April 3, 1934. J. R. McVEIGH 1,953,184

ENGINE

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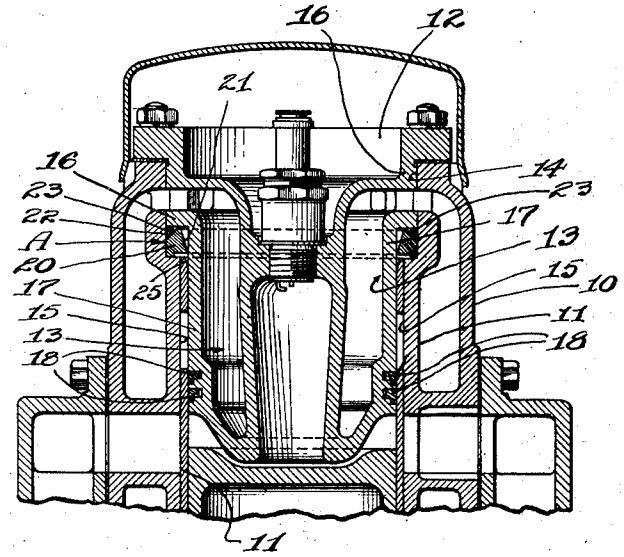


Fig. 1.

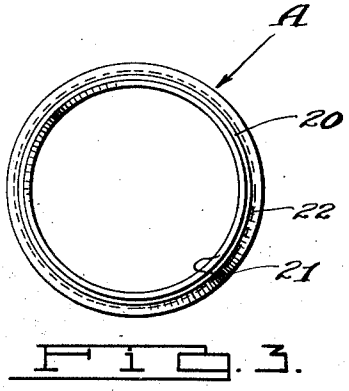


Fig. 3.

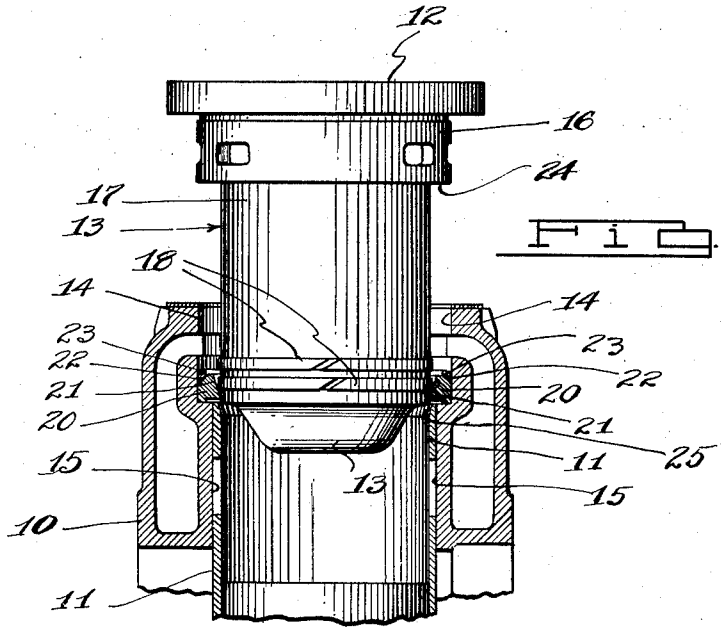


Fig. 2.

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1,953,184

ENGINE

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21 Claims. (Cl. 123—75)

My invention relates to internal combustion engines and more particularly to a device for facilitating the assembly with a cylinder structure of a sleeve valve engine of a reentrant piloted cylinder head structure.

It has been found to be very desirable to position the cylinder head of a sleeve valve engine by employing piloting means, one embodiment thereof being illustrated in the accompanying drawing and showing a pilot portion of the head engaged in an enlarged portion of the cylinder. However, with constructions of this general character, it is essential to employ spring sealing rings between the depending portion of the cylinder head and the sleeve valve means, such rings being preferably carried by the cylinder head structure. These sealing rings spring outwardly and must of course be compressed in order to assemble the cylinder head structure with the cylinder, the depending portion of the head having a fairly close fit within the sleeve valve means, and unless said sealing rings are compressed on assembly they will strike the upper edge of the sleeve valve means and prevent the assembly of the head with the cylinder. I find that these rings cannot be readily compressed in a construction as shown in the illustrated embodiment of my invention by the means usually employed for this purpose, due primarily to the fact that there is not sufficient room permitting the use of such tools.

