

J. J. COOPER.  
 IMPLEMENT FOR AUTOMOBILE ENGINES.  
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1,018,236.

Patented Feb. 20, 1912.

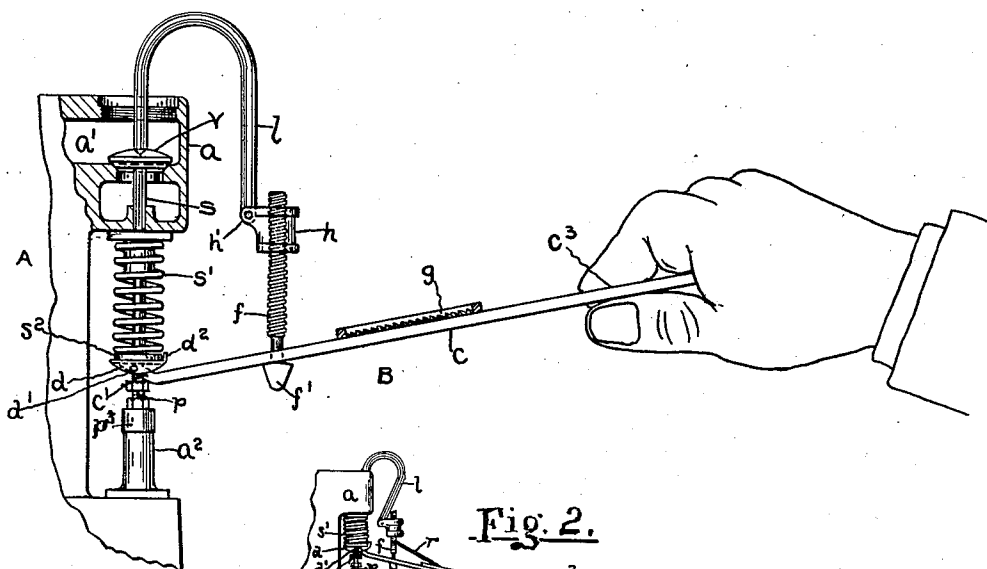


Fig. 1.

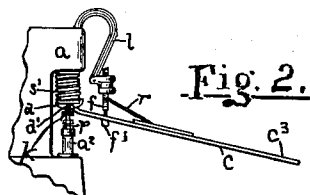


Fig. 2.

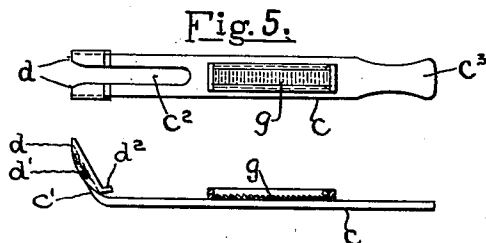


Fig. 3.

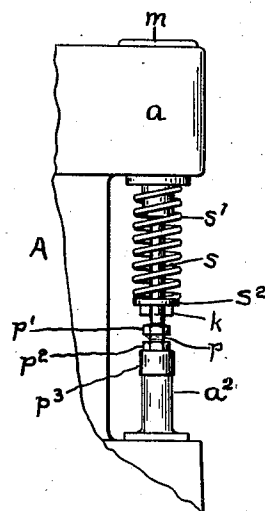


Fig. 4.

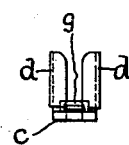


Fig. 5.

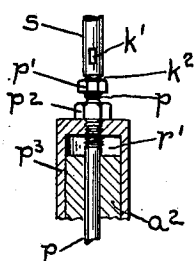


Fig. 6.

WITNESSES.  
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# UNITED STATES PATENT OFFICE.

JOHN J. COOPER, OF PROVIDENCE, RHODE ISLAND.

IMPLEMENT FOR AUTOMOBILE-ENGINES.

1,018,236.

Specification of Letters Patent.

Patented Feb. 20, 1912.

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*To all whom it may concern:*

Be it known that I, JOHN J. COOPER, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Implements for Automobile-Engines, of which the following is a specification.

My invention relates to portable accessories or implements for engines of motor-cars and kindred engines, and it consists in the novel construction of parts, all as more fully hereinafter set forth and claimed.

In motor engines, but more especially engines of the internal combustion type, wherein the valves are automatically closed by the force of comparatively stiff, helically coiled springs, it becomes necessary at times to temporarily remove said valve or valves from their seats for the purpose of inspection, reseating, repairs, &c., but owing to the normal downward pressure or force exerted by the spring upon the valve, the latter's removal is rendered practically impossible, or at least difficult unless the spring-pressure is first relieved therefrom.

The object I have in view is to provide a simple, cheap and thoroughly efficient tool or instrument adapted to be easily and quickly applied to the temporarily stopped engine, and so that, upon manipulating the tool, the closing action of the spring upon the valve is thereby withdrawn from it, thus obviously permitting and greatly facilitating the valve's removal, as well as its normal replacement after the repairs have been completed; the tool itself being subsequently removed from the engine.

In the accompanying sheet of drawings, Figure 1 represents, in side elevation, the manner of applying the device or tool embodying my improvement, preliminary to removing the valve portion of the engine, the valve-chest, being in section; Fig. 2 is a similar view, in reduced scale, showing the tool in action, the spring pressure being released from the valve, so that upon removing the valve-stem pin and tool, the valve itself may be readily taken out; Fig. 3 is a partial side view of the normal engine before applying the tool; Fig. 4 is a side view of the lever member of the tool in reduced scale; Fig. 5 is a corresponding top plan view of it; Fig. 6 is an end view; and Fig. 7 is an enlarged detail vertical sectional view of a portion of the engine.

