March 17, 1959 H. G. SCHALLER 2,877,752

DOUBLE LOBE CAM SHAFT

Filed Sept. 3, 1957

Fig. 1

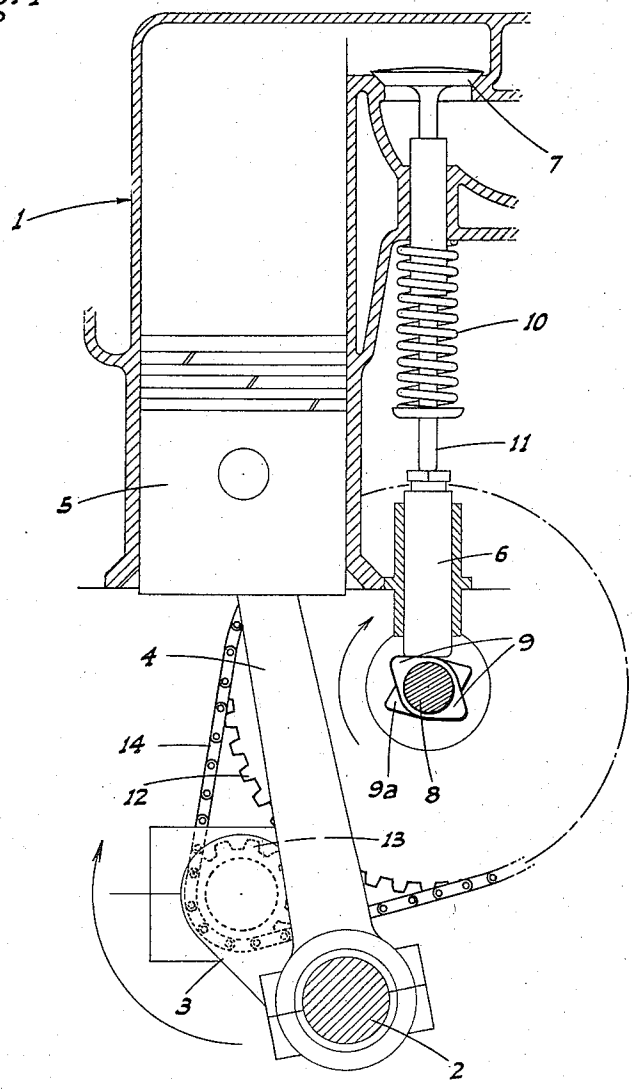
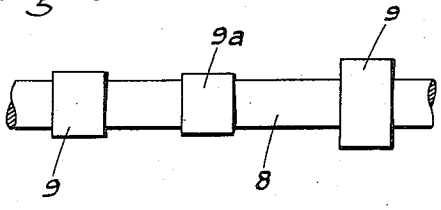


Fig. 2



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DOUBLE LOBE CAM SHAFT

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1 Claim. (Cl. 123—90)

This invention relates to internal combustion engines, and particularly to the cam shaft and cam arrangement for four-cycle gas engines.

The principal object of my invention is to provide a cam shaft having opposed cam lobes for each valve thereon; the lobes being identical and the cam shaft being connected to the crankshaft so as to turn at one-fourth crankshaft speed so as to maintain the proper timing of the valves in the four-cycle operation of the engine.

As a result of the use of such a double lobe cam shaft, with properly designed cams thereon, I have found that engine horse power is increased, and certain advantages with respect to wear and engine upkeep are obtained.

Another object of the invention is to provide a double lobe cam shaft which is designed for ease and economy of manufacture.

Still another object of the invention is to provide a practical, reliable, and durable double lobe cam shaft, and one which will be exceedingly effective for the purpose for which it is designed.

In the drawings:

Fig. 1 is a diagrammatic end elevational view showing the double lobe cam shaft as associated with a valve lifter and as connected in driving relation with a gas engine crankshaft.

Fig. 2 is a fragmentary side elevation of the cam shaft.

In the engine 1, generally shown in Fig. 1, each crank 2 of the crankshaft 3 is connected as usual to the connecting rod 4 of a piston 5 of the engine.

Disposed in alinement with and below the push rod or lifter 6 of each valve 7 of the engine is the cam shaft 8, which is the subject of this invention. This cam shaft, for each lifter, has a pair of diametrally opposed cams 9 of identical form and in common alinement lengthwise of the cam shaft. These cams are arranged to each lift

the push rod 6 the distance necessary to properly open the valve 7; the downward movement of the valve and push rod being effected by a compression spring 10 mounted about the valve stem 11.

Since each valve is only intended to be lifted once during each two full revolutions of the crankshaft 3 (in a four-cycle engine), it is necessary to drive the novel cam shaft 8 at one-fourth crankshaft speed. To this end a gear 12 is mounted on the cam shaft and a pinion 13, one-fourth the size of gear 12, is mounted on the crankshaft. Following current practice, the gear and pinion are connected in driving relation by a timing chain 14.

The valve here shown is presumed to be the exhaust valve for the corresponding cylinder of the engine; the cam shaft having of course opposed and alined cams 9*a* to lift the push rod of the corresponding intake valve.

It should here be noted that while I have shown an L-head motor, and the cams are of the straight flank or tangential type, it is immaterial as far as the functioning of the novel cam shaft is concerned whether the engine is of the L-head, T-head, or over-head valve design. Similarly, of course, the exact design of the cams may be altered from the specific showing as may be determined to be best for individual engines.

From the foregoing description it will be readily seen that there has been produced such a device as will substantially fulfill the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claim.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

In combination in a four-cycle gas engine, a crankshaft, a valve lifter for each valve of the engine, a cam shaft, diametrally opposed cams on the cam shaft disposed to alternately engage said valve lifter, and means connecting the crankshaft to the cam shaft to drive the latter at one-fourth the speed of the crankshaft.

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