

March 26, 1963

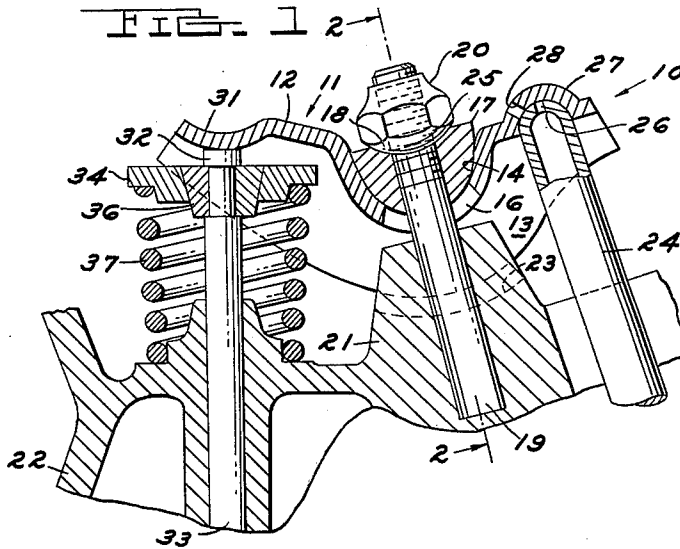
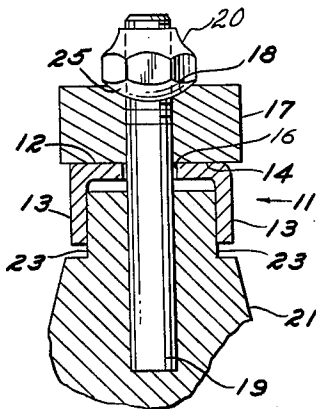
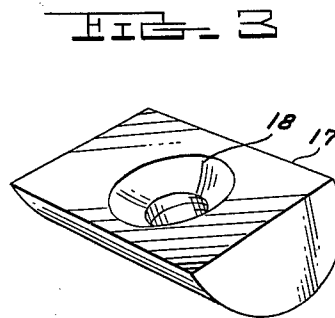
K. H. GROPP

3,082,755

VALVE GEAR

Filed Dec. 7, 1960

2 Sheets-Sheet 1



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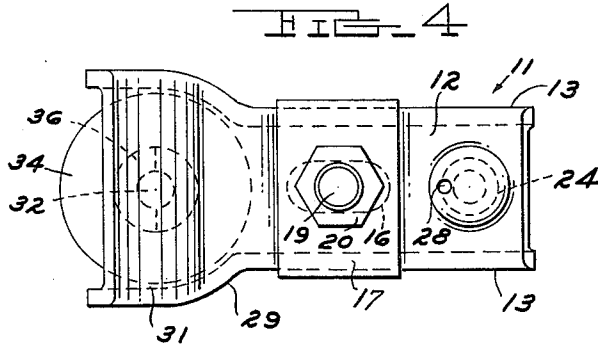
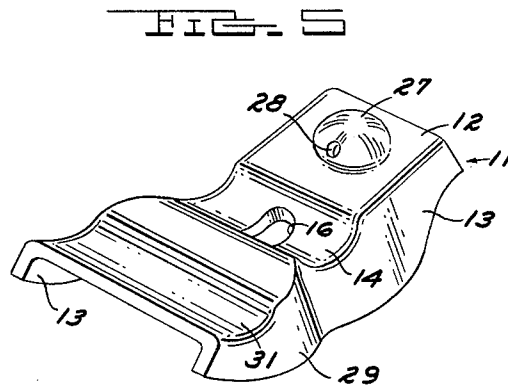
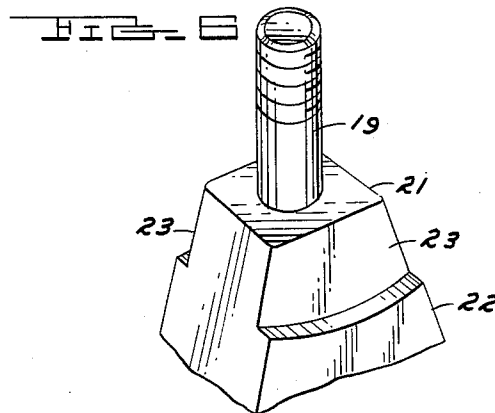
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VALVE GEAR

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Filed Dec. 7, 1960, Ser. No. 74,416
8 Claims. (Cl. 123—90)

This invention relates to a rocker arm and its associated mechanism, and particularly to a novel stamped rocker arm construction of the type used with the overhead valve gear of an internal combustion engine.

