J. E. GAYLORD.

VALVE LIFTER FOR EXPLOSIVE ENGINES.

APPLICATION FILED JULY 17, 1908.

908,556.

Patented Jan. 5, 1909.

Fig. 1.

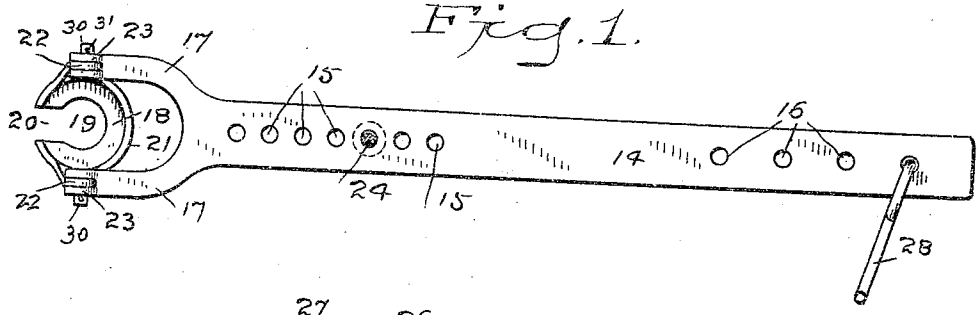


Fig. 2.

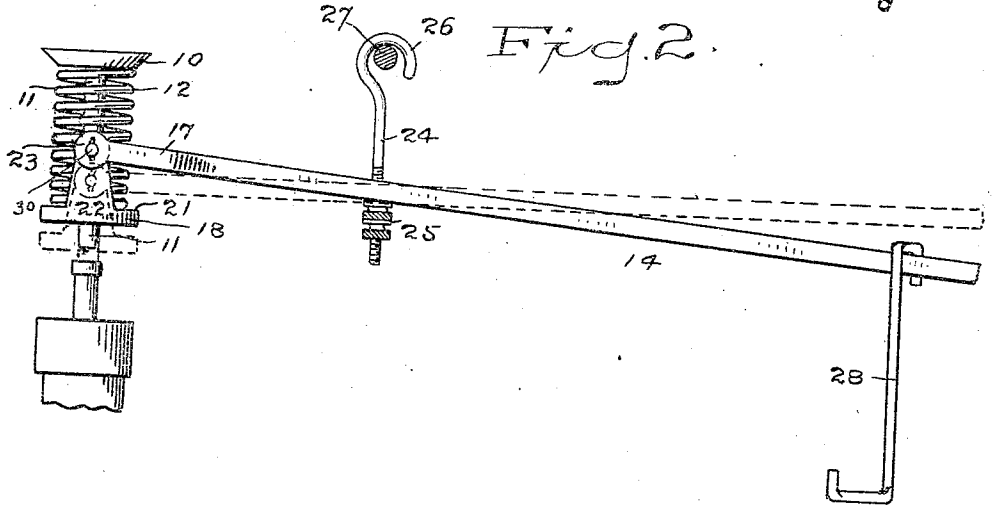


Fig. 3

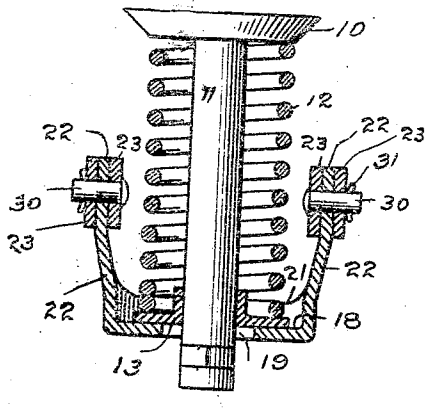
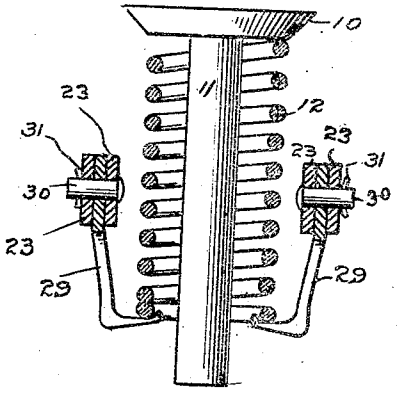


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

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VALVE-LIFTER FOR EXPLOSIVE-ENGINES.

No. 908,556. Specification of Letters Patent. Patented Jan. 5, 1909.

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To all whom it may concern:

Be it known that I, JARED E. GAYLORD, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented a new and useful Valve-Lifter for Explosive-Engines, of which the following is a specification.

This invention has for its object to provide an inexpensive and easily operated tool for lifting the valves of explosive engines.

It is of course well understood by those familiar with this type of engines that the springs which retain the valves seated act with considerable power, and furthermore that it is frequently necessary to raise the valves. This is especially true with automobile engines. Heretofore, so far as I am aware, no special tool or implement has been provided that would lift these valves easily and retain them lifted. On the other hand, it is a common practice to pry these valves up with various tools ill adapted to the purpose and liable to slip and with great danger of injuring the hands of the operator.

My present invention is provided with the necessary adjustments to adapt it for use upon different engines and to lift a valve against the power of any spring likely to be used and without the slightest danger of the operator bruising his hands or injuring them in any way.

