

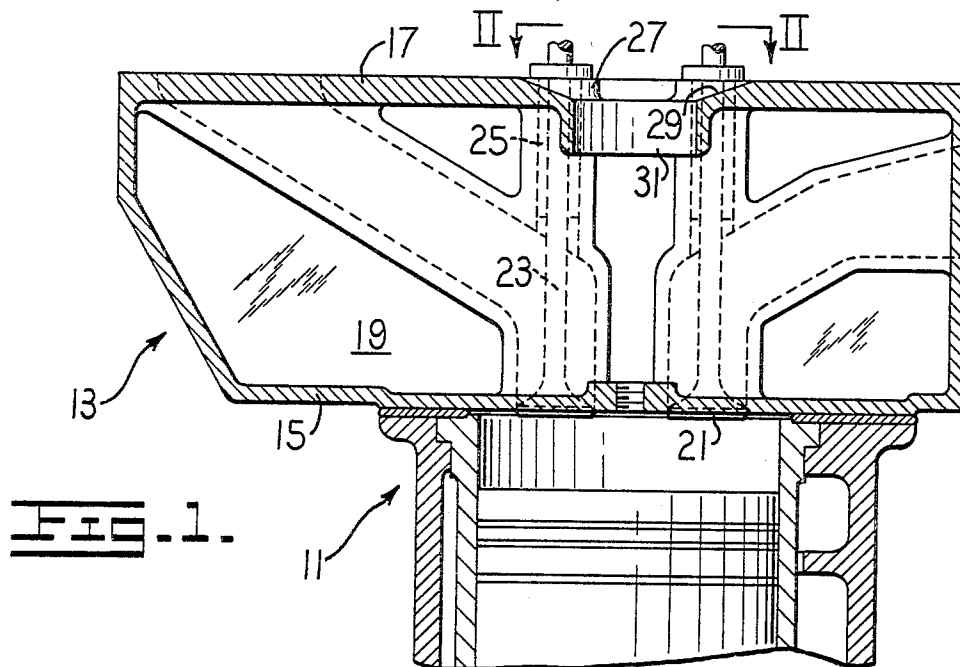
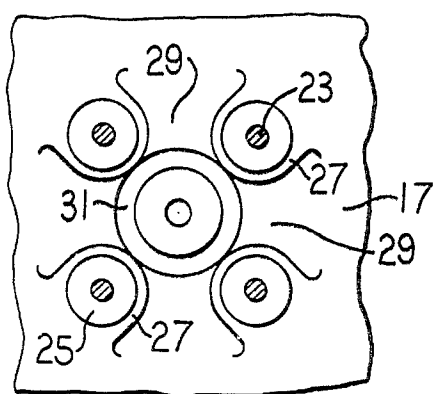
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3,483,856

RELIEVED CYLINDER HEAD

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3,483,856

RELIEVED CYLINDER HEAD

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2 Claims

ABSTRACT OF THE DISCLOSURE

An internal combustion engine cylinder head wherein the area between the valve guide bosses and precombustion chamber is inclined toward the precombustion chamber so as to relieve stress on the cylinder head.

Background and summary of the invention

When a cylinder head is secured to an engine block, it is subjected to assembly stresses, mechanical gas load, and thermal loading. Additional stresses are encountered at the valve guide boss when the valve guides are installed.

In engine designs utilizing four vertical valves per cylinder, a more compact head design and less complicated valve train is required than with a slanted valve design. A disadvantage arises, however, in that there is less wall thickness between the valve guide bore and the precombustion chamber bore. In the area of this smaller wall thickness, high cyclic stresses which occur often result in cracks between the two bores, causing leakage between water passages and the valve train lubricating system in the upper deck of the head.

It is therefore an object of this invention to provide a cylinder head wherein the advantages of the vertical valve system are present without having any of the disadvantages thereof.

It is also an object of the invention to provide an internal combustion engine cylinder head wherein the head is subjected to minimal assembly stresses, mechanical gas load stresses, and thermal load stresses.

It is also an object of the present invention to provide a cylinder head wherein the upper deck of the head is recessed in the area surrounding the precombustion chamber and between the valve bosses so as to relieve stresses within the head and obviate the problem of cracking therein.

Other objects of the invention will become apparent upon reading of the following description of a preferred embodiment of the invention.

The embodiment illustrated in the drawing is intended only as an illustration and other embodiments or equivalents of the invention will be obvious to those skilled in the art without departing from the scope of the invention as defined in the appended claims.

Brief description of the drawing

FIG. 1 shows a sectional view of a portion of an engine embodying the invention; and

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FIG. 2 shows a plan view of the cylinder head of the engine taken along a line II—II of FIG. 1.

Detailed description

Referring now to the drawing in more detail, FIG. 1 shows an internal combustion engine 11 having a cylinder head 13 mounted thereon. The cylinder head has a lower deck 15, an upper deck 17 and water passages 19 for cooling. A set of valves 21 are mounted in the cylinder head and, as shown, have valve stems 23 which pass through valve guides 25. The valve guides are mounted in bosses 27 on the upper deck of the cylinder head. Between each boss 27, a surface 29 is inclined toward a bore 31 which receives a precombustion chamber. These relief surfaces in deck 17 between the valve bosses serve to relieve stress between aperture 31 and the bosses 27 and thereby obviate cracking in the cylinder head.

Thus the applicant has provided a cylinder head wherein a compact head design allows the use of four vertical valves per cylinder, while solving the problem of leakage between water passages in the engine valve train lubrication system, brought about by structural cracking in the cylinder head.

I claim:

1. A cylinder head comprising an upper deck having:
a first bore therein,
a relief surface on the upper side of said upper deck and extending outwardly from the periphery of said first bore, and
valve passage means including bosses on the upper surface of said upper deck extending into said relief surface, whereby said relief surface extends outwardly from said aperture and between said bosses,
a lower deck having a second bore therein axially aligned with said first bore, and coolant passages between said upper and lower decks for passage of coolant between said decks.
2. The cylinder head of claim 1 wherein said relief surface comprises a surface which is sloped upwardly from said first aperture.

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123—41.77, 41.82