

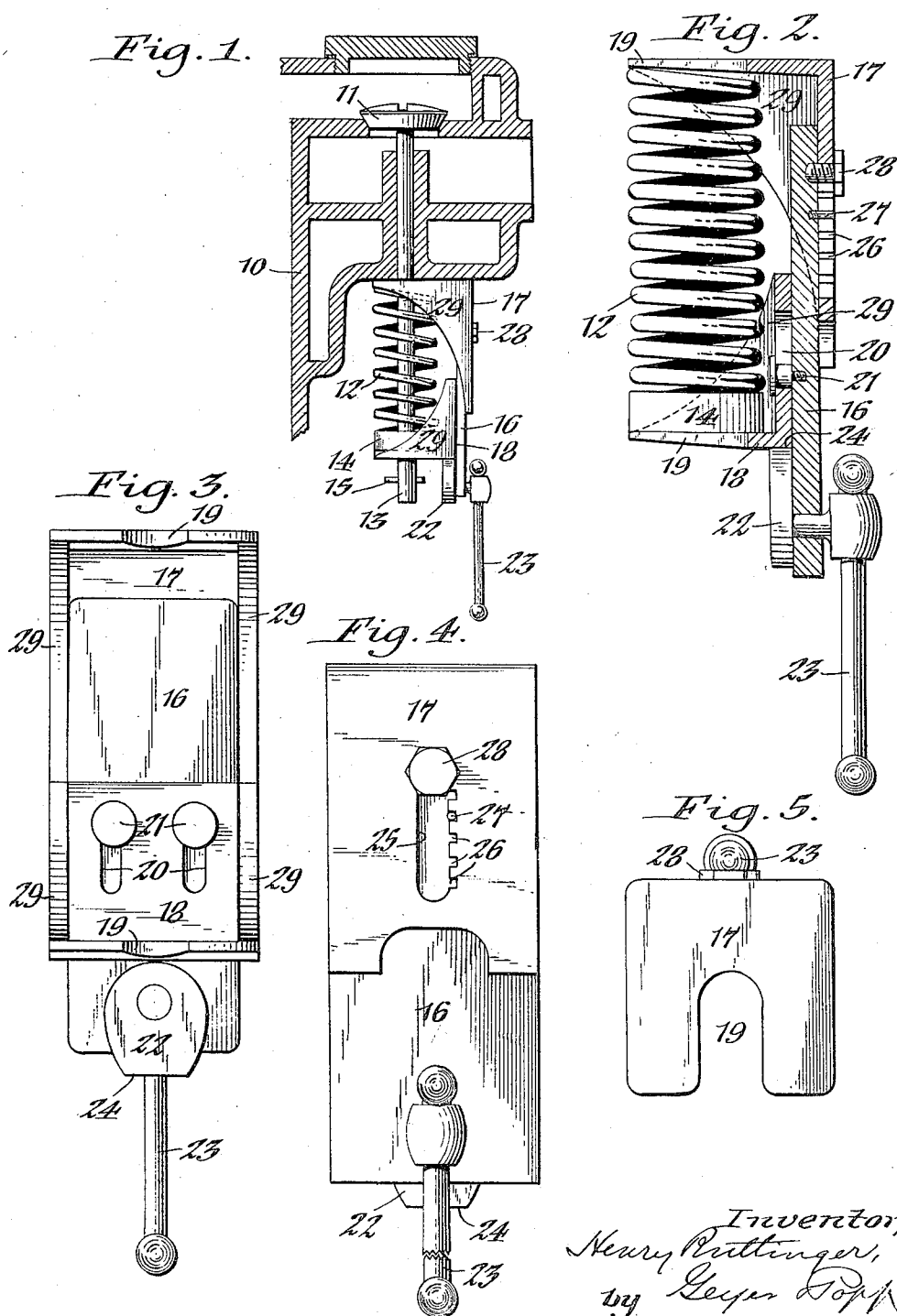
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VALVE REMOVER

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VALVE REMOVER.

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To all whom it may concern:

Be it known that I, HENRY RUTTINGER, a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Valve Removers, of which the following is a specification.

This invention relates to a tool which is more particularly adapted for facilitating the application and removal of the valves of internal combustion engines.

One of its objects is to produce a simple and efficient tool of this character which is compact in construction so as to render it capable of use within a small compass without liability of its interference with the surrounding parts of the motor.

A further object is to so construct the tool that it not only affords a means for compressing the valve spring to effect the removal of the valve, but it also constitutes a holder for said spring after the valve has been removed.

In the accompanying drawings:

Figure 1 is a side elevation of the improved tool showing the same in its operative position, the engine being shown in section. Figure 2 is an enlarged vertical section thereof detached from the engine and supporting the valve spring. Figure 3 is a front view of the tool. Figure 4 is a rear view thereof. Figure 5 is a top plan view of the same.

Similar characters of reference refer to like parts throughout the several views.

In the drawings, the tool is shown in connection with an internal combustion engine 10 having the usual inlet or exhaust valve 11, the spring 12 applied to the valve stem 13 and tending to resist opening of said valve, the washer 14 in which the lower end of the spring is seated, and the cotter pin or key 15 for holding said washer in position.