In the proposed construction the inventor provides a novel stamped rocker arm. The rocker arm operates on a trunnion adjustably secured upon a stud that is in turn secured to a rocker arm support. The rocker arm is provided with integral dependent sides that straddle and slidingly engage the sides of the rocker arm support to stabilize the rocker arm against lateral movement and against rotation in a horizontal plane. Undue wetting by oil of the poppet valve stem and undue carbonization of the oil in the valve guide is prevented by flaring out the rocker arm at the poppet valve end to cover the poppet valve and its associated parts.

It is a primary object of this invention to provide a new and improved rocker arm construction.

It is a further object of this invention to provide a rocker arm of stamped construction which is easy to manufacture, dependable in operation, and economical in cost.

It is still a further object of this invention to provide an improved valve gear for an internal combustion engine.

Further objects and advantages of this invention will be made more apparent as this description proceeds, particularly when considered in connection with the accompanying drawings, wherein:

FIGURE 1 is a fragmentary cross-sectional view of a valve gear train embodying the invention, and

FIGURE 2 is a cross-sectional view taken on the line indicated as 2—2 of FIGURE 1, and

FIGURE 3 is a perspective view of the rocker arm trunnion, and

FIGURE 4 is a plan view of the rocker arm construction shown in FIGURE 1, and

FIGURE 5 is a perspective view taken from above of the rocker arm made in accordance with this invention, and

FIGURE 6 is a perspective view taken from above of the rocker arm support and stud.

Referring now to the drawings (FIGURES 1 and 2), a portion of the internal combustion engine valve gear is indicated at 10. The rocker arm is indicated generally at 11 and comprises a longitudinally extending web 12 and dependent sides 13 integrally connected to the web. A semi-cylindrical saddle portion 14 is provided in the web 12 integral therewith and on the side of the web opposite to the dependent sides 13. A longitudinally extending slot 16 (FIGURE 4) is provided in the saddle portion 14.

A semi-cylindrical apertured trunnion 17 (shown in perspective in FIGURE 3) is nested in the saddle portion 14. Trunnion 17 is provided with a curved cavity 18 in the upper surface of the bearing. Stud 19 (threaded at the outer end) extends through the trunnion 17, slot 16 of the rocker arm and is press fitted or anchored in any well known manner in the rocker arm support 21 of the cylinder head 22. Rocker arm support 21 is provided with parallel sides 23 (FIGURES 2 and 6) that are slidably engaged by the dependent sides 13 of the rocker arm 11. The rocker arm 11 is thus positively restricted with respect to lateral movement.

Oscillatory movement is imparted to the rocker arm 11 through push rod 24. Push rod 24 may be tubular

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in construction and may have an apertured semispherical tip 26 that is received by a concave portion 27 located in the rocker arm web 12. The bore of the push rod 24 is conveniently open to a source of pressurized lubricant such as the hydraulic tappets. An opening 28 in the concave portion 27 allows the flow of the lubricant out of the push rod onto the web 14. The lubricant may then work its way between the trunnion 17 and the saddle portion 14 of the rocker arm 11.

The poppet valve end of the rocker arm 11 is flared outwardly (FIGURES 4 and 5) at 29 to substantially cover the poppet valve 33 (shown in part) and its spring retaining means. The spring retaining means is comprised of the spring retainer 34, locking means 36 that engages the poppet valve stem, and valve spring 37. Excessive wetting and possible carbonizing of oil on the valve stem is materially reduced as is the necessity of providing a special seal on the valve stem. A transversely disposed depression 31 (FIGURES 1 and 5) is provided in the flared portion 29 for engaging the foot 32 of the poppet valve 33.

