Nov. 3, 1953 R. J. POWELL 2,657,679

PUSH ROD HOUSING STRUCTURE

Filed Sept. 8, 1951

FIG.1.

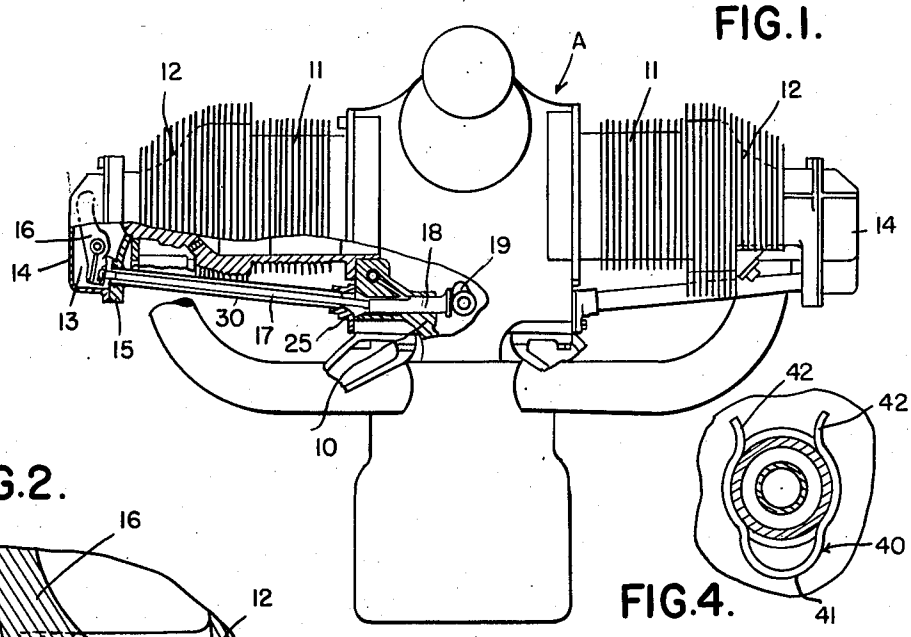


FIG.2.

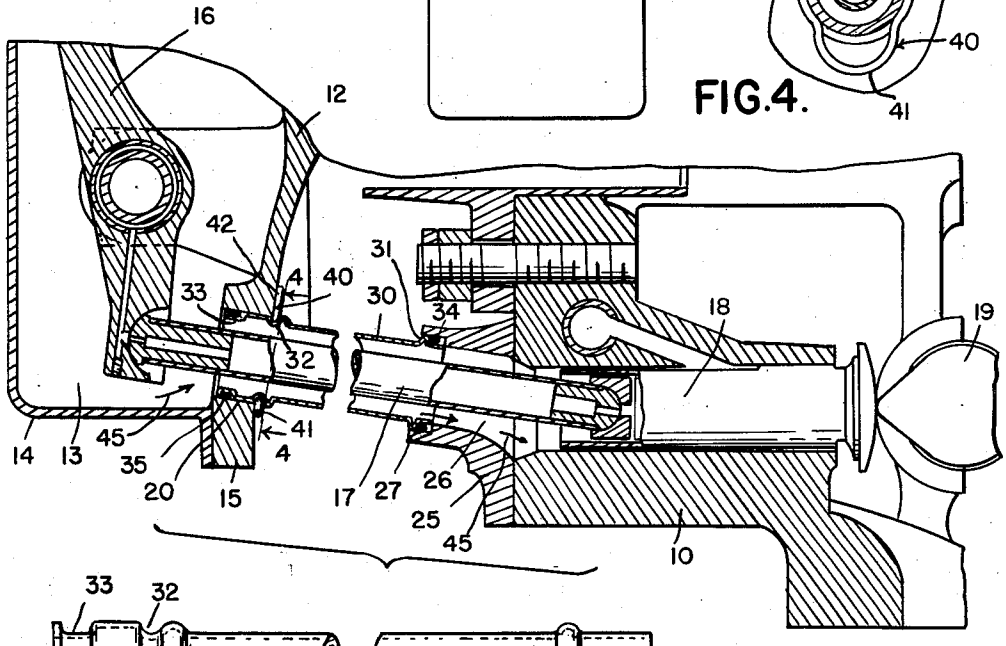
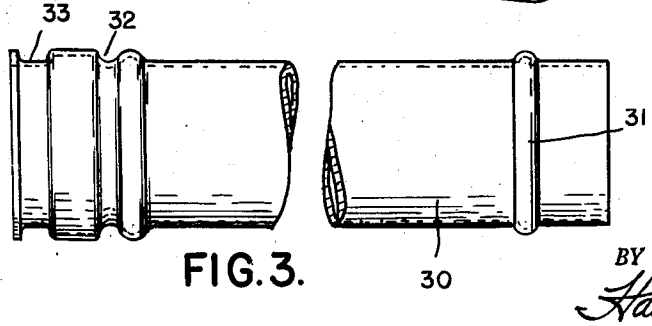


