

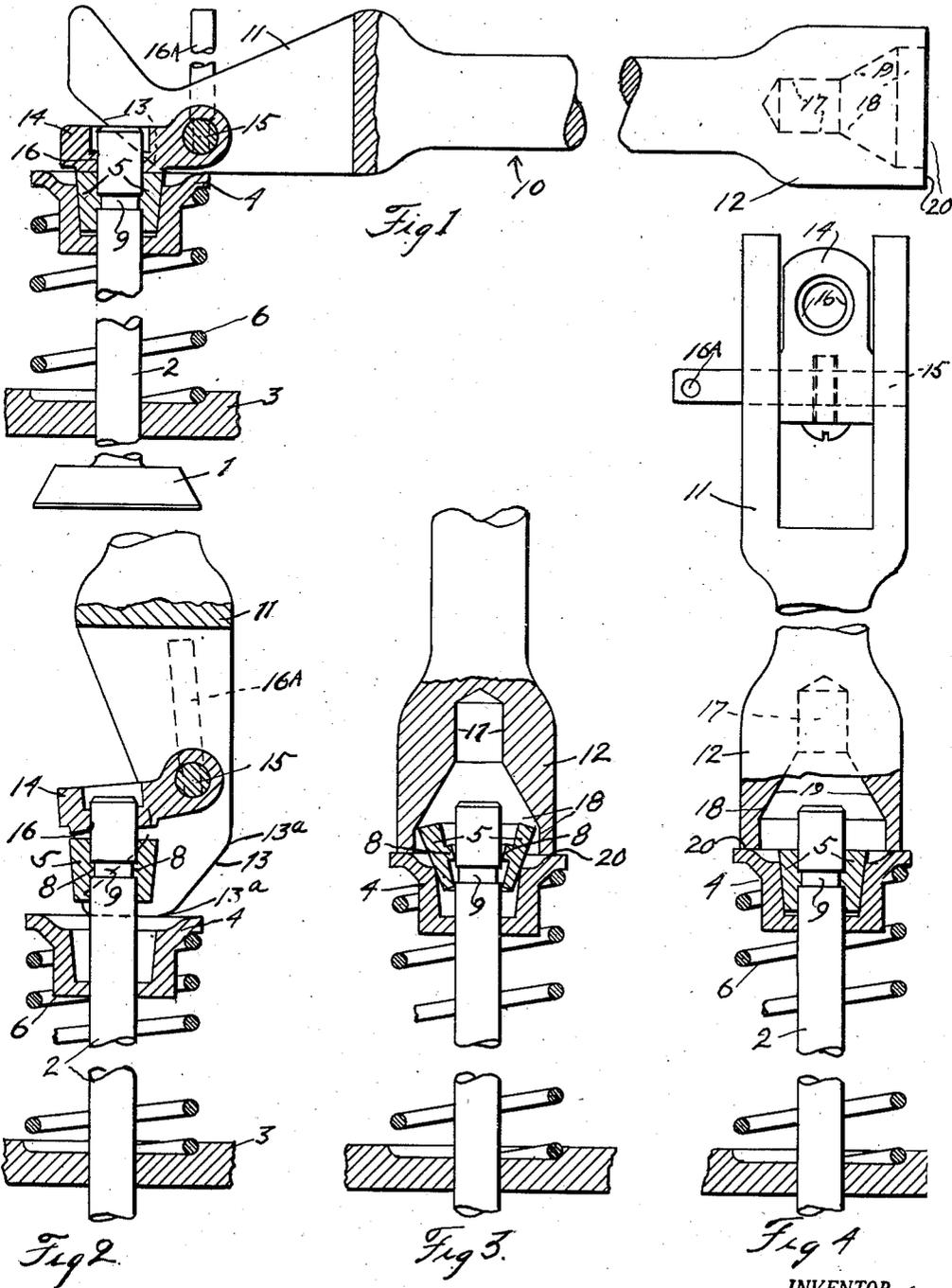
Sept. 9, 1947.