With these objects in view I have devised the simple and novel valve lifting tool, of which the following description in connection with the accompanying drawing is a specification, reference characters being used to indicate the several parts.

Figure 1 is a plan view of my novel tool, the fulcrum rod being in section; Fig. 2 a side elevation illustrating the operation of my novel tool in lifting a valve; Fig. 3 a detail view partly in section and on an enlarged scale, showing the manner in which the bearing washer under a spring is engaged; and Fig. 4 is a similar view illustrating a variant form of the invention which may be used, if preferred, when the spring does not bear upon a washer.

10 denotes a valve of the type ordinarily used in explosive engines, 11 the valve rod, 12 the spring and 13 a washer upon which the spring bears and which slides over the valve rod.

My novel tool comprises a shank, indicated by 14, which may be a flat bar of metal and is provided near its forward end with a series of holes, indicated by 15, and at its rear end with other holes, indicated by 16. At the forward end of the shank is a yoke 17 to which the lifting cup 18 is pivoted. The bottom of the cup is provided with an opening 19 and a slot 20 leading into said opening which receives the valve stem freely. A flange 21 surrounds the edge of the cup and prevents the washer or base of the spring from slipping out when pressure is applied to raise a valve.

In order that the cup may be self-adjusting to the plane of the washer or base of the spring, I provide arms 22 on opposite sides of the central opening, the upper ends of said arms being pivoted to ears 23 on the arms of the yoke.

24 denotes the fulcrum rod which is threaded at its lower end to receive a fulcrum nut or nuts 25 and is provided at its upper end with a hook 26 which is adapted to engage a bar 27 which may be a fixed part of the machine or may be a rod supported by fixed parts of the machine. The fulcrum rod passes freely through either of the holes 15 and may be readily shifted from one hole to another to change the fulcrum by dropping it down and swinging it over, the hook passing readily into or out of either of the holes. The nuts upon the threaded end of the fulcrum rod need not be removed in shifting the rod and give ample adjustment as to height of the fulcrum.

28 denotes a retaining hook which may or may not be used to hold down the outer end of the shank when it is desirous to hold a valve raised as in full lines in Fig. 2, the hook being engaged with any fixed portion of the engine or the machine.

29 (see Fig. 4) denotes lifting hooks which are pivoted to the ears upon the yoke and may be used instead of the lifting cup if found more convenient, for example, when no bearing washer is used. Under ordinary conditions, however, I have found the lifting cup most convenient. Either the lifting hooks or the arms of the lifting cup are secured between ears 23 on yoke 17 by means of headed pins 30 which are retained in place by cotter pins 31.

The operation of my novel tool in lifting a valve will be readily understood from Fig. 2. If a bearing washer is not used under the spring, hooks 29 may be used as in Fig. 4. If a bearing washer is used, the lifting cup will be found most convenient, in fact I pref-

erably use it under all conditions as it does away with all danger of the operator's bruising his hands. The special manner in which the tool is applied is unimportant. The operator may first place the lifting cup, or the hooks as preferred, (see Figs. 3 and 4), under the spring and may then adjust the fulcrum rod and the fulcrum, or he may first place the fulcrum rod in position as in Fig. 2 and then place the lifting cup or hooks under the spring. It will be noted that the lifting cup and hooks both swing on the yoke so that the lifting pressure applied to the spring is always vertical, that the fulcrum rod may be adjusted on the shank without removing the nuts by simply passing the hook through either of the holes 15, thereby enabling the operator to place the fulcrum wherever may be most convenient, and furthermore that the height of the fulcrum may be adjusted to suit the requirements of use by simply turning the nut or nuts up or down on the fulcrum rod. Having adjusted the tool in the manner described and placed the lifting cup or lifting hooks under the spring, the spring is lifted by pressure applied to the rear end of the shank, as indicated in Fig. 2. Having raised the spring it may be locked in the raised position by the use of retaining hook 28.

Having thus described my invention I claim:

1. A tool of the character described comprising a flat shank having a series of holes, a flanged swinging cup depending from one end of said shank, and a fulcrum rod having a hook and adapted to be passed through either one of the holes in said shank.

2. A tool of the character described comprising a flat shank having a series of holes and formed as a yoke at one end, the arms of said yoke having ears, a flanged swinging cup pivotally connected with said ears, and a fulcrum rod having a hook and adapted to be passed through either of the holes in said shank.

3. A tool of the character described, comprising a lifting cup having an opening to receive a valve rod, a slot leading into said opening and a flange surrounding its edge, a shank to which the lifting cup is pivoted and a fulcrum rod adjustably connected to the shank.

4. A tool of the character described, comprising a flanged lifting cup which is adapted to receive and retain the lower end of a spring, is provided with a slotted opening to receive a valve rod and with upwardly extending arms, a shank having a yoke to which the arms are pivoted, permitting the cup to swing freely, and a fulcrum rod adjustably connected to the shank.

5. A tool of the character described, comprising means for engaging and supporting a spring, a shank to which the supporting means is pivoted and which is provided with two series of holes, a fulcrum rod having a hook adapted to be passed through either of the holes in one series and having a fulcrum nut, and a retaining hook for holding a valve in the raised position, which is adapted to engage either of the holes in the other series.

In testimony whereof I affix my signature, in presence of two witnesses.

JARED E. GAYLORD.

Witnesses:
S. W. ATHERTON,
L. E. DISBROW.