T. SANDEFUR.

VALVE LIFTER.

APPLICATION FILED MAR. 3, 1920.

1,400,463. Patented Dec. 13, 1921.

Fig. 1.

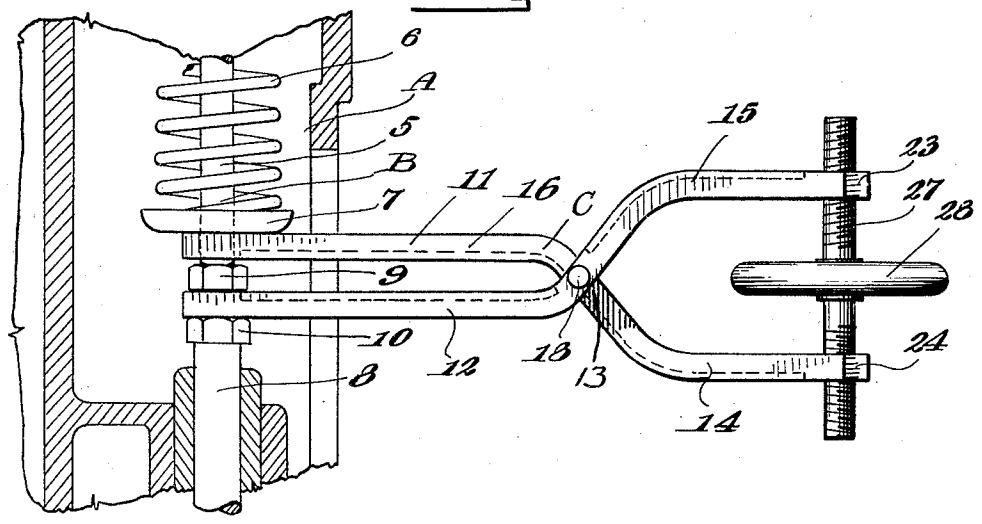


Fig. 2.

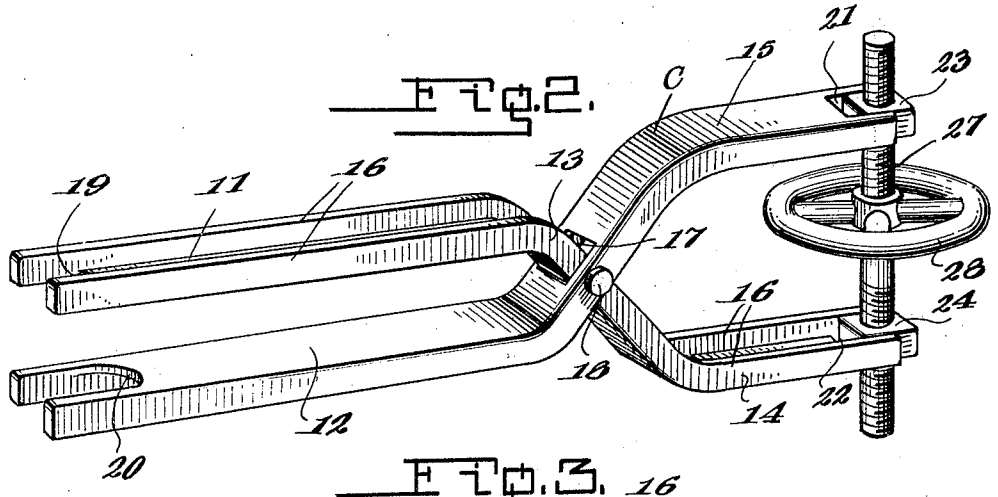
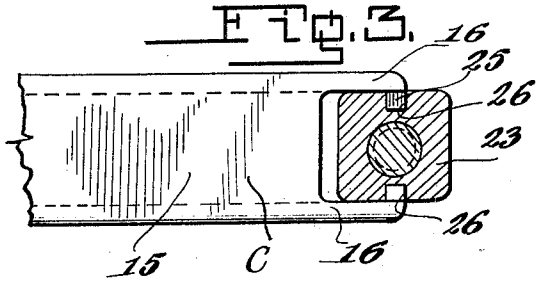


Fig. 3.



