Jan. 10, 1933. W. J. ROWAN 1,893,962

VALVE SPRING LIFTER

Filed Sept. 13, 1930 2 Sheets-Sheet 1

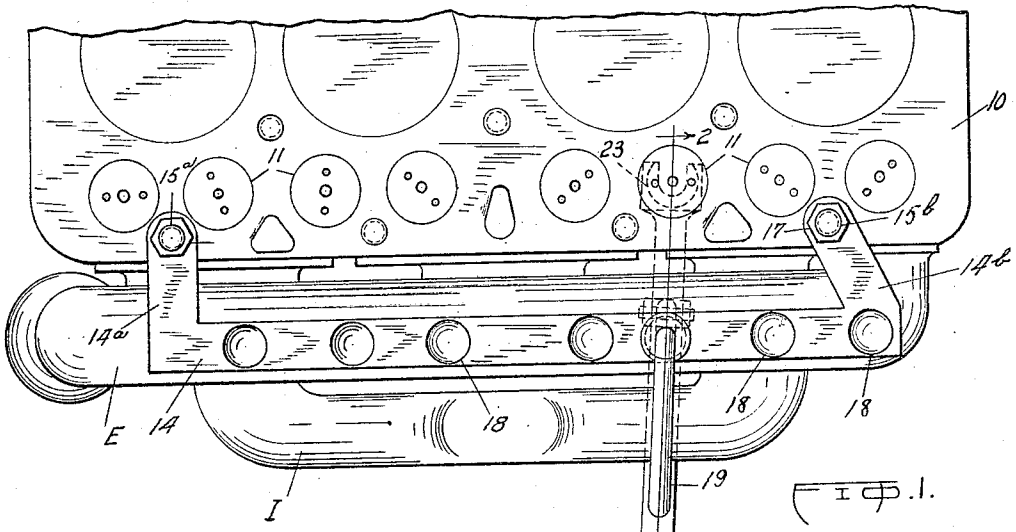


FIG. 1.

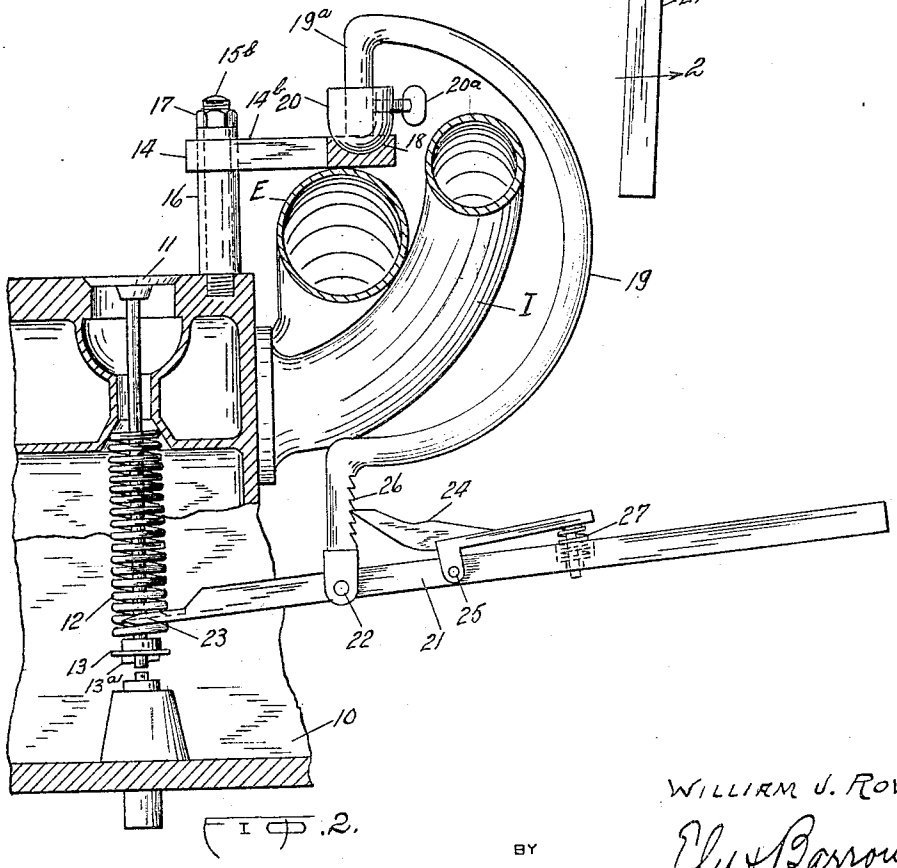


FIG. 2.

