May 24, 1938. J. HROMADKA 2,118,510

STRAINER FOR COOLING SYSTEMS OF INTERNAL COMBUSTION ENGINES

Filed March 7, 1936

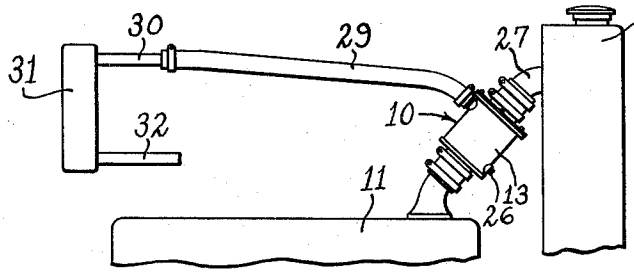


Fig.1.

Fig.2.

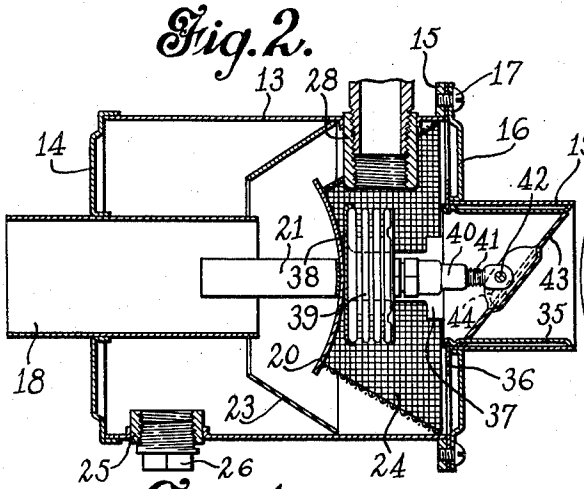


Fig.3.

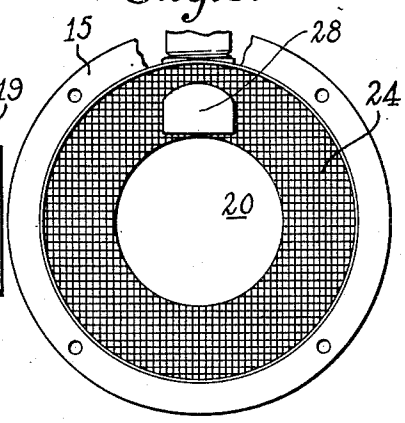


Fig.4.

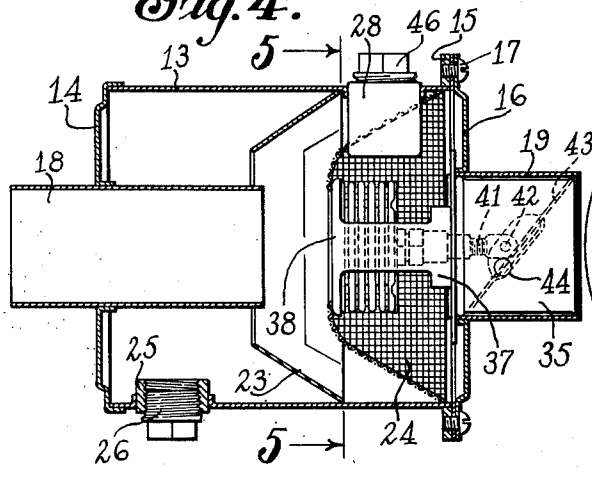
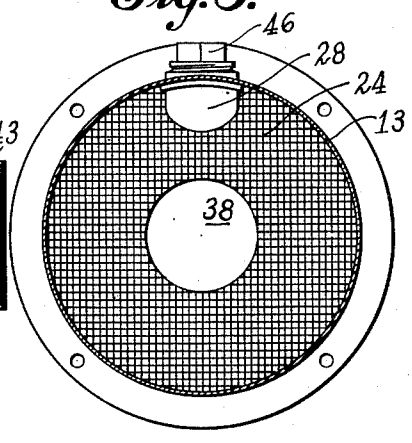


Fig.5.



