Oct. 30, 1951 C. F. BACHLE 2,572,968

ROCKER ARM CONSTRUCTION

Filed March 11, 1947

FIG. 2.

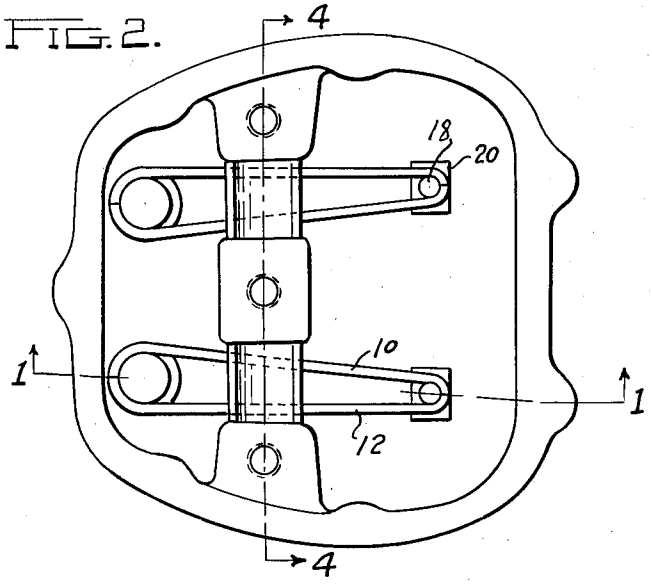
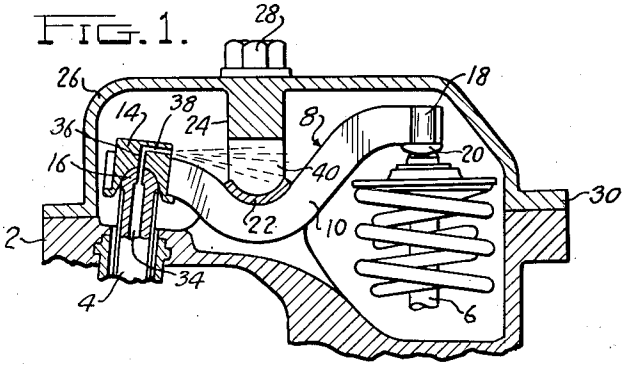


FIG. 1.



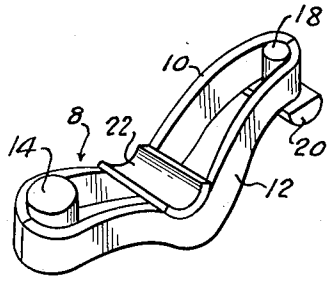
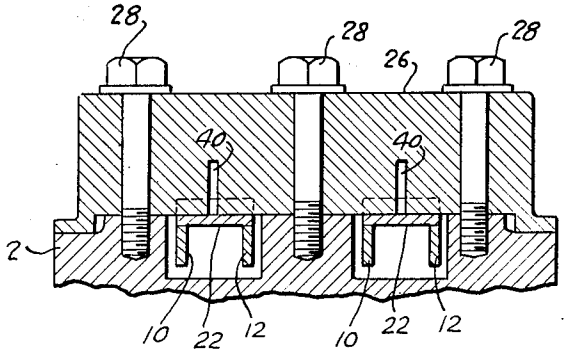


FIG. 3.

FIG. 4.



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Patented Oct. 30, 1951 2,572,968

UNITED STATES PATENT OFFICE

2,572,968

ROCKER ARM CONSTRUCTION

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Application March 11, 1947, Serial No. 733,900

3 Claims. (Cl. 123—90)

1

This invention relates to a rocker arm and its associated mechanism, particularly to a rocker arm such as is used with the overhead valves of an internal combustion engine.

In conventional rocker arm and valve mechanisms, the rocker arm operates on a fulcrum which comprises a pin suitably located in relation to the other mechanism. The pin has to be secured in place, and the entire mechanism is one which consists of a large number of individual parts which must be carefully assembled. Such mechanism necessarily involves a considerable expense, both in the manufacture of the component parts and in the assembly thereof.

It is an object of this invention to provide a rocker arm which is itself a simple combination of a few elementary parts and which operates on a fulcrum which is integral with a cover plate, the cover plate providing access to the rocker arm and valve mechanism.

In the drawings:

Fig. 1 is a view in section substantially on line 1—1 of Fig. 2.

Fig. 2 is a view of a portion of an internal combustion engine with the cover plate removed to show two rocker arms in position.

Fig. 3 is a perspective view of a rocker arm made according to the invention, and

Fig. 4 is a view in section on line 4—4 of Fig. 2.

