R. M. DEAN.

HEATER.

APPLICATION FILED FEB. 25, 1914.

1,164,075.

Patented Dec. 14, 1915.

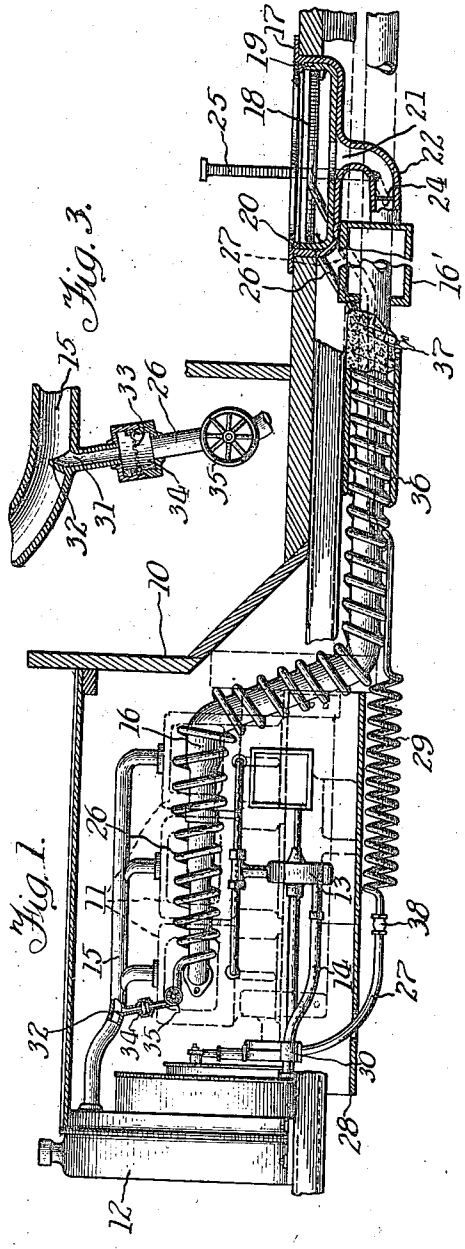

Fig. 1.

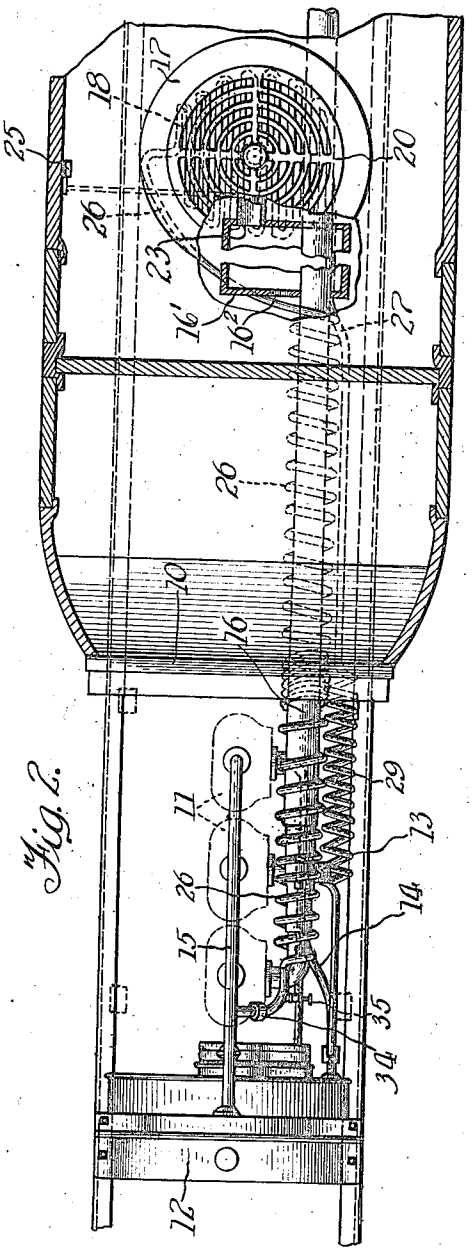

Fig. 2.



Fig. 3.

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# UNITED STATES PATENT OFFICE.

