May 12, 1925. 1,537,254

A. T. MILLS

RADIATOR CAP

Filed Jan. 10, 1924

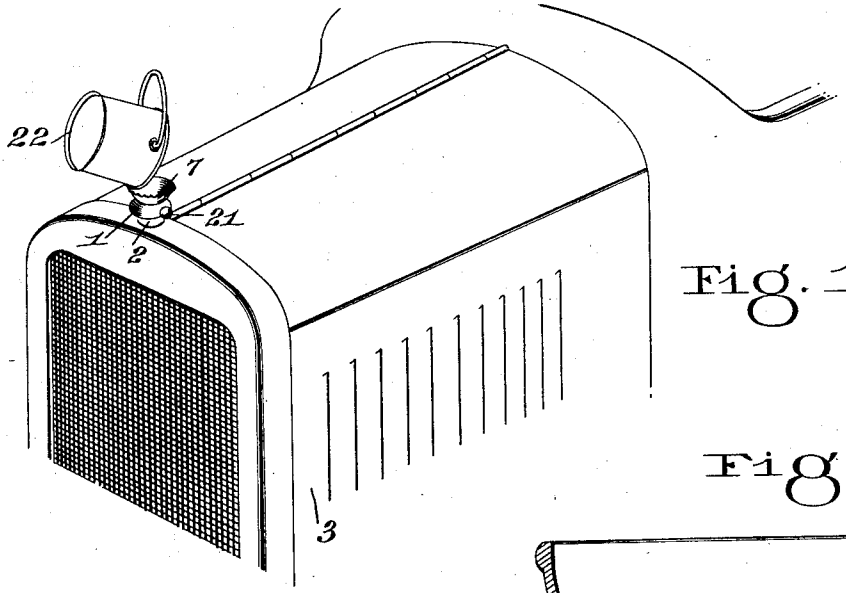


Fig. 1.

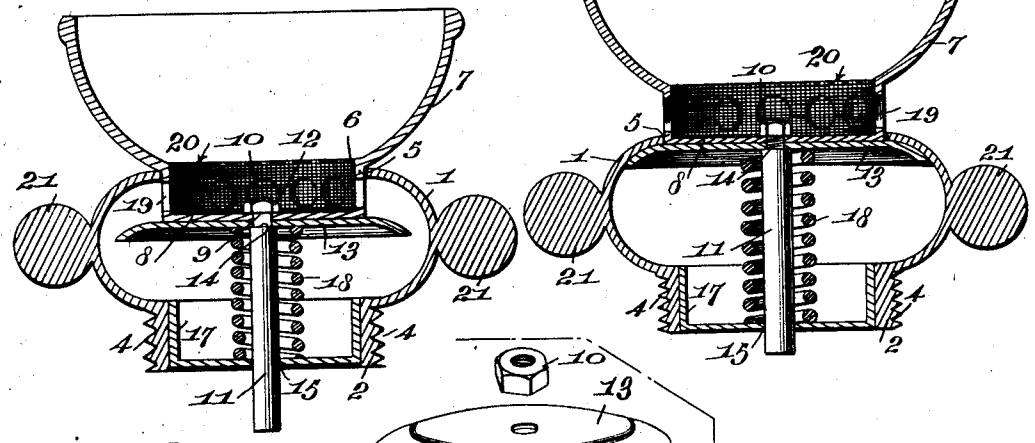


Fig. 2.

Fig. 3.

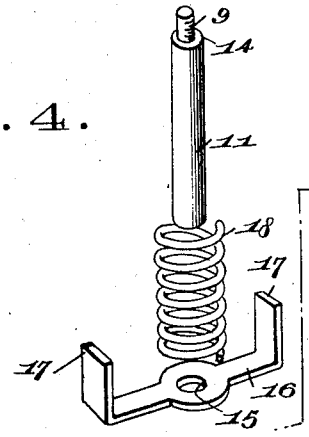


Fig. 4.

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Patented May 12, 1925. 1,537,254

UNITED STATES PATENT OFFICE.

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RADIATOR CAP.

