

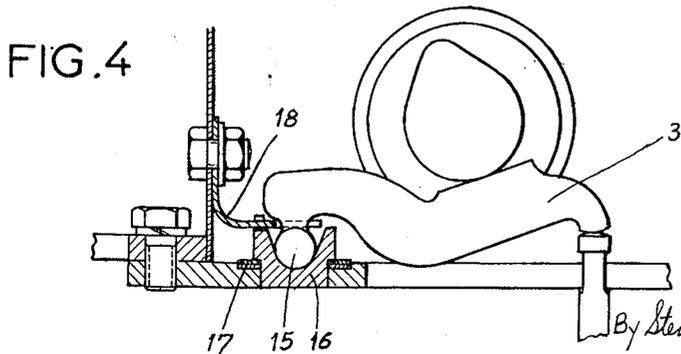
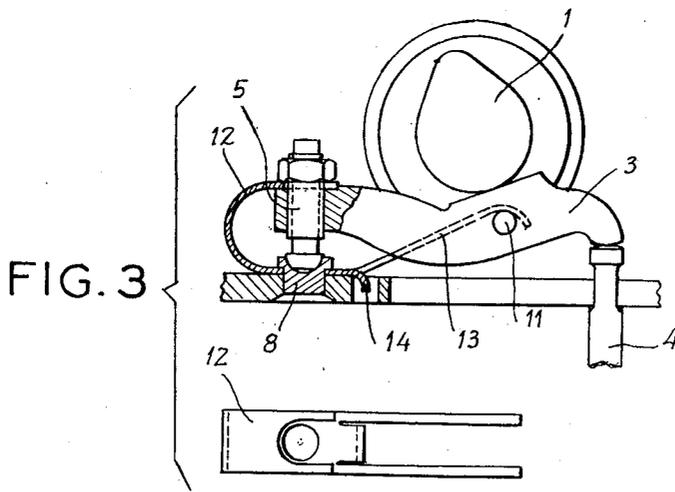
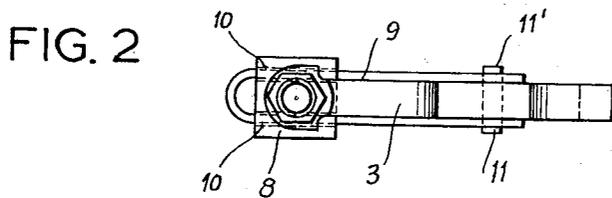
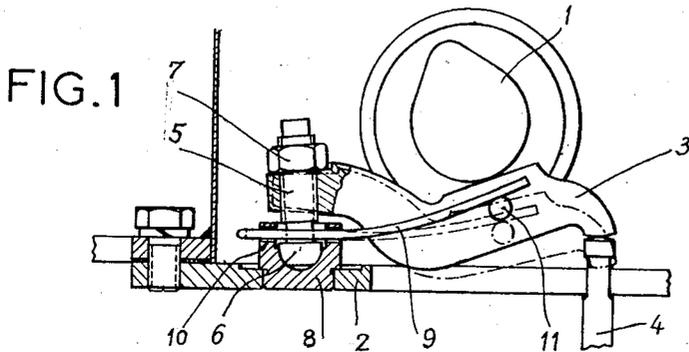
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OVERHEAD-CAMSHAFT ROCKER-ARM

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## OVERHEAD-CAMSHAFT ROCKER-ARM

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The present invention relates to valve gears of internal combustion engines, of the type comprising a single camshaft mounted in the cylinder head, according to the so-called overhead-camshaft disposal.

This invention is concerned more particularly to the arrangement and design of the valve-actuating rocker arms.

More particularly, the present invention relates to a device for the control of valves by an overhead camshaft and comprises an intermediate rocker arm having one end that engages the valve and having at its other end a swivel joint constituted of two elements, one element being carried by the rocker arm and the other element, which constitutes the female element of the swivel joint, forming a support for the one element, the device further comprises a spring mounted for engagement with said support-forming element and in engagement with said rocker arm at a point intermediate of the length thereof to urge it in valve engaging position and ensure the guiding of said rocker arm in operation.

Such described arrangement is advantageous not only on account of its constructional simplicity but also because it promotes on the one hand the lubrication of the swivel joint due to the accumulation of oil in the female element of the joint while preserving the facility of valve adjustment.

In order to afford a clearer understanding of the present invention and of the manner in which the same may be carried out in practice, reference will now be made to the accompanying drawing illustrating diagrammatically by way of example different forms of embodiment of the invention.