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STRAINER FOR COOLING SYSTEMS OF INTERNAL COMBUSTION ENGINES

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Application March 7, 1936, Serial No. 67,690

6 Claims. (Cl. 210—165)

This invention relates to a strainer or trap designed to be inserted in the cooling system of an internal combustion engine, and more especially to a strainer adapted to remove rust, sand or other sediment from the cooling water of the engine. The structure of the disclosed embodiment of my invention is similar in many respects to that shown in my Patent No. 1,931,988, granted October 24, 1933, it being understood that the present disclosure embodies certain improvements over and additions to the structure shown in the said patent.

At the present time many automobiles are provided with heaters for the body of the car. These heaters in the usual form comprise a radiator or heat exchange apparatus which consists of a core provided with water passages constructed in a manner similar to that of the ordinary automobile engine radiator. This core is provided with connections to the cooling system so that the hot water from this system will pass through the core, and a fan is provided to blow air through the core into the body of the car to heat the latter. It will be apparent, therefore, that as it is necessary to provide for a circulation of water through the core of the heater, it is important to prevent the clogging of the water passages of the core, just as it is important to prevent the clogging of such passages in the automobile engine radiator.

Also at the present time many cars are provided with a thermostatically operated valve in the cooling system which prevents the circulation of the cooling water until this water attains a certain degree of temperature sufficient to cause the thermostat to open the valve. This insures that the engine will be quickly brought up to an efficient running temperature, and is, of course, especially desirable in cold weather. Such a device is also particularly desirable in connection with a heater for the body of the car, as the heater will, of course, not be effective until the water in the cooling system becomes hot.

Many cars are not equipped as manufactured with such thermostatically-controlled valves, and in some cases they are inserted as a unit in the hose connection between the upper portion of the radiator and the engine. My strainer unit is also adapted to be inserted at this place in the cooling system, and it is often found that there is not sufficient space provided for both units. I have, therefore, in the present invention provided for a combined strainer or trap and thermostat embodied in a single structure, which may be inserted in the hose connection between the engine and the radiator, and also have provided that this strainer shall not only strain the water entering the radiator of the engine cooling system, but shall also strain the water entering the radiator of the car heater.

One object of the present invention is the provision of an improved strainer and trap to strain the cooling water of an internal combustion engine as it enters the radiator, and also as it leaves the cooling system to enter the radiator of the car heater.

A still further object of the invention is the provision of a strainer or trap of the character described which will also include in a single unit a thermostatic device which insures that the temperature of the cooling water will be maintained at a predetermined figure.

A still further object of the invention is the provision of a combined thermostat and strainer or trap which may be readily inserted in the cooling system of an internal combustion engine so as to prevent clogging not only of the engine radiator but also of the car heater.

A still further object of the invention is the provision of a strainer or trap of the character described which will operate efficiently in either a horizontal or vertical position or at an angle inclined between the horizontal and vertical.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the drawing:

Fig. 1 is a view of a part of an internal combustion engine and radiator therefor having a strainer according to my invention connected in the cooling system thereof, there also being a car heater disclosed diagrammatically;

Fig. 2 is a sectional view of the strainer shown in Fig. 1, including the thermostatically-controlled valve which the device comprises;

Fig. 3 is an end view of the device with the cover and thermostat removed;

Fig. 4 is a view similar to Fig. 2, showing a modified form of my invention; and

Fig. 5 is a sectional view on line 5—5 of Fig. 4.

Referring to the drawing with which I have illustrated my invention, the improved strainer is represented in general by a reference numeral 10, and, as shown, may be placed in the hose line or connection between the upper portion of the engine block 11 and the upper portion of the engine radiator 12.

The strainer shown in Figs. 2 and 3 of the drawing comprises a cylindrical shell 13 covered at one end by the cap 14, which may be soldered

in place, and provided at the other end with an outwardly extending flange 15 to which is secured the upper cover cap 16 by means of the screws 17, which pass through the flange 15 and a corresponding flange on the cap 16.

The covers or caps 14 and 16 are provided with openings at their central portions in which are secured the inlet and outlet pipes 18 and 19.