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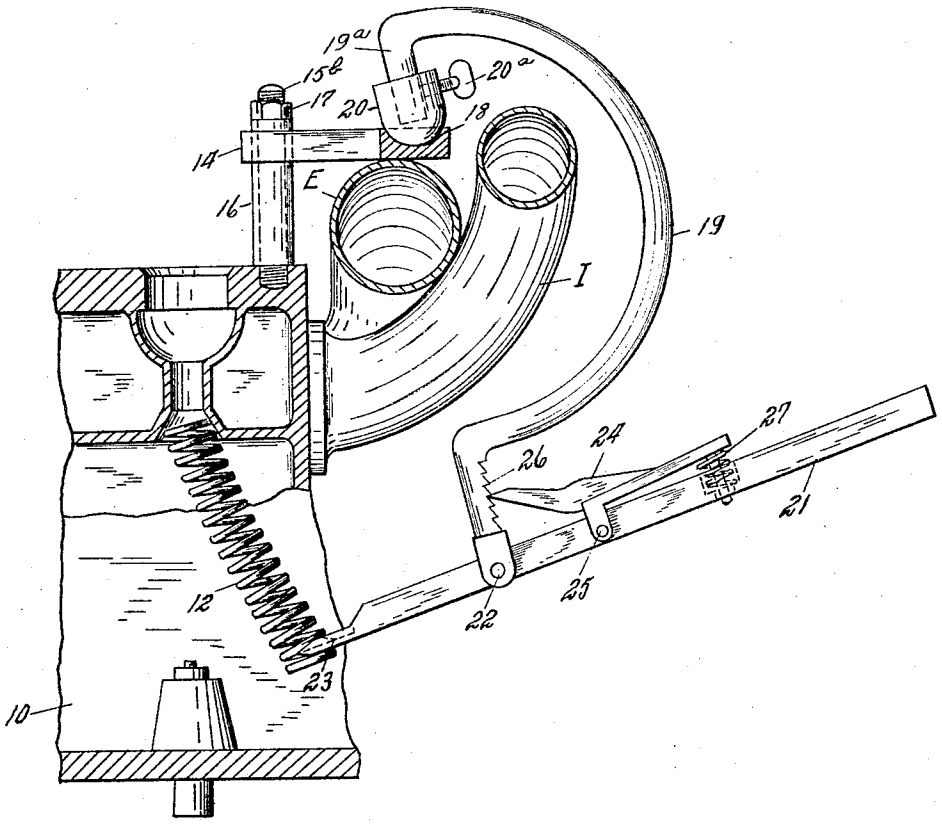


FIG. 3.

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UNITED STATES PATENT OFFICE

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VALVE SPRING LIFTER

Application filed September 13, 1930. Serial No. 481,655.

This invention relates to valve spring lifting tools for use in removing valves from internal combustion engines.

The general purpose of the invention is to improve upon this type of tool which heretofore have not been entirely satisfactory in use. More specifically, the invention has for its object the provision of a tool adapted to be mounted on the engine block with a depending supporting rod carrying a lever, the rod preferably having a universal connection with its mounting so that it can both rotate and swing thereon, and a lever pivoted on said rod and having a spring engaging element on one end and the other end providing a handle for operating the tool.

A further purpose of the invention is to provide a tool of the type described which may be mounted on the engine block and effectively used without dismantling the intake or exhaust manifolds.

A further purpose of the invention is to provide a tool construction of the type described including one member adapted to be seated on the engine and providing a plurality of supports on which the tool may be removably mounted to position it for quick removal or replacement of a plurality of valve springs.

A further purpose of the invention is to provide a tool of this type which may be latched to hold a valve spring compressed while a valve is disconnected and removed or while said valve is reinserted and connected.

The foregoing and other purposes or objects of the invention are attained in the tool shown in the accompanying drawings and described below. It is to be understood that the invention is not limited to the specific form thereof shown and described.

Of the accompanying drawings,

Figure 1 is a plan view of a portion of an engine block showing a tool embodying the invention in place thereon in position to remove a valve spring;

Figure 2 is a section on line 2—2 of Figure 1; and

Figure 3 is a view similar to Figure 2 showing the manner of actuating the tool to disengage the spring.

Referring to the drawings, the numeral 10 designates an engine block in which is a valve 11 controlled by a spring 12 normally supported at the bottom of the valve stem by means such as a flanged collar 13 retained thereon by a key 13^a.

The improved tool includes a bar 14 which may be adapted to extend along the engine over the exhaust manifold E and which is provided with inwardly projecting ends 14^a, 14^b apertured so as to be bolted to the engine block by head bolts 15^a, 15^b, the bar being supported by spacer sleeves such as 16 on said bolts preferably of such height that the bar may rest on the exhaust manifold E, the bar being secured by nuts 17.

Bar 14 is formed with a series of sockets 18, 18 in its upper face so spaced and arranged as to provide seats for positioning the spring lifter in operative relation to the various valve springs of the engine, these sockets preferably being spherical or equivalent shape to permit universal rocking of the tool on the bar.

A supporting rod 19 is provided for suspending the tool from the engine block, this rod being formed with a downwardly extending upper end 19^a on which is arranged a knob 20 formed with a bottom surface of spherical or equivalent shape to seat in sockets 18, this knob having a socket in the upper surface thereof for receiving the end 19^a of rod 19, the knob being secured to the rod in any suitable way as by means of a set screw 20^a. The rod 19 is curved outwardly and downwardly as shown to clear the exhaust manifold E and also the intake manifold I and has pivoted on its lower end as at 22 a lever 21, the rod 19 preferably being so shaped that pivot 22 is inwardly of the seats 18.