A cylinder head 2 of an internal combustion engine is shown as being provided with a valve push rod 4 which actuates valve stem 6 through a rocker arm indicated generally at 8.

Rocker arm 8 comprises a pair of metallic strips 10 and 12 which are joined at their ends, as by brazing or welding, to form an elongated closed loop. In one end of the loop there is secured, as by brazing, a concave bearing 14 which cooperates with the rounded end 16 of push rod 4. In the other end of the loop there is provided a pin 18 which is integral with a convex bearing 20. Bearing 20 is in contact with the end of valve stem 6. Between the two ends of the closed loop, an arcuately shaped bearing 22 bridges the members 10 and 12 and is secured to them by any suitable means, such as brazing or the like.

Bearing 22 cooperates with a bearing surface on a downwardly extending projection 24 which is integral with a cover plate 26. Cover plate 26 is held in place on cylinder head 2 by means of cap screws 28 extending through the projection 24. It may be pointed out here that cap screws 28 serve also to strengthen and stiffen the projection 24.

Push rod 4 is made hollow by means of a drilled

2

hole 34 to provide a passage for oil. The oil flowing under pressure through the passage 34 flows to the bearing 14 and serves to lubricate the common surface of bearing 14 and rounded end 16. Bearing 14 is provided with two intersecting passages 36 and 38. Passage 36 opens onto the bearing surface of bearing 14 and for most of the operating time of the engine, substantially registers with the end of oil passage 34. Passage 38 opens onto that side of bearing 14 which faces the opposite end of the rocker arm. Oil which squirts out of the passage 38 carries across to the other end of the rocker arm and serves to lubricate the upper end of the valve stem which is in contact with convex bearing 20. To permit this oil flow from the push rod end of the rocker arm to the valve stem end, the projection 24 is recessed as shown at 40. This recess may be provided simply by making a saw cut across the projection 24.

In assembling the valve and rocker arm assembly made according to this invention, the rocker arm 8 is simply laid in position on the push rod 4 and valve stem 6. Cover plate 26 is then put in place so that the bearing surface of projection 24 engages the arcuate bearing 22 on the rocker arm. The cover plate is then secured in place by means of the cap screws.

As oil is fed under pressure into the passage 34 in push rod 4, some of the oil serves to lubricate the bearing surface in bearing 14, and some of the oil squirts out from passage 38 and is projected through the recess 40 across to the top of valve stem 6.

I claim:

1. In an internal combustion engine, a hollow valve push rod having a rounded end, a valve, a valve assembly cover plate, a projection on the cover plate, the projection having a bearing surface, a rocker arm having its fulcrum on the bearing surface and one end in position to actuate the valve, and a concave bearing in the other end of the rocker arm positioned to cooperate with the rounded end of the push rod and being provided with an oil passage which communicates with the hollow of the push rod and which is open in the direction of the other rocker arm, the projection on the cover plate being recessed to permit oil to be projected from the concave bearing across to the other end of the rocker arm.

2. A rocker arm for an internal combustion engine, comprising a pair of spaced metallic strips disposed on edge and having their ends curved towards each other and joined together to form an elongated closed loop, a bearing at each end of the loop, and a separate arcuately shaped bearing

member bridging said spaced strips and secured to the sides of the loop between the ends, said sides of the loop formed with an arcuate recessed upper edge receiving said arcuately shaped bearing member, one of said end bearings having an oil passage opening onto the bearing surface, the other end of the oil passage opening in the side of the bearing which faces the other end of the rocker arm and disposed to project lubricating oil through the space between the said strips towards the other end of said rocker arm.

3. A rocker arm for an internal combustion engine, comprising a pair of spaced metallic strips disposed on edge and having their ends curved towards each other and joined together to form an elongated closed loop, a bearing at each end of the loop, and a separate arcuately shaped bearing member bridging said spaced strips and secured to the sides of the loop between the ends, said sides of the loop formed with an arcuate recessed upper edge receiving said arcuately shaped bearing member, one of said end bearings having an oil passage opening onto the bearing surface, the other end of the oil passage opening in the side of the bearing which faces the other end of the rocker arm and disposed to project lubricating oil through the space between the said strips towards the other end of said rocker arm, said looped rocker arm structure having an open space between said strips on both

sides of said bearing member through which said sprayed lubricating oil may pass, said engine having a rocker box in which said rocker arm is operated and a cover plate closing said rocker box, a projection depending from said cover plate and having a bearing surface on which said rocker arm bearing member is fulcrumed, said projection being recessed to provide another oil passage disposed above said bearing plate to permit passage of oil projected from one end of the rocker arm to the other end of said rocker arm.

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