No. 896,336. PATENTED AUG. 18, 1908.

B. A. SWENSON.

VALVE REMOVER.

APPLICATION FILED FEB. 24, 1908.

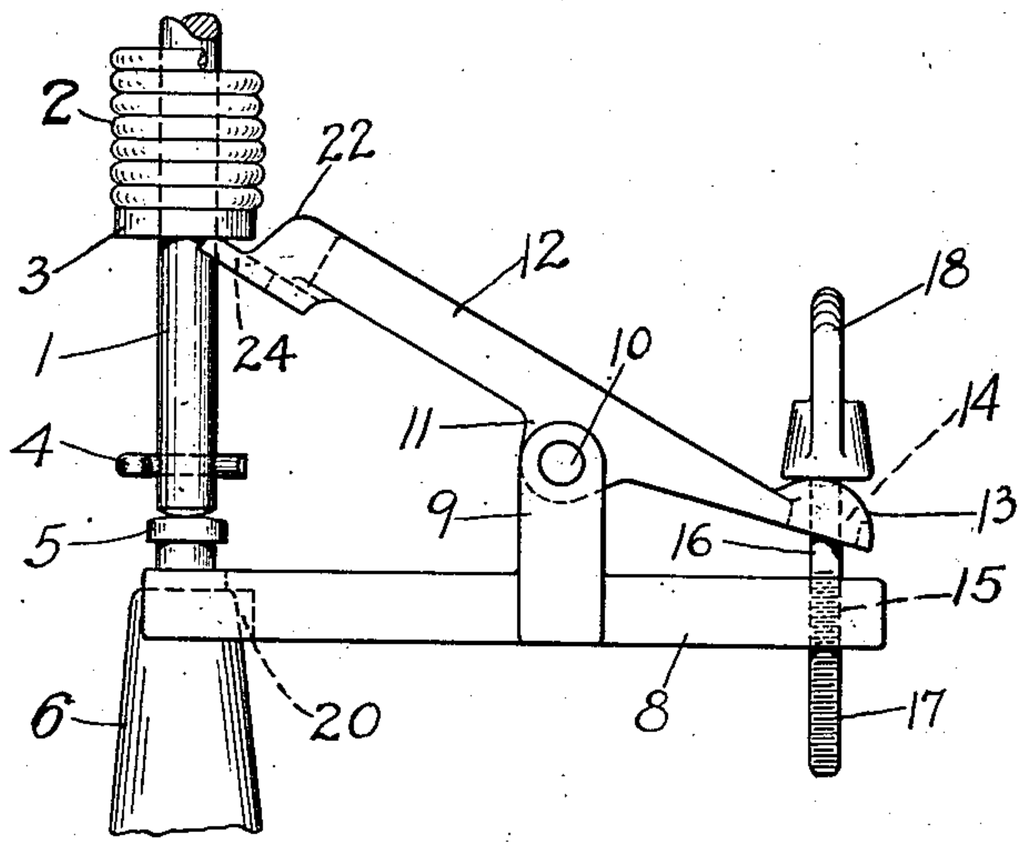

FIG. 1.

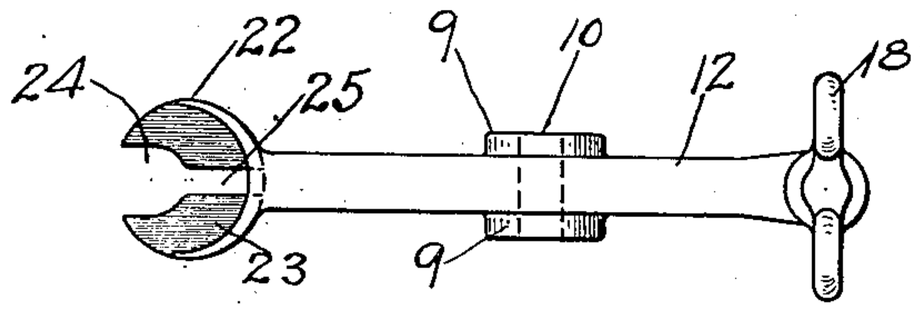

FIG. 2.