Inventor

Telford Sandefur

By Lancaster and Allwine

Attorneys

UNITED STATES PATENT OFFICE.

TELFORD SANDEFUR, OF ROANOKE, VIRGINIA.

VALVE-LIFTER.

1,400,463. Specification of Letters Patent. Patented Dec. 13, 1921.

Application filed March 3, 1920. Serial No. 362,396.

To all whom it may concern:

Be it known that I, TELFORD SANDEFUR, a citizen of the United States, residing at Roanoke, in the county of Roanoke and State of Virginia, have invented certain new and useful Improvements in Valve-Lifters, of which the following is a specification.

This invention relates to tools, and the primary object of the invention is to provide an improved tool for lifting and compressing the springs of the inlet and exhaust valves of an internal combustion engine so as to permit the convenient removal of the valves for repairs or for the regrinding of the valve seats.

Another object of the invention is to provide an improved valve spring compressor which can be adjusted and held in any adjusted position so as to permit the spring to be held in a compressed position while the valve and stem is being removed.

A further object of the invention is to provide a tool for compressing and lifting valve springs embodying a pair of jaws for engaging the valve spring and the valve lifting rod and an improved means for adjusting the jaws in relation to each other so as to permit the convenient and easy operation of the tool.

A further object of the invention is to provide an improved means for operatively connecting the adjusting mechanism to the handles or jaws, so as to permit the swinging of the handles or jaws in relation to the adjusting means.

A still further object of the invention is to provide an improved valve spring compressor and lifter of the above character, which is durable and efficient in use, one that is simple and easy to manufacture, and one which can be placed upon the market at a reasonable cost.

Other objects and advantages of the invention will appear in the following detailed description taken in connection with the drawings, forming a part of this specification, in which drawings:

Figure 1 is a side elevation of the improved valve spring compressor and lifter showing the same in operative position in relation to a valve stem and spring, a fragment of an internal combustion engine being shown.

Fig. 2 is a perspective view of the improved tool.

Fig. 3 is an enlarged fragmentary horizontal section through the tool illustrating the means for attaching the nut for receiving the adjusting rod to the operating handles.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A indicates the internal combustion engine of the ordinary or any preferred type or make and B the valve, and C the improved tool for lifting and compressing the valve spring.

The valve B includes the valve stem 5, which is normally held in a lowered position for holding the valve on its seat (not shown) by the compression spring 6, which is coiled around the stem 5. The lower end of the spring 6 rests on the cup shaped spring seat 7 which is slidably mounted on the valve stem in the ordinary manner and is held against displacement from off the lower end of the stem by any preferred means such as a pin or the like. The valve stem 5 is lifted in the ordinary manner by the usual valve stem rod 8 having the adjusting screw and nut, 9 and 10 arranged on the upper end thereof for adjusting the stroke of the rod.

The improved spring lifter and compressor includes the parallel arranged spaced shanks 11 and 12 which have their inner ends bent inwardly toward each other and crossed as at 13 and then brought outwardly and rearwardly in parallel relation to form the operating handles 14 and 15. The shanks 11 and 12 with the integral handles 14 and 15 are preferably formed of one piece of metal which is bent along spaced longitudinal lines to provide the outwardly extending edge flanges 16 which serve to reinforce the shanks 11 and 12 with their handles 14 and 15. By providing the shanks and handles with the oppositely extending side flanges 16 a substantially U-shaped configuration in cross section is obtained, and these side flanges not only form means for reinforcing and strengthening the shanks and handles but also form means for engaging the valve stem, spring seat and lifter rod.

The shank 11 and its handle 14 is formed relatively narrower than the shanks 12 and its handle 15 and the inwardly bent portion of the shank which connects the shank and handle 12 and 15 respectively is provided with an opening 17 which is adapted to receive the inwardly extending bent

connecting the shank 11 and the handle 14. The flanges 16 of the shanks are connected together at this point by a suitable pivot pin 18, as clearly shown in Fig. 2 of the drawings.