On its inner end lever 21 is provided with a suitable forked formation 23 to engage a spring about a valve stem, the outer end of the lever 21 being used as the tool operating handle. This lever may be arranged to be latched to hold the operating end 23 up to maintain a spring 12 compressed by means of a latch 24 pivoted at 25 on the handle of lever 21 and adapted to engage teeth 26

formed on the lower end of rod 19, latch 21 being urged into engagement with said teeth by a spring 27 and adapted to be depressed by hand against the action of said spring to release the same. This feature of the invention may be dispensed with if desired since it is quite easy with the present tool to hold the spring compressed by pressure of one hand on the tool.

In operation, the tool is so mounted that the fork 23 may be engaged in between the lower coils of spring 12 whereupon the handle 21 is depressed to compress spring 12 clearing the collar 13 and key 13^a for removal, the spring when the latch is used being held compressed by the latch 24 permitting the operator to use both hands in disconnecting the collar 13.

After the collar 13 has been removed, the valve 11 is removed and the tool is then moved on its support 14 as may be necessary to swing the lower end of the spring to one side of its seat whereupon compression on the spring is released and the handle 21 is raised so that the spring 12 drops out of its position in the engine.

It will be understood that in reinstalling the spring it is first arranged as shown in Figure 3 and the handle 21 depressed and the tool moved to return the spring to its position in Figure 2, the operator inserting and securing the valve and finally releasing compression on the spring.

It will be apparent from the foregoing that a simple, but effective tool has been provided for the purposes described. Obviously modifications of this invention may be resorted to without departing from the spirit thereof or the scope of the appended claims.

What is claimed is:—

1. A tool for use in removing engine valves comprising a supporting bar adapted to be mounted on top of the engine block, a rod adapted to be mounted on said bar so as to be suspended thereon to rotate and to swing, a lever pivoted on the lower end of said rod, said lever having a valve spring engaging member at one end and the other end providing an operating handle, a latch on said lever, a series of teeth arranged vertically of said rod, and yielding means whereby said latch is adapted to hold a valve spring compressed.

2. A tool for use in removing engine valves comprising a supporting bar adapted to be mounted on top of the engine block, a rod adapted to be mounted on said bar so as to be suspended thereon to rotate and to swing, a lever pivoted on the lower end of said rod, said lever having a valve spring engaging member at one end and the other end providing an operating handle, a latch on said lever, and a series of teeth arranged vertically of said rod with which said latch is adapted to engage to hold a valve spring compressed.

3. A tool for use in removing engine valves comprising a supporting bar adapted to be mounted on top of the engine block, a rod adapted to be mounted on said bar so as to be suspended thereon to rotate and to swing, a lever pivoted on the lower end of said rod, said lever having a valve spring engaging member at one end and the other end providing an operating handle, and latch means associated with said lever and rod.

4. A tool for use in removing engine valves comprising a supporting bar adapted to be mounted on top of the engine block, and a rod adapted to be mounted on said bar so as to be suspended thereon to rotate and to swing, a lever pivoted on the lower end of said rod, said lever having a valve spring engaging member at one end and the other end providing an operating handle.

5. A tool of the character described including means for fixedly mounting the tool on an engine block in non-obstructing relation to a valve head, a supporting rod depending from said means, and an operating lever pivoted on said rod, said lever having a work-engaging portion at one end and an operating handle at its other end.

6. A tool of the character described including means for mounting the tool on an engine block, a supporting rod depending from said means and angularly movable relatively thereof, an operating lever pivoted on said rod and having a work-engaging portion offset with relation to said tool mounting means, and latch means associated with said lever and rod to lock them in fixed relative positions.

7. The combination with a tool for the purpose described comprising a fixed support, a rod swiveled for universal movement on said support and a work-engaging lever pivoted on the rod, of releasable latch means associated with the lever and rod to hold the lever in a fixed angular position relative to said rod.

8. A tool for the purposes set forth comprising a bar adapted to extend along an engine block over the exhaust manifold, means for securing said bar to said engine block so as to rest on said manifold, said bar having a series of seats thereon, a rod having a knob thereon adapted to be removably seated in said seats to rock or rotate thereon, said rod being shaped to extend outwardly and downwardly about said exhaust manifold and the intake manifold of said engine, a valve spring lifting lever shiftably mounted on said rod, said rod being adapted to suspend said valve spring lifting lever from said bar in operative association with the valve springs of said engine.

9. A valve spring lifter comprising a support adapted to be mounted on an engine

block and having a plurality of seats thereon, a valve spring lifting tool, and means for suspending said tool from said support on any of said seats, said seats being arranged operatively to associate said tool with the various valve springs of the engine.

10. A valve spring lifter comprising a support having a plurality of seats thereon, a valve spring lifting tool, and means for suspending said tool from said support on any of said seats, said seats being arranged operatively to associate said tool with the various valve springs of the engine.

11. A valve spring lifter for use in removing valves without removing the manifold of an engine comprising supporting means fixedly secured to the engine block, and a rod swiveled on said supporting means for suspending the tool therefrom, said rod being of curvilinear form so as to clear said manifold.

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