

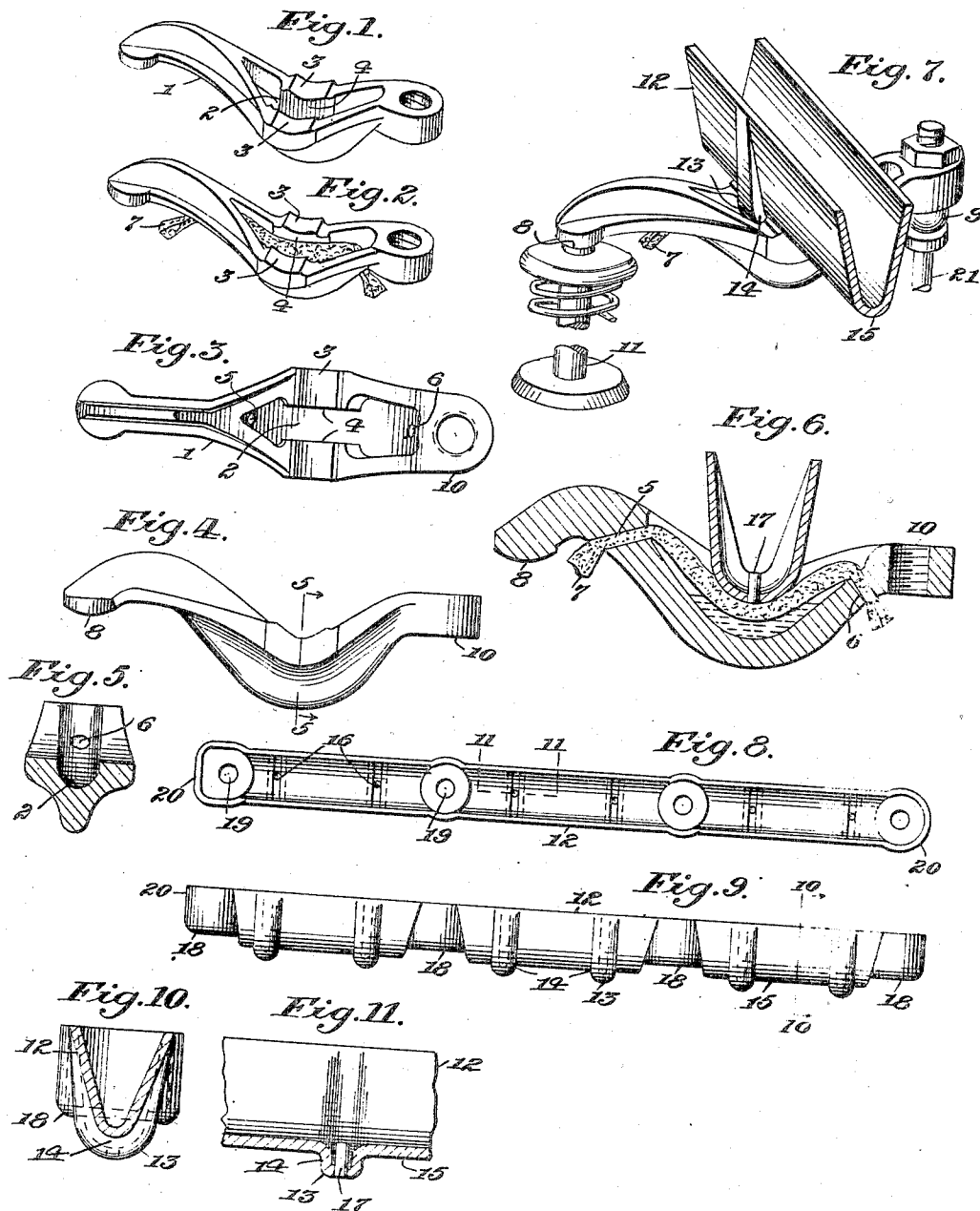
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ROCKER ARM AND ROCKER ARM SHAFT

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ROCKER ARM AND ROCKER-ARM SHAFT.

