

July 9, 1963

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3,096,851

ENGINE ATTACHMENT FOR VALVE GEAR LUBRICATION

Filed June 20, 1961

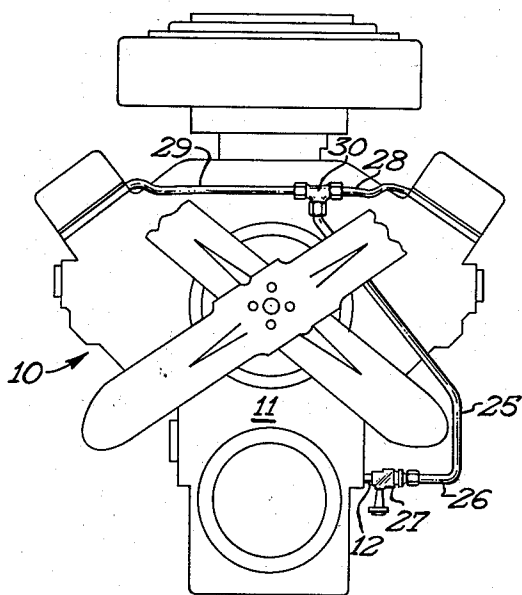


Fig 1

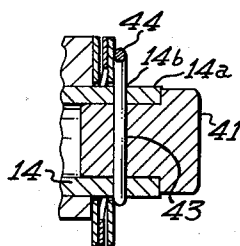


Fig 3

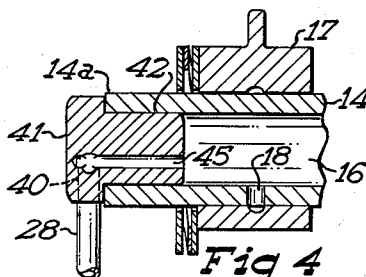


Fig 4

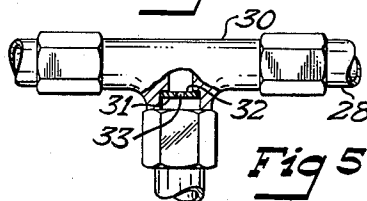


Fig 5

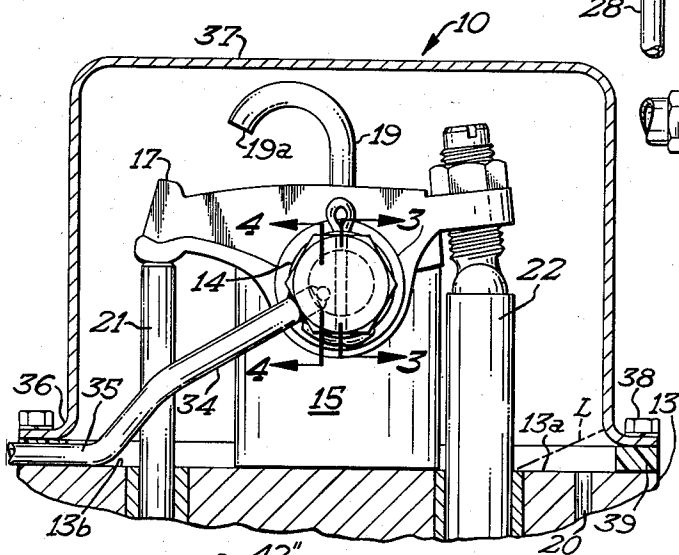


Fig 2

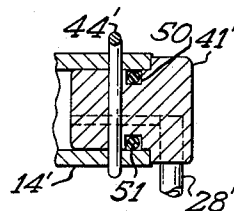


Fig 6

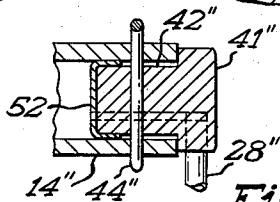


Fig 7

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ENGINE ATTACHMENT FOR VALVE GEAR LUBRICATION

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Filed June 20, 1961, Ser. No. 118,449

2 Claims. (Cl. 184-6)

This invention relates to an attachment for automotive vehicles and more particularly relates to an attachment for a V-8 engine of such a vehicle.