Referring now to the construction of the tool itself, the same comprises a body section or supporting member 16 and a pair of opposing upper and lower jaw sections 17, 18, mounted on the opposite ends of said body section and adapted to receive the valve spring 12 between them, as shown in Figs. 1 and 2. These jaw sections are substantially L-shaped in cross section and their horizontal portions are bifurcated as shown at 19, for the purpose of straddling or embracing the valve stem 13. The upper jaw

section 17 is normally fixed while the companion lower jaw section 18 is movable toward and from said upper section to compress and expand the valve spring during the removal and application of the valves. Said movable jaw is preferably mounted on the front side of the supporting member 16 and its vertical portion is provided with a pair of vertical slots 20 for receiving the guide studs 21 carried by said member. A cam 22 is journaled in the lower end of the latter for actuating the movable jaw section and is provided with a suitable handle 23 for manipulating it. The salient portion of the cam is provided with a flat face 24 for reliably holding its co-operating jaw section in its fully elevated position.

To adapt the tool to valve springs of different lengths, the fixed jaw section 17 is adjustable lengthwise on the supporting member 16 toward and from the movable jaw section. For this purpose, said jaw section is preferably mounted on the rear side of said supporting member and its vertical portion is provided centrally thereof with a longitudinal slot 25 having a row of notches 26 in one of its side edges. A pin 27 projecting from the supporting member into this slot is adapted to interlock with one or another of said notches for holding the co-operating jaw section in a correspondingly adjusted position. A clamping screw 28 passing through the slot 25 serves to reliably hold said fixed jaw section in a set position on the supporting member.

In order to prevent the valve spring 12 from slipping laterally from the position it assumes when held by the tool, as shown in Fig. 2, the companion jaw sections are provided with side walls or wings 29.

In the use of this device, when it is desired to remove one of the engine valves for grinding or cleaning, the same is placed over the valve stem 13 with the upper jaw section 17 inserted between the upper end of the valve spring 12 and the opposing portion of the engine, while the lower jaw section 18 is arranged beneath the spring washer 14. The cam 22 is then turned through the medium of its handle 23 to elevate the lower jaw section so as to compress the valve spring and move its washer above and out of contact with the cotter pin 15, as shown in Fig. 1. The operator can now withdraw said cotter pin which permits the ready removal of the valve from the engine,

the valve spring together with its washer being held intact by the tool which now forms a holder for these parts and which can be laid to one side until it is desired to replace the valve.

When the valve is ready for insertion, the tool together with the valve spring and washer, is placed in the position shown in Fig. 1, after which the valve is applied with its stem extending through said spring and said washer in position to again receive the cotter pin. The cam is then turned to its original position, allowing the valve spring to expand and forcing its washer into engagement with said cotter pin. Upon the completion of this operation, the tool is removed by simply forcing it outwardly from engagement with the valve stem.

As a whole this improved valve remover is manifestly simple in construction, being composed of few parts which enables it to be manufactured at a moderate cost.

I claim as my invention:

1. A valve remover of the character described, comprising a support, jaw sections mounted at opposite ends of said support and having alining bifurcations arranged to engage the valve stem, one of said jaw sections being movable toward and from the other, and means mounted on said support for actuating the movable jaw section, said actuating means being located at that end of the support containing said movable jaw section and approximately within the dimensional area thereof.

2. A valve remover of the character described, comprising a support, jaw sections mounted at opposite ends of said support and having alining bifurcations arranged to engage the valve stem and to support the valve spring therebetween, one of said jaw sections being fixed and adjustably mounted at one end of said support and the other section being mounted at the other end thereof and movable toward and from said fixed jaw section, and a cam journaled at that end of the support containing said movable jaw section and arranged directly beneath the latter.

3. A valve remover of the character described, comprising a supporting member, a pair of substantially L-shaped jaw sec-

tions mounted at opposite ends and on opposite sides of said member, one of said jaw sections being movable toward and from the other, the horizontal portions of both jaw sections having bifurcations arranged to engage the valve stem and to support the valve spring therebetween, and means for actuating said movable jaw section, a part of said actuating means being disposed beneath the latter.

4. A valve remover of the character described, comprising a supporting member having a guide pin projecting therefrom, a fixed jaw section mounted at one end of said member, a movable jaw section mounted at the other end thereof and having a slot engaging said guide pin, said jaw sections having bifurcations arranged to engage the valve stem, and means for actuating said movable jaw section.

5. A valve remover of the character described, comprising a supporting member having a locking pin projecting therefrom, a fixed jaw section adjustably mounted at one end of said member and having a slot, one side of said slot having a row of notches arranged to engage said locking pin, a clamping screw for holding said jaw section in adjusted position, a movable jaw section mounted at the other end of said supporting member, and means for actuating said movable jaw section.

6. A valve remover of the character described, comprising a supporting member having a guide pin projecting from one side thereof and a locking pin projecting from its opposite side, a pair of substantially L-shaped jaw sections mounted at opposite ends of said supporting member, one of said jaw sections being movable and the other fixed, the vertical portion of the movable jaw having a slot engaging said guide pin and the corresponding portion of said fixed jaw having a row of notches arranged to engage said locking pin, the horizontal portions of both jaw sections having bifurcations arranged to engage the valve stem, and a cam mounted on the lower end of said supporting member for actuating said movable jaw section.

HENRY RUTTINGER.