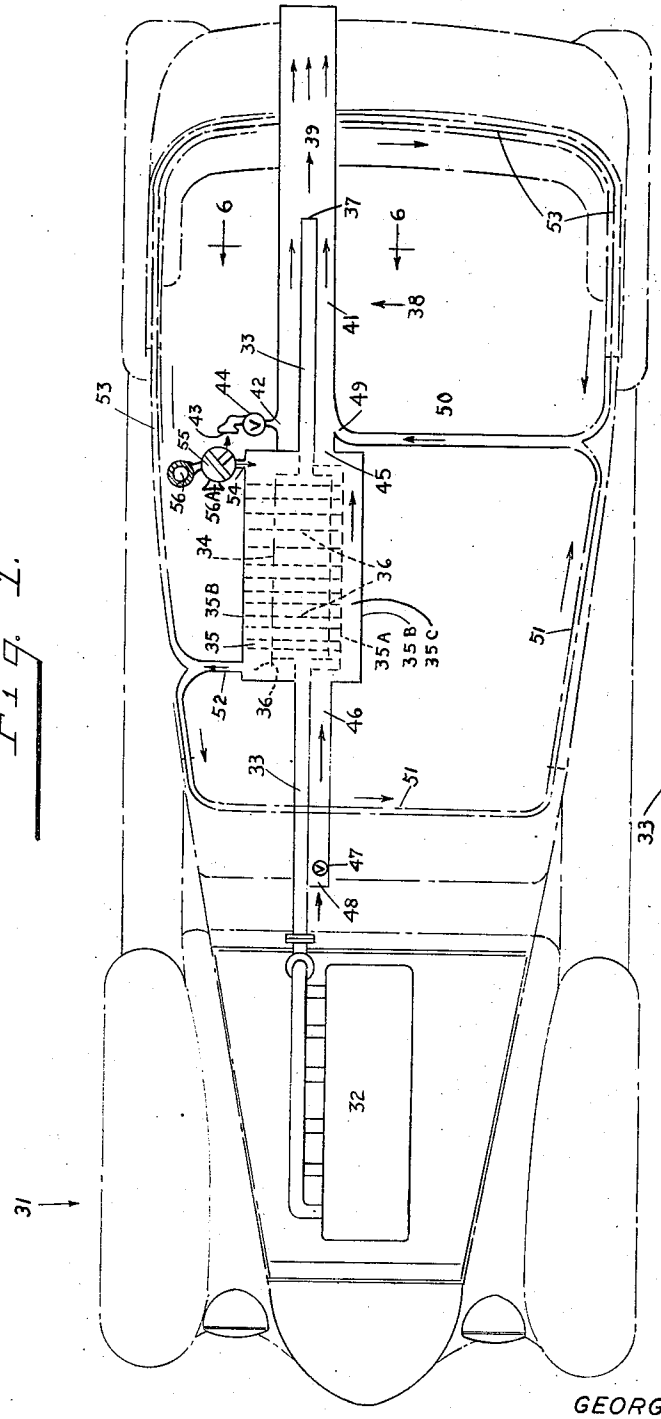


Fig. 1.

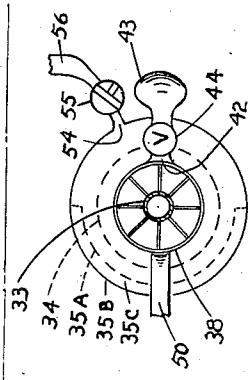


Fig. 2.

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UTILIZATION OF GAS FLOW

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1 Claim. (Cl. 237—12.3)

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This invention relates to a method and means for utilizing the flow of exhaust gases and the like.

An object of the present invention is to utilize the draft caused by suction of escaping gases for the purpose of increasing the force developed in the process in the course of which the gases were produced, of providing or furthering the circulation of a heating or ventilating medium, and for a variety of other purposes.

Other objects of the present invention will become apparent in the course of the following specification.