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This invention relates to rocker arms of the underslung type and rocker arm assemblies, including their shafts, and means to lubricate the bearing surfaces thereon, for use with internal combustion engines, such as are used in automobiles, motor boats, etc. An object of the invention is to provide a rocker arm assembly that will be practically free from noise in operation, and also be practically frictionless.

A further object is to provide a rocker arm assembly that is cheap, may be quickly installed on existing automobiles, and that is very durable in use.

A further object is to provide a rocker arm assembly that serves as an oil reservoir, and that maintains all bearing surfaces thoroughly oiled.

A further object is to provide a trough-like shaft that will hold a supply of oil, and that will slowly feed the same to the bearing surfaces, and to the rocker arms.

A further object is to provide a balanced rocker arm that has a very minute movement and that has a rolling action upon its bearing, as distinguished from a simple oscillation on a knife edge.

A further object is to provide a rocker arm that has an oil well, and a wick to supply oil to the outer bearing surfaces.

Other objects will appear on reading the specification.

In the accompanying drawings:

Fig. 1 is a view in perspective of the improved rocker arm.

Fig. 2 is a similar view, but also showing an oil wick threaded through ducts which conduct films of oil to the outer bearings.

Fig. 3 is a plan view of the rocker arm.

Fig. 4 is a side elevation of the rocker arm.

Fig. 5 is a transverse sectional view of the rocker arm, on the line 5—5 of Fig. 4, looking toward the push-rod end.

Fig. 6 is a longitudinal sectional view of the rocker arm, showing a section of the shaft, and also showing the oil in the oil well and the wick partly immersed therein.

Fig. 7 is a view in perspective showing the rocker arm mounted on a section of the shaft, and showing the valve stem and the push rod.

Figs. 8 and 9 are plan and side elevation views of one type of shaft, which serves as a trunk feed for oil for the rocker arms.

Fig. 10 is a transverse sectional view on the line 10—10 of Fig. 9, looking to the right; and

Fig. 11 is an enlarged view of a longitudinal section on the line 11—11 of Fig. 8, showing the oil hole and fibrous oil feed plug therein.

In Figure 1, the rocker arm 1, which is of the underslung type, is shown as a suitable metal forging, or it may be a suitable casting, and is provided with a recess in the center, 2, which constitutes an oil well, and arc-shaped bearing surfaces, 3, 3, on the upper surface on each side. The inner walls 4, 4, of the oil well 2, are preferably milled smooth and parallel to form bearing surfaces, and co-operate with surfaces 14 on the shaft to maintain the rocker arm in alinement as hereafter described. At the outer ends of the oil well 2 are holes or ducts 5, 6, at each end, through which a suitable wick, 7, Fig. 2, is threaded, the central part of the wick dipping into the oil well and the ends serving to continuously supply oil to the outer surfaces of the rocker arm, and especially to the end bearing surfaces 8 and 9, which contact with the valve stem 11 and push rod 21 of the engine. The rocker arm may be hardened by any of the commonly known processes of carbonizing, or may be chrome plated. The end 10 of the rocker arm is provided with a threaded opening through which a hardened bearing surface 9 is secured, and which receives the impacts from the push rod 21.

The shaft 12, Figures 7, 8, 9, 10, and 11, represents a simple structure, preferably made of sheet steel, stamped, or it may be forged, and with pressed-out lobes 13, having smooth parallel sides 14, which co-operate with the inner walls 4, 4, of the rocker arms to maintain the rocker arm in alinement as noted above. The shaft is also provided with ends 20, 20, to provide an oil holding well. The underrounded edge 15 of the shaft 12 is smoothed and polished, and serves as the bearing surface against which the bearing surfaces 3 of the underslung rocker arm 1 rests. The radius of curvature of the rounded edge 15 of the shaft is less than the radius of curvature of the cooperating bearing surfaces 3, the rocker arm thereby receives a rolling action over the edge 15 during its movement, as distinguished from an oscillating one such as

is present in the ordinary V-shaped knife-edge bearings, or the tubular bearing and rod-shaft type.

