G. G. THAU.

VALVE LIFTER.

APPLICATION FILED JUNE 16, 1914.

Patented Mar. 9, 1915.

1,131,440.

2 SHEETS—SHEET 1.

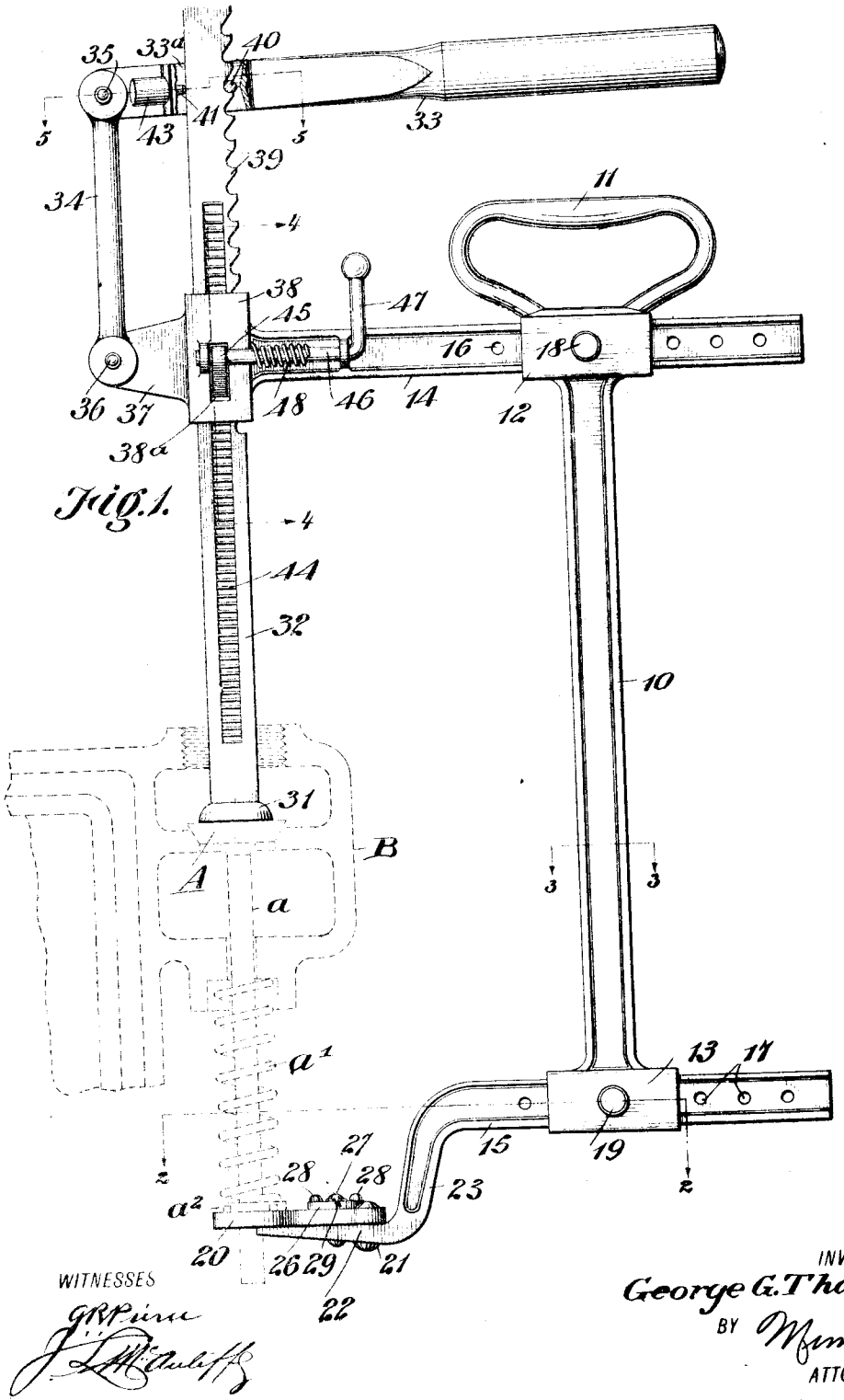


Fig. 1.

WITNESSES

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2 SHEETS—SHEET 2

Fig. 2.

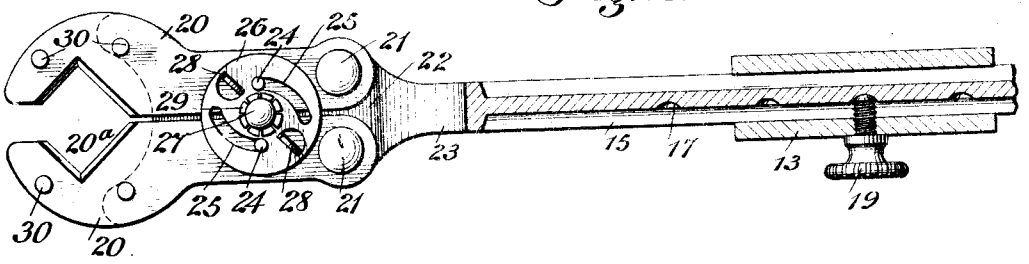


Fig. 3.