The entire rocker arm is adjustably mounted upon the threaded end of the stud 19 by an adjusting nut 20. A curved portion 25 on the underside of the adjusting nut 20 nests in a complementary curved cavity 18 of the trunnion 17 to compensate for any possible misalignment of the parts.

It is to be understood that this invention is not to be limited to the exact construction shown and described but that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A rocker arm for an internal combustion engine valve gear, said rocker arm comprising a web having poppet valve and push rod engaging end portions, a saddle portion in the web integral therewith and intermediate of said poppet valve and push rod engaging end portions, dependent sides integrally connected to said web and on the side of the web opposite to the saddle portion and adapted to engage a portion of the internal combustion engine to laterally stabilize said rocker arm, said poppet valve engaging end portion being of a width greater than the push rod engaging end portion and adapted to substantially cover a poppet valve spring and retaining members.

2. An internal combustion engine valve gear comprising a rocker arm having a web and dependent sides integrally connected to said web, a semi-cylindrical saddle portion in the web integral therewith and on the side of the web opposite to the dependent sides, a rocker arm support, a trunnion mounted upon said rocker arm support and engaging said saddle portion, said dependent sides straddling said rocker arm support with at least one of the dependent sides slidingly engaging said rocker arm support.

3. An internal combustion engine valve gear comprising a rocker arm having a web and dependent sides integrally connected to said web, an apertured saddle in the web integral therewith and on the side of the web opposite to the dependent sides, a rocker arm support, stud means mounted upon said rocker arm support and extending through said apertured saddle, a trunnion supported on the free end of the stud means and engaging said saddle, said dependent sides straddling said rocker arm support with at least one of the dependent sides slidably engaging the rocker arm support.

4. An internal combustion engine valve gear comprising a rocker arm having a web provided with poppet valve and push rod engaging end portions, a saddle portion in the web integral therewith and intermediate of said poppet valve and push rod engaging end portions, at least

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one dependent side integrally connected to said web on the side of the web opposite to the saddle portion, a rocker arm support having a trunnion engaging said saddle portion, said poppet valve engaging end portion being of a width greater than the push rod engaging end portion and adapted to substantially cover a poppet valve spring and retaining means, at least one dependent side slidably engaging at least one side of the rocker arm support to laterally stabilize said rocker arm arm.

5. An internal combustion engine valve gear comprising a rocker arm having a web and at least one dependent side integrally connected to said web, a saddle portion in the web integral therewith and on the side of the web opposite to the dependent side, a rocker arm support having a side slidably engaged by said dependent side, a trunnion engaging said saddle portion, a stud secured to said rocker arm support, a nut adjustably securing said trunnion upon said stud, a curved cavity in one of said nut and trunnion and a complementary curved portion in the other of said nut and trunnion whereby said nut and said trunnion may be adjustably positioned with respect to each other.

6. An internal combustion engine valve gear comprising a rocker arm having a web and dependent sides integrally connected to said web, a saddle portion in the web integral therewith and on the side of the web opposite to the dependent sides, a rocker arm support, a trunnion mounted upon said rocker arm support and engaging said saddle portion, said dependent sides straddling said rocker

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arm support with at least one of the dependent sides slidably engaging said rocker arm support.

7. An internal combustion engine valve gear comprising a rocker arm having a web and dependent sides integrally connected to said web, a saddle portion in said web integral therewith and on the side of said web opposite to said depending sides, a rocker arm support, a trunnion mounted upon said rocker arm support and engaging said saddle portion, and means affixed to the engine between said depending sides and adapted to be in sliding contact with said depending sides to laterally stabilize the rocker arm.

8. A rocker arm for an internal combustion engine valve gear, said rocker arm having poppet valve and push rod engaging end portions, a supporting portion intermediate said poppet valve and push rod engaging end portions, said poppet valve engaging end portion being of a width greater than the push rod engaging end portion and adapted to substantially cover a poppet valve spring and retaining member to provide a shield preventing undue wetting of the poppet valve stem by oil.

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