In most V-8 engines for automobiles, a problem exists in properly lubricating the rocker arms. The rocker arm mounting shaft of the engine is actually a tube with apertures at the several rocker arms to allow oil to flow from the interior of the shaft to the rocker arm bearings. Ordinarily oil is supplied through an internal passage in the engine block, but it frequently occurs that this oil passage will become clogged to the extent that insufficient oil is supplied for lubricating the rocker arms. To clean the clogged passages involves a major engine overhaul job and requires removal of the cylinder heads.

An object of my invention is to provide a new and improved apparatus of simple and inexpensive construction and operation for properly lubricating the rocker arms of an engine.

Another object of my invention is the provision of a novel apparatus for supplying oil into the rocker arm mounting shaft of an engine without materially modifying any of the existing components of the engine.

A further object of my invention is to provide an improved attachment for V-8 automobile engines which may be quickly and easily applied with conventional tools and with a minimum of effort to properly supply lubricating oil to the rocker arm mounting shaft and the rocker arm bearings without necessitating removal or modification of any of the major components of the engine.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is a somewhat diagrammatic elevation view of the front end of an automotive V-8 engine with the present invention applied;

FIG. 2 is a detail elevation view showing the present invention applied to the rocker arm shaft of the engine, with portions of the cylinder head and rocker arm cover shown in section;

FIG. 3 is a detail section taken at 33 in FIG. 2;

FIG. 4 is a detail section taken at 4-4 in FIG. 2;

FIG. 5 is an enlarged detail elevation view of a portion of the apparatus seen in FIG. 1;

FIG. 6 is similar to FIG. 3 and showing a modified form of the invention; and

FIG. 7 is a view similar to FIG. 3 and showing still another form of the invention.

The automotive V-8 engine is shown in FIG. 1 and indicated in general by numeral 10 and has an engine block 11 which is provided with a port at 12, at which oil under pressure is available. Actually, the port 12 is used in most instances for connecting the oil pressure gauge on the dashboard of the vehicle so that the operator of the engine will be apprised of the oil pressure. As seen in FIG. 2, the cylinder head 13 of the engine (which is normally disposed at an inclined angle as depicted in FIG. 1) has a stationary rocker arm mounting shaft 14 affixed thereto in spaced relation thereabove by a plurality of mounting blocks 15, and the rocker arm mounting shaft, as best seen in FIGS. 3 and 4 is actually

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of hollow and tubular construction defining an open interior chamber 16. The shaft 14 carries a plurality of rocker arms 17 operating in a conventional way to cause operation of the valves of the engine. The shaft 14 has a plurality of apertures 18 therein at each of the rocker arms 17 and permitting flow of lubrication oil from the hollow interior of the shaft 14 to the bearing surfaces between the rocker arms 17 and the shaft 14. When oil is under slight pressure on the hollow interior of the shaft 14, the rocker arms are well lubricated. The shaft 14 is also connected to an overflow pipe 19 which is mounted on one of the mounting blocks 15 and in communicating relation with the hollow interior of the shaft 14 so as to permit at least limited oil flow through the shaft 14, and the oil will spill downwardly from the end 19a of the overflow pipe 19 onto the inclined upper surface of the cylinder head, whereupon this oil which has overflowed will run downwardly to the lower transverse side 13a of the cylinder head to a return port 20 which carries the oil which overflows from pipe 19 back to the crank case of the engine. The dot-dash line L seen in FIG. 2 shows the possible surface level of a pool of oil collected on the cylinder head if the pool of oil were not allowed to return to the crank case. It will be understood that the upper surface of the cylinder head is inclined. Normally the oil will drain immediately through the return port 20 to the crank case.