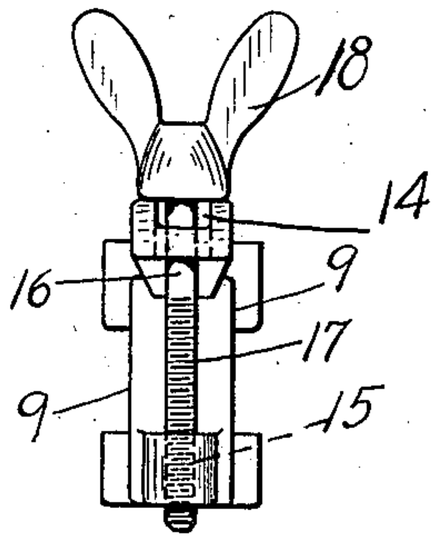

FIG. 3.

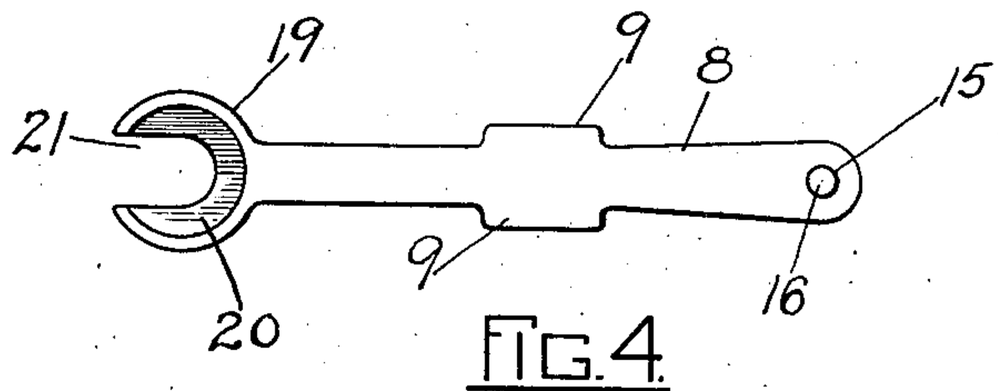

FIG. 4.

WITNESSES.

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VALVE-REMOVER.

No. 896,336. Specification of Letters Patent. Patented Aug. 18, 1908.

Application filed February 24, 1908. Serial No. 417,261.

To all whom it may concern:

Be it known that I, BERNDT A. SWENSON, 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 Valve-Removers, of which the following is a specification.

My invention relates to devices for temporarily lifting the exhaust valve spring of a motor to permit the exhaust valve cotter pin or key to drop out or be removed; and has for its objects compactness which permits its insertion into a garment pocket for road use, simplicity, and cheapness.

To the above ends essentially my invention consists in the novel construction and combination of parts hereinafter described, and illustrated in the accompanying drawings, wherein

Figures 1, 2 and 3 are side, top plan, and rear end views respectively of my novel device, and Fig. 4, a plan of the bottom of the lower arm or base.

Like reference characters indicate like parts throughout the views.

My device is illustrated in conjunction with the usual exhaust valve stem, 1, spring 2, washer 3, cotter pin 4, upon which the washer normally rests, cam rod 5, and cam rod guide 6, of an ordinary vehicle motor.

The remover comprises a lower or base arm, 8, with uprights 9, upon its opposite sides intermediate its length connected near their tops with a pivot pin, 10, traversing a lug, 11, upon the bottom of an upper arm, 12, intermediate the length of the latter. The arm, 12, has a curved bearing projection, 13, upon the upper face of its rear end, and through this projection and the arm itself is an oblong longitudinal slot, 14. In alinement with this slot in the end of arm 8, is a round threaded opening, 15. Passing through the slot and opening is a rod, 16, provided upon its lower end with threads, 17, adapted to engage in the threaded opening, 15, and fixed upon its upper end is a butterfly head, 18; the whole constituting an adjusting screw for the pivoted arms, 8, and 12. The forward end of the arm 8 has a flat expanded portion, 19, provided with a circular cavity, 20, upon its lower face, and a longitudinal slot, 21, extending inwardly some distance from the outer end of the arm, as shown in Fig. 4. Upon the upper face of the forward end of the arm 12 is also a flat expanded or rounded portion, 22, provided with a curved cavity, 23, and a longitudinally disposed marginal slot, 24, having a preferably narrowed inner portion, 25.