Opposite the inner end of the inlet pipe and spaced therefrom is a baffle 20 which may be supported from the inlet pipe upon spaced arms or metal strips 21 secured to the pipe. Also, a second baffle 23, as shown in the form of a truncated cone, is secured by soldering or the like to the inner surface of the shell 13, this baffle extending from its point of securement to the shell to a point substantially opposite the end of the inlet pipe 18.

A screen 24 is provided adjacent the outlet end of the shell 13. This screen may also be in the form of a truncated cone and may, at its lower end, rest against and have the opening at this end closed by the baffle 20. At its upper end the screen is of substantially the same size as the inner diameter of the shell 13, so that it rests snugly in position within the shell against the baffle 20. The screen may be soldered in place at its upper edge, or may, if desired, be held in place by the cover 16 and the baffle 20. A clean-out nipple 25 is provided in the shell 13 at a point adjacent the lower end of the shell when the latter is in an inclined or vertical position, the opening in this nipple being closed by the plug 26.

It will be understood that the parts of my device described heretofore are similar to the corresponding parts shown in my prior patent referred to, and operate in the manner described in that patent. Briefly speaking, the water from the engine block 11 enters the shell 13 through the inlet pipe 18, and impinges against the baffle 20. The velocity of the water is thereby lost, and any particles of rust, sand or other foreign matter will drop upon the baffle 23 and through the opening at the lower end of this baffle around the pipe 18 into the lower portion of the shell 13, where it may be removed and the shell cleaned by unscrewing the plug 26. Thus a trap is provided for the foreign matter to remove it from the circulating water. The water passes on through the screen 24 into the space above this screen, and passes out to the engine radiator through the outlet pipe 19 and the hose connection 27, shown in Fig. 1. It will, of course, be understood that in the inclined position of the strainer, as shown in Fig. 1, the pipe 19 is at the upper end and the pipe 18 at the lower end of the shell 13.

A nipple 28 is provided in the shell 13 adjacent the upper end of this shell and opposite the screen 24, this nipple being of sufficient length to extend through an opening in the side of the screen 24 so that it opens at its inner end into the space within the screen and thus communicates with that part of the strainer containing the clean water. To this nipple 28 is connected a pipe 29 which at its other end is connected to the inlet 30 of a car heater radiator shown diagrammatically at 31. At the lower end of this radiator is shown in a fragmentary way a return pipe 32 which also may be connected at a convenient point to the cooling system of the engine 11 to provide for circulation of water through the radiator 31. It will be seen that with this construction the water of the engine cooling system after passing through the screen 24 and being cleaned thereby, will be carried through the nipple 28 and pipe 29 to the radiator 31 of the car heater, so that the strainer will serve not only the radiator for the automobile engine but also the radiator of the car heater, and only clean water will be permitted to enter the latter, thus insuring that this radiator will not become clogged with dirt, rust or extraneous matter.

I have also incorporated in my device a thermostatically-controlled valve which is designed to maintain the temperature of the engine cooling water at a predetermined point. As shown this structure comprises a tubular portion 35 provided with an outwardly extending annular flange 36. Depending from this flange are a pair of oppositely disposed arms 37 supporting a plate or base member 38 to which is secured a collapsible bellows 39. Upon the upper end of the bellows is a stem 40 which threadedly receives a screw 41, the upper end of which is pivotally connected at 42 to a swinging valve 43, which valve is pivoted at opposite sides thereof upon the wall of the tubular member 35, as shown at 44.

It will be apparent that a portion of the cover 16 of the shell 13, as shown in Fig. 2, seats against the flange 36 when the thermostatic device is in place, with the tubular portion 35 inserted within the pipe 19. Thus the thermostatic device is held in place with the lower base portion 39 thereof resting against the baffle 20. If desired, the flange 36 may be secured by soldering or the like to the cover 16, but this is not necessary, and if made of such proportions that the base 38 will rest upon the baffle 20 when the device is in place, it will be readily removable so that it may be replaced when that is desired. It will also be apparent that when the bellows 39 expands due to the heat of the water passing through the strainer, the stem 40 will be moved upwardly and swing the valve 43 about its pivot 44 to open the valve and permit the passage of the water through the pipe 19. The valve as shown in Fig. 2 is, of course, in closed position, and when the water in the radiator cools and the bellows again contracts, it will be returned to this position. It may also be noted that the pivot point 42 is offset with relation to the pivot points 44, so as to bring about the movement of the valve.

