July 8, 1969 J. S. SALETZKI ET AL 3,453,993

PRECHAMBER MOUNTING

Filed Sept. 27, 1967 Sheet 1 of 2

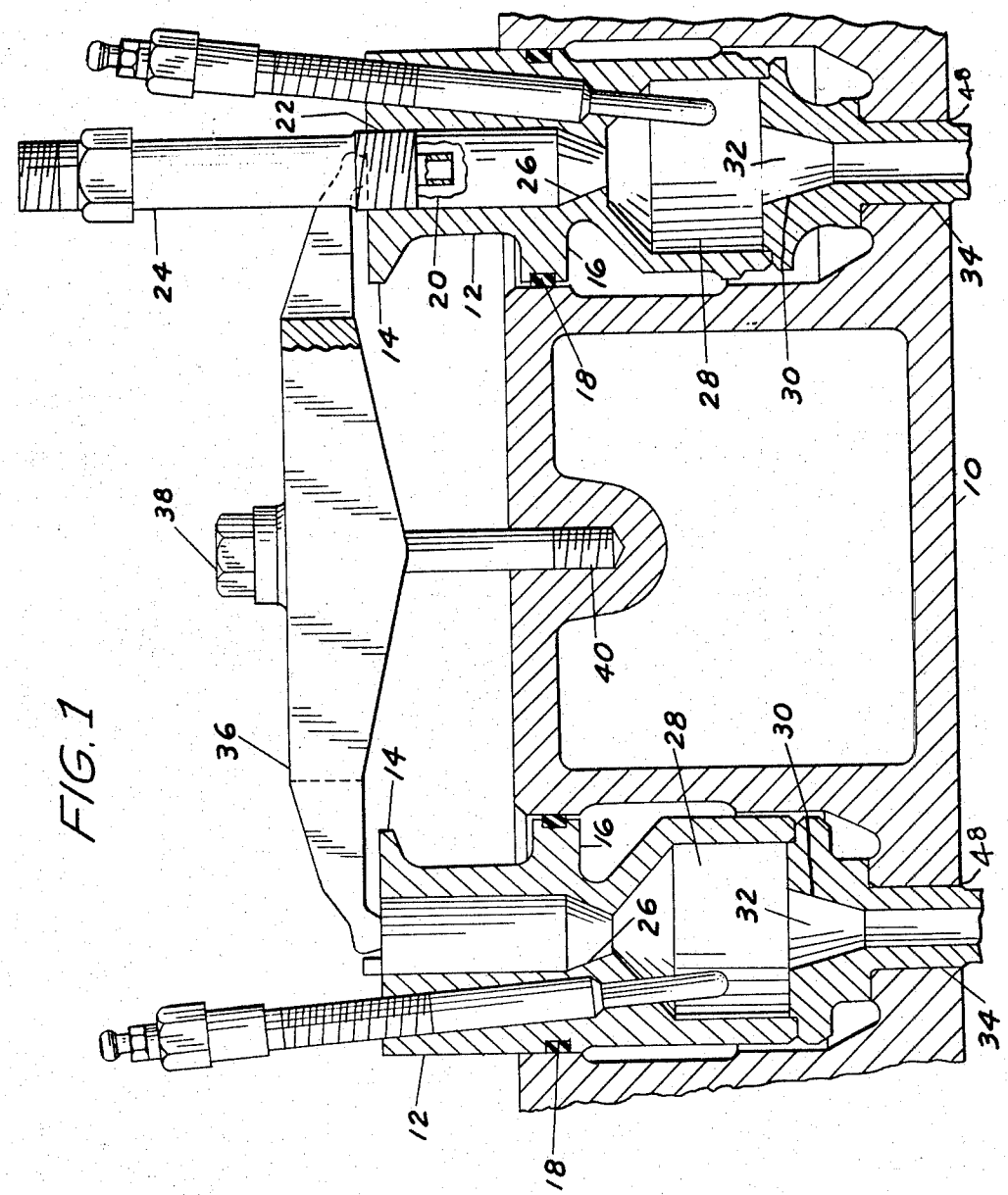


FIG. 1

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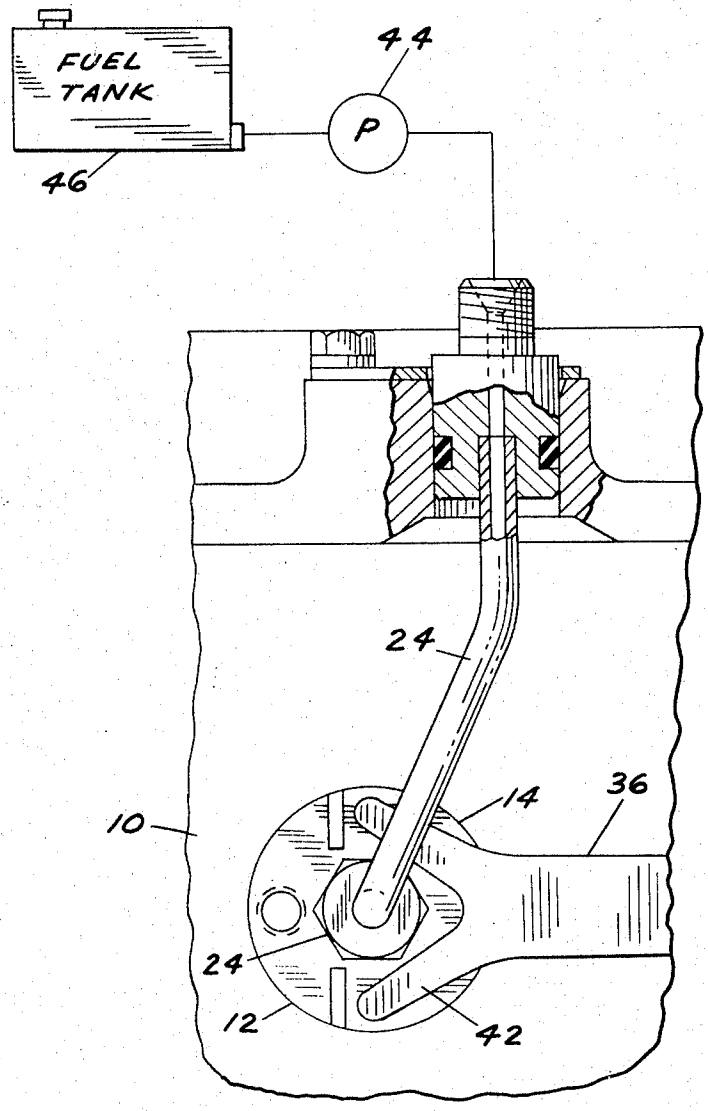


FIG. 2

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PRECHAMBER MOUNTING

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ABSTRACT OF THE DISCLOSURE

Apparatus in the form of a welded assembly containing a precombustion chamber and means for clamping same within an internal combustion engine to provide a certain amount of spring action to compensate for the difference in expansion between the steel welded assembly and an aluminum head.

This invention relates to internal combustion engines and more particularly engines having an aluminum cylinder head and opposed flanged assemblies having precombustion chambers therein mounted adjacent thereto.

In the past many types of clamping means have been used to hold precombustion chambers in place, but within the knowledge of applicants' various types of threading means have been used. These clamping means do not allow for differences in expansion between the precombustion chamber assembly and head and great damage is caused thereby, such as cracking or distortion.

The principal object of the present invention is to provide a new and improved clamping bar member designed to provide spring action to allow for differences in expansion between a steel precombustion welded assembly and an aluminum cylinder head.

Another object is to provide a new and improved clamping bar supported centrally upon an engine cylinder head the outer extremity of same being forked and adapted to engage the top of opposed welded assemblies containing precombustion chambers.

