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ENGINE ROCKER ARM

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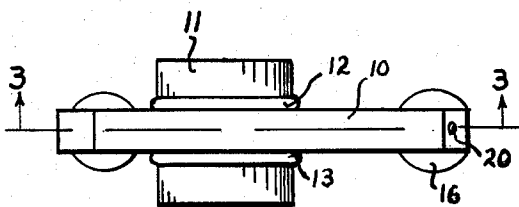


FIG. 1

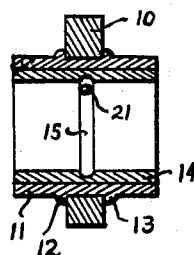


FIG. 4

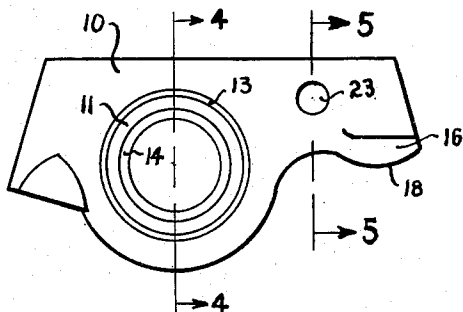


FIG. 2

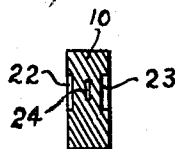


FIG. 5

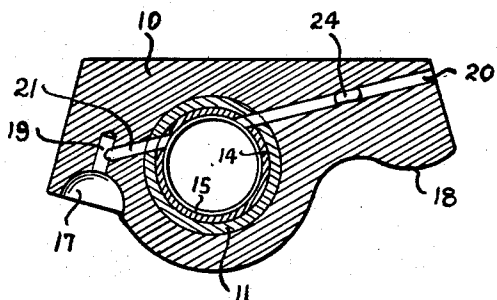


FIG. 3

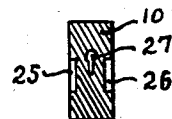


FIG. 6

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ENGINE ROCKER ARM

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This invention relates to engine rocker arms and more particularly to the type used in the valve mechanism of overhead valve internal combustion engines.

The primary object of this invention is to provide an engine rocker arm with an improved means for controlling the feeding of lubricating oil to the ends of the engine rocker arm and particularly to provide proper and adequate lubrication to the valve actuating end of the rocker arm without permitting an excess of lubricant reaching the valve stem. The delivery of excess lubricating oil to the valve stem causes excess oil consumption due to the tendency of the vacuum in the intake system to draw oil into the cylinders along the valve stem during the intake stroke.

A more specific object of the invention is to provide an engine rocker arm which limits the flow of lubricating oil to the valve stem contacting end of the engine rocker arm.

Another object of this invention is to provide an engine rocker arm constructed of single layer metal provided with drilled oil passageways deformed at a predetermined point to limit the flow of oil therethrough.

Another object of this invention is to provide an engine rocker arm that provides restrictions in certain oil passageways without the use of bushings.

Another object of this invention is to provide an engine rocker arm having oil feeding means so arranged that oil can not be discharged in a spray or jet, either due to the pump pressure or due to the centrifugal action of the engine rocker arm.

Another object of this invention is to provide an engine rocker arm provided with a lubricating system that provides adequate lubrication to both ends of the arm member without wasting oil.

Another object of this invention is to provide an engine rocker arm that eliminates oil grooves or passageways on the top edge of the arm where sludge and dirt collect and destroy the effectiveness of oil flow control arrangements.

Another object of this invention is to provide an engine rocker arm provided with a lubrication control means that is strong, durable, dependable and inexpensive.

With these and other objects in view, my invention consists in the construction, combination and the arrangement of the various parts of my improved device as described in the specification, claimed in the claims and illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a top plan view of an engine rocker arm embodying one form of my invention.

FIGURE 2 is a front elevation thereof.

FIGURE 3 is a sectional view taken along line 3-3 of FIGURE 1, showing the restriction in the oil passageway.

FIGURE 4 is a sectional view taken along line 4-4 of FIGURE 2.

FIGURE 5 is a sectional view taken along line 5-5 of FIGURE 2, showing a restricted portion in the oil passageway.

FIGURE 6 is a sectional view showing a modified form of the restriction in the oil passageway.

Referring to the drawings in more detail, I have shown in FIGURES 1 and 2 an assembled engine rocker arm

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provided with a plate metal or single layer metal arm member 10. A hub member 11 is secured in an opening in the arm member by means of the annular upset portions 12 and 13 transverse to the arm member 10. A tubular bearing member 14 is secured in the hub member 11. An annular oil groove 15 is located in the inner surface of the bearing member 14, intermediate its ends.

One end of the engine rocker arm is provided with an upset portion adapted to provide a contact bearing 16. The other end of the arm member 10 is provided with a socket contacting bearing 17. When the engine rocker arm is in operation on an engine, the upper end of the push rod engages the socket contacting bearing while the lower surface 18 of the contacting bearing 16 engages the valve stem.

A hole is drilled from the socket portion 17 upwardly to provide an oil passageway 19 extending upwardly from the socket contacting bearing 17. A second hole is drilled from the end of the arm member 10 through the hub member 11 and bearing member 14 terminating in the oil passageway 19, forming an oil passageway 20 extending from the end of the arm member 10 to the oil groove 15 and a second oil passageway 21 extending from the oil groove 15 to the oil passageway 19 which in turn extends to the socket contacting bearing 17.

