May 26, 1931. I. J. CLARK 1,807,509

VALVE STEM SPLIT LOCK CATCHER

Filed March 11, 1930

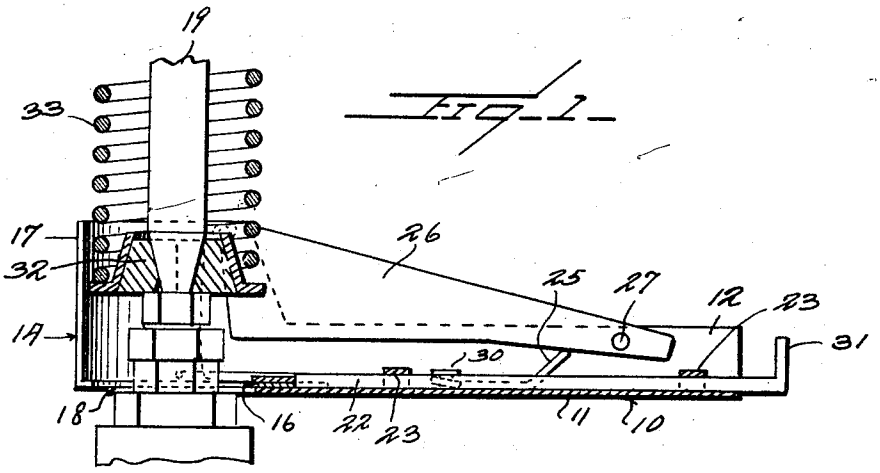

Fig. 1

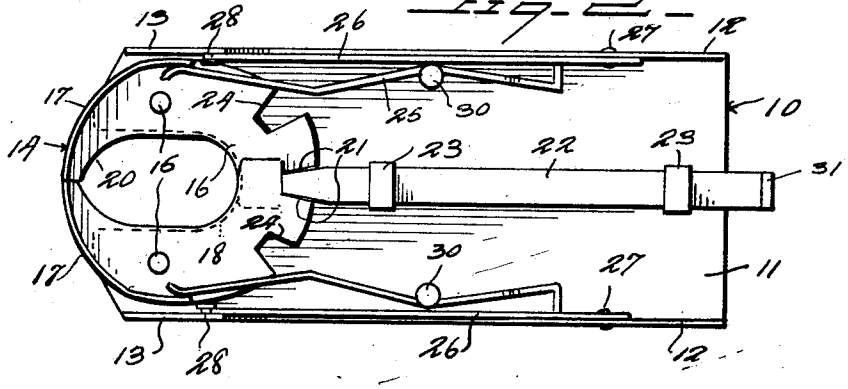

Fig. 2

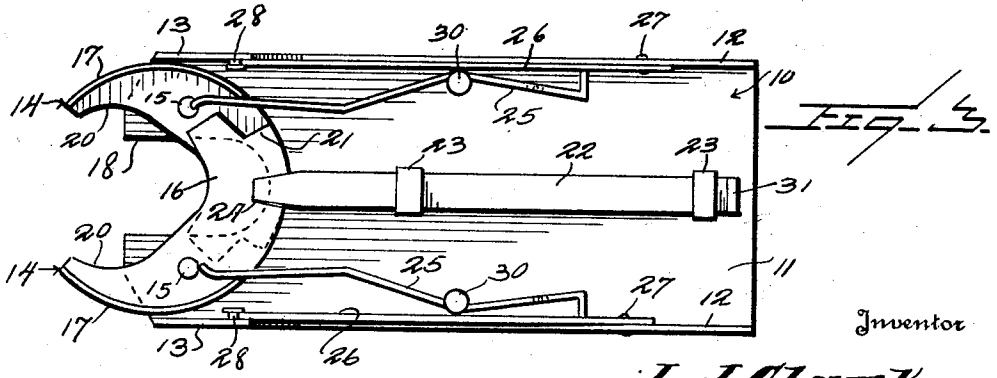

Fig. 3

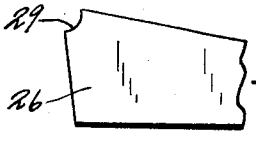

Fig. 4

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UNITED STATES PATENT OFFICE

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VALVE STEM SPLIT LOCK CATCHER

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The present invention relates to devices for use in removing split cone lock washers employed for coupling valve stem springs with the valve stems of internal combustion engines.