In Figs. 4 and 5 of the drawing I have shown a strainer device similar to that which has been described, except that the baffle 20 has been omitted. In this instance the screen 24 is secured within the shell 13, and the base 38 of the thermostatic device is adapted to extend to the lower portion of this screen and to serve also as the baffle 20. In this case the base 38 may rest for support upon the lower portion of the screen 24, or the thermostat may be secured to the cover 16. In any event, however, if an opening is provided in the lower part of the screen, the base 38 closes this opening and also serves the purpose of the baffle 20, shown in Fig. 2, so that the water entering through the pipe 18 impinges upon the base 38 and is deflected and caused to lose its velocity thereby, thus permitting the foreign particles carried in suspension to drop through the baffle 23 to the lower portion of the shell 13, where these particles may be removed through the nipple 25.

It will, of course, be understood that the strainer is normally filled with water if the cooling system is full, as it should be, and that there is little movement of the water in the trap portion of the strainer below the baffle 23, most of the circulation taking place between the inner end of the pipe 18 and the pipe 19. As there is little

water movement in the trap portion of the strainer, the foreign matter which falls into the lower end of the shell 13 into this trap will remain there and not be stirred up. As shown in Fig. 4, if it is desired to use the device without the car heater, the nipple 28 may be closed by a plug 46 similar to the plug 26. With the removal of the plug, however, the device is provided with an outlet for connection to the car heater when one is used.

While I have shown and described some preferred embodiments of my invention, it will be understood that it is not to be limited to all the details shown but is capable of modification and variation within the spirit of the invention and within the scope of the appended claims.

What I claim is:

1. In a strainer in the cooling system of an internal combustion engine, a hollow body forming a chamber and having inlet and outlet means, a screen extending into said chamber from one end thereof and covering said outlet means to strain the water passing into and out of the chamber, and a second outlet means passing through a wall of the chambers and through the screen to communicate with the space between said screen and the first-named outlet means to carry the water therefrom to an automobile heater or the like.

2. In a cooling system for an automobile having an internal combustion engine and a cooling radiator, a strainer device adapted to be inserted as a unit between the engine and the inlet of the radiator, said device comprising a hollow body having inlet and outlet means and a screen between said means, and also being provided with a trap for foreign particles in the cooling fluid and a thermostatically-controlled valve within said device to control the flow of water therethrough.

3. In a cooling system for an automobile having an internal combustion engine and a cooling radiator, a strainer device mounted between the engine and the inlet of the radiator, said device comprising a hollow body having inlet means at one end and a detachable cover at the other end having outlet means, a screen between said means, and a unitary thermostatically-controlled valve structure detachably carried by said cover.

4. In a cooling system for an automobile having an internal combustion engine and a cooling radiator, a strainer device mounted between the engine and the inlet of the radiator, said device comprising a hollow body having inlet and outlet means, a screen between said means and a removable cover, a unitary structure detachably carried by said cover, said structure comprising a suitably supported valve member to control the flow of water through the device, and thermostatic means for controlling said valve structure.

5. In a strainer for automobile cooling systems, a hollow body forming a chamber, outlet means at one end of the chamber, an inlet pipe at the other end of the chamber and extending for a substantial distance thereinto, a strainer between the inlet and outlet means, means in said body providing a trap for foreign matter in the cooling fluid, a valve carried by said body and adapted to control the passage of water therethrough, thermostatic controlling means for said valve within the body, and a part of said controlling means lying opposite the inner end of said inlet pipe to serve as a baffle for the incoming water.

6. A straining device for the cooling system of an internal combustion engine, comprising a casing having inlet means connected to the engine, a baffle opposite said inlet means against which the incoming water impinges, a screen extending from said baffle to the walls of the casing, and a plurality of outlets provided in said casing on the side of said screen opposite said inlet means.

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