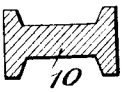


Fig. 4.

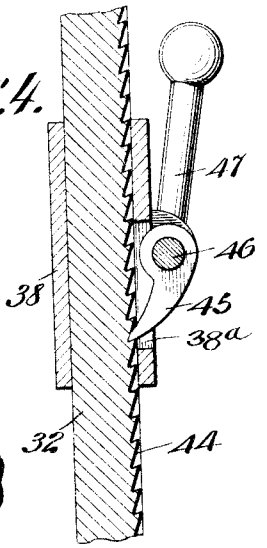
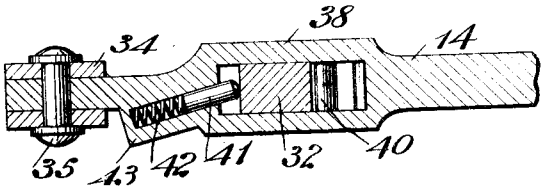


Fig. 5.



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GEORGE GUSTAVE THAU, OF EVART, MICHIGAN.

VALVE-LIFTER.

1,131,440. Specification of Letters Patent. Patented Mar. 9, 1915.

Application filed June 16, 1914. Serial No. 845,393.

To all whom it may concern:

Be it known that I, GEORGE G. THAU, a subject of the Emperor of Germany, and a resident of Evart, in the county of Osceola and State of Michigan, have invented a new and Improved Valve-Lifter, of which the following is a full, clear, and exact description.

My invention relates to a device for removing or replacing the valves of internal combustion engines, and generally termed a valve lifter.

An object of my invention is to provide a device capable of the necessary adjustments to suit different sized motors and different sized valves.

A further object of the invention is to provide a lever for effecting the clamping or gripping of the valve, and to provide on the frame of the device a handle so situated relatively to the lever, that one man alone using the device can so manipulate it as to remove or replace a valve from a dismantled cylinder without tipping over the latter.

The invention furthermore has for its object, to improve devices of the indicated character in various particulars, to the end that efficiency in operation may be promoted, as well as simplicity in construction and convenience of adjustment and control.

The invention will be particularly explained in the specific description following.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a valve lifter embodying my invention; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a detail cross section of the frame on the line 3—3 of Fig. 1; Fig. 4 is a detail vertical section on the line 4—4 of Fig. 1; and Fig. 5 is a detail horizontal section on the line 5—5 of Fig. 1.

In constructing a practical embodiment of the invention in accordance with the illustrated example, the frame 10 is provided, preferably consisting of a single I-bar, and the same is formed at the upper end with a handle 11. Adjacent to the handle 11 at the upper end of the frame 10, and adjacent to the lower end of said frame, transverse sleeves 12, 13, are formed respectively to slidably receive lateral arms 14, 15, equipped with valve-clamping means, as hereinafter described. To adjustably bind the arms 14, 15, in their respective sleeves, the latter are provided with set screws 18, 19, the ends of which are received in depressions 16, 17, in the said lateral arms.

The lower arm 15 is equipped with adjustable jaws 20 to engage different sized valve washers. The jaws 20 are each pivoted by rivets 21 or equivalent means to the depressed outer end 22 of the arm 15, said depressed end being connected with the arm by a downwardly-extending member 23. The jaws 20 are provided with pins 24, which are received in arcuate slots 25 in a disk 26 secured by a pivot pin or rivet 27 to the depressed end 22. A spring washer 29 beneath the head of the rivet 27 gives the necessary friction between the parts. The washer 29 may be turned by means of ears 28 or equivalent members thereon. The jaws 20 are provided with opposite angular recesses 20^a, and with pins 30 adjacent to the recesses. The recesses accommodate the rims of washers or collars on the valve stems, and with the pins 14, provision is made to center collars, even large ones, and prevent the slipping of the device on the valve.

I have indicated a valve A in dotted lines in Fig. 1 and a portion of a motor B, the letter a indicating the valve stem, a' the spring, and a^2 a washer or collar.

