

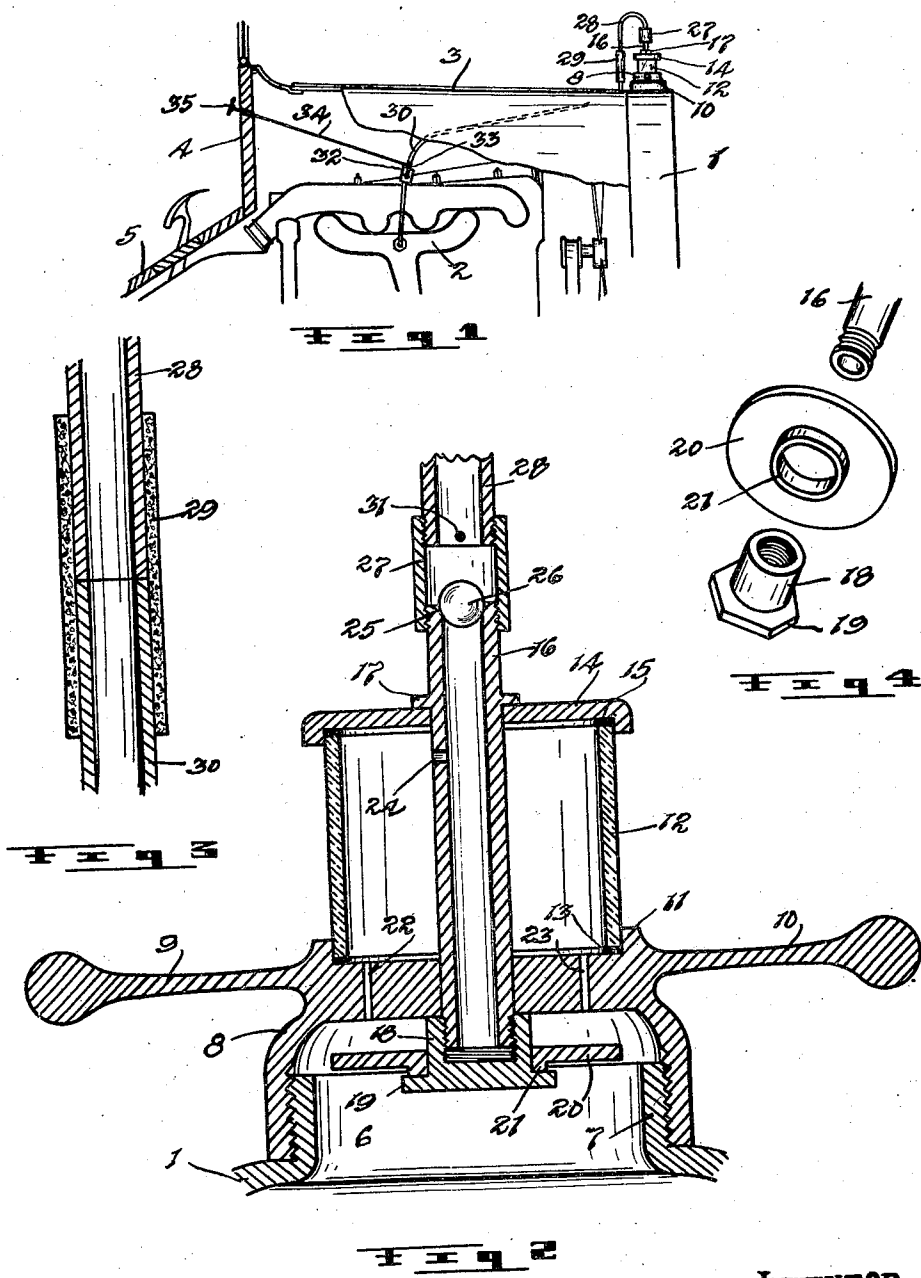
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COMBINATION HUMIDIFIER AND DECARBONIZER

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COMBINATION HUMIDIFIER AND DECARBONIZER.

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The invention relates to improvements in combination humidifiers and decarbonizers and an object of the invention is to provide a device which can be readily attached to the customary radiator of an automobile and connected with the intake manifold thereof and which will supply hot vapor to mix with the firing mixture passing to the cylinder, thereby improving the firing mixture and also preventing the accumulation of carbon within the cylinder.

A further object of the invention is to embody the device as part of the radiator cap so that it can be readily removed and such that it is at all times visible to the driver.

A further object is to construct the device in a simple, durable and inexpensive manner and such that it will not interfere in any way with the present car construction.

A further object is to construct the device so that there is no possibility of water flooding into the manifold from the radiator through the device and a further object is to provide a device with a valve controlling the vapor passing to the manifold and actuated from the dash.

With the above more important objects in view, the invention consists essentially in the arrangement and construction of parts hereinafter more particularly described, reference being had to the accompanying drawing in which:

Fig. 1 is a side view of the front part of an automobile equipped with my invention, the hood being broken away and the dash and foot boards being shown in vertical section.

Fig. 2 is an enlarged detailed vertical sectional view centrally through the device.

Fig. 3 is an enlarged detailed sectional view centrally through the hose connecting the ends of the pipe.

Fig. 4 is a perspective view of certain parts showing the manner in which they are formed and how they are assembled.

In the drawing like characters of reference indicate corresponding parts in the several figures.

The automobile presents the customary radiator 1, intake manifold 2, engine hood 3, dash 4 and foot boards 5, these being of ordinary construction and on such account not further detailed.