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2,427,045

POPPET VALVE TOOL

Filed May 9, 1944



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UNITED STATES PATENT OFFICE

2,427,045

POPPET VALVE TOOL

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Application May 9, 1944, Serial No. 534,753

3 Claims. (Cl. 29—219)

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This invention relates to tools for releasing the poppet valves of internal combustion engines, and particularly overhead valves, and for reassembling the valves and their springs, and has for its object a tool including a clutch operable to clutch the end of the valve stem, so as to pull upwardly on the valve stem and push downwardly on the spring abutment upon giving a tilting or lever movement to the tool, at which time the tool slidably fulcrums on the abutment, and also the tool having means for reassembling the valve and spring assembly and operable to depress the spring abutment against the spring and move the valve locks or lock members into interlocking coaction with the valve stem.

The tool here illustrated is particularly adapted for overhead valves, such as the type used in the engines in Chevrolet cars, trucks, etc.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is an elevation, partly in section, of this tool and the contiguous portion of the valve assembly showing the tool in its initial position prior to releasing the valve from the spring and spring abutment.

Figure 2 is a view similar to Figure 1 showing the operation of the tool in depressing the spring to free the lock members so that they can be removed from interlocking engagement with the valve stem.

Figure 3 is a view showing the use of the tool for reassembling the valve stem, its spring, abutment and lock members, the tool being shown in starting position.

Figure 4 is a view similar to Figure 3 showing the position of the tool at the time the parts are assembled.

1 designates the valve having the usual stem 2 mounted in any suitable manner in the head 3 of an automotive engine. 4 is a spring abutment on the stem and locked thereto by lock members 5; and 6 is a spring thrusting in one direction against the cylinder head 3 in any well known manner and against the spring abutment 4. The spring abutment of this type is formed with a conical recess about the stem in which the lock members 5 are located. These lock members are arcuate or semi circular in cross-section with their outer surface conical to conform to the con-

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ical walls of the recess. They are formed on their inner sides with ribs 8 which interlock in a circumferential groove 9 in the upper end of the stem 2. This is the conventional construction and forms no part of the invention.

The invention resides in the tool for assembling and dismantling the valve unit. This tool is here shown as double in the general form of a bar having a foot at one end and a head at the other. The foot coacts with the spring abutment to depress the abutment 4 for the purpose of removing the lock members 5 and disassembling the valve unit. The foot is provided with a clutch operable to clutch the upper end of the valve stem while the tool is being operated as a lever to depress the abutment 4 when the tool is fulcruming about the axis of a pivot between the clutch and the lever or foot of the bar. During this operation, the valve head is thrusting against its seat. The head at the other end of the bar is for the purpose of reassembling the valve spring and lock members. 10 designates the tool as a whole; 11 the foot at one end, and 12 the head at the other end. The foot 11 is here shown as bifurcated, the ends of its bifurcations being formed with inclined pressure surfaces 13, which slidably press on the abutment at the corners 13^a of the surfaces 13.

14 designates the clutch, this being shown as a strip pivoted at 15 between the bifurcations and having an opening 16 for normally slidably fitting the upper end of the valve rod 2. The clutch is keyed to its pivot pin 15, which is provided with an operating handle 16^a located outside one of the bifurcations. When the tool is located as seen in Figure 1, wherein the opening in the clutch 14 is fitted over the end of the stem, and the lever 16 is operated into the position shown in Figure 2, the clutch 14 is tilted slightly, causing diametrically opposite sides of the opening to bite into the upper end of the rod 2. Now, the tool, upon movement upwardly about the pivot 15 as a fulcrum takes a lever movement slidably pressing on the surface 13, and in so doing, depresses the abutment 4 against the spring 6 into the position shown in Figure 2. As the lock members 5 are interlocked with the rod, the abutment is withdrawn from the lock members 5, as shown in Figure 2, where they can be easily removed. The clutch is then operated to release the rod 2, so that now upon removal of the tool, the abutment and spring can be removed, thus releasing the valve.

