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VAPOR CONDENSING AND RECOVERY DEVICE

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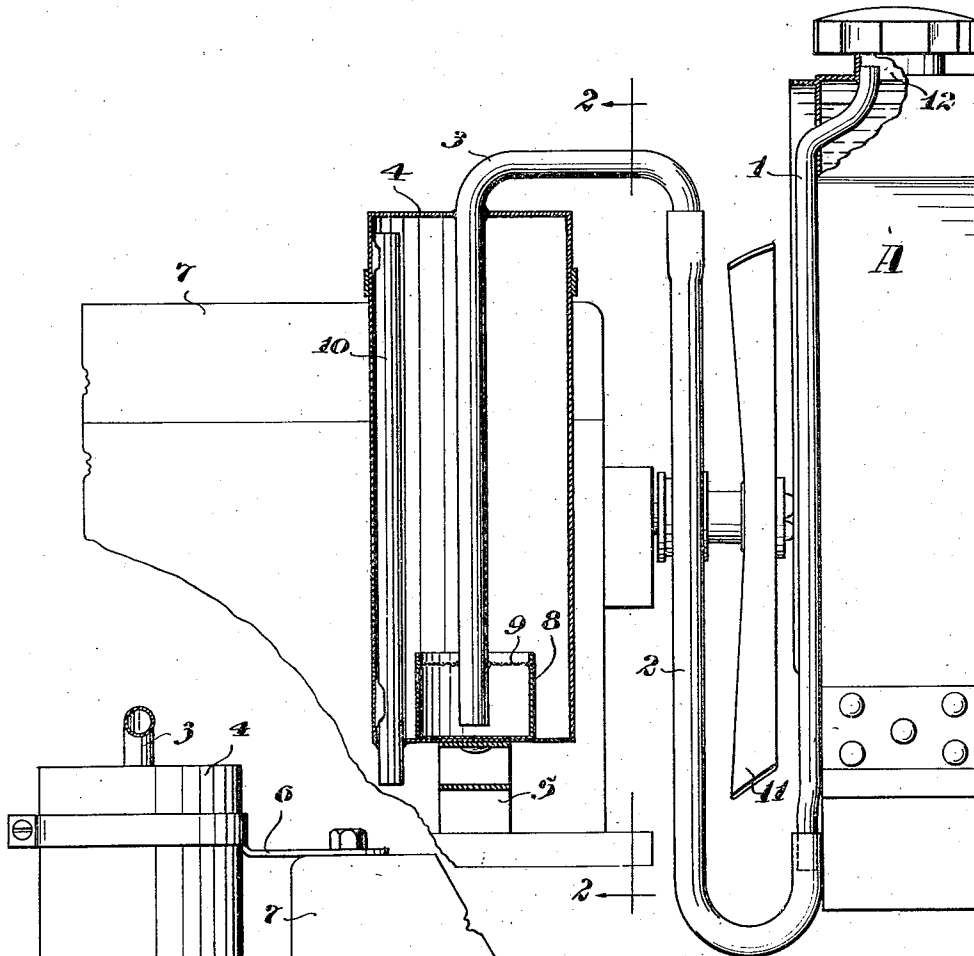


Fig. 1

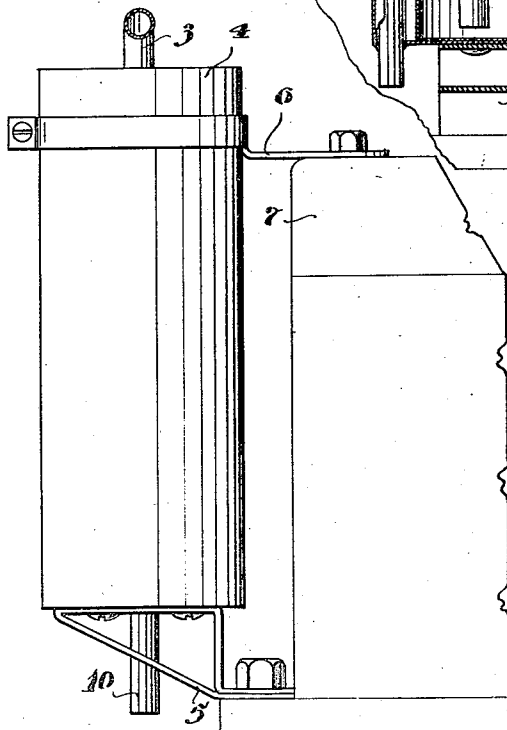


Fig. 2

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VAPOR CONDENSING AND RECOVERY DEVICE

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The present invention relates to a vapor condensing and recovery device for water cooled motors.