It is the object of my invention to facilitate the assembly of a reentrant cylinder head structure with the cylinder of a sleeve valve engine by providing a novel construction whereby said engine parts may be readily and quickly assembled without employing such tools and other similar devices as generally found to be necessary.

A further object of my invention is to facilitate the assembly with a cylinder of a sleeve valve engine, of a piloted cylinder head structure having one or more sealing rings for engagement with the sleeve valve means by providing a novel cylinder construction carrying means adapted for engagement with said rings for compressing the same during the assembly of the head and cylinder.

For a more detailed understanding of my invention, reference may be had to the accompanying drawing which illustrates one form which my invention may assume, and in which:

Figure 1 is a vertical sectional view of a sleeve valve engine constructed in accordance with my invention,

Figure 2 is a detail view partly in section illustrating the operation of the assembling device or ring, and

Figure 3 is a plan detail view of the assembling ring.

The sleeve valve engine illustrated in the accompanying drawing includes a cylinder structure 10, sleeve valve means 11 operating in the cylinder, and a cylinder head structure 12 secured to said cylinder, said cylinder head having a portion 13 depending within the cylinder and spaced therefrom to provide a sleeve pocket for receiving the upper end of the sleeve valve means.

In the illustrated embodiment of my invention, the cylinder head is accurately positioned with respect to the cylinder structure by piloting the head within the cylinder bore. The piloting means of the cylinder is preferably constructed by boring out the upper part of the cylinder bore as at 14, to a larger diameter than the remaining portion 15 of the cylinder bore. That portion of the cylinder head structure which depends within the cylinder bore is provided with a pilot portion 16 of a diameter adapted for a snug engagement with the enlarged cylinder bore portion 14 or piloting means, and with a lower portion 17 depending within the reduced cylinder bore portion 15 but spaced therefrom to provide a sleeve pocket for receiving the upper portion of the sleeve valve means 11.

The lower depending portion 17 of the cylinder head preferably carries sealing means such as the spring sealing rings 18, one or more of such rings being employed. These spring rings yieldingly engage the inside surface of the sleeve valve means to seal against leakage of fluid into the sleeve pocket.

These sealing rings normally spring out when the cylinder head is disassembled from the cylinder and must necessarily be compressed in order to allow the depending cylinder head portion 17 to enter the sleeve valve means. It would be difficult if not entirely impossible to insert a tool or other similar device in the enlarged cylinder bore to compress the sealing ring or rings during the assembly of the head.

However, my novel construction provides means for readily compressing the sealing ring or rings during the assembly of the head with the cylinder. I employ an assembling device A which consists of a ring 20 adapted to be supported or seated at or adjacent to the bottom of the enlarged cylinder bore portion. The inner face of the ring 20 is beveled as at 21 and so constructed as to engage the expanded spring sealing rings to compress the

same during assembly so that the sealing rings will very easily slip into the sleeve valve means.

It will be noted that the top edge of said sleeve valve means lies closely adjacent to the lower edge of the assembling ring 20 when the sleeve is in its uppermost position. Thus the sealing ring enters the sleeve valve means before it leaves the assembling ring 20. Preferably the upper face of the ring 20 is beveled as at 22 and a gasket 23 or other compressible ring is preferably inserted between the assembling ring and shoulder 24 formed by the enlarged depending portion of the cylinder head structure.

If desired the inner top edge of the sleeve valve means may be slightly beveled as at 25 so as to eliminate any tendency of the sealing rings to catch on the edge of said sleeve valve means.

It will thus be noted that I have provided a novel cylinder construction carrying an assembling ring for facilitating the assembly of the cylinder and cylinder head of a sleeve valve internal combustion engine.

Although I have illustrated but one form of my invention and have described in detail but a single application thereof, it will be apparent to those skilled in the art to which my invention pertains that various modifications and changes may be made therein without departing from the spirit of my invention or from the scope of the appended claims.

