Jan. 8, 1957 H. M. SHEPPARD 2,776,494

CAMSHAFT LIFT INDICATOR

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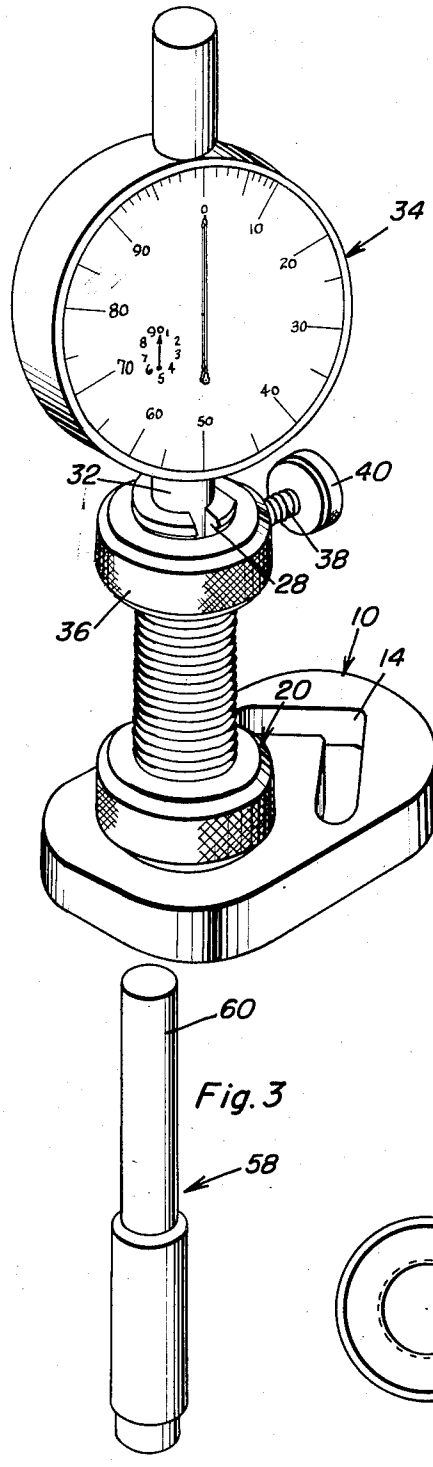


Fig. 1

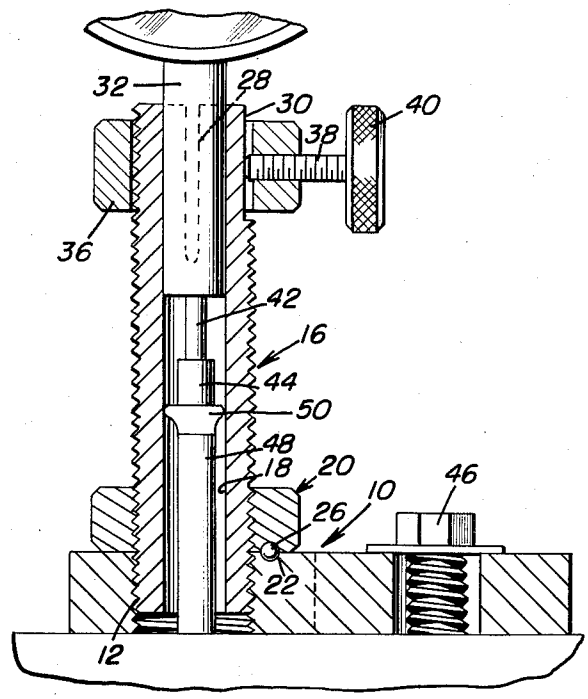


Fig. 2

Fig. 3

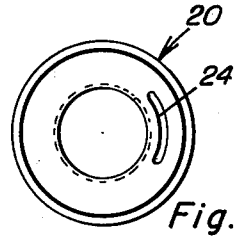


Fig. 4

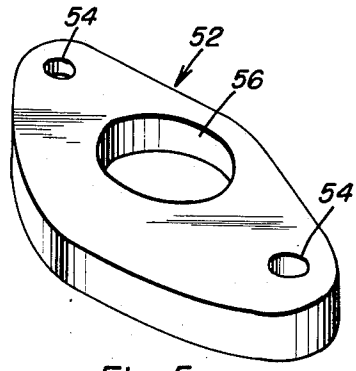


Fig. 5

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CAMSHAFT LIFT INDICATOR

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2 Claims. (Cl. 33—181)

This invention relates generally to automotive tools and pertains more particularly to a tool for determining the effective lift of a camshaft.

As is well understood in the automotive repair art, it is absolutely mandatory for proper and smooth operation of an internal combustion engine that the lobes on the camshaft be of substantially equal and proper form such as to impart the proper lift and timing of the valves in conjunction with the reciprocating pistons of the engine.

It is therefore a primary object of this invention to provide an improved tool constructed specifically for use in conjunction with automotive engines which will enable an operator to determine the effective lift of the cam lobes of the engine without necessitating removal of any other structure except the rocker arm cover plate and rocker arm assemblies. This invention is directed primarily to tools for use with 1949 Cadillacs and later, although it will be readily appreciated that the same may be designed for use with other engines having overhead valve construction.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view of the tool;

Figure 2 is a vertical section taken through the tool showing the same in mounted relation on an associated engine;

Figure 3 is a perspective view of an adaptor rod used in determining the effective lift of a camshaft fuel pump lobe;

Figure 4 is a bottom plan view of the lock nut; and

Figure 5 is a perspective of a spacer plate for use in conjunction with the tool component shown in Figure 3.