In accomplishing the objects of the present invention it was found desirable to provide a partly enclosed chamber at the mouth of the gas flow. This chamber may consist of a sleeve of substantially larger diameter than an exhaust pipe and supported surrounding the same and extending for a substantial distance to the front and rear of the mouth thereof. Suction created within the sleeve forward of the mouth of the pipe will increase the power of jet propulsion motors, rockets, bazooka projectiles and the like. Furthermore, the cold air sucked in at the sleeve inlet will cool the exhaust pipe and retard erosion thereof by the exhaust gases. Finally the suction may be utilized as a motive power for the circulation of heating or ventilating medium. In the case of moving vehicles, this suction may be combined with the suction caused by the movement of the vehicle. Centrifugal force may be utilized for the same purpose in the case of airplane propellers and similarly revolving parts.

A bazooka projectile may be provided with a cylindrical sleeve open at both ends, and gases escaping from the exhaust pipe mouth will suck rearward the air in the sleeve forward of the pipe mouth. This causes a backward sucking of air into the sleeve inlet, increasing the speed and range of the projectile.

In a second embodiment, a similar sleeve was mounted on an automobile exhaust pipe extending forward and rearward of the mouth thereof. The above mentioned suction was used to draw air from the car interior and pass it through a series of heat exchanging fins mounted on the pipe, cooling the pipe, heating the air, which was further drawn through various heating pipes in the car interior before being drawn out with the exhaust gases.

In a third embodiment, a similar mounting and heating arrangement was availed of to lead hot air to the leading edges of an airplane propeller

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and to the wingtips and rudder thereof for the purpose of deicing same.

The invention will appear more clearly from the following detailed description when taken in consideration with the accompanying drawings showing, by way of example, a preferred embodiment of the inventive idea.

In the drawings:

Figure 1 is a view of the invention applied to an automobile;

Figure 2 is a lateral section along the line 6—6 of Figure 1.

The drawing shows the invention applied to an automobile to heat the same and cool the exhaust pipe. The automobile 31 has the usual motor 32, exhaust pipe 33, and muffler 34. Around the exhaust pipe 33 and muffler 34 is supported the hot air heater 35 comprising a plurality of heat exchanging vanes or fins 36 connected to the muffler 34. Heater 35 has a cylindrical outer wall 35B and a semi-cylindrical inner wall 35A, the space between the two walls forming a passage 35C through the heater but having only boundary contact therewith, as no fins 36 extend beyond wall 35A. The vanes 36 can be mounted directly on the exhaust pipe 33 if no muffler is used or if any other consideration so dictates.

The exhaust pipe 33 terminates in a mouth 37 and supported surrounding the exhaust pipe 33 is the sleeve 38 having a rear portion 39 extending to the rear of or beyond the mouth 37, and a longitudinally coincident portion 41 forward of mouth 37.

The forward sleeve portion 41 is connected to three inlets, the first of which is an inlet opening 42 formed in the foremost portion thereof and communicating directly with the outside air through scoop or funnel 43 and valve 44. The second inlet 45 communicates with passage 35C within the heater 35 and through it and advanced pipe 46 and valve 47 with the outside air, the mouth 48 of pipe 46 being located at a point in advance of the heater 35.

The third inlet to portion 41 is an opening 49 into suction pipe 50, which communicates through a forward circuit 51 of pipe with the heater 35 through pipe 52. The circuits 51 and 53 have been indicated diagrammatically only, it being understood that they may contain radiators and have fans associated with them, as desired, in order to heat the car, defrost the windshield and the like. Suction pipe 50 also communicates with rear circuit 53 of pipe leading to pipe 52 and heater 35. Heater 35 has an inlet opening 54 communicating with the interior of the vehicle

through three-way valve 55 and pipe 56, and communicating with the outside air through valve 55 and scoop 56A.