The outer terminals of the shanks 11 and 12 are provided with inwardly extending notches 19 and 20 and these notches are adapted respectively to receive the valve stem 5 and the lifting rod 8. The rear ends of the handles 14 and 15 are also provided with inwardly extending notches 21 and 22 in which are fitted the oppositely threaded nuts 23 and 24. The rear terminals of the flanges 16 of the handles 14 and 15 are provided with inwardly extending lugs 25 which are rotatably mounted in suitable oppositely disposed inwardly extending openings 26 formed in the opposite faces of the nuts 23 and 24. This permits the nuts 23 and 24 to turn in relation to the handles 14 and 15 and thus conform to all inclinations thereof. The oppositely threaded nuts 23 and 24 receive the oppositely threaded terminals of the rod 27, the central portion of which carries the adjusting hand wheel 28.

In operation of the improved tool, the forward end of the shank 12 is slid between the adjusting screw 9 and the nut 10 of the valve lifting rod 8, and the forward end of the shank 11 is pushed into engagement with the valve stem 5, and below the valve stem seat 7 which rests on the upper standards of the flanges 16. The hand wheel 28 is then rotated so as to bring the handles 14 and 15 toward each other which will move the outer ends of the shanks 11 and 12 in opposite directions and lift and compress the spring 6 which permits the easy removal of the pin or other fastening element for the valve stem and thus allow the valve and stem to be readily removed from the engine.

From the foregoing description, it can be seen that an improved type of valve lifter and spring compressor has been provided, which will effectively compress the spring and hold the spring in its contracted position during the removal of the valve from the engine.

Changes in details may be made without departing from the spirit or scope of my invention; but,

I claim:

1. A valve spring compressor comprising a pair of members substantially U-shaped in cross section have a body portion and side flanges, said members each including a shank, an offset handle portion, and an inclined connecting bight portion, means pivotally connecting the bight portions together, the outer ends of the shanks having the body portions thereof provided with notches for engaging the valve stems, and means adjustably connecting the handle portions of the members together for permitting the adjusting of the shanks toward or away from each other and the holding thereof in any preferred adjusted relation.

2. A valve spring compressor comprising a pair of members substantially U-shaped in cross section having a body portion and side strength flanges, each of said members including a shank portion, an offset handle portion, and an inclined connecting portion, one of the connecting portions being slotted to receive the connecting portion of the other member, a pivot pin extending through the side flanges of the members at the connecting portions thereof and adjacent to said slot, means formed on the outer ends of the shanks for engaging the valve stem, and means connecting the outer ends of the handles for permitting the shanks to be adjusted toward and away from each other.

3. A valve spring compressor comprising a pair of shanks arranged to engage respectively the spring seat of a valve structure and the lifting rod for the valve stem, means pivotally connecting the shanks together intermediate their ends, nuts pivotally carried by the rear ends of the shanks, and an oppositely threaded rod threaded into said nuts.

4. A valve lifter and spring compressor comprising a pair of shanks having their inner ends bent inwardly toward each other, handles formed on said bent ends, means for pivotally connecting the shanks together at the inwardly bent portions thereof, notches formed in the inner ends of the shanks, notches formed in the outer ends of the handles, nuts pivoted in said last mentioned notches, for swinging movement, the bores of the nuts being oppositely threaded, an oppositely threaded rod fitted in the nuts, and a hand wheel on said rod.

5. A spring compressor and valve lifter comprising a pair of relatively long shanks having handles formed on one end thereof, the shanks and handles being formed of sheet metal and having inwardly extending side flanges formed thereon, the terminals of the shanks and handles having notches formed therein, the notches formed in the handles being polygonal in plan, nuts fitted in said polygonal notches, the opposite faces of the nuts having openings formed therein, inwardly extending pivot lugs formed on the handles and fitted in said openings, the bores of the nuts being oppositely threaded, a rod having its terminals oppositely threaded and fitted into the bores of said nuts, and an operating hand wheel secured to said rod.

TELFORD SANDEFUR.