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R. W. MYERS

2,178,895

VALVE SEAT INSET

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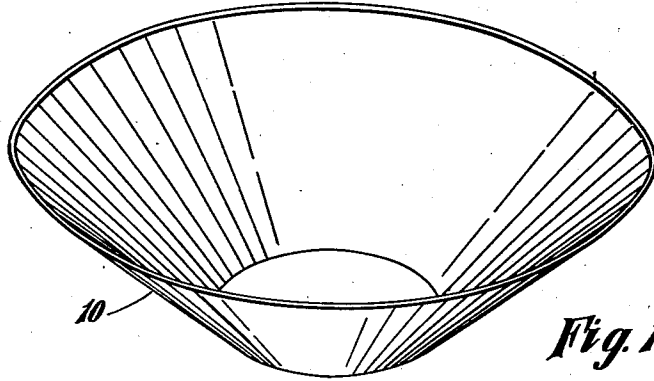


Fig. 1

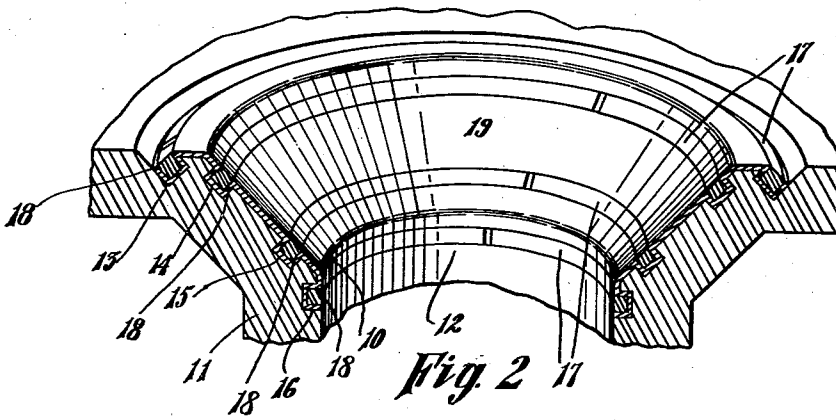


Fig. 2

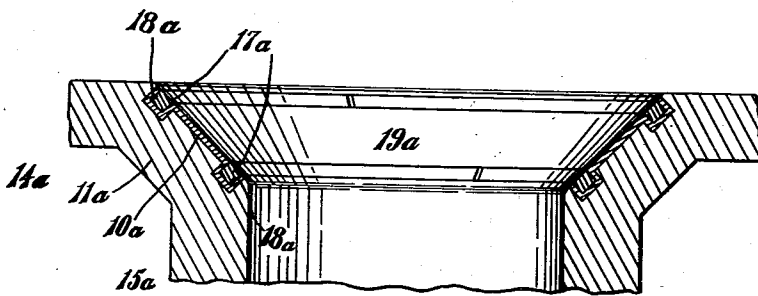
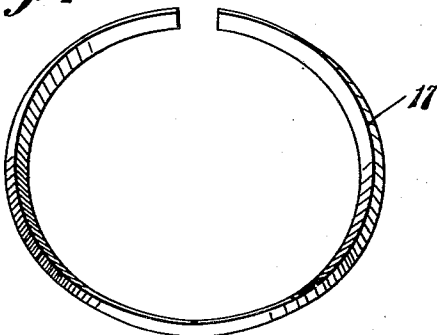


Fig. 3

Fig. 4



Inventor

Roy W. Myers

By *Freese and Bishop*

Attorneys

UNITED STATES PATENT OFFICE

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VALVE SEAT INSET

Roy William Myers, Dennison, Ohio, assignor of
one-fifth to Leo Myers, Dennison, Ohio

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6 Claims. (Cl. 123—188)

The invention relates to fabricated metallic structures which are subjected to wear and wide temperature variations, and more particularly concerned with valve seat insets for internal combustion engines, and also adapted for bearing surfaces where resistance to wear and temperature are required.

Valve seat insets have been used to some extent in connection with the poppet valves of internal combustion engines, particularly the exhaust valves of such engines, the insets being formed of a suitable alloy to provide the necessary resistance to heat, impact and acid, making it possible to use a softer and more easily machined metal for the cylinder block than would be possible where the valve seat is formed in the material of the block.

Due to the difference in the coefficient of the expansion of the two metals there is a tendency for such valve seat insets to become loosened when the engine temperature increases under operation. Furthermore, the alloys of which such valve seat insets are formed are quite expensive and add to the cost of the engine.

The object of the present invention is to provide a valve seat inset formed of chrome nickel or the like provided with means for holding the same securely in place upon the engine block.

