June 29, 1954 R. H. LANTZ 2,682,260

CAMSHAFT CONTROL MECHANISM

Filed Jan. 13, 1953

Fig. 1.

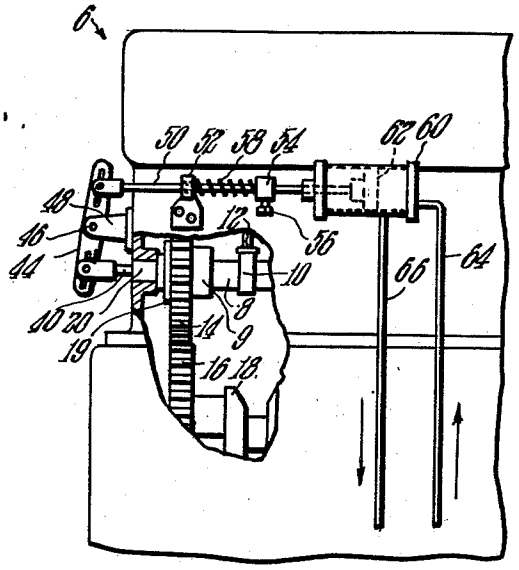


Fig. 2.

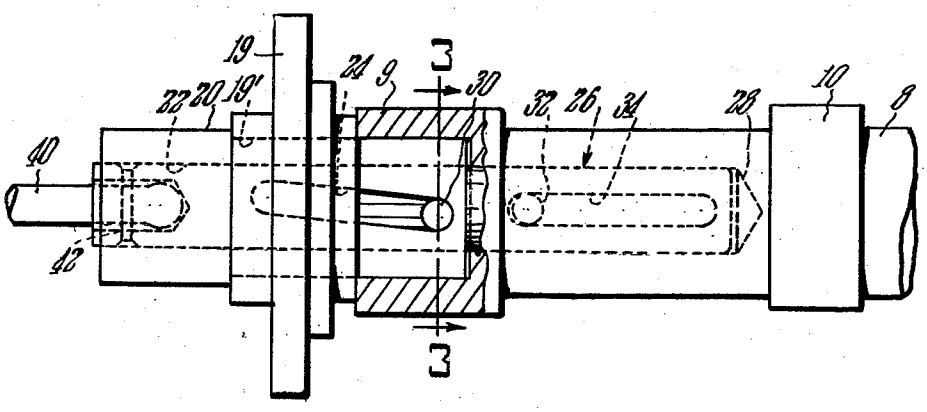
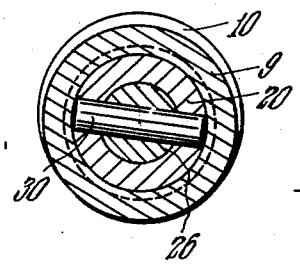


Fig. 3.



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CAMSHAFT CONTROL MECHANISM

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1 Claim. (Cl. 123—90)

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My invention relates to new and useful improvements in internal combustion engines and is directed more particularly to the provision of a means whereby the speed of the engine may be increased or decreased, merely by the changing of the relative positions of the cam shaft and the crank shaft.

It is the principal object of my invention to provide a novel and improved construction of the type in which the cam shaft is moved peripherally with respect to the crank shaft, while the engine is in operation.

One of the primary purposes of my invention is to provide structural and operational improvements in devices of the class to which reference has been made, which improvements not only simplify the structure as such, but also provide important distinct advantages in efficiency, durability and the like.

Generally stated, my invention provides an arrangement for obtaining relative rotary adjustments between the cam shaft and the crank shaft as the engine speed varies, thereby advancing or retarding the operation of the valves to insure greater engine efficiency and economy in full consumption.

More specifically, it provides an automatic valve control means whereby the above desiderata are effectively obtained. It contemplates a hydraulically operated control means which is particularly adapted to actuate the cam shaft peripherally relative to the crank shaft.

With the above primary objects in view, it is another object of my invention to provide a construction of the above described character in which the number of operating parts is greatly reduced and which is not only practical in its value but also reliable in its operation and efficient in its use.

It is a still further object to provide a mechanism which is constructed of relatively simple parts which are adapted to be readily assembled and which when once assembled are securely retained in operative relationship.

Other prime objects of my invention include: first, the provision of a simplified construction and arrangement of a cam shaft control means; second, the securement of a higher degree of accuracy in the manner of work performed therewith than has heretofore been possible with prior devices known in the art; third, the attainment of a high speed of assembly of the device due to its simplification of design and its unique composition of parts; fourth, the achievement of a greater ease in adjustment and repairs; fifth, the provision of an improved cam shaft control which may be made more economically and with fewer operations in the manufacture of its parts, as well as in the assembly of the same than prior devices known in the art, and sixth, the provision of such other improvements in and relating to cam shaft controls of the type above referred to as are hereinafter described and claimed.

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All of the above objects I accomplish by means of such structure and relative arrangements of parts thereof, as will fully appear by a perusal of the description below and by various specific features which will be hereinafter set forth.