The primary object of this invention is to provide a device which will catch the split cone lock washers when the spring has been moved upwardly on the valve stem.

It is well known that in the construction of a great many of the internal combustion engines at present in use that relatively large openings are formed in the upper portion of the crank casing of the engine, particularly on the side of the engine where the valves are positioned, the openings being particularly formed so as to properly lubricate the valve parts.

When the valve lifting devices are placed about the valve stem and the valve spring so as to lift the valve spring and release the split cone washer, it frequently happens that the split cone washers fall into the crank case, and the same is true when the split cone washers are being replaced, thereby necessitating the removal of the oil pan and increasing the cost of labor in connection with the grinding or replacing of the valves.

It is, therefore, obvious that an important object of this invention is to provide a device which will catch the split cone washers when the spring has been forced upwardly, the device being also adapted to prevent the washers from dropping into the crank case when they are being replaced about the valve stem.

A further object of this invention is to provide a device of this character which embodies a trigger for permitting the gate portion thereof to swing about the valve.

A still further object of this invention is to provide a trough-like tray having swinging side portions which may be swung downwardly so that the side portions of the device will not interfere with any of the valve washer replacing mechanisms or valve spring lifter devices.

The above and various other objects and advantages of this invention will in part be described in and in part be understood from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawings wherein:—

Figure 1 is a longitudinal sectional view, partly in detail, showing a device constructed according to the preferred embodiment of this invention;

Figure 2 is a detail top plan view of the device in closed position;

Figure 3 is a detail top plan view of the device in open position; and

Figure 4 is a fragmentary side elevation of one of the swinging members.

Referring to the drawings wherein like numerals of reference designate corresponding parts throughout the several views, the numeral 10 designates generally a trough or tray which is provided with a bottom 11 and upstanding side portions 12. The forward end of the trough is provided with an upstanding flange 13 which is preferably formed integrally with the sides 12.

A pair of swinging gates or closure members generally designated as 14 are swingingly mounted on the forward end of the trough 10 and are pivotally secured to the bottom 11 by pivotal members 15. The swinging gate members 14 preferably comprise a horizontally positioned plate 16 and an upstanding arcuately inclined gate structure 17.

The bottom 11 of the trough is provided at the forward end portion thereof with an inwardly extending slot or opening 18 so that the trough 10 may be positioned about the lower end portion of a valve stem 19.

The horizontal plates 16 are also provided with cut out portions or recesses 20 so that the gates 14 may rotate or swing about the lower end portion of the valve stem 19. The plate members 16 are also provided with notches 21 which open on the inner edge portion of the plates, the notches 21 in the plates 16 forming a locking portion for receiving a locking bolt or latch 22 which is slidably mounted on the bottom 11 by means of loops 23 or the like. The bolt 22 when engaged in the notches 21 locks the plates 14 in closed position. This is of advantage

so as to prevent the accidental removal or withdrawal of the trough from about the valve stem during the time that the operator is working on the valve parts. The bottom plates 16 are also provided with a second notch 24 which is positioned on the plates spaced outwardly from the inner end portion thereof, the notch 24 of each plate being adapted to register with each other when the plates are swung into opened position. When in opened position, the locking bar or latch 22 may be moved forwardly so as to position within the recesses 24 of the plates 16 and thereby hold the plates in opened position so as to permit the device to be moved forwardly and about the lower end portion of the valve stem 19.

A spring 25 is mounted on the trough 10 spaced outwardly from the inner end portion thereof and engages at the forward end the gate members 14 so as to constantly urge the gate members 14 into closed position.

The side members 12 are provided with swinging plate members 26 which are swingingly mounted on the side members 12 by means of rivets or pivotal members 27 or the like which are positioned adjacent the outer end portions of the trough 10, and the swinging movement of the side plates 26 may be limited by stop members 28 which may be positioned in the flanges 13 adjacent the upper end portion thereof, and if desired, the inner upper end portion of the plates 26 may be provided with arcuate cut out portions 29.

