

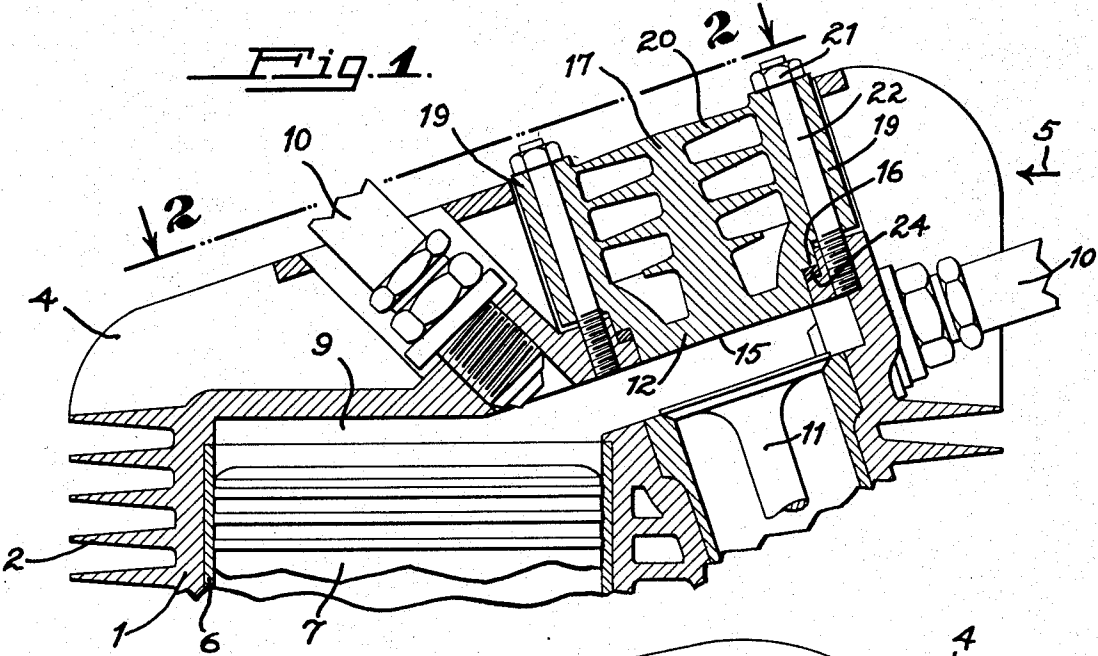
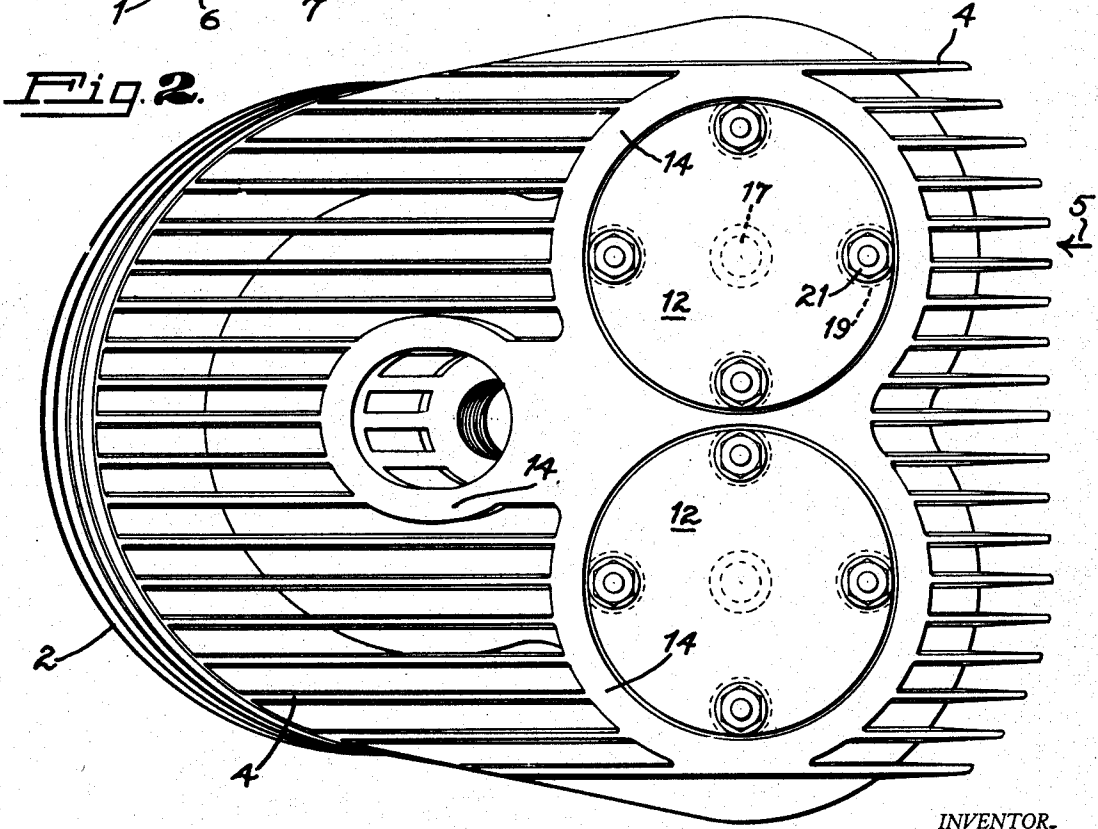
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VALVE CAP

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VALVE CAP

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2 Claims. (Cl. 123—171)

My invention relates to valve caps, and more particularly to a valve chamber cover for use in conjunction with poppet valves mounted in air-cooled internal combustion engines.