What I claim as my invention is:

1. In a sleeve valve engine having a cylinder, sleeve valve means, a cylinder head structure depending within said cylinder and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, sealing rings carried by the depending portion of said cylinder head structure and adapted for engagement with said sleeve valve means, and means carried by said cylinder for compressing said sealing rings during assembly of said cylinder head structure with said cylinder.

2. In a sleeve valve engine having a cylinder, sleeve valve means, a cylinder head structure depending within said cylinder and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, sealing rings carried by the depending portion of said cylinder head structure and adapted for engagement with said sleeve valve means, and an assembly ring, said cylinder having a counterbored portion for receiving said assembling ring, said assembling ring adapted to compress said sealing rings during assembly of said cylinder head structure with said cylinder.

3. In a sleeve valve engine, a cylinder structure provided with piloting means, sleeve valve means, a cylinder head structure depending within the cylinder bore and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, the depending portion of said cylinder head structure having a pilot portion engaging said piloting means and provided with sealing rings below said pilot portion, and means engaging said sealing rings to compress same during assembly of said cylinder head structure with said cylinder.

4. In a sleeve valve engine, a cylinder structure provided with piloting means, sleeve valve means, a cylinder head structure depending within the cylinder bore and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, the depending portion of said cylinder head structure having a pilot portion engaging said piloting means and provided with sealing rings below said pilot portion, and assembly ring means for engaging said sealing rings to compress same during assembly of said cylinder head structure with said cylinder.

5. In a sleeve valve engine, a cylinder structure provided with a piloting means, sleeve valve means, a cylinder head structure depending within the cylinder bore and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, the depending portion of said cylinder head structure having a pilot portion engaging said piloting means and provided with sealing rings below said pilot portion, and assembling ring means carried by said cylinder below said piloting means for compressing said sealing rings during assembly of said cylinder head structure with said cylinder.

6. In a sleeve valve engine, a cylinder structure provided with piloting means, sleeve valve means, a cylinder head structure depending within the cylinder bore and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, the depending portion of said cylinder head structure having a pilot portion engaging said piloting means and provided with sealing rings below said pilot portion, and a beveled assembly ring carried by said cylinder for compressing said sealing rings during assembly of said cylinder head structure with said cylinder.

7. In a sleeve valve engine, a cylinder structure provided with piloting means, sleeve valve means, a cylinder head structure depending within the cylinder bore and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, the depending portion of said cylinder head structure having a pilot portion engaging said piloting means and provided with sealing rings below said pilot portion, and a beveled assembly ring carried by said cylinder below said piloting means and adapted to engage said sealing rings to compress the same during assembly of said cylinder head structure with said cylinder.

8. In a sleeve valve engine, a cylinder having an enlarged top portion providing piloting means, sleeve valve means, a cylinder head structure having a pilot portion engaging said piloting means and a reentrant head portion depending within the cylinder bore and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, sealing rings carried by said reentrant head portion adapted for engagement with said sleeve valve means, and means for compressing said sealing rings during assembly of said cylinder head structure with said cylinder.

9. In a sleeve valve engine, a cylinder having an enlarged top portion providing piloting means, sleeve valve means, a cylinder head structure having a pilot portion engaging said piloting means and a reetrant head portion depending within the cylinder bore and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, sealing rings carried by said reentrant head portion adapted for engagement with said sleeve valve means, and sealing ring compressing means positioned in said enlarged cylinder portion and adapted for engagement with said sealing rings during assembly of said cylinder head structure with said cylinder.

10. In a sleeve valve engine, a cylinder having an enlarged top portion providing piloting means, sleeve valve means, a cylinder head structure having a pilot portion engaging said piloting means and a reentrant head portion engaging said piloting means and a reentrant head portion depending within the cylinder bore and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, sealing rings carried

by said reentrant head portion adapted for engagement with said sleeve valve means, and a beveled assembly ring carried within said enlarged cylinder portion for compressing said sealing rings during assembly of said cylinder head structure with said cylinder.