During cold weather, in order to prevent freezing of the water in automobile water cooling systems, it is common practice to add alcohol to the water in the radiator to lower the freezing point thereof. Since alcohol vaporizes at a lower temperature than water an amount of alcohol is frequently lost through vaporization by passing downwardly through the overflow pipe from the radiator to raise the freezing point of the resulting liquid in the cooling system and permit freezing of the liquid therein. Various types of condensers have been employed to condense and return this vapor to the cooling system, but most of such condensers which are effective, are so complicated as to make their cost prohibitive.

An object of the present invention is to make a simple and efficient vapor condensing device for water cooling systems.

A mechanism for accomplishing this object is disclosed in the following description and the accompanying drawings, wherein:

Figure 1, is a view in side elevation partly in section of the device mounted at the side of an automobile motor; and

Figure 2, is a sectional view on the line 2—2 of Figure 1 all the parts except the inlet pipe being in elevation.

Referring to the drawings in detail, an automobile radiator A is shown as provided with the customary overflow pipe 1, to the lower end of which is connected a rubber tube 2. The other end of the rubber tube is connected to a metal tube 3 which extends downwardly into the interior of a metal container 4, which metal container is mounted as by means of brackets 5 and 6 to a convenient portion of the automobile, such as the motor block 7. The tube 3 extends downwardly to within a short distance of the bottom of the metal container 4, and beneath the lower end of the tube 3 is provided a cup-shaped receptacle 8 of smaller diameter than the container 4. A mesh screen 9 may be provided across the upper end of the receptacle 8 to reduce splashing of liquid contained therein and also

to prevent vibration of the lower end of the tube 3. An overflow pipe 10 is mounted within the container, the upper end being open, and near the upper end of the container, the lower end also being open and extending through the bottom of the container. The container is preferably placed in the air stream from the fan 11 so as to be kept as cool as possible.

In operation the vapor from the radiator A is carried by means of the pipes 1 and 3 and the rubber tube 2 to the interior of the container 4, where it is discharged into the small receptacle 8. The vapor condenses either in its passage from the radiator to the container, or, after entering the container, and collects within the receptacle 8 and within the container 4 around the receptacle. As soon as a quantity of liquid is condensed in the receptacle 8, sufficient to cover the lower end of the tube 3, the efficiency of the device is greatly increased, since the vapor passing through the liquid contained in the receptacle 8 is cooled thereby, and this greatly accelerates the condensation. Splashing of the liquid from the container is retarded by the mesh screen 9 across the upper end thereof.

When the motor is stopped, the water in the cooling system cools off and the vapor above the radiator as at 12 is also cooled and condensed. This creates a partial vacuum at 12, which sucks the water from the receptacle 8 through the pipes 3 and 1 and the rubber tube 2, back into the radiator. After the device has been in operation long enough to condense enough liquid to fill the receptacle 8, the pipes 1 and 3 and the tube 2 will never be absolutely devoid of liquid, since it is impossible for the suction within the radiator to draw all the water out of the system, owing to the long, vertical rise through the overflow pipe 1. There is thus left in the U-shaped lower portion of the overflow pipe 1 and the tube 2 a quantity of liquid, which, upon the starting of the motor and the heating and expanding of the air at 12 in the radiator, is forced into the receptacle 8 to provide a cooling medium for the vapor discharged from the tube 3 into the container 4. Should a quantity of liquid more

than sufficient to fill the receptacle 8 be present, this liquid will, of course, collect in the bottom of the container around the receptacle 8, and, when there is sufficient liquid in the container about the receptacle to bring the surface of the liquid near the upper edge of the receptacle 8 the vibration of the motor will be sufficient to splash a portion of this liquid over into the receptacle upon the starting of the motor so as to provide an additional supply of liquid for the initial operation of the device. In case of boiling of the liquid in the radiator, the steam and liquid from the radiator is conducted into the container 4 and the larger portion of the vapor is condensed and remains in the container. However, should the boiling be so violent as to overtax the capacity of the container, any excess is free to pass out through the overflow pipe 10. After such a boiling of the water in the radiator, a comparatively large amount of liquid is retained within the container 4 and this is gradually returned to the radiator A through successive heatings and coolings of the air above the water in the radiator in successive operations of the motor.

I claim:

1. A vapor condensing device of the character described, comprising a container, means connecting the container with the cooling system of an internal combustion motor, said means opening into said container near the lower end thereof, a receptacle positioned beneath the lower end of said means, said receptacle being of smaller diameter than said container, and overflow means associated with the container and opening into the container near the upper end thereof.

2. A vapor condensing device of the character described, comprising a container, a receptacle of smaller diameter than said container mounted interiorly thereof, a tube connecting the interior of the container to the cooling system of an internal combustion motor and opening into said receptacle near the bottom thereof, and an overflow outlet near the upper end of said container.

In testimony whereof I affix my signature.

ARTHUR E. HESSE.

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