Among the objects of my invention are: To provide a means and method of cooling a valve cap; to provide a means and method of closing a valve chamber in an air-cooled internal combustion engine; to provide a valve cap for an air-cooled cylinder which will interfere to a minimum degree with cooling air; to provide a means and method of finning a cylinder head and a valve cap to obtain optimum cooling of both; and to provide a simple and efficient valve cap.

My invention possesses numerous other objects and features of advantage, some of which, together with the foregoing, will be set forth in the following description of specific apparatus embodying and utilizing my novel method. It is therefore to be understood that my method is applicable to other apparatus, and that I do not limit myself, in any way, to the apparatus of the present application, as I may adopt various other apparatus embodiments, utilizing the method, within the scope of the appended claims.

Referring to the drawing:

Figure 1 is a transverse-sectional view of an engine cylinder equipped with a preferred embodiment of my invention.

Figure 2 is a top plan view of the engine cylinder shown in Figure 1.

In both air and water cooled engines having L heads, valve caps are necessary to close the cylinder chamber immediately over the poppet valves, as it is customary to insert these valves through the cylinder head wall. As a consequence, difficulties are encountered in cooling the valve caps, particularly that cap which is positioned immediately over the exhaust valve where it is subject to maximum heat.

My invention broadly comprises a valve cap which is used in conjunction with an air-cooled cylinder, which in itself is cooled by fins, and the fins are so arranged as to interfere with the air stream a minimum amount.

My invention may be more fully understood by a direct reference to the drawing, in which a cylinder 1 is provided with the usual cooling fins 2, in this case preferably horizontal fins. The top of the cylinder, or as it is usually termed, the cylinder head, is provided however with vertical fins 4 which extend across the cylinder head in order that they may present the greatest surface to an air cooling stream flowing over the head, as indicated by arrows 5. The cylinder, which in

this case is shown as being provided with a liner 6, contains a piston 7 attached to a crank shaft through the usual connecting rod and wrist pin, not shown, and the combustion space 9 above the piston is provided with several apertures. Spark plug 10 fills one of these apertures. A poppet valve 11 is shown as filling another aperture, and a valve cap 12 is shown as closing an aperture immediately above the valve.

It is of course to be understood that it is customary to utilize two valves in each cylinder, and therefore in Figure 2 I have shown in plan the top surfaces of two such cap assemblies.

In order to strengthen the cooling fins on the top of the cylinder, I prefer to unite them around the valve cap aperture and around the spark plug aperture at the top of the fins by connecting rings 14, thus uniting the cut edges of the fins.

The valve cap 12 is formed to fit into the recess defined by the cut away portions of the fins, and comprises a basal portion 15, a seat shoulder 16, a central column 17, stud columns 19, and fins 20, these fins being horizontal with respect to the plane of the basal portion 15 and therefore at right angles to cylinder head fins 4. The cap itself is held down by nuts 21, engaging studs 22, entering the cylinder head, the stud columns being bored out to receive the stud. In order that a tight seal be made, I prefer to utilize a soft metal gasket 24 between the seat shoulder 16 and the cylinder head proper.

In operation, cooling air enters between the fins 4 and passes through fins 20 of the valve cap, these fins giving up heat to the cooling air, this heat being supplied by conduction from the basal portion 15 through central column 17 and stud columns 19. Thus, not only is the cap itself cooled but the air is allowed to continue past the cap fins and to further cool the cylinder head by passing between the rear portions of fins 4.

Furthermore, it should be noted that, although I have shown my present valve cap as held in position by studs, it is ideally adapted to be screwed in, if desired, inasmuch as no matching of fins is necessary. Rotation of the entire valve cap assembly 12 may be made without substantially changing the air flow conditions over the head.

I have therefore provided a valve cap which may be cooled fully as well as the remainder of the cylinder head, but which does not interfere, to any deleterious extent, with the cooling air flow over the head.

I claim:

1. In combination with a cylinder and piston, said cylinder having an aperture therein, parallel

cooling fins extending from the top of said cylinder, said fins being cut away above said aperture to form a recess, a closure cap having a basal portion cooperating with said cylinder to close said aperture, a column extending into said recess 5 from the center of said basal portion, spaced fins extending across said recess laterally from said column, and a plurality of spaced uprights attached to the basal portion near the edge thereof 10 and contacting the edge of each fin.

2. In combination with a cylinder and piston, said cylinder having an aperture therein, parallel cooling fins extending from the top of said cyl-

inder, said fins being cut away above said aperture to form a recess, a closure cap having a basal portion cooperating with said cylinder to close said aperture, a column extending into said recess 5 from the center of said basal portion, spaced fins extending across said recess laterally from said column, a plurality of spaced uprights attached to the basal portion near the edge thereof and contacting the edge of each fin, said uprights being bored, and bolts passing through the bores in 10 said uprights and attached to said cylinder to clamp said cap to said cylinder.

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