FIG.4.

FIG.3.



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PUSH ROD HOUSING STRUCTURE

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3 Claims. (Cl. 123—90)

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My invention relates to internal combustion engines, and more particularly to a push rod housing for engines of the overhead valve type employing a push rod for operating the valve actuating means.

In such constructions, the surplus lubricating oil collecting in the rocker box is drained back into the engine crankcase through the push rod housing, necessitating liquid tight seals between the push rod housing and the engine cylinder and crankcase assembly.

When utilizing the push rod housing for a return lubricant passage, the customary two-part push rod housings had to be abandoned because it was difficult to seal the slip joint between the housing parts. Likewise, the problems arising in sealing a single piece push rod housing were many, and various means have been tried, some of which have been quite satisfactory, but due to the fact that the engine crankcase and cylinder expand when heated, and because they are subjected to varying degrees of heat, it has been found difficult to secure a single piece push rod housing in place to maintain a tightly sealed connection between the housing and engine crankcase and cylinder assembly.

The many difficulties have been quite successfully overcome by applicant and the push rod housing assembly as described and claimed in the present application has for its object the provision of an improved and simplified construction which is readily assembled to the engine, and may be readily removed for servicing the engine.

For a more detailed understanding of my invention reference may be had to the accompanying drawing illustrating a preferred embodiment of my invention in which like parts are referred to by like characters throughout the several views, and in which

Fig. 1 is an end view of an internal combustion engine with parts broken away and shown in section, which engine is provided with my improved push rod housing assembly.

Fig. 2 is an enlarged sectional view of the push rod housing assembly.

Fig. 3 is an elevational view of the push rod housing, and

Fig. 4 is a detail sectional view taken substantially on the line 4—4 of Fig. 2.

While my invention has been illustrated in the present instance in connection with a horizontally opposed cylinder engine, it will be readily understood that this improved and novel push rod housing may be as readily adapted for other types of internal combustion engines as well, same being especially adaptable to such engines in which the push rod housing is utilized as an oil return duct.

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The present engine, as herein illustrated, is designated as a whole by the reference character A, and the engine is constructed with a crankcase structure 10, cylinders 11, cylinder heads 12 fastened to the cylinders and a rocker box 13, closed by a rocker box cover 14. For purposes of simplicity the cylinder head 12 may be considered to be a part of the cylinder structure, and the flange 15 carried by the cylinder head portion is hereinafter referred to as a cylinder flange, this flange being laterally extended and underlying the rocker box (see Figs. 1 and 2).

The engine intake and exhaust valves (not shown) are actuated by means of rocker arms 16 and a push rod 17, which in turn is operated by the standard tappet 18 by the cam 19. The cylinder flange 15 is provided with an opening 20 through which the push rod is extended to engage the rocker arm in the conventional manner. An abutment or fixture 25 is secured to the crankcase 10 and is provided with a bore 26 through which this push rod extends and an enlarged counterbored seat portion 27.

