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C. R. SHORT

COMPOSITE PISTON

Filed Feb. 23, 1926

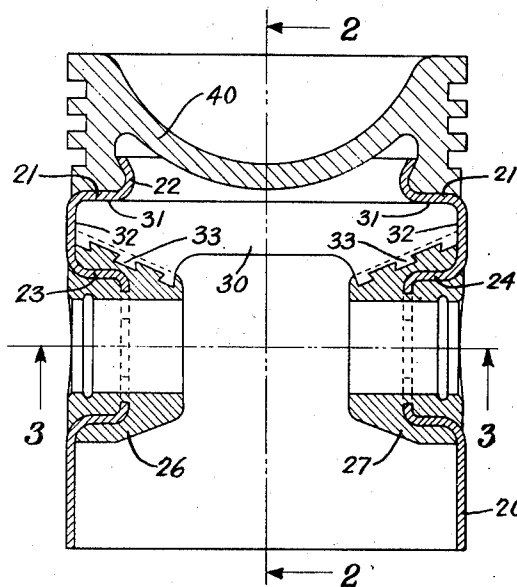


Fig. 1.

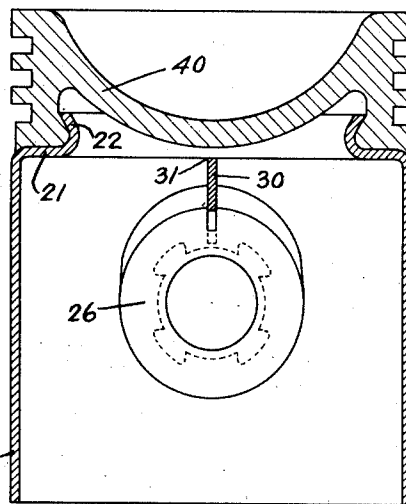


Fig. 2.

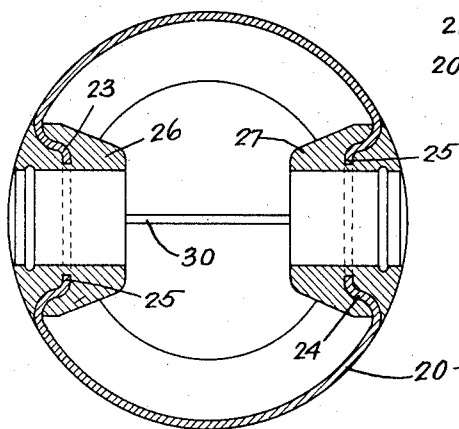


Fig. 3.

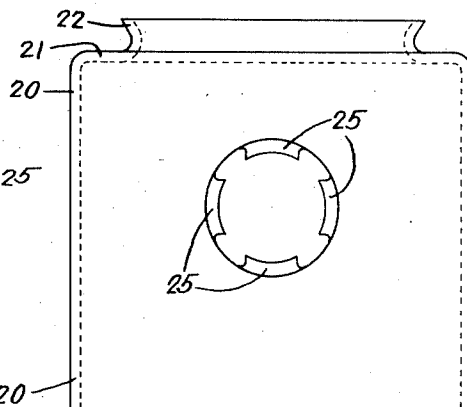


Fig. 4.

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COMPOSITE PISTON.

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This invention relates to improvements in pistons for internal-combustion engines and particularly to pistons of the composite type which comprise in their construction two or more different kinds of material.

It is among the objects of the invention to produce a rigid, light-weight piston, the skirt of which is made of sheet metal such as steel and whose head and wrist pin bosses are made of a lighter and better conducting material, such as aluminum.

Further objects and advantages of the invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred embodiment is illustrated.

In the drawings:

Fig. 1 is a longitudinal sectional view of the piston, through the piston bosses.

Fig. 2 is a section taken along the lines 2—2 of Fig. 1.

Fig. 3 is a transverse section taken along the line 3—3 of Fig. 1.

Fig. 4 is a view in elevation of the skirt of the piston unattached to the head.

Referring to the drawings, the piston comprises a skirt member 20, preferably made of sheet steel rolled into cylindrical shape and butt-welded. One end of the piston skirt is drawn to form a circular flange 21 which extends inwardly toward the axis of said skirt and merges into an outwardly flaring conical flange 22.

On diametrically opposite sides of the piston skirt and substantially midway between its ends, there are provided cup shaped depressions 23 and 24. The bottom portions of these depressions are parallel and equidistant from the axis of the skirt member, said bottom portions being apertured in such a manner that tongues 25 are formed by the edges thereof.

The portions 23 and 24 support piston pin bosses 26 and 27, respectively. These bosses are made preferably of aluminum and are cast on the skirt member 20, the portions 23 and 24 being embedded respectively in the bosses 26 and 27. The outer surfaces of the bosses are substantially flush and conform to the outer cylindrical surface of the piston skirt member 20.

In order to increase the rigidity of the skirt and boss structure and particularly to maintain the bosses in alignment, there is provided a bridging member 30, certain

portions thereof engaging with the interior surface of the piston skirt, as shown at 31 and 32, while other portions of said member 30 are secured to the bosses 26 and 27. In the Fig. 1 the portions of the bridging element 30 which engage with the bosses 26 and 27 are provided with tongue members 33, which are embedded in the bosses. In this form of the construction, the member 30 is placed in position in the piston skirt previous to the casting of the bosses 26 and 27, so that when said bosses are cast on the skirt, they will also be cast on the member 30 which thus forms a rigid connection between said bosses.

The piston head 40 is preferably of metal of less specific gravity and of greater thermal conductivity than the skirt. For example, the head may be made of aluminum and may be formed and united to the skirt by casting in the same operation which forms the piston pin bosses and unites them to the skirt, or the bosses may be formed and united in a separate operation.

The flanges 21 and 22 of the skirt form anchoring means by which the piston head is securely joined to the piston skirt. The flanges are so related that the joint will remain tight throughout the working ranges of temperatures of the engine.

The bridging element may, of course, be secured to the wrist pin bosses in any suitable manner, the casting method described above being deemed the most satisfactory.

While the form of embodiment of the invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A composite piston comprising a skirt member; a head cast on the skirt; wrist pin lugs also cast on said skirt; and means interposed between the lugs separate from said head for increasing their rigidity.

2. A composite piston comprising a cylindrical, sheet metal skirt; a piston head; piston lugs cast on said skirt; and a bridging member separate from said head having an end anchored to each of said piston lugs to support and hold the lugs rigid.

3. A composite piston comprising a cylindrical, sheet metal skirt; a piston head; piston lugs cast on said skirt; and a sheet metal bridging member having an end em-

bedded in each lug to support and hold said lugs rigid.

4. A composite piston comprising a cylindrical, sheet metal skirt; a piston head; 15
5 piston lugs cast on said skirt; and a sheet metal bridging member secured to the skirt and having oppositely disposed notched portions which are embedded in the piston lugs when the same are cast on said skirt.
- 10 5. A composite piston comprising a cylindrical, sheet metal skirt having apertured cup formations in its peripheral surface,

said cup formations being directly opposite and the apertures thereof having notched edges; a piston head on said skirt; a piston 15
wrist pin lug cast on each of the cup formations of the skirt so that this entire formation is embedded in the lug; and a bridging member engaging portions of the skirt and having portion thereof embedded in 20
the lugs to hold them rigid.

In testimony whereof I affix my signature.

CHARLES R. SHORT.