Indentations 22 and 23 are coined or pressed in the arm member 10. A portion of the oil passageway 20 is thereby partially closed to provide the restricted portion 24. The size of the restriction 24 is controlled by coining the indentations 22 and 23 to different depths. It will be noted that the greater the depths of the indentations 22 and 23 the smaller the opening or restriction 24. The restriction 24 may be located at any point intermediate the ends of or at the outer end of the oil passageway 20.

FIGURE 6 shows a variation in the position of the coined portions 25 and 26 with respect to the oil passageway, thereby, providing a differently shaped restriction 27.

In operation oil under pressure is fed from an oil passageway in the rocker shaft (not shown) to the annular oil groove 15. Oil then flows through the unrestricted oil passageways 21 and 19 to the socket contacting bearing 17. At the same time oil flows from the oil groove 15, through the oil passageway 20 and over the end of the arm member 10 onto the contacting bearing surface 18. The restricted portion 24 of the oil passageway 20 limits the flow of oil in the oil passageway 20, thereby limiting the amount of oil that reaches the contacting bearing 18. The size of the restriction 24, for a particular type of engine, can be determined experimentally by varying the depths of the indentations 22 and 23 in the coining process until the proper oil flow is obtained. When the desired restriction is determined it can readily be reproduced in quantity production by coining the indentations 22 and 23 to the depth determined by experiment. Since the oil pressure in different types and makes of engines varies, the oil restriction in engine rocker arm must be determined for every type and make of engine.

It will be noted that my novel oil control permits the use of a single layer metal arm member, thereby, eliminating expensive brazing or welding processes used in the manufacture of many present types of engine rocker arms. It also eliminates the need of bushings in oil passageways to provide proper oil control.

It will be apparent that many modifications in my novel engine rocker arm, as shown and described, can be made without departing from the scope of the invention. For example, the hub member may extend at an oblique angle to the arm member instead of at a right angle as shown in the drawings. The socket contacting bearing 17 may be replaced by an adjustable contacting bearing

that threads into the arm member 10. Furthermore, in some installations the unrestricted oil passageway is eliminated while in others the inner surface of the hub member is used to provide a bearing surface to engage the rocker shaft thereby eliminating the tubular bearing member 14.

While I have described the details of one form of my invention, I do not wish to be limited to the particular form shown and described as it will be apparent to those skilled in the art that many modifications therein can be made without departing from the proper scope and fair meaning of the subjoined claims.

I claim:

1. An engine rocker arm comprising, a single layer arm member protruding from said arm member, a hub member intermediate the ends of said arm member, an internal oil passageway in said arm member extending from said hub member to the proximity of one of said ends of said arm member, a second internal oil passageway in said arm member extending from said hub member to the proximity of the other of said ends of said arm member and an oil metering means in said second internal oil passageway comprising a deformed portion therein.

2. An engine rocker arm comprising an arm member, a hub member protruding on either side of said arm member intermediate the ends of said arm member, a socket contacting bearing near one of said ends of said arm member, an internal oil passageway in said arm member extending from said hub member to said socket contacting bearing, a convex contacting bearing near the other of said ends of said arm member, a second internal oil passageway extending from said hub member to said other end of said arm member and a deformed portion of said second internal oil passageway providing an oil flow metering means.

3. An engine rocker arm comprising, a single layer arm member, a hub member rigidly secured in said arm member intermediate the ends of said arm member, said hub member extending substantially transverse to said arm member, a push rod contacting bearing near one of said ends of said arm member, an internal oil passageway located in said arm member, said internal oil passageway extending from said hub to the proximity of said push

rod contacting bearing, a valve stem contacting bearing near the other end of said arm member, a second internal oil passageway located in said arm member, said second internal oil passageway extending from said hub member to said other end of said arm member, said second internal oil passageway adapted to provide lubrication for said valve stem contacting bearing and a partially collapsed portion of said second internal oil passageway adapted to limit the flow of oil to said valve stem contacting bearing.

4. An engine rocker arm comprising an arm member having a transverse opening intermediate the ends of said arm member, a tubular hub member extending through said opening and rigidly secured in said arm member, an internal oil passageway in said arm member, said internal oil passageway extending from said tubular hub member to the proximity of one of said ends of said arm member and an oil flow control means comprising a partially collapsed portion of said internal oil passageway.

5. An engine rocker arm comprising an arm member having a transverse opening, a tubular hub element extending through said opening and rigidly secured therein, a means for conducting lubricant to one end of said arm member including an annular passageway within said arm member and an oil flow control means comprising a restriction in said annular passageway.

6. An engine rocker arm comprising a single layer metal arm member having a transverse opening intermediate the ends thereof, a hub member rigidly secured in said opening, an oil passageway located within said arm member, said oil passageway extending substantially radially from said hub member and an oil metering means comprising a deformed portion of said oil passageway.

References Cited in the file of this patent

UNITED STATES PATENTS

2,288,831	Harrow	July 7, 1942
2,490,262	Gable	Dec. 6, 1949
2,509,661	Winter	May 30, 1950
2,521,621	Winter	Sept. 5, 1950
2,523,489	Winter	Sept. 26, 1950
2,563,699	Winter	Aug. 7, 1951