The following is a description of my improved engine implement or tool and including the manner of its application and operation:—I would first state, however, that A indicates a portion of a motor-car engine having an extension *a* forming the walls of a valve-chest *a*<sup>1</sup> in which (separated by a partition) the usual inlet and release valves, as *v*, are seated; said valves each having a relatively long stem *s* extending downward therefrom through the bottom wall of part *a* and terminating in a loose collar or washer *s*<sup>2</sup> superimposed upon a removable transverse pin or key *k* passing through an opening *k*<sup>1</sup> of the stem. The lower end *k*<sup>2</sup> of each valve-stem is in normal frictional engagement with the head *p*<sup>1</sup> of an intermittently movable vertical screw-threaded rod *p*, screwed into a cap member *p*<sup>3</sup>, surrounding the upper end of a stationary stand *a*<sup>2</sup>, and forming therewith a compression chamber *r*<sup>1</sup>. The rod is adapted to be accurately adjusted with relation to the lower end of the valve-stem. The valve is self-closing through the medium of the helically coiled spring *s*<sup>1</sup> interposed between and bearing against the underside of said extension *a* and the upper face of said collar *s*<sup>2</sup>, all as usual. It may be stated that the construction, mounting and means for operating the intake and release valves are practically the same for both valves. The forked or bent end *c*<sup>1</sup> of the lever *c* of the tool forming the subject of my invention is adapted to be inserted under the spring-pressed collar *s*<sup>2</sup>, for sliding the collar upward to relieve the pressure of the spring from the key *k*. The lever *c* is longitudinally slotted or forked, as at *c*<sup>2</sup>, at one end and has a handle form *c*<sup>3</sup> at the other. Its forked part is upturned at an obtuse angle and provided with tilting shoes *d* pivoted at *d*<sup>1</sup> to its inner end. These shoes, when in use, are self-leveling and are adapted to bear evenly against the underside of said collar when the corresponding end of the lever is moved upward. The lugs or upturned inner edges *d*<sup>2</sup> of the shoes are adapted to engage the rim of the collar, thus preventing the lever from moving too far forward. The upper side of the lever is provided with a series of suitable notches or teeth *g*; these may be ratchet-shaped, if desired. Coöperating with the lever *c* is the screw-threaded rod *f* reduced in diameter at its lower end to freely slide in the slot *c*<sup>2</sup>

and terminating in the enlarged head  $f^1$ , the latter forming a fulcrum. To this rod is movably fitted a nut  $h$  having a lateral extension to which is jointed at  $h^1$ , the U-shaped connection  $l$  having the lower end of its free arm adapted, when in use, to bear against the seated valve  $v$ , first removing the screw-cap  $m$  from the top of the valve-chest.

10 Fig. 1 represents the normal application of the device immediately preceding the application of manual downward pressure upon the lever; and Fig. 2 represents the same when the spring  $s^1$  has been further  
15 compressed by the lever to temporarily relieve the downward pressure from the key  $k$  so that the latter may be withdrawn in order to remove the valve from the engine. In some cases the withdrawal of the key is  
20 attended with considerable difficulty, owing to wedge action, &c., or even in case a cotter-pin is used. In such event and in order to effect its removal a brace member  $r$  may be interposed between the notches  $g$  and the  
25 thread or nut—see Fig. 2—thereby locking it in position and enabling the operator to release his hand from the lever so as to use both hands in removing the member  $k$  from the valve-stem. After the key's removal the  
30 device may be detached from the engine, thereby permitting the spring and collar to move downward until arrested by the head of the member  $P$ , and also permitting the valve and its stem to be readily with-  
35 drawn. Upon again replacing the latter, the tool is then reapplied, as before described, and the spring compressed until the key-way  $k^1$  is exposed below it, followed by reinserting the key therein; after which the  
40 tool is detached or disconnected and the cap or bonnet  $m$  of the valve-chest secured in place.

It may be further stated that the drawing shows the implement adapted and adjusted  
45 to one type or style of engine. It is apparent that without departing from the invention the tool may be arranged for use in connection with other motor-engines having spring-closing valves, the nut  $h$  then ob-  
50 viously being correspondingly adjusted on

the screw  $f$ . In any event the head  $f^1$ , when in use, forms a movable fulcrum for the lever  $c$ .

I claim as my invention:—

1. In a portable device or tool of the gen- 55  
eral character described, the combination of a manually controlled operating lever member having one end bifurcated and adapted, when in use, to engage with and compress the spring of a self-closing valve, a suitable 60  
fulcrum screw adjustably engageable with said forked or bifurcated end of the lever, a nut mounted to move longitudinally on said screw, and a bent hook-shaped rod having one end thereof hinged to said nut and the 65  
other or free end adapted to engage the valve of an engine when the valve-bonnet or cap is removed.

2. The combination with an operating lever of the character described, having a 70  
plurality of spaced notches on its face therein, of a screw adapted to movably engage and be actuated by said lever, a nut mounted to move endwise on the screw, a bent rod having one end jointed to said nut, and a 75  
strut or brace arranged, when in use, to engage the screw-threaded element and said notches.

3. In a portable tool or device of the gen- 80  
eral character described, the combination with an operating-lever having its inner end portion forked and bent at an obtuse angle, of a shoe member pivoted to each arm of said forked part of the lever.

4. In a portable tool or device of the gen- 85  
eral character described, the combination with an operating-lever having its inner end portion forked and bent at an obtuse angle, of a pair of oppositely disposed shoe members pivoted to the said forked portion of 90  
the lever, and having the heel or rear edge of each shoe upturned, for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOHN J. COOPER.

Witnesses:

GEO. H. REMINGTON,  
CALVIN H. BROWN.