The rocker arms are operated by a reciprocating rod 21 and cause reciprocation of the valve-operating rods 22.

All of the structure hereinbefore described is standard equipment on a typical V-8 automotive engine and in addition the rocker arm mounting shaft 14 normally has a "soft plug" at the end 14a of the shaft. This soft plug is actually no more than a piece of soft iron sheet metal driven into the end of the shaft 14 under pressure and fitting the shaft in a frictional oil sealing relation. The soft plug is normally held in the end of the shaft by a cotter key behind and through the aligned apertures 14b in the end of the shaft.

The present attachment to the V-8 engine comprises an elongate rigid tube 25 which has a supply end portion 26 connected with a suitable fitting 27 and attached thereby to the port 12 at which the supply of oil under pressure from the engine is available. Tube 25 is divided into a pair of branches 28 and 29 adjacent the upper portion of the engine by means of a T fitting 30. The T fitting 30 is of substantially conventional design, but also includes a disc 31 seated in a press fit against shoulder 32 in the T connector 30 and the disc 31 also has a flow-restricting orifice 33 therein for reducing the pressure between the supply end of the tube and the discharge ends 34 of the branches 28 and 29. It will be noted that the branches 28 and 29 of the tube are similar in nature to each other and each of the tubes has a linear, and slightly flattened cylinder head-engaging portion 35 adjacent the discharge end 34 and lying flush against the upper surface of the cylinder head 13 at the upper transverse side 13b thereof beneath the downwardly facing rim portion 36 of the cover 37 which confronts the cylinder head 13. The gasket 39 is deformed around the linear portion 35 of the tubing.

It is to be particularly noted that the linear portion 35 of the tubing passes beneath the rim 36 of the cover adjacent the upper transverse side 13b of the cylinder head so as to be in widely spaced relation and above the oil return port 20 which is disposed at the lower transverse side of the cylinder head. Although the gasket 39 can be deformed around the portion 35 of the tubing to a reasonable degree, there is no particular need for an extremely tight sealing fit at the tube portion 35 because the oil which is spilled out of the tube 19 will flow downwardly

toward the lower transverse side 13a of the cylinder head and to the return port 20. It is to be particularly noted that the tubing is readily and easily applied to the engine and laid in the proper position with respect to the cylinder head and with respect to the shaft 14 without necessitating any modification of any of the major components of the engine.

The discharge end 34 of each branch of the tubing is soldered or brazed into an opening 40 in a plug 41, the peripheral portion 42 of which is smooth and very slightly tapered so that the plug 41 fits tightly in oil-sealing and frictional relation within the open end 14a of the rocker arm mounting shaft 14. The plug 41 has an aperture 43 therein which will align with the apertures 14b in the shaft 14 so that a cotter pin 44 may be inserted through the aligned apertures of the shaft and plug to hold the plug in the proper position so that it will not vibrate out of place.

The plug 41 has an internal oil passage 45, the inner end of which communicates with the hollow interior 16 of the shaft 14 and the outer end of which communicates with the opening 40 in the plug and with the interior of the tubing. The branches 28 and 29 of the tubing are preshaped to the proper angular relationship so that the linear portion 35 will lie flush against the cylinder head when the plug 41 is placed in the end of the shaft 14. It should be recognized, as compared to removing of the cylinder heads from the block of the engine and cleaning out the ports which normally supply oil to the interior of the mounting shaft 14, the application of the present attachment to the engine 10 is an extremely simple operation. The fitting 27 is applied to the port 12 and the tubing 25 is attached thereto. The branches 28 and 29 of the tubing are laid on their respective cylinder heads and the plugs 41 are merely tapped into the smooth surfaced hollow interior of the rocker arm mounting shafts 14. The T-connection 30 is then connected in and the cover 37 and gasket 39 will be replaced after the tubing is properly positioned. The gasket 39 may be easily deformed to the necessary degree and no modifications need be made to any of the major components of the engine 10. When the engine is started, oil is supplied upwardly through the tubing 25 at approximately 40 p.s.i., which is typical of oil pressures in a V-8 engine. At the orifice 33, the flow of the oil is restricted and the pressure is thereby reduced so that the oil pressure actually applied at the hollow interior 16 of the mounting shaft 14 is similar to that for which the engine is designed. A limited amount of oil is spilled through the pipe 19 and returns through the port 20. Oil is supplied through the apertures 18 and the shaft 14 for the rocker arm bearing surfaces.