In the drawing:

FIGURES 1 and 2 are respectively a part-sectional, part-elevation side view and a plane view from above of a valve gear disposal for an overhead-camshaft according to a first embodiment of the present invention;

FIGURE 3 is a view similar to FIG. 1 (with a detail shown in plane view from above) in connection with another form of embodiment of the device for holding and guiding the rocker arm, and

FIGURE 4 is another modified embodiment utilizing a cylindrical swivel joint.

Referring to the drawing and more particularly to FIGS. 1 and 2, the arrangement comprises an overhead-camshaft 1, and a cylinder head 2. The rocker arm 3 for actuating the valve 4 is mounted as follows: it bears with one end against the valve shank and has screwed through its other end a screw-threaded rod 5 formed with a lower swivel-joint head 6 of part-spherical configuration. A nut and lock-nut system 7 engages the upper end of rod 5 and bears against the upper face of the relevant end of the rocker arm. The part-spherical head 6 is adapted to swivel in a correspondingly shaped cavity formed in a female joint element 8 secured for example by fitting in the upper surface of the cylinder head 2.

A spring wire 9 of substantially hairpin configuration is threaded on the rocker arm to urge same in the valve-engaging position. The sides of the spring extend through the upper portion of the female joint element 8 and engage a pair of parallel grooves 10 formed in the rod 5 above the part-spherical head 6.

The hairpin spring 9 holds the rocker arm 3 in line

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by engaging its two lateral faces, and on the other hand it bears with the outer end of its sides on the laterally projecting ends 11, 11' of a pin fitted through the rocker arm, as shown.

The valve play is taken up by the resilient pressure exerted by the two ends of the hairpin spring on the aforesaid pair of lateral pins 11 and 11'.

FIG. 1 shows in dotted lines the rocker arm in the valve-actuating position.

In the alternate embodiment of FIG. 3 the hairpin spring is replaced with a blade spring of loop configuration, wherein one arm is clamped between the upper face of the rocker arm and the nut 7, the other arm being clamped at its inner end between the upper surface 2 of the cylinder head and the female joint element 8, and formed with a fork-like extension 13 of which the prongs extend on either side of the rocker arm for guiding same. These prongs also engage the projecting ends 11 of a pin on either side of the rocker arm. At the root of these prongs 13 a bent lug 14 engages a hole formed for obvious purposes in the top of the cylinder head, as shown.

FIGURE 4 illustrates another arrangement wherein the rocker arm 3 is formed with an integral cylindrical swivel portion 15 pivoting about its axis in a female bearing 16 slidably fitted in the cylinder head.

Adjusting shims 17 may be provided for properly adjusting the valve operating clearance or play.

A spring 18 is provided for locking the bearing 16 against rotation and maintaining same in position.

Of course, various modifications and variations may be brought to the forms of embodiment shown and described herein without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A device for the control of valves by an overhead camshaft comprising an intermediate rocker arm having one end that engages the valve and having at its other end a swivel joint constituted of two elements, element one being carried by the rocker arm and the other element forming a support therefor, said device further comprising a spring mounted for engagement with said support forming element and in engagement with said rocker arm at a point intermediate of the length thereof to urge it in valve-engaging position and ensure the guiding of said rocker arm in operation.

2. A device according to claim 1 in which the support forming element constitutes a female element of the swivel joint.

3. A device according to claim 1 in which said spring is also in engagement with the swivel element that is carried by the rocker arm.

4. A device according to claim 1 in which said swivel element carried by the rocker arm comprises a threaded pin which is screwed through the rocker arm to permit the adjustment of the device.

5. A device according to claim 2 in which the spring is a hairpin spring having two legs, said female support forming element having two parallel passages receiving the two legs of said hairpin spring, said two legs enclosing the rocker arm to the point of engagement therewith, whereas the other swivel element carried by the rocker arm and constituting the male element of the swivel joint is engaged and held captive in said female element between the legs of said spring.

6. A device according to claim 3 comprising a support for the attachment of said swivel element, in which said spring is a blade spring of loop configuration wherein one upper arm is fixed between the rocker arm and said swivel element carried thereby, and a lower arm is fixed between said support forming element and said support, said last

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arm extending beyond said support forming element in the form of a fork-like extension which encloses the rocker arm to the point of engagement therewith.

7. A device according to claim 6 in which the lower arm of the spring comprises a bent lug that engages a hole in said support. 5

8. A device for the control of valves by an overhead camshaft comprising an intermediate rocker arm having opposing ends, one of said ends being adapted to engage the valve, a supporting swivel joint at the other end, said swivel joint being constituted of two elements, one element being carried by the rocker arm and the other element constituting the female element of the swivel joint and forming a support for the one element, said device further comprising a spring mounted for engagement with 15

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said support forming element and also being in engagement with the swivel element that is carried by the rocker arm and in engagement with the rocker arm at a point intermediate of the length thereof to ensure the guiding of said rocker arm in operation.

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