Application filed January 10, 1924. Serial No. 685,410.

To all whom it may concern:

Be it known that I, ASBERY T. MILLS, a citizen of the United States, and resident of Richland, in the county of Keokuk and State of Iowa, have invented certain new and useful Improvements in Radiator Caps, of which the following is a specification.

My invention relates to improvements in caps for radiators of internal combustion engines, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of the invention is to provide a radiator cap which is attachable to the inlet of the radiator and which then affords facilities for permitting controlled flow of a liquid therethrough into the radiator without there being any necessity of detaching the cap from the radiator inlet.

A further object of the invention is to provide a radiator cap having a body attachable to the inlet of a radiator and adapted to permit of the passage of liquid therethrough into the radiator and having also a spring pressed valve normally closing said body.

A further object is to provide a radiator cap having the construction set out in the foregoing and having also a filler member protruding from the valve body and adapted to be actuated by pressure in the outer end thereof to move said valve to open position and to then permit the passage of liquid from said filler member into the body of the cap and thence into the radiator.

A further object of the invention is to provide in a radiator of the character described a self-cleaning filler member.

Other objects and advantages will be apparent from the following description, considered in conjunction with the accompanying drawings, in which—

Figure 1 is a perspective view showing a radiator equipped with a cap embodying the invention,

Figure 2 is a central vertical section through the cap, showing the valve thereof closed,

Figure 3 is a view similar to Figure 2, showing the valve in open position, and

Figure 4 is a perspective group view showing certain of the elements of the device in separated position.

A radiator cap embodying the invention comprises a hollow or tubular body 1 as best seen in Figures 2 and 3. The body 1 is provided at its lower end with a tubular attaching portion 2 which is adapted to be secured in the inlet of a radiator 3 for an internal combustion engine. Any suitable means may be employed to secure the attaching portion 2 in the inlet of the radiator, as for example the screw threads indicated at 4.

An opening 5 is formed through the wall of the upper part of the body 1, preferably in vertical alignment with the tubular attaching portion 2. The cylindrical throat portion 6 of a substantially funnel-shaped filler member 7 is slidably received in the opening 5. The funnel-shaped filler member 7 is open at its upper end and is provided at the lower end of the throat portion thereof with an end wall 8 which preferably is integral with the side wall of the throat portion. The end wall 8 is provided with a central opening 9 through which extends the reduced upper end portion 10 of a rod 11. A nut 12 threadedly engages the upper end portion 9 of the rod above the end wall 8 and may be tightened to clamp a valve disk 13 against the under face of the end wall 8 to hold the valve disk in concentric relation to the end wall 8, the valve disk resting upon a shoulder 14 which is provided at the juncture of the reduced end portion 9 and the body of the rod 11. The valve disk has a central opening through which the reduced end portion 9 of the rod 11 extends.

The valve disk 13 extends beyond the outer edge of the end wall and the extending marginal portion of such valve disk is fashioned to conform substantially to the curvature of the inner wall of the overlying portion of the body 1 so that the extending marginal edge portion of the valve disk will closely contact with the inner wall of the upper portion of the body 1 when the funnel-shaped filler member 7 has been raised to the position shown in Figure 2, whereby leakage between the valve disk 13 and the wall of the opening 5 will be prevented when the valve is in raised or closed position.

The valve rod 11 extends slidably through an opening 15 in the intermediate portion of the guide 16 which extends diametrically of the attaching portion 2 at the lower end of the latter and has upwardly bent attaching portions 17 at the ends thereof for engaging with the attaching portion 2 to hold the guide against displacement from position within the attaching portion 2.

An expansion spring is disposed between the guide 16 and the valve disk 13 in encircling relation to the valve stem 11 and continuously urges the valve disk 13 toward closed position. The attaching portions 17 may be permanently secured to the portion 2 in any suitable known manner.