The above and other objects of the invention will appear more fully from the following more detailed description, and from the drawing, wherein:

FIGURE 1 is a cross-sectional view of an engine cylinder head with the clamping bar mounted thereon, and

FIGURE 2 is a top plan view showing the top flanged portion of the precombustion welded assembly and the forked end portion of the clamping bar in contact therewith.

Referring now to the drawings, the numeral **10** designates a cylinder head of an internal combustion engine formed of aluminum, or the like, and numeral **12** designates a welded one piece assembly made up of machined steel components having formed therein a precombustion chamber **28**. Assembly **12** also has formed thereon a top flange portion **14**, a lower flanged portion **16**, and an O-ring **18**. Assembly **12** is cored, as at **20** and a portion thereof is threaded, as at **22**, to receive a bonnet **24**, one only being shown.

The lower extremity of cored portion **20** is tapered, as at **26**, the same leading into the precombustion chamber **28**. The lower portion of assembly **12** is cored, as at **30**, to form a fuel line **32** leading from chamber **28**.

A clamping bar member **36** is provided, the same comprising an elongated bar member supported above and midway on cylinder head **10** by means ofa bolt **38** which in turn passes through bar member **36** and has the lower extremity of same threaded, as at **40**, to engage the cylinder head. The opposed ends of bar **36** are forked, as at **42**, to rest upon the top flanged portion **14** of welded assembly **12**. Numeral **44** designates a fuel pump and **46**

a fuel tank. Numeral **48** designates an opening in the lower portion of cylinder head **10** and **34** a reduced portion of welded assembly **12**.

The manner in which the device operates is as follows: The clamping bar **36** is secured to cylinder head **10** by threaded bolt member **38** into the cylinder head as shown in FIG. 1. The forked end **42** of bar **36**, FIG. 2, straddles bonnet **24** which is threaded into chamber **12**, as at **22**, and rests upon the top of flange portion **14** of welded assembly **12**. Bar **36** is designed to provide spring action which enables same to compensate for the difference in thermal expansion between the steel welded assembly **12** and the aluminum cylinder head **10**. The downward pressure of opposed forked ends of bar **36** on top flange portion **14** of assembly **12** is imparted downwardly on assembly **12** and tends to hold the reduced portion **34** of said assembly within opening **48** located in the lower portion of cylinder head **10**. The floating bar member **36** takes care of the difference in the coefficient of expansion between the quickly expanding aluminum cylinder head and the slowly expanding steel assembly. Inasmuch as the lower extremity of assembly **12** is seated freely in opening **48** and not secured rigidly therein, as by threading and held downwardly by arm **36**, expansion can take place without the tendency to cause breakage or distortion of the steel assembly.

There has been disclosed herein a new and novel means for clamping a steel welded assembly made up of machined steel components and containing a precombustion chamber within an aluminum cylinder head and having means provided to springably hold said steel assembly in yieldable relationship with said cylinder head to compensate for the different rates of expansion between the steel and aluminum.

It will be noted that the construction shown and described will serve admirably to accomplish the objects stated above. It is to be understood, however, that the construction disclosed above is intended merely as illustrative of the invention and not as limiting, as various modifications therein may be made without departing from the invention as defined by a proper interpretation of the claims which follow.

We claim:

1. In an internal combustion engine having a head and at least a pair of reduced thread free flanged assemblies each of which has a precombustion chamber located therein secured to said head and a bonnet member supported within each of said chambers, the improvement comprising;

a clamping bar mounted upon said head, the opposed extremities of said bar member being forked to straddle said bonnets and contact the tops of said flanged assemblies and hold same yieldably within the lower reduced portion of said flanged assemblies so that the same seat freely within said thread free openings in said head.

2. The apparatus of claim **1**, wherein the clamping means is adapted to bend elastically when the flanged assembly and the head, which have different rates of expansion, thermally expand.

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