11. In a sleeve valve engine, a cylinder having an enlarged top portion providing piloting means, sleeve valve means, a cylinder head structure having a pilot portion engaging said piloting means and a reentrant head portion engaging said piloting means and a reentrant head portion depending within the cylinder bore and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, sealing rings carried by said reentrant head portion adapted for engagement with said sleeve valve means, and a beveled assembly ring carried within said enlarged cylinder portion closely adjacent to the upper end of said sleeve valve means when in the uppermost position, said assembly ring being adapted for compressing said sealing ring during assembly of said cylinder head structure with said cylinder.

12. In a sleeve valve engine having a cylinder, sleeve valve means, a cylinder head structure depending within said cylinder and spaced therefrom to provide a sleeve pocket for receiving said sleeve valve means, said cylinder head structure having sealing rings adapted for engagement with said sleeve valve means, and a cylinder head sealing ring compressing device carried by said cylinder for piloting said sealing rings into said sleeve valve means during assembly of the cylinder head structure with said cylinder.

13. In an engine of the type having a cylinder and associated cylinder head structure provided with a head portion depending within the cylinder, an expansible sealing ring carried by the depending cylinder head portion, and means associated with said cylinder for compressing said sealing ring during assembly of said cylinder head structure with said cylinder.

14. In a sleeve valve engine having a cylinder and associated cylinder head structure provided with a head portion depending within the cylinder and spaced therefrom to provide a sleeve pocket, sleeve valve means, sealing means carried by the depending portion of said cylinder head structure, and means carried by said cylinder for compressing said sealing means during assembly of said cylinder head structure with said cylinder.

15. In a sleeve valve engine having a cylinder and associated cylinder head structure provided with a head portion depending within the cylinder and spaced therefrom to provide a sleeve pocket, sleeve valve means, sealing means carried by the depending portion of said cylinder head structure, and an assembling ring associated therewith and cooperating with said sealing means to facilitate assembly of said cylinder head structure with said cylinder.

16. In a sleeve valve engine having a cylinder and associated cylinder head structure provided with a head portion depending within the cylinder and spaced therefrom to provide a sleeve pocket, sleeve valve means, sealing means carried by the depending portion of said cylinder head structure, and a beveled assembling ring carried interiorily of said cylinder and cooperating with said sealing means to compress same on assembly of said cylinder head structure with said cylinder.

17. In a sleeve valve engine having a cylinder and associated cylinder head structure provided with a head portion depending within the cylinder and spaced therefrom to provide a sleeve pocket, sleeve valve means, sealing means carried by the depending portion of said cylinder head structure, and an assembling ring overlying the end of said sleeve valve means and cooperating with said sealing means to facilitate assembly of said cylinder head structure with said cylinder.

18. In a sleeve valve engine having a cylinder and associated cylinder head structure provided with a head portion depending within the cylinder and spaced therefrom to provide a sleeve pocket, sleeve valve means, sealing means carried by the depending portion of said cylinder head structure, and an assembling ring overlying the end of said sleeve valve means for compressing said sealing means during assembly of said cylinder head structure with said cylinder.

19. In a sleeve valve engine having a cylinder and associated cylinder head structure provided with a head portion depending within the cylinder and spaced therefrom to provide a sleeve pocket, sleeve valve means, sealing means carried by the depending portion of said cylinder head structure, and an assembling ring closely overlying the outer edge of said sleeve valve means for compressing said sealing means during assembly of said cylinder head structure with said cylinder to facilitate the entrance of said sealing means within said sleeve valve means.

20. In a sleeve valve engine having a cylinder and associated cylinder head structure provided with a head portion depending within the cylinder and spaced therefrom to provide a sleeve pocket, sleeve valve means, sealing means carried by the depending portion of said cylinder head structure, and a beveled assembling ring closely overlying the outer edge of said sleeve valve means for compressing said sealing means during assembly of said cylinder head structure with said cylinder, said sealing means thereby arranged to be guided into said sleeve valve means while compressed.

21. In a sleeve valve engine having a cylinder, sleeve valve means, a cylinder head structure having a portion depending within said cylinder and spaced therefrom to provide a sleeve pocket for accommodating the outer portion of said sleeve valve means, a sealing ring carried by the depending portion of said cylinder head structure, and an internally beveled assembling ring carried by the cylinder and overlying the outer end of said sleeve valve means for compressing said sealing ring during assembly of said cylinder head structure with said cylinder.

JOHN R. McVEIGH.