The throat portion 6 of the funnel-shaped filler member is of sufficient length that an annular series of openings 19 formed through the side walls of the throat portion to extend circumferentially thereof will be disposed above the upper end of the opening 5 when the valve disk 13 is in closed position as illustrated in Figure 2 and will be disposed below the level of the lower end of the opening 5 when the valve disk 13 is in open position, as illustrated in Figure 3. A band 20 of foraminous material interfits the throat portion 6 and provides a filter for the openings 19. The body 1 may have lateral extensions 21 adapted to be conveniently gripped in the hand when it is desired to attach the body to a radiator inlet or to remove the body from such inlet.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The expansion spring 18 has sufficient strength to hold the valve disk 13 normally in closed position. At this time, the series of lateral openings through the throat portion of the filler member will be disposed above the upper end of the opening 5 in the body 1. Air passing through the openings 19 will tend to prevent the accumulation of dust, sediment, or like foreign matter within the filler member. Rain falling into the filler member when the valve is in closed position will pass from the filler member through the opening 19 without entering the body 1. When it is desired to pour a liquid into the radiator 3, a vessel such as the bucket indicated at 22 in Figure 1 may be employed to transfer the liquid from any convenient source of supply to the filler member 7. The rim portion of the vessel is placed upon the upper end of the filler member 7 and the weight of such vessel then will cause the filler member to be moved downward against the action of the spring 18 until the lower end of the substantially funnel-shaped portion of the lower member rests upon the upper wall of the body 1. At this time, the series of openings 19 will be disposed below the lower end of the opening 5 and it therefore will be obvious that any liquid poured into the filler member from the vessel 22 will pass through the openings 19 into the body 1 and thence through the attaching portion 2 of the body 1 into the radiator. When the weight of the vessel 22 has been removed from the filler member 7, the spring 18 will act to return the valve 13 to position to close the opening 5 and to thus prevent the entrance of dust, rain or other foreign matter into the radiator.

Important advantages of a cap embodying the invention arise from the fact that it is not necessary to remove the cap from the inlet of the radiator when it is desired to place a liquid in the radiator and since the device is automatic in its nature and is normally in a closed condition, neither the cap nor any of the parts thereof are likely to be lost because of failure of the operator to properly secure the cap or any of the parts thereof in place after a filling operation.

Obviously, my invention is susceptible of embodiment in forms other than that illustrated in the accompanying drawing, and I therefore consider as my own all modifications and adaptations of the form of the device herein described as fairly fall within the scope of the appended claims. For example, the invention obviously may be used with vessels other than a radiator.

Having thus described the invention, what is claimed is:—

1. A radiator cap comprising a hollow body having a tubular attaching portion at the lower end thereof and having an opening through the walls of the upper part thereof in vertical alignment with said tubular attaching portion, a valve disposed within said body for closing said second named opening, said valve having guided vertical movement, spring means urging said valve continuously toward closed position, a filler member carried by said valve and extending through said second named opening, said filler member being closed at its lower end and having a lateral opening located above the upper end of the second named opening when the valve is in closed position and below the lower end of said second named opening when the valve is in open position.

2. A radiator cap comprising a hollow body having a tubular attaching portion at the lower end thereof and having an opening through the walls of the upper part thereof in vertical alignment with said tubular attaching portion, a valve disposed within said body for closing said second named opening, said valve having guided vertical movement, spring means urging said valve continuously toward closed position, a substantially funnel-shaped filler member having a throat portion of its lower end carried by said valve and extending through said second named opening, said throat portion being closed at its lower end and being secured to said valve, said throat portion also having a circumferentially extending series of openings formed through the walls thereof in position to be located above the upper end of the second named opening when the valve is in closed position and below the level of the lower end of the second named

opening when the valve is in open position, and a band of foraminous material interfitting the throat portion of said filler member and providing a filter for said lateral opening.

3. A radiator cap comprising a hollow body having a tubular attaching portion at its lower end and having an opening in the upper wall thereof in alignment with said tubular attaching portion, a vertically movable valve disposed within said body, spring means urging said valve upward to position to close said second named opening, and a filler member secured to said valve and extending slidably through said second named opening, said filler member being adapted to be actuated by pressure on the upper end thereof to move said valve from closed position.

ASBERY T. MILLS.