In the form of the invention shown in FIG. 6, the construction is substantially identical to that shown in FIGS. 1-5 with the exception that the plug 41' to which is connected one of the branches, such as 28', has an annular groove 50 around the shank portion thereof and a resilient O-ring gasket 51 is placed in the groove 50 to seal against the interior of the shaft 14'. The cotter key 44' again holds the plug 41' in the shaft 14'. The external periphery 42' of the plug 41' is cylindrical and without a taper in this form of the invention.

In the form of the invention shown in FIG. 7, the plug 41'' is similar in construction to the plug 41 with the exception that the external periphery 42'' thereof is slightly smaller than the internal periphery of the shaft 14''. In this form of the invention, a cup-like sealing element 52 which may be constructed of soft iron (and is similar in construction to the "soft plug" previously mentioned as original equipment to plug the end of the shaft 14) is applied over the inner end of the plug 41''

so as to seal against the internal periphery of the shaft 14''. Again, in this form of the invention, a cotter pin 44'' is employed to hold the plug 41'' in proper position. The sealing element 52 engages the inner periphery of the shaft in oil-sealing and frictional relation. In installation and operation, the forms of the invention shown in FIGS. 6 and 7 are substantially identical to the form of the invention shown in FIGS. 1-5.

It will, of course, be understood that various changes may be made in the form, detail, arrangement and proportion of the parts without departing from the scope of my invention which consists of the matter described herein and set forth in the appended claims.

What I claim is:

1. In combination with an automotive V-8 engine having an engine block with a pair of transversely inclined cylinder heads thereon, each of the heads including a flat sloping upper surface having a lower transverse portion with an oil return port therein, and also having an upper transverse portion, a stationary hollow rocker arm mounting shaft affixed to the flat sloping surface of each head, a plurality of rocker arms on the shaft, the shaft having means for applying oil from the interior thereof to the exterior thereof for lubricating said rocker arms, said shaft also having an oil overflow discharge means connected thereto so as to spill oil from the interior of the shaft onto the sloping surface from which the oil flows into said return port, and a cover secured to each head so as to enclose the sloping surface thereof, the rocker arms and mounting shaft, a gasket between each of said covers and its respective flat sloping surface, said block also having an oil supply port therein for supplying oil under pressure, an attachment connected to said engine comprising an elongated tube means disposed at the exterior of said block and head and having a supply end, said tube means being branched to provide a pair of discharge ends, means connecting said supply end of said tube means with said oil supply port in the engine block, a pair of fluid connectors each applied onto the end of the hollow interior of a respective shaft, and in tight fitting frictional relation with said shaft, each of said connectors having an oil passage therein, each passage having an inner end communicating with the hollow interior of the shaft and also having an outer end, each of the discharge ends of the tube means being affixed in the outer end of the passage in a respective connector, each of said discharge ends of each tube means passing over the upper transverse portion of one of the respective flat sloping surfaces of one of said cylinder heads and extending under said gasket and an edge portion of said cover whereby to supply oil to the interior of said shaft for lubricating the rocker arms, each of said discharge ends being flattened whereby it extends under said cover so as not to separate the edge of said cover from said flat sloping surface more than the thickness of said gasket.

2. The combination of claim 1, including a T-fitting having an inlet end connected to said supply end of said tube means and a pair of outlet ends each connected to one of said discharge ends of said tube means, and said inlet end having a disc with a restricted orifice pressed therein.

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