G. H. RYAN.

VALVE REMOVER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JUNE 29, 1915.

1,198,281. Patented Sept. 12, 1916.

FIG. 1

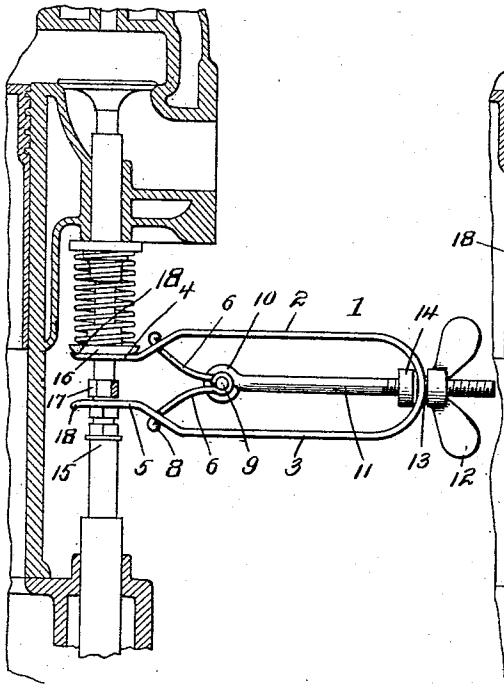


FIG. 2

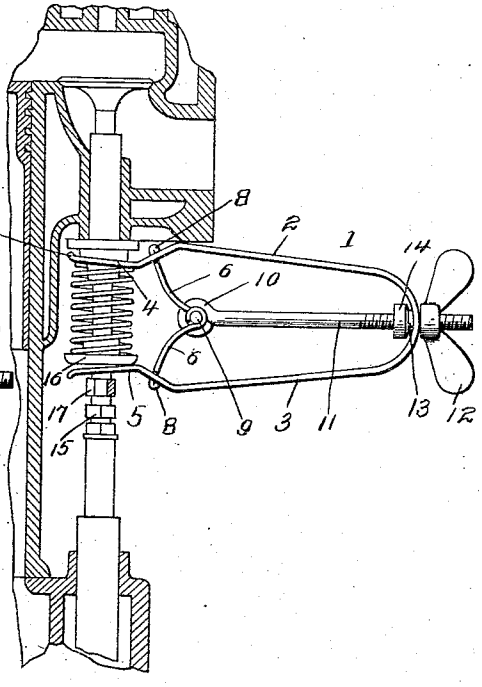
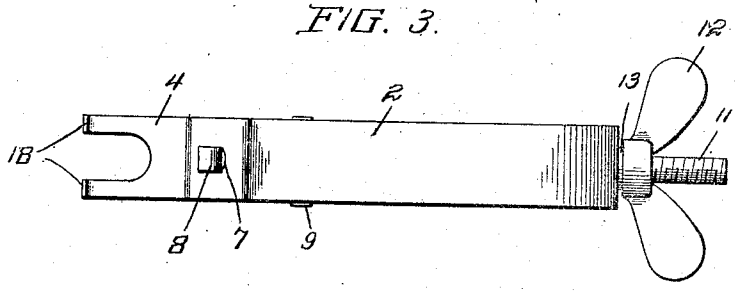


FIG. 3.



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Witnesses

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UNITED STATES PATENT OFFICE.

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VALVE-REMOVER FOR INTERNAL-COMBUSTION ENGINES.

1,198,281. Specification of Letters Patent. Patented Sept. 12, 1916.

Application filed June 29, 1915. Serial No. 37,041.

To all whom it may concern:

Be it known that I, GLEN H. RYAN, a citizen of the United States, residing at Pacific Grove, in the county of Monterey and State of California, have invented new and useful Improvements in Valve-Removers for Internal-Combustion Engines, of which the following is a specification.

This invention relates to valve removers for hydrocarbon or internal combustion engines and one of the principal objects of the invention is to improve upon the type of structure now in use and illustrated in the Kraemer Patent No. 1,035,974, of August 20, 1912, and to provide a device which may be either utilized to cause the approach of the ends of the valve spring and in this manner compress the same or raise the lower end of the valve spring from the retaining pin by applying the device between the push rod or valve lifter and the lower end of the spring.

A further object of the invention is to provide a valve remover which is simple in construction, inexpensive, conveniently and positively operated in both directions and which is arranged to hold the spring in compressed position.

Further objects of the invention will appear as the following specific description is read in connection with the accompanying drawing which forms a part of this application, and in which:—

Figure 1 is a sectional view through an internal combustion engine showing the application of the device in one method of compressing the valve spring. Fig. 2 is a similar view showing a second method of compressing the spring. Fig. 3 is a top plan view of the device.

Referring more particularly to the drawing, 1 represents the body of the device which is made substantially U-shaped and of spring metal, the legs of which are indicated at 2 and 3 and terminate in inwardly off-set bifurcated ends 4 and 5. At the offsets in the legs, the same are joined together by a toggle lever 6 whose terminals are pivotally connected to the legs by being passed through apertures 7 therein and bent back upon themselves to form enlarged heads 8.

Connected to the pivot bolt 9 of the toggle lever is an eye 10 formed on the inner end of an actuating rod 11 which is threaded at its outer end and passed through an aperture in the connecting portion of the body between the legs thereof. Screwed upon the threaded portion of the rod 10 is a thumb nut 12 having an extension sleeve 13 journaled in the aperture in the connecting portion and having secured upon its inner end an enlarged collar 14 which makes the thumb nut non-displaceable but permits of its free rotation within the connecting portion. It will be seen, therefore, that by rotating the thumb nut in the proper direction, that the bifurcated ends of the legs will be positively actuated in either direction, thereby making it possible to force the ends of the valve spring toward each other for compressing the same or applying the device as shown in Fig. 1 where one leg is raised upon the valve lifter or push rod 15 and the opposite leg engaged beneath the spring cup 16 so as to elevate the lower end of the spring above the limiting pin 17. The bifurcated ends may be made plain, but preferably having off-set tips 18. These tips prevent accidental displacement of the remover when used as shown in Fig. 1.

It is believed that from the foregoing, the operation of the device will be clearly understood without further description.

What is claimed is:—

A valve remover comprising a spring body formed from a single piece of material and of U-shaped formation and having the medial portion thereof formed with an opening, the terminals of the body being offset toward each other and having the ends thereof bifurcated, links pivotally connected to the offset portions and to each other, a threaded rod having one end pivotally connected to the connected ends of the links and extending longitudinally of the body and the other end passing through the opening in said body, a thumb-nut threadedly mounted upon the last named end of the rod, and an extension formed on said nut and surrounding said rod and passing through the opening in said body, and a collar formed on the free end of said extension whereby displacement of said nut will be prevented.

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

GLEN H. RYAN.

Witnesses:
J. M. STOW,
J. O. LEEK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."