Through the provision of the swinging side plate members 26, the trough 10 is provided with tapering side members which taper downwardly from the inner end portion of the trough so that when the trough 10 is positioned about the valve stem 19 a relatively high side of the trough will be presented at the point where the split cone washers usually fall into the crank case openings. The side members 26 when the device is being inserted about a valve stem may be pushed downwardly so as to permit the ready positioning of the gate members 14 about the valve stem. The notches or cut out portions 29 engage about the periphery of the stop member 28 and the head of the stop member 28 prevents lateral movement of the free end of these plate members 26.

The spring 25 is preferably extended rearwardly from the securing pin 30 and engages at the rear end portion thereof against the lower edge of the swinging side plates 26 so as to constantly urge the side plates upwardly.

The stop members 28 which limit the upward movement of the side plates 26 are preferably headed so that when the plates 26 are engaged thereagainst, they will be held against lateral movement in addition to being held against vertical movement.

In the use of this device, the gate members 14 may be swung outwardly against the tension of the spring 25 until the notches 24 in each of the plates register with each other, whereupon the locking bolt 22 may be moved inwardly so as to be positioned within the notches 24 thereby holding the gates 14 against swinging movement. The trough 10 may then be moved inwardly and about the lower end portion of the valve stem 19, whereupon the bolt 22 may be moved outwardly, the bolt 22 being provided with an upstanding flange or lug 31 so as to facilitate movement of the bolt.

Upon release of the plates 16, the spring 25 will rotate the gates about the valve stem 19 so that when the split washers 32 are released from the tension of the spring 33, the split washer will drop into the trough 10.

Through the provision of the swinging side plates 26, it is possible to use the valve tools at present available for lifting the spring 33 so as to permit removal or replacing of the split washers 32.

When it is desired to remove the trough from about the valve stem, the trough 10 may be pulled outwardly and at the same time the gate members 14 will swing upon their pivots 15 against the tension of the spring 25, the forward portion of the opening 20 being preferably forwardly and arcuately inclined so as to facilitate removal of the trough. It will be obvious that through the use of this device, the split cone washer will be prevented from falling into the crank case of the machine and that the labor of removing or replacing the lock washer 32 will be greatly facilitated.

It will, of course, be understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of the invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:—

1. A split washer catcher of the character described comprising an elongated trough, and a pair of gate members swingingly mounted on the trough and means for holding the gate members in either closed position about a stem or in open position.

2. A split washer catcher of the character described comprising an elongated trough, a pair of swinging gate members carried by the trough, resilient means for constantly urging said gate members into closed position, and latch means for holding the gate members in opened position against the tension of said resilient means.

3. A valve stem split washer catcher of the character described comprising an elongated trough, a pair of swinging gate members mounted on the trough, resilient means carried by the trough and engaging said gate members whereby to constantly urge said gate members into closed position, latch means slidably mounted on the trough, said gate members having a plurality of spaced notches therein for engagement with said latch whereby to hold said gate members in adjusted position.

4. A valve stem split washer catcher of the character described comprising a trough having upstanding side portions, a pair of gate members swingingly mounted in said trough, a spring mounted in said trough and engaging said gate members whereby to constantly urge said gate members into closed position about the valve steam, and means for locking said gate members in either closed or opened position.

5. A valve stem washer catcher of the character described comprising an elongated trough having upstanding side portions, an upstanding flange mounted on the forward end of said trough, swinging gate members mounted in said trough, resilient means for constantly urging said gate members into closed position, and latch means for holding said gate members in either opened or closed position.

6. A valve stem washer catcher of the character described comprising an elongated trough having upstanding side portions, an upstanding flange carried by the side portions of said trough at the forward end thereof, a pair of swinging gate members mounted on the forward end of said trough, resilient means for constantly urging said gate members into closed position, a sliding bolt mounted in said trough and adapted to engage said gate members whereby to hold the same in either open or closed position, a pair of side plates swingingly mounted on the sides of said trough, resilient means carried by said trough and engaging said plates whereby to constantly urge said plates upwardly, and stop means mounted in said flanges and adapted to limit the movement of said plates.

In testimony whereof I hereunto affix my signature.

IRA J. CLARK.