The lob 13 depends into the oil well 2, and in the bottom of the lob is a duct or perforation 16 in which is a fibrous plug 17, Figs. 6 and 11, for example of soft wood, serving as a wick to feed the oil slowly from the supply in the shaft to the rocker arm. The shaft 12 is also provided with flattened bottom surfaces 18, 18, provided with openings 19, through which the shaft is secured by means of bolts or the like to supports on the engine body. The central, vertical plane of the surfaces 18, 18, passes through the central vertical plane of the rounded bearing surface 15. Owing to the well balanced construction and support, and its slight resulting movement, which is a rolling movement, the operation of the rocker arm is as near silent as it is possible for a device of this kind to be, and the wear after a long test is negligible.

I claim—

25 1. A rocker arm assembly comprising a rocker arm and shaft, said rocker arm provided with a recess, bearing walls on the sides of said recess, and a depending lob of said shaft projecting into said recess, the sides of said lob co-operating with the sides of said recess to maintain said rocker arm in alinement.

2. A rocker arm assembly comprising a rocker arm and shaft, said rocker arm provided with a recess adapted to hold oil, oil feeding ducts from said recess, bearing wall surfaces on the sides of said recess, said shaft constructed to conduct oil, a depending lob from the shaft extending into said recess, said lob provided with bearing surfaces and adapted to co-operate with the side walls of the recess to maintain the rocker arm in alinement, and oil ducts from said shaft to feed oil to said recess.

3. An underslung rocker arm comprising a structure having a recess, curved bearing surfaces on the upper part of said structure, side bearing walls in said recess, and oil feeding means leading from said recess to the outer bearing surfaces at the ends of said rocker arm.

4. An underslung rocker arm comprising a structure having a recess, bearing surfaces on the upper part of said rocker arm, and side bearing surfaces within said recess.

5. A shaft provided with a lower curved bearing edge, a projection extending below said bearing edge, said projection provided with bearing surface sides, said bearing sur-

face sides in a plane at right angles with the longitudinal axis of the shaft.

6. A shaft comprising an oil feeding body, a lower curved edge comprising a bearing edge surface, a depending lob extending below the bearing edge, the sides of said lob constituting bearing surfaces, and an oil duct from said shaft.

7. A shaft comprising an oil feeding body, a lower curved bearing surface thereon, a depending lob extending below the shaft bearing surface, the sides of said lob constituting bearing surfaces, an oil duct, and a wick-like body in said duct.

8. A shaft comprising an oil feeding body, a lower curved bearing surface thereon, a depending lob extending below the curved bearing surface, the sides of said lob constituting bearing surfaces, an oil duct, a wick-like body in said duct, and means by which the shaft is secured to a support.

9. A rocker arm assembly comprising a rocker arm and shaft, said rocker arm having a longitudinal opening therein, side bearing walls on said opening, said shaft having a transverse enlargement with side bearing surfaces said transverse enlargement registering and co-operating with the longitudinal opening of the rocker arm to maintain the rocker arm in alinement.

10. A shaft comprising an oil feeding body, a lower curved bearing surface thereon, a depending lob extending below the curved bearing surface, the sides of said lob constituting bearing surfaces, an oil duct to discharge oil from the shaft, and means comprising areas above the bearing surface by which the shaft is secured to a support.

11. A rocker arm assembly comprising an underslung rocker arm and shaft, co-operating bearing surfaces, and co-operating inter-engaging elements independent of the bearing surfaces on said rocker arm and shaft adapted to maintain said rocker arm in alinement.

12. An underslung rocker arm provided with longitudinal and transverse linear bearing surfaces, both sets of bearing surfaces arranged to co-operate with a shaft to maintain said rocker arm in alinement.

13. A shaft provided with longitudinal and transverse bearing surfaces, a rocker arm, said rocker arm constructed to simultaneously engage said longitudinal and transverse bearing surfaces.

In testimony whereof I hereby affix my signature.

JOHN T. FAGAN.