Referring now more particularly to the drawings and more specifically to Figures 1 and 2 thereof, reference numeral **10** indicates generally an elongated plate member which forms a mounting plate for the tool assembly and which is provided adjacent one end thereof with a threaded aperture as indicated by the reference character **12** and at the opposite end thereof with a generally V-shaped elongated aperture indicated by the reference character **14**. A sleeve member is indicated generally by the reference character **16** and it will be noted that this member is provided with a smooth internal bore **18** and has its outer surface threaded throughout its extent. The lower end of the sleeve member is threadedly engaged within the threaded aperture **12** of the base plate and a lock nut member indicated generally by the reference character **20** is also threaded on the lower end of the sleeve such that its lower surface will bind against the upper surface of the mounting plate and maintain the proper adjustment between the sleeve member and the base plate for a purpose which will be presently apparent. The upper face of the mounting plate is provided with a depression **22** of cup-like configuration and the bottom surface of

the nut member **20** is provided with an arcuate trough **24**, which portions receive a ball member **26** in a manner shown most clearly in Figure 2. It will be noted that the cooperation between the depression **22**, the trough **24** and the ball member **26** is such that the nut member **20** is effectively locked with relation to the sleeve and the mounting plate and will prevent accidental displacement or rotation of the sleeve with respect to the mounting plate.

The upper end of the sleeve is split at opposite sides thereof as indicated by the reference character **28** and one side of the upper end portion is flattened as indicated by the reference character **30**. The barrel **32** of a dial indicator indicated generally by the reference character **34** is slipped into the bore at the upper end of the sleeve member and a collar member **36** surrounding its upper end is provided with a set screw member **38** having a knurled finger knob portion **40** such that the set screw may be engaged with the upper end of the sleeve to clamp this portion thereof into frictional engagement with the barrel **32** and prevent longitudinal displacement between the sleeve and the barrel. The indicating or movable spindle **42** of the dial indicator terminates in a conventional enlarged head portion **44** which is disposed within the bore **18**, in the manner shown most clearly in Figure 2.

In utilizing the above described assembly, it will be manifest that the rocker arm cover and rocker arm assemblies must be removed whereupon a fastening element **46** is inserted through the elongated aperture or slot **14** for engagement with one of the tapped holes which was utilized to mount the rocker arm assembly. The mounting plate is then manipulated such that the conventional valve push rod **48** is guidably received within the bore **18** of the sleeve **16**, it being noted that the cup **50** thereof engages the inner surface of this bore. It is now necessary to rotate the crankshaft or camshaft of the engine such that the heel of the cam lobe under consideration is in engagement with the valve lifter associated with the push rod **48**. At this point, the nut **20** is backed off and the sleeve **16** threaded into or out of the mounting plate **10**, as the case may be, such that the needle of the dial indicator is deflected a slight amount, at which point the locking nut **20** is manipulated to hold the desired adjustment and the dial indicator is zeroed in a conventional manner. The engine crankshaft is then rotated until a maximum reading is obtained on the face of the dial indicator whereby the operator may record the over-all effective lift of that associated camshaft lobe. This operation is, of course, repeated as many times as is necessary to check the valve mechanisms under consideration.

Referring now more particularly to Figures 3 and 5, the assemblies shown are to be utilized in conjunction with determining the effective lift of the fuel pump lifter lobe on the camshaft. In this respect, a spacer plate indicated generally by the reference character **52** is positioned between the engine block and the mounting plate **10** with the usual fuel pump mounting elements projecting through the apertures **54** disposed at opposite ends of the spacer plate which will position its enlarged aperture **56** in registry with the opening for the fuel pump push rod. The fuel pump push rod is also removed and a calibrated dummy rod **58** is inserted in its place such that its tapered upper end portion **60** will project into the bore **18** of the sleeve **16** when one of the fastener elements extending through the bores **54** in the spacer plate is utilized to fasten the mounting plate **10** on top of the spacer plate. The operation for determining the lift of the fuel pump cam lobe is essentially the same as that previously described in conjunction with a valve cam lobe.

From the foregoing, the construction and operation of

the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. A camshaft lift indicator comprising a mounting plate, said mounting plate having an elongated V-shaped slot therein for the reception of a fastening element and having a threaded aperture adapted to surround an internal combustion engine valve push rod, a sleeve member having its lower end portion engaged within said aperture such that its bore guidably receives the upper end of an associated valve push rod, and a dial indicator having its barrel frictionally engaged within the upper end of said sleeve with its spindle projecting downwardly therein with the free end of the spindle spaced from the lower end of the sleeve for abutting the upper surface of the associated push rod, whereby rotation of the engine crankshaft will effect a reading on the dial indicator indicative of the total lift of the cam lobe under consideration.

2. In combination with an overhead valve internal combustion engine including a cylinder head having valve

push rods extending therethrough, a camshaft lift indicator comprising a mounting plate having an aperture adjacent one end and an elongated V-shaped slot adjacent its other end, a fastening element extending through said slot and securing said mounting plate to said cylinder head with the aperture thereof surrounding one of said push rods, an upstanding sleeve member having its lower end portion received in said aperture such that its bore guidably receives the upper end of the associated push rod, and a dial indicator having its barrel frictionally engaged within the upper end of said sleeve with its spindle projecting downwardly therein with the free end of the spindle spaced from the lower end of the sleeve for abutting the upper surface of the associated push rod, whereby rotation of the engine crankshaft will effect a reading on the dial indicator indicative of the total lift of the cam lobe under consideration.

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