ROY M. DEAN, OF CHICAGO, ILLINOIS.

## HEATER.

1,164,075. Specification of Letters Patent. Patented Dec. 14, 1915.

Application filed February 25, 1914. Serial No. 820,892.

*To all whom it may concern:*

Be it known that I, ROY M. DEAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heaters, of which the following is a specification.

This invention relates to improvements in heaters, particularly adapted for use with automobiles, and one of the objects of the same is to provide an improved device of this character, whereby the radiator water, and the engine cooling water may be used as a heating medium, and which medium is raised to the proper temperature by means of radiation from the exhaust of the engine.

A further object is to provide an improved device of this character having means whereby the temperature of the water may be lowered after it leaves the heater, and before it reaches the radiator, or engine cylinders, whereby overheating of the water will be obviated, and to return the water to the circulating system in a cooled condition.

A further object is to provide an improved device of this character having means for controlling the circulation of the water through the heater.

To the attainment of these ends, and the accomplishment of other new and useful objects, as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts, hereinafter more fully described and claimed, and shown in the accompanying drawing exemplifying the invention, and in which:

Figure 1 is a longitudinal sectional view of a portion of an automobile, having a heater attachment constructed in accordance with the principles of this invention, applied thereto and with parts of the attachment in section and parts in elevation. Fig. 2 is a top plan view of the parts shown in Fig. 1. Fig. 3 is an enlarged detail sectional view showing the filter and the means whereby a portion of the circulating fluid is directed into the attachment.

Referring more particularly to the drawing, the numeral 10 designates generally the body of an automobile, having the engine cylinders 11, the radiator 12, the pump 13, for drawing the water from the radiator through the pipe 14 and discharging the same to circulate around the engine cylinders, the return manifold 15 leading back to the radiator 12 to discharge the circulating water thereinto, and the engine exhaust 16. All of these parts are of the ordinary and well known construction and constitute no part of the present invention, as the invention is well adapted to any form of engine and any form of circulating system for the engine cooling medium.

Arranged in any convenient position within a chamber or box 17, preferably set into the floor of the vehicle, is a heater coil 18 of any desired configuration and size, and this box or chamber 18 is preferably lined with asbestos 19, and is closed by means of a grating 20. The bottom of the box is preferably provided with an opening 21, having a pipe or entrance leading therefrom and located beneath the floor of the vehicle, with its open end 23 directed toward the front of the vehicle, so that when the vehicle is advancing, air currents will enter the opening 23 to flow through the box 17, over the heater coil 18 and out through the grating 20 into the vehicle.

In order to control the entrance of the air into the box 17, any suitable controlling means may be provided, such as a damper 24, which is itself controlled by means of a handle or lever 25, connected with the damper, and which handle is located in a convenient position within the vehicle.

Leading from the return manifold 15, preferably adjacent the radiator 12 is a pipe 26 of any desired diameter, and this pipe is coiled about the exhaust 16, for any desired distance, and has communication with the inlet of the heater element 18, as shown clearly in Fig. 2. Leading from the outlet of the heater element 18 is a return pipe 27, which preferably extends below the bottom of the vehicle, and also below the drip pan 28 of the engine, and is shaped into a cooling coil 29, of any desired size, length and configuration, while the extremity of this coil 29, which constitutes the end of the pipe 27 preferably has communication as at 30 with the outlet pipe 14 of the radiator 12 and the inlet pipe of the pump 13.

In order to divert a portion of the circulating fluid from the return manifold 15, there may be provided adjacent the opening 31, with which the pipe 26 communicates, a baffle or deflector lip 32, which projects into the manifold 15. This deflector is of a size to permit a portion of the water to flow past

the same so that it will enter the radiator 12. In order to prevent foreign particles from entering the pipe 26, which might clog the heater element as well as the inlet and outlet thereof, there may be provided in the pipe 26, a screen or filter 33 which extends across the chamber or receptacle 34. The latter may be of any desired size and configuration and may be made in sections so as to be separated to permit the screen to be removed for cleansing purposes.

