Oct. 6, 1931. M. J-B. BARBAROU 1,825,769

CONSTRUCTION OF THE CYLINDERS OF INTERNAL COMBUSTION ENGINES

Filed July 17, 1930

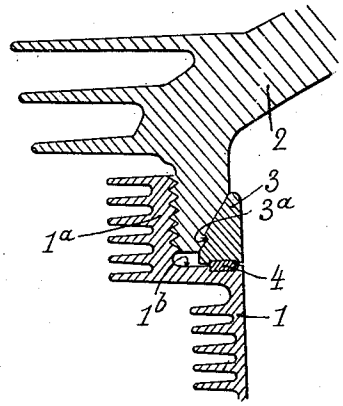


Fig.1

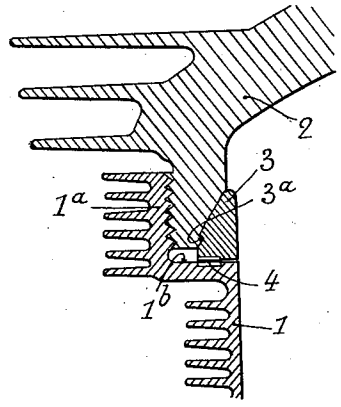


Fig.2

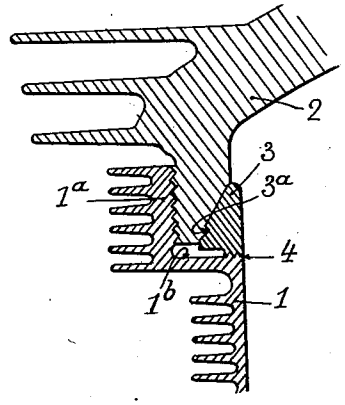


Fig.3

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UNITED STATES PATENT OFFICE

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CONSTRUCTION OF THE CYLINDERS OF INTERNAL COMBUSTION ENGINES

Application filed July 17, 1930, Serial No. 468,479, and in France September 16, 1929.

The present invention relates to improvements in internal combustion engines of the air-cooled type, in which, for the sake of lightness, the cylinder head is made of aluminum or other light metal or alloy, having a high expansion coefficient, whilst the cylinder body consists of steel or like metal, having a lower expansion coefficient. having a lower expansion coefficient.

The object of the invention consists in devising an improved arrangement for assembling the cylinder and cylinder head, whereby to obtain a sound assembly and a ready mounting.

According to one feature of the invention, the cylinder head is screwed into the enlarged upper part of the cylinder or barrel, previously heated and which constitutes an external hoop, while an internal hoop is fitted into the cylinder head preliminarily heated, said hoop having substantially the same expansion coefficient as the cylinder body and being located substantially at the same level as the enlarged portion of the cylinder or barrel.

According to another feature of the invention, a packing member is mounted within the cylinder body, between an annular shoulder formed on said body and the internal hoop, thus providing a leakless joint between the cylinder body and the cylinder head.

In the accompanying drawings, which are given solely by way of example:

Fig. 1 is a partial vertical section showing the cylinder body and cylinder head assembled in conformity to the invention.

Figs. 2 and 3 are similar views, showing modifications.

In the constructional forms herein represented, the body 1 of the cylinder, consisting of steel, cast iron or the like, is screwed at its upper enlarged end 1^a upon the cylinder head 2. Before assembling, the cylinder body is heated, and after cooling, it shrinks and forms an external hoop.

At the same level as said external hoop 1^a, the cylinder head is provided inwardly with a ring 3, forming an internal hoop; said ring consists of steel, cast iron, malleable bronze or like metal whose expansion coefficient is near that of the cylinder body 1, and it has an external tapered surface, having a peripheral shoulder 3^a adapted to hold said ring in place. To assemble the parts, the cylinder head 2 is heated to a temperature which is much higher than the temperature attained when the engine is running. The internal hoop 3 is positioned in a tapered recess provided for the purpose. Upon cooling, the cylinder head shrinks, and it thus remains under tension upon the said hoop, which cannot be driven out owing to the shoulder 3. Due to the high temperature employed in the assembling process, the tension of the cylinder head will not be removed when the engine is running.

The cylinder body 1 forming the external hoop 1^a comprises a shoulder 1^b engaging the lower face of the inner hoop when said body is screwed in position; according to the invention, a packing member 4 may be mounted between said shoulder 1^b and the inner hoop 3, thus preventing all leakage of gas from the explosion chamber. Said packing member is flattened when the cylinder body is screwed on, and it may consist of a ring of copper (Fig. 1) or of a composite packing member comprising a yielding metal with a plastic material (Fig. 2); more simply, the tight joint may be secured by means of a roughened part of the inner hoop (Fig. 3).

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. In an air-cooled internal combustion engine, a cylinder having an internally screwthreaded enlarged upper end, a cylinder head screwed in said enlarged end, and an internal hoop of a metal having substantially the same coefficient of expansion as the cylinder, located within said cylinder head, opposite said enlarged end.

2. In an engine as claimed in claim 1, packing means between said internal hoop and the face of said cylinder which connects said enlarged end with the cylinder body.

3. An engine, as claimed in claim 1, wherein the lower face of said internal hoop is roughened and engages the face of said cylin-

der which connects said enlarged end with the cylinder body.

4. An engine as claimed in claim 1, wherein the surfaces of contact between said cylinder head and said internal hoop taper upwardly toward the cylinder head and are provided with interfitting shoulders adapted to prevent axial movement of said hoop toward the cylinder body.

In testimony whereof I have signed my name to this specification.

MARIUS JEAN-BAPTISTE BARBAROU.