Dec. 9, 1924. 1,518,499

J. GARLICK

CAM SHAFT

Filed May 2, 1921

Fig. 1.

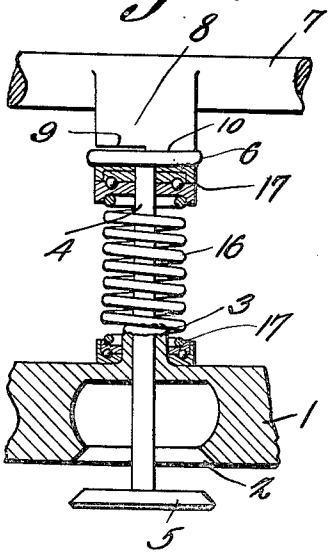
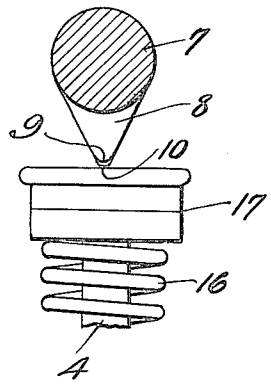


Fig. 2.



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UNITED STATES PATENT OFFICE.

JEW GARLICK, OF PATERSON, NEW JERSEY.

CAM SHAFT.

Application filed May 2, 1921. Serial No. 466,160.

To all whom it may concern:

Be it known that I, JEW GARLICK, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Cam Shaft, of which the following is a specification.

This invention aims to provide novel means for imparting rotation to the valve stem of an internal combustion engine.

Generally stated, a cam may be located in three different ways with respect to the axis of rotation of a valve stem. First, the cam may be so placed that it is symmetrical with respect to the axis of the valve stem. This construction has no bearing on the present invention, because it produces no rotation of the stem, and, consequently, no grinding of the valve, and no cleaning of the valve of carbon, or like deposits. Second, the cam may be located more or less at one side of the axis of the stem. This construction has a bearing on the present invention, because a rotation of the valve stem results. The construction alluded to, however, is unsatisfactory and undesirable, because if the entire periphery of the cam exerts a pressure on the stem, the right line sliding movement of the stem is interfered with, and there is a continuing force tending to cause the stem to reciprocate at an acute angle to the cam shaft, the result being increased friction, wear on the valve stem, and wear on the opening wherein the stem reciprocates. A third construction, and the one which characterizes this invention, embodies a cam, located symmetrically with respect to the valve stem, and trimmed off, at the point or highest portion of the cam, to define a projection which engages the stem at one side of the axis of the stem, the cam exerting a direct thrust on the stem, throughout the major portion of the periphery of the cam, and exerting a rotating action only whilst the comparatively small projection, formed by cutting away the highest part of the cam, is engaged with the stem, at one side of the axis of the stem.

Within the scope of what is claimed, a mechanic may work changes in the structure shown and described, without departing from the spirit of the invention.

In the drawing:—Figure 1 shows in elevation, a device constructed in accordance with the invention; Figure 2 is a sectional detail wherein the cam is viewed at right angles to the showing of Figure 1.

Referring to the drawing the numeral 1 denotes a support, in the form of a portion of the valve chamber of an internal combustion engine, the seat appearing at 2, the numeral 3 denoting a boss wherein a stem 4 is mounted for right line reciprocation, the stem carrying a valve 5 cooperating with the seat 2. Although the invention may be used in connection with tappets, an extremely simple construction has been shown, a head 6 being mounted directly on the stem 4, the term "valve-operating member" being used hereinafter to cover any kind of an element whereby a valve may be carried, unseated or otherwise controlled.

A cam shaft is shown at 7 and carries a cam 8. The cam 8 is disposed symmetrically with respect to the axis of the stem 4. The cam 8 is cut away, as shown at 9, at the highest point of the cam, and throughout a minor and exceedingly small portion of the periphery of the cam, to define a projection 10, located unsymmetrically with respect to the axis of the stem 4. In practice, the cam 8 may be cut away at 9, one one-thousandth of an inch, more or less, the decimal mentioned being a satisfactory embodiment, and rendering it clear that the amount of the cam which is cut away need be but very small. The result of the operation of a cam, constructed as described, is that, throughout practically all of the rotation of the cam, the cam will exert a straight line thrust on the valve, no rotation being imparted to the valve, and there being no tendency to produce wear or friction. When, however, the small projection 10 cooperates with the part 6 or its equivalent, the valve is rotated.

The valve spring 16 may exert a thrust at one or both ends on anti-friction devices 17 cooperating, respectively, with the part 1 of the valve chamber and with the element 6.

Because the straight bearing edge of the projection 10 extends to a point closely adjacent to the periphery of the head 6, the projection will have a maximum tendency

to rotate the operating member, 4—6, and because the said edge extends to a point in direct alinement with the stem 4, the projection will have a minimum tendency to push the stem out of alinement.

I claim:—

In a device of the class described a valve operating member comprising a stem and a head on the stem, a shaft having a cam located symmetrically with respect to the axis of the stem and substantially equal in width to the diameter of the head, a portion of the high end of the cam being cut away to form a projection disposed unsymmetrically with respect to the axis of the stem, the projection having a straight bearing edge located at right angles to the stem and extending radially of the head from a point in direct alinement with the stem to a point closely adjacent to the periphery of the head, the projection having a maximum tendency to rotate the operating member, and having a minimum tendency to push the stem out of alinement.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JEW GARLICK.

Witnesses:
LESTER A. DE VOE,
W. A. HARRISON.