

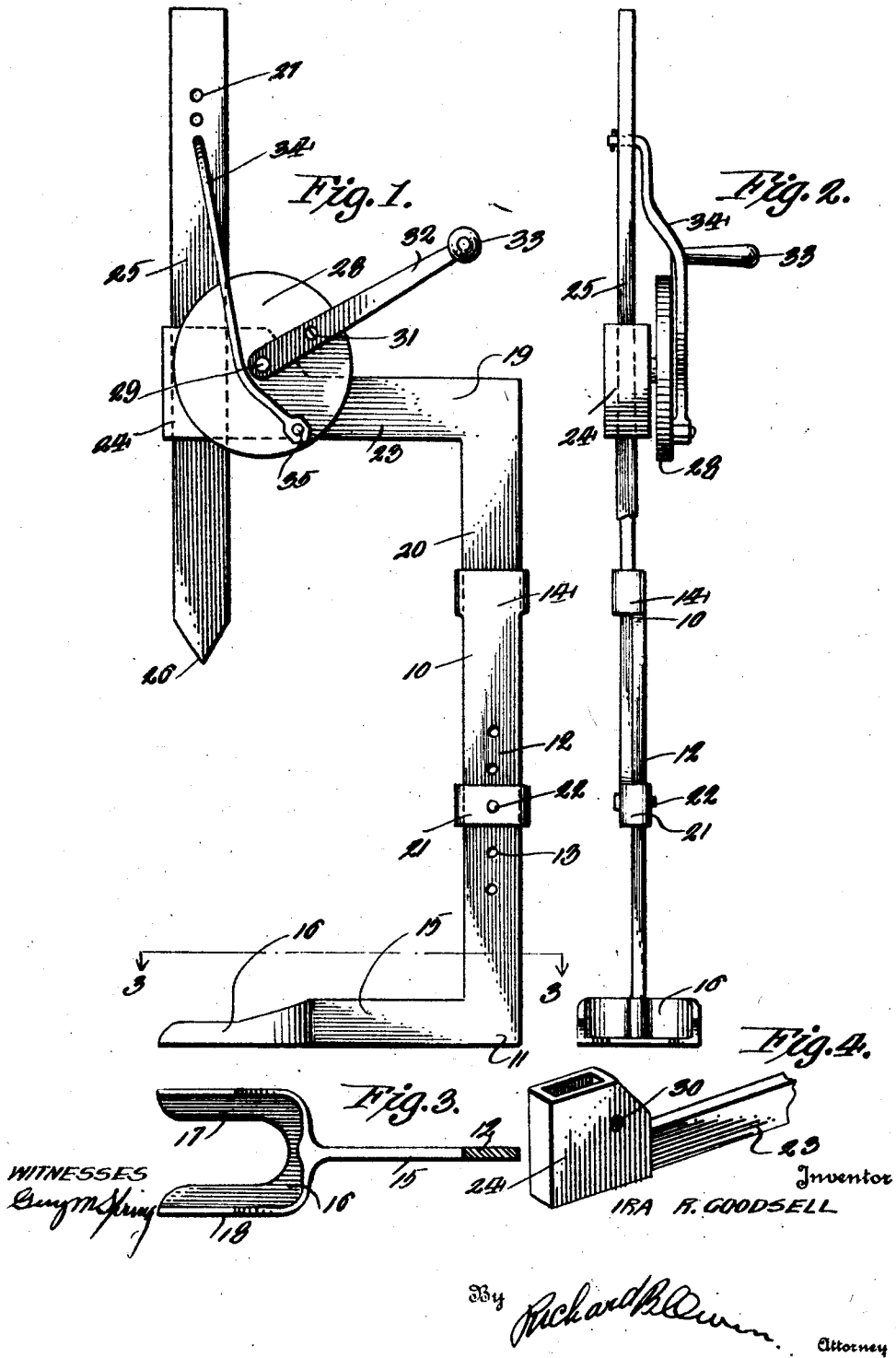
Oct. 16, 1928.

1,687,723

I. R. GOODSSELL

VALVE SPRING COMPRESSION

Filed Jan. 25, 1927



Patented Oct. 16, 1928.

1,687,723

UNITED STATES PATENT OFFICE.

IRA R. GOODSSELL, OF TULSA, OKLAHOMA.

VALVE-SPRING COMPRESSION.

Application filed January 25, 1927. Serial No. 163,365.

The present invention relates to improvements in valve spring lifting devices and has for its primary object to provide a device embodying an adjustable frame and having means for conveniently and safely compressing valve springs to permit disconnection of the valve.

A further object of the invention is the provision of a valve spring lifting device designed so as to be conveniently applied upon a motor and engageable with the spring to facilitate the compression of the valve spring.

Another object of the invention is the provision of a spring compressing device of the above character which is comparatively simple and durable of construction.

Still another object of the invention is the provision of a valve spring device of the above type which can be readily disassembled and which can be manufactured at a relatively low cost.

Other objects and advantages of the invention will become apparent as the description progresses.

In the accompanying drawing forming a part of this specification and in which like reference characters are employed to designate corresponding parts throughout the same;

Figure 1 is a side elevational view of a valve spring lifting device constructed in accordance with my invention,

Figure 2 is a front end elevational view of the same,

Figure 3 is a horizontal transverse sectional view taken on the line 3—3 of Figure 1, and Figure 4 is a fragmentary perspective view of a portion of the frame structure.

Referring to the drawing, wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numeral 10 generally designates a supporting frame of generally U-shaped formation. This frame is preferably extensible embodying a pair of adjustable sections.