The radiator presents the usual filling opening 6 which is enclosed by the customary exteriorly screw threaded upstanding

annular flange 7. The usual radiator cap threads onto this flange. In my case, however, the cap is formed as part of my device.

The cap 8 which is in reality the base of my device is adapted to screw thread onto the flange and it is provided with two outstanding diametrically opposed hand grips 9 and 10 which facilitate in the screwing up or unscrewing of the cap. The body of the cap is provided on the top side with an upstanding marginal flange 11 within which I seat a cylinder 12 which is preferably transparent. I have found a glass cylinder serves my purpose. A gasket 13 is placed beneath the cylinder. A flanged top or cover is placed over the upper end of the cylinder and a gasket 15 is inserted between the cover and the cylinder. A tube 16 passes centrally through the cover and the body of the cap and is provided above the cover with an outstanding flange 17 and has the lower end exteriorly screw threaded. A screw cap 18 screws onto the lower end of the pipe and engages the under side of the body of the cap, the arrangement being such that the tightening up of the cap 18 pulls down the flange 17 and accordingly holds the cover and cylinder tightly in place.

The cap 18 is cylindrical and it is provided with an extending hexagonal head 19. On the cylindrical body of the cap 18, I mount slidably a disc 20 having a slight boss 21 which prevents the tilting of the disc. The disc under certain conditions is adapted to move up and close the lower ends of holes or ducts 22 and 23 passing through the body of the cap 8 and opening to the interior of the cylinder 12. The tube or pipe 16 is provided within the cylinder 12 and adjacent the cover 14 with a hole or duct 24 and the upper end of the tube is provided with a seat 25 adapted to receive a ball valve 26. A short sleeve 27 is screw threaded to the upper end of the tube and forms a valve casing. A pipe 28 which is really an extension of the pipe 16 beyond the valve is screw threaded to the sleeve and is connected by a length of hose 29 to a further pipe 30, the latter pipe opening to the interior of the intake manifold 2. The pipe 30 passes through the hood in a location adjacent the rear side of the radiator and preferably at the customary top hinge of the hood as I find at this location there is usually a place where one can pass a small pipe through without actually having to drill a hole and further by passing

it through at this point, the hinge is not interfered with. It will be observed that the length of hose 29 is above the hood. This arrangement permits me to readily disconnect the pipes 29 and 30 by slipping the hose endwise on the pipe 29 after which one can remove the device from the radiator by unscrewing the cap 8. In order to prevent the ball valve from seating against the lower end of the pipe 28, I have passed a pin 31 across this pipe. A controlling valve 32 of any approved type is inserted in the pipe 30 and presents a lever 33 to which I attach a push rod 34 passing slidably through the dash and fitted with a finger grip 35.

When the device is in use and the engine is initially started, one keeps the valve 32 closed. After the engine has warmed up and the water in the radiator has become heated and is giving off water vapor or steam, the valve 32 can be opened by manipulating the push rod 34 from the dash. When this occurs the suction from the engine cylinders will raise the valve 26 from its seat and will draw the hot vapor from the radiator through the ports 22, 23 and 24 and pipes and discharge it into the intake manifold where it mixes with the ingoing firing mixture. This hot vapor gives a much more efficient firing mixture and also prevents the formation of carbon within the cylinder and particularly on the spark plugs. One can control the amount of vapor admitted to the intake manifold by opening the valve 32 a greater or less amount as conditions warrant.

Under certain road and engine conditions, there is a possibility of the water in the radiator boiling and in order to prevent this entering the intake manifold, I have provided the disc 20 which is adapted when struck by the boiling water to fly up and seat against the under side of the body of the cap 8 and in so doing close the openings 22 and 23.

Obviously the device can be readily removed from the radiator when it is desired to place more water in the radiator and the driver is at all times able to see just how the device is functioning as he can see the steam rising in the cylinder 12.

Whilst I have described the cap 8 as interiorly screw threaded to fit an exterior screw threaded flange 7, it will be readily understood that the cap 8 could be modified to fit the various existing types of flanges presented by the varying radiators.

What I claim as my invention is:

1. A combination humidifier and decarbonizer for attachment to a radiator of an internal combustion engine comprising a demountable radiator cap, a transparent cylinder mounted on the cap and having the ends thereof closed and communicating through suitable openings provided in the cap with the interior of the radiator, and an extending vapor outlet pipe opening to the top of the cylinder, said pipe being cut adjacent the cylinder and having the cut ends detachably connected together and a ball valve normally seated within the pipe.

2. A combination humidifier and decarbonizer for attachment to a radiator of an internal combustion engine comprising a demountable radiator cap, a cylinder seated on the cap, there being openings passing through the cap and connecting the radiator with the interior of the cylinder, a cover enclosing the upper end of the cylinder, a pipe passing centrally through the cover and the cap and provided above the cover with an outstanding flange and within the cover with an outlet opening communicating with the interior of the cylinder, a nut screw-threaded on the lower end of the pipe and engaging the under side of the cap, a ball valve located within the pipe above the cover and a vapor outlet pipe leading from the latter pipe.

3. In a combination humidifier and decarbonizer for internal combustion engines having a radiator, a cap for said radiator, a cylinder having closed ends mounted on the cap, a vapor pipe leading from the cylinder, entry ports passing through the cap and communicating with the bottom of the cylinder and a vertical slidable disc contained within the cap and adapted to close the entry ports.

Signed at Regina this 3rd day of February 1925.

MELVIN EDGAR GILLESPIE.