The operation of this embodiment of the invention is that exhaust gases moving rearwardly in rear portion 39 of sleeve 38 create rearward suction and rearward movement of air in forward portion 41 of sleeve 38. The least effect of the installation is observed with valves 47 and 55 closed and valve 44 open. The fresh air entering scoop 43, valve 44, and inlet passage 42 into portion 41 by mixing with partly unburned gases escaping from mouth 37 of pipe 33 completes their combustion. This constitutes portion 39 to a small extent a jet propulsion chamber, the combustion occurring therein causing a further expansion of the gases and creating a pressure which escapes out the mouth of sleeve 38 and in so doing creates a forward push in sleeve 38. In addition, the further combustion of the carbon monoxide included in the exhaust gases or oxidation thereof to carbon dioxide is desirable in order to avoid the possibility of accidents caused by inhaling it. The suction at scoop 43 also tends to draw the car forward. With valves 44 and 55 closed and valve 47 open, the suction in portion 41 draws air through advance pipe 46, passage 35C, and inlet 45 thus cooling heater 35 and muffler 34 and retarding deterioration of the latter. Suction now exists at mouth 48 and tends to draw the car forward.

With valves 44 and 47 closed and valve 55 open, air is drawn through pipe 56 from the car interior and passes through inlet opening 54 into heater 35, over fins 36 which heat it, out pipe 52 and into circuits 51 and 53, from circuits 51 and 53 into suction pipe 50 and through opening 49 into forward portion 41 of sleeve 38, the suction in portion 41 being the force creating all the above air movement. The movement of air from the car interior through heater 35 also tends to cool muffler 34. The withdrawal of air from the car interior causes a lowering of pressure therein which is compensated by an increased inward seepage of fresh air from outside, the new air being readily heated by the circuits 51, 53, and the increased circulation being most beneficial.

A third position of valve 55 provides for air for the heater 35 to come from outside the car instead of inside, but the advantage of starting with warm air is obvious. Such third position of valve 55 would find its use where the car was passing through an area of foul air and it was not wished to cause any seepage thereof into the car body.

The valves 44, 47 and 55 will preferably be interconnected and thermostatically controlled so that any desired combination of the above described effects may be obtained and thermostatically maintained.

It is noteworthy that air and not exhaust gases circulate in the heating circuits 51, 53, so that a leak in them would not introduce exhaust gas into the car interior.

The most noteworthy feature is that all the above benefits flow from energy which at present is being wasted for want of the within invention.

It is apparent that the illustrations shown above have been given by way of illustration and not by way of limitation and that the above described illustrations are subject to wide variations and modifications, without departing from the scope or intent of the present invention. All of such variations and modifications are to be included within the scope of the present invention.

What is claimed is:

An automobile heating system comprising, in combination with an automobile comprising a body and an exhaust pipe for hot gases, said exhaust pipe comprising a muffler mounted thereon, a tubular sleeve mounted on said exhaust pipe surrounding at least a portion thereof and having a forward portion extending forwardly of the mouth of said pipe and a rear portion extending rearwardly thereof, a hot air heater mounted on said muffler, said heater comprising a plurality of heat exchanging fins mounted on said muffler, said heater further comprising a substantially cylindrical outer wall, a substantially semi-cylindrical inner wall and a passage through said heater constituted between said inner and outer walls and devoid of said fins, said heater further comprising an inlet opening formed therein, a three-way valve connected with said opening and air conducting means connecting said valve to the interior of said body and to the outside air, said outside-communicating means comprising a forward-facing scoop, forward and rear circuits of pipe extending through said body and connected to said heater, a suction pipe connecting said circuits to said forward portion of said sleeve, an advanced pipe comprising a mouth portion located at a point in advance of said heater, said advanced pipe being connected to said passage in said heater and said passage being connected to said forward portion of said sleeve, said forward portion further comprising an inlet opening formed therein communicating with the outside air, said inlet opening comprising a forward-facing scoop, and valves located in said mouth of said advanced pipe and in said inlet opening in said forward portion.

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