The detailed construction of the arm portions, 19 and 22, are not to be regarded as exclusive, but the form thereof herein described has been found best adapted to meet the requirements of a majority of motors.

The operation of my device is as follows; the bearing portion or head, 19, of the arm, 8, rests upon the guide, 6, whose top is within the cavity, 20, and the cam rod, 5, traverses the slot, 21. Or the head, 19, may rest upon the head of the rod, 5. The adjusting screw is next rotated downwardly, the body of the head, 18, riding upon the curved projection, 13, whereby a continuous bearing surface is afforded the nut, 18, regardless of the angle of the arm, 12. The downward movement of the screw gradually raises the end, 22, of the arm, 12, which end has been previously placed beneath the washer, 3, which is normally supported by the key, 4. In placing the end or head, 22, beneath the washer, 3, the slot portion, 25, prevents interference with the key, 4, and the slot portion, 24, permits passage of the valve stem, 1. While the arms are distended as described, and as shown in Fig. 1, the key, 4, may be manually removed, and thereupon the valve remover may be then removed, and the motor parts be disassembled.

What I claim is,

1. In a device of the character described, the combination with an arm and uprights thereon intermediate its ends, a second arm pivotally mounted intermediate its ends on said uprights, the first-mentioned arm having a bearing at one end and a threaded opening at the other end, a second arm having a bearing at one end and a curved bearing projection on its outer face at its other end and having an oblong longitudinal slot and means passed through said slot and having threaded engagement with said opening with adjusting means bearing on said curved projection.

2. In a device of the character described, the combination with an arm and uprights thereon intermediate its ends, a second arm pivotally mounted intermediate its ends on said uprights, the first-mentioned arm having a bearing at one end and a threaded opening at the other end, a second arm having a bearing at one end and a curved bearing projection on its outer face at its other end and

having an oblong longitudinal slot and means passed through said slot and having threaded engagement with said opening with adjusting means bearing on said curved projection, the bearings of said arms having cavities upon their adjacent faces.

3. In a device of the character described, the combination with an arm provided with a threaded opening in its rear end, of uprights upon the arm intermediate its length, a second arm pivotally mounted intermediate its length in the uprights and provided with an oblong opening in its rear end, bearing members upon the forward ends of the arms, a rod traversing the oblong slot and provided with threads adapted to engage in the threaded opening, and a nut fixed to the end of the rod.

4. In a device of the character described, the combination with an arm provided with a threaded opening in its rear end, of uprights upon the arm intermediate its length, a second arm pivotally mounted intermediate its length in the uprights and provided with an oblong opening in its rear end, bearing members upon the forward ends of the arms, a curved bearing projection upon the rear end of the second arm, a rod traversing the oblong slot and provided with threads adapted to engage in the threaded opening, and a nut fixed to the end of the rod and adapted to bear upon the curved projection.

5. In a device of the character described, the combination with an arm, of a bearing member upon one end of the arm provided with a longitudinal slot, uprights upon the arm, a second arm pivotally mounted in the uprights, a bearing member upon one end of the second arm provided with a longitudinal slot, and means at the other ends of said arms having one end in threaded engagement with one of the arms and the other end passed loosely through the adjacent end of the other arm for radially adjusting said arms.

6. In a device of the character described, the combination with an arm, of a bearing member upon one end of the arm provided with a slot and having a cavity upon its lower face, uprights upon the arm, a second arm pivotally mounted in the uprights, a bearing member upon one end of the second arm provided with a longitudinal slot and having a cavity upon its upper face, and means upon other ends of said arms and having threaded engagement with one of the arms and loose engagement with the other with a rounded bearing surface on the last-named arm and adjusting means engaging the same.

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

BERNDT A. SWENSON

Witnesses:

HORATIO E. BELLOWS,

JOSEPH E. BURNS.