In order to control the flow of liquid into the pipe 26 and consequently through the heater 18, a valve 35 may be provided and located in any convenient position. With this improved construction it will be manifest that when it is desired to use the heater 18, all that is necessary is to open the valve 35 and a portion of the water from the manifold 15 will flow into the pipe 26, a portion of the latter being coiled about the exhaust pipe 16, both will be heated by radiation therefrom, and the water will be raised to a high temperature. Circulating from the pipe 26 the water will enter the heater 18 and flow therefrom through the pipe 27, until it meets the coil 29, and passing through the latter, which is exposed to the outside air and to the air currents while the machine is moving, the water will be cooled, or the temperature thereof reduced so that when the water passes out of the pipe 27 and into the pipe 14, it will be drawn at a reduced temperature through the pipe 14 by the pump 13 into the engine case or jacket to be circulated therethrough and from there into the return manifold 15, a portion of the water finally entering the radiator 12. The pump 13 aids in creating circulation not only through the radiator 12 and about the engines, but also through the pipes 26 and 27, heater 18 and cooling coil 29. When it is not desired to use the heater, the valve 35 may be closed.

In order to conserve the heat so that the water flowing through the portion of the pipe coiled about the exhaust 16 will be quickly heated, a covering or casing 36 may be provided to surround the exhaust 16 and the adjacent portion of the pipe 26. Obviously any number of these heaters 18 may be employed, and may be located in any desired position in the vehicle.

A drain cock 37 may be provided preferably in the pipe 26, or at the lowest point of circulation of the water therethrough, so as to drain the attachment when it is not desired to use the same. A check valve 38 may also be provided in the pipe 27, and the purpose of this check valve is to prevent the back flow of the water from the circulation system into the attachment, when the engine is standing still. Obviously instead of the pipe 27 discharging into the pipe 14 it may discharge directly into the radiator 12.

To preheat the air before it enters the opening 23 of the box 17, a heating drum 16′, may be provided which surrounds a portion of the exhaust pipe 16, and with which drum the box 17 has communication. The drum has one or more inlet openings $16^2$ through which outside air enters the drum.

While the preferred form of the invention has been herein shown and described, it is to be understood that many changes may be made in the details of construction, and in the combination and arrangement of the several parts without departing from the spirit of this invention.

What is claimed as new is:—

1. In combination, an engine, an exhaust pipe leading therefrom, a water circulating system for cooling the engine, a branch water circulation pipe leading from said system, a foot warmer included in the said branch, the supply end of the branch encompassing the exhaust pipe and extending lengthwise thereof and in contact therewith, and the outlet end of the branch being shaped into a cooling coil, and means for controlling at will the circulation of the water through the said branch.

2. In combination, an engine, an exhaust pipe leading therefrom, a water circulation system for cooling the engine, a branch water circulation pipe leading from said system, a foot warmer included in the said branch, the supply end of the branch encompassing the exhaust pipe and extending lengthwise thereof and in contact therewith, and the outlet end of the branch being shaped into a cooling coil, heat insulating material incasing the exhaust pipe and the portion of the said branch pipe coiled about the said exhaust pipe, and means for controlling at will the circulation of the water through the said branch.

3. In combination, an engine, an exhaust pipe leading therefrom, a water circulation system for cooling the engine, a branch circulation pipe leading from the said system, an open chamber within the vehicle to be heated, said branch pipe passing through said chamber, the supply end of the branch pipe coiled about the exhaust pipe exterior of the chamber, means for controlling the circulation of the water through said branch pipe, said chamber also having an inlet for outside air, and means for controlling said air inlet at will.

4. In combination, an engine, an exhaust pipe leading therefrom, a water circulation system for cooling the engine, a branch circulation pipe leading from the said system, an open chamber within the vehicle to be heated, said branch pipe passing through said chamber, the supply end of the branch pipe coiled about the exhaust pipe exterior of the chamber, means for controlling the circulation of the water through said branch

pipe, said chamber also having an inlet for outside air, a preheater for the air before it enters said chamber, and means for controlling said air inlet at will.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 14th day of February, A. D. 1914.

ROY M. DEAN.

Witnesses:
I. M. BARING,
J. H. JOCHUM, Jr.