Another object is to provide such a valve seat inset formed from a relatively thin sheet of chrome nickel or other suitable alloy so as to use only the minimum amount of the expensive alloy necessary to obtain the desired result.

A further object of the improvement is to provide a valve seat inset of the character referred to which is held in position upon the engine block by means of expansible split rings.

A still further object is to form the improved valve seat inset from a hollow cone of sheet alloy pressed or rolled into annular grooves in the engine block.

The above objects together with others which will be apparent from the drawing and following description, or which may be later referred to, may be attained by constructing the improved valve seat inset in the manner illustrated in the accompanying drawing in which

Figure 1 is a perspective view of the hollow cone blank from which the improved valve seat inset is formed;

Fig. 2, a perspective sectional view through a valve seat provided with the improved inset;

Fig. 3, a longitudinal sectional view showing a slightly modified form of the improved valve seat inset; and

Fig. 4, a detached perspective view of one of the expansible split rings used for retaining the valve seat inset in position.

Similar numerals refer to similar parts throughout the drawing.

In Figure 1 is shown the blank from which the improved valve seat inset is formed, and comprising a hollow truncated cone 10 of sheet chrome nickel or other alloy material having high resistance to temperature changes, impact, abrasion, and acids.

As shown in Fig. 2, the engine block 11 has plurality of annular grooves formed therein surrounding the valve port 12 to be surfaced, these grooves being indicated at 13, 14, 15, and 16. The cone blank of alloy sheet metal is then pressed or rolled into the annular grooves of the engine block as shown in Fig. 2 and expansible split rings 17 which are preferably of the same material as said cone blank are then placed in the annular channels 18 thus formed in the sheet alloy material so as to retain the alloy valve seat inset in position upon the motor block.

The surface 19 of said inset, between the expansible grooves 14 and 15, forms the valving surface against which the poppet valve of the engine seats. By undercutting the upper groove 13 and the lower groove 16 at an angle to the body portion of the valve seat inset and pressing the sheet metal inset into the same, it will be seen that the inset is more securely attached to the engine block.

It will be seen that while the four annular grooves, each having the adjacent portion of the inset pressed or rolled therein and retained by means of a split ring, produces the maximum securing means any one or even two of these grooves, and accompanying split rings may be dispensed with just so that there is one ring above and one below the valving surface.

For instance, as shown in Fig. 3, the engine block 11a is provided with two spaced grooves 14a and 15a into which the upper and lower edge portions of the sheet metal cone 10a are rolled or pressed forming the channels 18a into which are pressed the expansible split rings 17a, at opposite ends of the valving surface 19a.

The expansible split rings inserted into the annular channel portions of the sheet alloy inset securely retain the same upon the engine block and by forming the inset of sheet alloy the minimum amount of this expensive material may be used to produce the valve seat inset.

I claim:

1. In combination with a member having a

valve port therein provided with spaced annular grooves, a valve seat inset comprising an annulus of heat resisting alloy metal having spaced, annular, channel portions fitted into said grooves, and expansible spring rings located in said annular channel portions, providing a valving surface of heat resisting alloy metal between said rings.

2. In combination with an engine block having a valve port therein provided with spaced annular grooves, a valve seat inset comprising a hollow truncated cone of heat resisting alloy metal having spaced, annular, channel portions fitted into said grooves, and expansible spring rings located in said annular channel portions, providing a valving surface of heat resisting alloy metal between said rings.

3. In combination with an engine block having a valve port therein terminating in a flared portion and provided with annular grooves, a valve seat inset comprising a hollow truncated cone of heat resisting alloy metal having spaced, annular channel portions fitted into said grooves, and expansible spring rings located in said annular channel portions, providing a valving surface of heat resisting alloy metal between said rings.

4. In combination with an engine block having

a valve port therein terminating in a flared portion and provided with annular grooves beyond said flared portion, a valve seat inset comprising a hollow truncated cone of heat resisting alloy metal having spaced, annular channel portions fitted into said grooves, and expansible spring rings located in said annular channel portions, providing a valving surface of heat resisting alloy metal between said rings.

5. In combination with an engine block having a valve port therein terminating in a flared portion and provided with undercut annular grooves, a valve seat inset comprising a hollow truncated cone of heat resisting alloy metal having spaced, annular channel portions fitted into said grooves, and expansible spring rings located in said annular channel portions, providing a valving surface of heat resisting alloy metal between said rings.

6. In combination with a member having a bearing opening therein provided with spaced, annular grooves, a bearing inset comprising an annulus of heat resisting alloy metal having spaced, annular channel portions fitted into said grooves, and expansible, spring rings located in said annular channel portions, providing a bearing surface of heat resisting alloy metal between said rings.

ROY WILLIAM MYERS.