The head 12 is used to reassemble the abut-

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ment, spring and lock members on the valve stem, after the valve is placed in the cylinder head. The head 12 is here shown as formed with a bore 17 for receiving the end of the valve stem and a counter bore 18 having a conical or cam shaped bottom wall 19, the end of the head around the counter bore forming a bearing surface at 20 to be pressed against the abutment 4, as seen in Figure 3, after the lock members 5 have been located partly in the recess of the abutment but are out of or above interlocking engagement with the groove 9 in the valve stem. Now upon force being applied to the tool to depress the head 12, the abutment 4 is depressed, compressing the spring 6 and the conical bottom 18 of the counter bore presses against the upper edges of the lock members 5 forcing them also axially along the valve stem until the lock members or the ribs 8 thereon become alined with the groove 9 of the stem, where further depression cams the lock members radially inward, causing the ribs 8 to interlock in the groove 9. The tool can then be removed.

This tool is particularly simple and consists of few parts for a tool of this type of valve lock.

What I claim is:

1. A poppet valve tool for spring-pressed valves in which the spring thrusts against an abutment on the valve stem and the abutment is held in position on the stem by lock members removably carried thereby and interlocked in a groove in the stem, the tool comprising a one piece lever having a shank and a foot at one end of the shank integral therewith formed with an end face for pressing on the abutment, and a clutch member, means pivoting the clutch member to the lever intermediate its ends adjacent the shank end of said foot, said means pivoting said member on an axis transverse of said lever, said clutch member extending from said pivot means and said extension being provided with an opening having at least diametric opposite portions for close engagement of opposite sides of the stem, the axis of said opening and the axis of said pivot means lying in parallel planes with the axis of said opening at right angles to the axis of said pivot means, whereby a tilting of said lever with its foot against the abutment will tilt said clutch extension to tilt said diametric opposite portions into biting engagement with the stem.

2. A poppet valve tool for spring-pressed valves in which the spring thrusts against an abutment on the valve stem and the abutment is held in position on the stem by lock members removably carried thereby and interlocked in a groove in the stem, the tool comprising a one piece lever having a shank and a foot at one end of the shank integral therewith formed with an end face for pressing on the abutment, and a clutch member, means pivoting the clutch member to the lever intermediate its ends adjacent the shank end of said foot, said means pivoting said member on an axis transverse of said lever, said clutch member extending from said pivot means and said extension being provided with an opening having at least diametric opposite portions for close engagement of opposite sides of the

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stem, the axis of said opening and the axis of said pivot means lying in parallel planes with the axis of said opening at right angles to the axis of said pivot means, whereby upon tilting movement of the lever with its foot portion against the abutment, the foot portion moves about the fulcrum between it and the clutch member, and the clutch member gripping the valve stem holds the foot portion and the shank from axial movement, and means for tilting the clutch to tilt said diametrically opposite portions into and out of stem gripping position.

3. A poppet valve tool for spring-pressed valves in which the spring thrusts against an abutment on the valve stem and the abutment is held in position on the stem by lock members removably carried thereby and interlocked in a groove in the stem, the tool comprising a one piece lever having a shank and a foot portion at one end of the shank integral therewith, said foot portion being bifurcated and each bifurcation having an end face for pressing on the abutment, and a clutch member, means pivoting the clutch member to the lever intermediate its ends adjacent the shank end of said foot portion between the bifurcations thereof, said means pivoting said lever on an axis transverse of said lever, said clutch member extending from said pivot means and said extension being provided with an opening having at least diametric opposite portions for close engagement of opposite sides of the stem, the axis of said opening and the axis of said pivot means lying in parallel planes with the axis of said opening at right angles to the axis of said pivot means, whereby upon tilting movement of the lever with its foot portion against the abutment, the foot portion moves about the pivot between it and the clutch member, and the clutch member gripping the valve stem holds the foot portion and the shank portion from axial movement.

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