To engage the opposite end of the valve in gripping the same, a head 31 is provided on a vertically sliding presser bar or gripper bar 32, and is adapted to be operated by a lever 33 connected by a link 34 with the arm 14, said link being pivoted as at 35 to the lever 33, and at its opposite end as at 36 to a bracket 37 on said arm 14. The bar 32 has guided movement in a vertical sleeve 38 formed on the arm 14. Interengaging elements are provided on the bar 32 and lever 33, which preferably consist of teeth 39 on said bar, and a transverse pin 40 in a vertical opening 33^a of the lever. At the side of the opening 33^a opposite the pin 40, is a presser pin 41 under the influence of a compression spring 42, disposed in a housing 43 formed on the said lever, as best shown in Fig. 5. The arrangement is such that the pin 40 is normally held maintained in position to engage a tooth 39 of the bar 32, but the pin 41 will yield to an upward move-

ment of the lever to permit the pin 40 to slip over the teeth 39. On a face of the clamp bar 32, a vertical series of ratchet teeth 44 is provided, adapted to be engaged by a pawl 45 operating in a transverse opening 38ª in the sleeve 38, said pawl being carried on a rock shaft 46 provided with a crank handle 47, and the shaft being under the influence of a torsion spring 48 which normally tends to maintain the pawl in engagement with the rack 44, so as to hold the bar in the depressed position to which it has been moved by the lever 33.

By the lateral adjustment of the arms 14 the device may be made to conform to engines and motors of different sizes, and the different sized valves are accommodated by the described construction and arrangement of the gripping jaws 20 and their appurtenances.

Referring again to the handle 11, it is disposed beneath the lever 33, and by reason of this fact, one person using the device may so grip the handle 11 and lever, as to give complete control, and perform the necessary manipulations on a valve of a dismantled cylinder without liability of tipping over the latter.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:

1. In a device of the character described, a frame, a laterally disposed arm on the frame having means to engage valve parts near one end of a valve stem, a second laterally disposed arm spaced from the first arm, a presser bar movable in the second arm toward or from the said means carried by the first arm, to clamp a valve, and actuating means for said presser bar, said actuating means being mounted on the said second arm and having a member movable into engagement with said presser bar.

2. In a device of the character described, a frame, a laterally disposed arm on the frame having means to engage valve parts near one end of a valve stem, a second laterally disposed arm spaced a fixed distance above the first arm, a presser bar movable vertically in the second arm toward or from the said means carried by the first arm to clamp a valve, a lever, means connected with the said second arm and with the lever and forming a fulcrum for the lever, and interengaging elements on the lever and presser bar for actuating the latter.

3. In a device of the character described, a frame, upper and lower lateral arms thereon, valve-engaging means on the lower arm, a valve-clamping bar slidable in the upper arm toward or from the lower arm, a lever for actuating the said bar, and means connecting the lever with said upper arm, the lever and presser bar having interengaging means to actuate the said bar.

4. In a device of the character described a frame, upper and lower lateral arms thereon, valve-engaging means on the lower arm, a toothed valve-clamping bar slidable in the upper arm toward or from the lower arm, a lever for actuating the said bar, the lever having a member to engage the teeth of the bar, and a spring-pressed member on the lever bearing against the clamp bar at the side opposite the member engaging the teeth of the bar.

5. In a device of the character described, a frame, upper and lower lateral arms thereon, valve-engaging means on the lower arm, a valve-clamping bar slidable in the upper arm toward or from the lower arm, a lever, co-acting members on the lever and clamping-bar, to cause the lever to actuate the said bar, the said clamping bar having ratchet teeth, and a pawl on the upper arm engaging said ratchet teeth, to hold the said bar in the position to which it has been advanced by the lever.

6. In a device of the character described, a frame, upper and lower lateral arms thereon, valve-engaging means on the lower arm, a valve-clamping bar slidable in the upper arm toward or from the lower arm and formed with ratchet teeth, means for actuating said bar, a pawl engaging the ratchet teeth, a rock shaft on the upper arm carrying the said pawl, and a torsion spring on the said shaft normally tending to hold the pawl in engagement with the ratchet bar.

7. In a device of the character described, a frame, upper and lower lateral arms, means on the upper arm adapted to engage a valve, jaws pivoted on the lower arm to move toward or from each other, and means whereby the relative positions of the said jaws may be adjusted.

8. In a device of the character described, a frame, upper and lower lateral arms on said frame, a bar slidable in the upper arm adapted to engage a valve at one end, and jaws on the lower arm pivoted to move toward or from each other.

9. In a device of the character described, a frame having upper and lower lateral arms, means carried by the upper arm to engage the valve at one end, pivoted jaws on the lower arm, a disk turnable on the lower arm, and co-acting elements on the said jaws and disk to close or open the jaws by a turning movement of the said disk.

10. In a device of the character described, a frame having upper and lower lateral arms, means on the upper arm to engage one end of a valve, jaws on the lower arm pivoted to move toward and from each other, means whereby said jaws may be adjusted toward and from each other, and pins on the upper side of the jaws, near the ends.

11. In a device of the character described,

a frame having upper and lower arms spaced on the frame a fixed distance apart, means on the lower arm to engage a valve near one end, a vertically reciprocating bar slidable in the upper arm to engage the opposite end of the valve, a lever, means connecting the said lever with the upper arm, the lever being disposed above the said upper arm, interengaging means between the presser bar and lever and a handle on the frame beneath the said lever.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE GUSTAVE THAU.

Witnesses:

WILLIAM F. UMPHREY,

F. B. HOISINGTON.