To the above cited and other ends and with the foregoing and various other novel features and advantages and other objects of my invention as will become more readily apparent as the description proceeds, my invention consists in certain novel features of construction and in the combination and arrangement of parts as will be hereinafter more particularly pointed out in the claim hereunto annexed and more fully described and referred to in connection with the accompanying drawings wherein:

Fig. 1 is a partial side elevational view of an internal combustion engine with parts broken away for purposes of clarity in order to better show the device of my invention;

Fig. 2 is an enlarged elevational view of the actuating mechanism of my invention; and

Fig. 3 is a sectional view along line 3—3 of Fig. 2.

In the following description and claims, various details will be identified by specific names for convenience. These names however are intended to be as generic in their application as the art will permit.

Referring now to the drawing more in detail, in which similar characters of reference indicate corresponding parts in the several figures, and referring more particularly to the preferred form of my invention selected for illustrative purposes, I have shown an internal combustion engine generally designated by 6. This is of conventional design and is not to be considered as forming a part of this invention.

The ordinary internal combustion engine, as is well known, has a cam shaft 8 upon which cams 10 are fixed for operating the valves of the engine through valve lifters such as 12.

The gear 14 at one end of the shaft 8 is actuated by a gear 16 secured to the crank shaft 18. These gears 14 and 16 are of the well known construction.

A hub part 19 fixed to the gear 14 in a suitable

manner has a centrally disposed opening 19' therethrough in which a sleeve 20 is receivable. The sleeve 20 is fixed to the hub 19 and has a longitudinal bore 22 extending therethrough.

Elongated cam slots 24 are formed in the sleeve 20 and are disposed on opposite sides thereof, the openings being suitably inclined in opposite directions.

An elongated shaft 26 is rotatably receivable in the bore 22 of the sleeve 20 and has one extremity receivable in a bore 28 in the outer end of the cam shaft 8 in alignment therewith.

The shaft 26 carries a key 30 which extends transversely therethrough and has diametrically opposed end portions receivable in the slots 24 in the sleeve 20.

A pin 32 has opposite ends rigidly fixed to the shaft 8 and it extends transversely through an elongated slot 34 in the shaft 26.

An offset end portion 9 of the cam shaft 8 encloses the inner end of the sleeve 20 and is rotatable thereon as the cam shaft is rotated relative to the cam gear hub 19.

As shaft 26 is moved longitudinally relative to sleeve in one direction or the other, the key 30 of shaft slides along the inclined slots 24 of sleeve 20 and pin 32 slides along slots 34 of cam shaft 8. This brings about angular movement of the shaft 26 relative to the sleeve 20 and gear hub 19 and similar movement of the cam shaft relative to said hub.

At one extremity of the shaft 26, a socket is provided in which an extremity of a connecting link 40 is receivable, being secured thereto by means of a pin 42 extending therethrough and having opposite ends fixed in diametrically opposed sides of the shaft 26. The opposite extremity of the member 40 is pivotally engaged with the lower end of an arm member 44.

The member 44 is pivoted at 46 to a bracket 48 supported on the engine 6 permitting swinging movements of the member 44 relative to the engine.

The upper end of the member 44 is pivotally engaged with an operating link member 50 which is extensible through a supporting bracket 52, and carries an adjustable stop member 54. The stop member may be fixed relative to the link member 50 by means of an adjusting nut 56.

A spring member 58 is disposed around the link member 50 between the bracket 52 and the stop member 54.

A cylinder 60 having a piston 62 slidable therein. The piston 62 is fixed to the opposite extremity of the member 50 which extends into the cylinder through an end wall thereof.

An oil line 64 extends from the oil pump within the engine to one end of the cylinder 60 and a return oil line 66 leads from within the cylinder to the engine crankcase the oil circulating in the direction indicated by the arrows

The invention may be embodied in other specific forms without departing from the essential characteristics thereof. Hence, the present embodiments are therefore to be considered in all respects merely as being illustrative and not as being restrictive, the scope of the invention being indicated by the appended claim rather than by the foregoing description, and all modifications and variations as fall within the meaning and purview and range of equivalency of the appended claim are therefore intended to be embraced therein.

What it is desired to claim and secure by Letters Patent of the United States is:

Mechanism for changing the angularity of a cam shaft of an internal combustion engine relative to rotating means therefor comprising, a support, an elongated sleeve having an outer end rotatable in said support and an inner end and provided with an axial bore therethrough, a hub for rotating means fixed to said sleeve intermediate outer and inner ends thereof, said cam shaft being in axial alignment with said sleeve and extending inwardly thereof and provided with an axial bore in alignment with the bore of said sleeve and having an outer end rotatably supported on the inner end of said sleeve, an elongated shaft reciprocable simultaneously in the bores of said sleeve and cam shaft, said sleeve provided with elongated slot means in opposite sides thereof disposed angularly relative to the longitudinal axis of said bores and said shaft having a key fixed thereto provided with opposite ends disposed in said slot means whereby as said shaft is reciprocated in opposite directions said shaft is rotated angularly in opposite directions relative to said sleeve, said shaft within the bore of the cam shaft provided with an elongated slot in parallelism with said bores and said cam shaft having a pin fixed thereto disposed in said slot whereby as said shaft is rotated angularly relative to said sleeve the cam shaft is rotated angularly relative to said sleeve.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,632,223	Fey	June 14, 1927
2,072,474	Helming	Mar. 2, 1937