The lower frame section 11 embodies a vertical body 12 formed of a flat metallic bar perforated at its intermediate portion as indicated at 13 to provide a series of longitudinally arranged openings. The upper end of the bar 12 is formed with a rectangular elongated sleeve 14 engageable with the complementary bar of the upper frame section. Formed at the lower end of the body bar 12 and extending at a right angular position

therefrom is a horizontal arm 15 forming a continuation of the bar 12 and formed at its outer end with a bifurcated bracket 16. The bracket 16 is of angular cross section providing a horizontal valve pin engaging plate 17 and a vertical continuous flange 18.

The upper complementary frame section designated by the numeral 19 embodies a vertically extending longitudinal body bar 20 slidably projected through the sleeve 14 of the lower frame section. The lower end of the upper section body bar carries a detachably connected sleeve 21 adapted to slidably embrace the body 12 of the lower section and formed with transversely aligned openings adapted to align with the opening 13 in the lower section body for adjustable connection of the sections. A pin 22 is adapted for slidable engagement with the openings formed in the lower section and the sleeve 21 of the upper section for securing the sections in set position. Formed integral with the bar 20 of the upper section 19 and extending in a right-angular position therefrom is a horizontally directed arm 23, the outer end being formed with an enlarged transversely directed guide 24 formed with a transversely directed vertical bore of rectangular formation.

Mounted for vertical reciprocating movement in the bore of the guide 24 and adapted to adjustably support the frame in association with the block of an internal combustion engine is a vertical lifting bar 25, the lower end being tapered to form a point 26 for secure engagement with the block while the upper end is provided with a series of longitudinally aligned openings 27.

Rotatably mounted in vertical position beside the guide member 24 and pivotally connected with the rear portion of the guide member is a circular crank disk 28 supported by a crank pin 29 extended through an opening 30 formed in the rear portion of the guide, rigidly fastened to the disk 28 by means of machine screws 31 and extending radially therefrom is a crank arm 32 carrying a rotatable actuating handle 33 at its outer extremity.

Connecting the reciprocably movable lifting rod 25 and the rotatable disk 28 for simultaneous movement is a rod 34 having its upper end bent at a right angular position for projection through the openings 27 in the lifting rod and its intermediate portion offset for extension parallel with the outer face of

the disk 28. The lower extremity of the rod 34 is pivotally connected with the disk by means of a pivot pin 35 mounted in an eccentric position adjacent the peripheral edge of the disk. The lower portion of the rod 34 is bent inwardly to facilitate the reciprocating movement of the rod.

In use, the device is mounted in a suitable position on the engine block, the lower tapered end of the lifting bar 25 being positioned on a stationary abutment of the block while the bifurcated bracket 16 formed on the lower end of the frame is positioned below the lower extremity of the valve spring. The valve sections 11 and 19 are adjusted so that the yoke will be disposed immediately below the spring in an expanded position. The frame 10 is then elevated by rotatably operating the crank arm 32 through the medium of the handle 33. The maximum stroke movement of the bracket is attained by a semicircular movement of the arm, producing a substantial elevation of the frame 10 and contraction of the valve spring so as to permit convenient removal of the valve spring. A further, more accurate adjustment may be obtained by longitudinal movement of the upper end of the connecting rod 34 which may be placed in engagement with any of the openings 27 in the lifting bar.

From the foregoing description, and the drawing, it will be readily noted that the present structure presents an extremely simple and durable device for elevating and compressing the valve springs of an internal combustion engine to permit removal of the valve spring pins whereby the valves may be readily removed from the block. The extensible frame structure allows substantial adjustment for application upon various types of motors and also permits contraction of the frame for storage in a relatively small space. The compression of the spring is very easily effected by the rotary operation of the crank arm, reducing the efforts incident to this operation by the substantial leverage obtained by the arm.

It is to be understood that the form of my invention herewith shown and described is to be taken as the preferred example of the same and that various changes as to the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A valve spring lifting device comprising a U-shaped frame including a pair of longitudinally adjustable sections, a bifurcated bracket formed on the lower end of the frame engageable with the lower end of a valve spring, a guide member formed on the upper end of the frame formed with a vertical bore, a vertically movable lifting bar mounted in the bore of the guide member, a crank pin rotatably supported in a vertical position on the upper end of the frame, a disk body pivotally mounted on the frame, a crank arm secured to the disk and extending radially therefrom, and an offset connecting bar pivotally connected with the upper portion of the lifting bar and with the crank disk for vertical reciprocating movement of the frame with respect to the said bar.

2. A valve spring lifting device including a U-shaped frame including adjustably connected frame sections, a bifurcated bracket formed on the lower end of the lower frame section engageable with the lower end of a valve spring, a guide member formed with a vertical bore formed on the upper end of the upper frame section, a lifting bar mounted for vertical reciprocating movement in the guide member, a crank disk rotatably mounted in vertical position on the upper end of the frame, a radially extending crank arm rigidly secured to the crank disk, and a connecting rod having its upper end adjustably connected with the connecting bar and its lower end pivotally connected in an eccentric position with the crank disk so that rotary movement of the crank disk will vertically reciprocate the frame with respect to the lifting bar.

3. A spring-lifting device of the character described, comprising a frame, means carried by the frame for engaging beneath a spring, a vertically shiftable element directed toward the spring lifting means, a reciprocatory rod arranged substantially parallel to the vertically shiftable element and having one end removably engaged therewith, and rotary means carried by the frame and connected with the other end of said reciprocatory rod for actuating the same and the shiftable element controlled thereby.

In testimony whereof I affix my signature.

IRA R. GOODSELL.