A push rod housing is provided for this push rod and comprises a tubular section 30, preferably a cylindrical tube and same is provided with an annular bead 31 adjacent its inner end and a pair of annular grooves 32 and 33 adjacent its outer end (see Figs. 2 and 3).

An annular ring 34 of compressible packing material is secured around the inner end of the push rod housing, to the inner end portion of the bead 31, and packing 35 is also carried by the outmost annular groove 33.

The housing is thus assembled to the engine by shoving the tubular housing member down through the opening 20 until same seats on the fixture 25, the packing ring 34 being compressed during this assembly until the groove 32 clears the inner surface of the flange 15, whereupon a spring clip 40 is snapped into the groove 32, said clip being constructed to provide a looped portion 41 and end portions 42 which overlie the surface of the flange 15 and thus serve to prevent the housing from moving outwardly or from unseating on the fixture 25. The packing 35 in groove 33 is disposed in sealing contact with the walls of the opening 20, as is also the packing 34 with walls of the counterbored seat portion 27 of fixture 25.

This push rod housing structure thus provides a liquid tight duct for conveying lubricating oil

from the rocker box 13 to the engine crankcase as indicated by arrows 45. The push rod housing may be readily displaced by releasing the clip 40 so as to permit the housing to be moved outwardly into the opening 20 until its inner end clears the fixture 25 and the seat 27 and entirely removed without disconnecting the push rod on removal of the rocker and rocker box cover.

It will be apparent to those familiar with the art to which my invention pertains that various changes and modifications may be made therein without departing from the spirit of my invention or from the scope of the appended claims.

I claim:

1. A push rod housing assembly for an internal combustion engine having a crankcase, a cylinder structure having a laterally extending flange underlying a rocker box, and provided with an opening, comprising a tubular section seated on the crankcase structure of said engine and telescopically extended into said opening in said cylinder flange, a push rod in said push rod housing projecting into the rocker box, said housing having a pair of annular grooves adjacent its outer end, packing in the outermost groove in sealing contact with the walls of said opening, and a spring clip assembled in said other of said annular grooves and locking the housing to the engine cylinder and crankcase assembly.

2. A push rod housing assembly for an internal combustion engine having a crankcase, a cylinder structure having a laterally extending flange underlying a rocker box, and provided with an opening, comprising a tubular section seated on the crankcase structure of said engine and telescopically extended into said opening in said cylinder flange, a push rod in said push rod housing projecting into the rocker box, said housing having a pair of spaced annular grooves adjacent the outer end thereof, packing in the outermost groove in sealing contact with the walls of said opening, said other groove disposed immediately adjacent the inner surface of said cylinder flange, and a spring clip anchored in said last mentioned groove and engaged with the inner surface of said cylinder flange to lock the push rod housing to the engine cylinder and crankcase assembly.

3. A push rod housing assembly for an internal combustion engine having a crankcase, a cylinder structure having a laterally extending flange underlying a rocker box, and provided with an opening, comprising a tubular section seated on the crankcase structure of said engine and telescopically extended into said opening in said cylinder flange, a push rod in said push rod housing projecting into the rocker box, said housing having a pair of spaced annular grooves adjacent the outer end thereof, packing in the outermost groove in sealing contact with the walls of said opening, said other groove disposed immediately adjacent the inner surface of said cylinder flange, and a spring clip anchored in said last mentioned groove and engaged with the inner surface of said cylinder flange to lock the push rod housing to the engine cylinder and crankcase assembly, said push rod housing initially assembled from the rocker box, a compressible packing adjacent the inner end of said housing, and a heading adjacent the inner end of said push rod housing engaging said last mentioned packing and compressed into sealing contact with the crankcase on assembly of the push rod housing to locate the last mentioned annular groove whereby to snap said spring clip in place as aforesaid.

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