

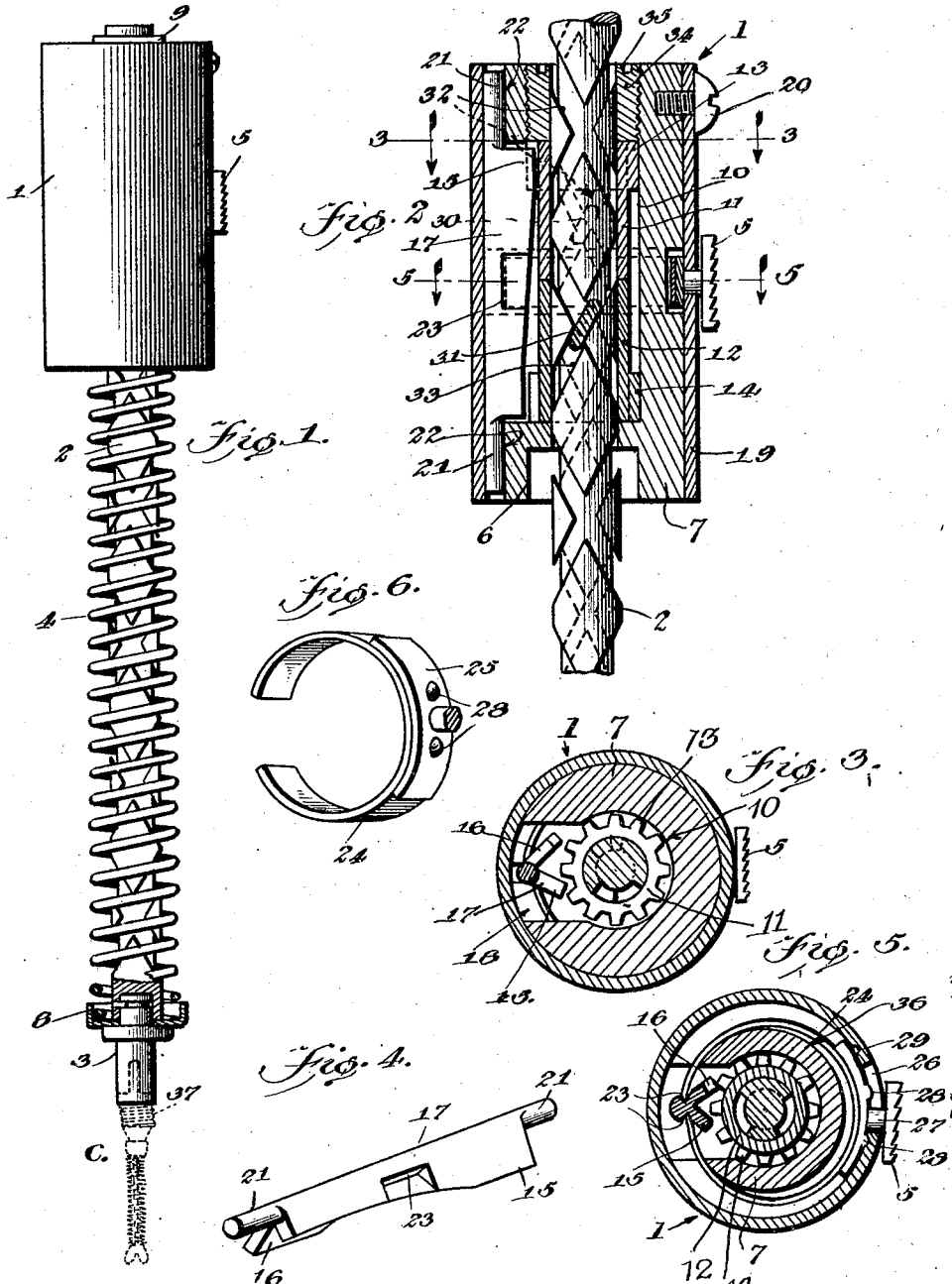
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VALVE CORE EXTRACTOR

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VALVE-CORE EXTRACTOR.

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This invention relates to improvements in extracting tools, being designed particularly for removing the cores of tire valves, and it consists of the constructions, combinations and arrangements herein described and claimed.

An object of the invention is to provide a simple tool for expeditiously extracting and replacing the cores (often referred to as "insides") of pneumatic tire valves.

Other objects and advantages appear in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 is a side elevation of the valve extractor, the valve core which is intended to be extracted being shown in dotted lines for the purpose of illustration.

Figure 2 is a central longitudinal sectional view of the handle of the valve extractor.

Figure 3 is a cross section on the line 3—3 of Figure 2.

Figure 4 is a detail perspective view of the double pawl.

Figure 5 is a cross section on the line 5—5 of Figure 2.

Figure 6 is a detail perspective view of the pawl spring and mounting plate.

It is commonly known that to remove the valve core, often referred to as the valve "insides" of a pneumatic tire is not easily accomplished. The ordinary valve cap is slotted for the purpose, however, providing an inadequate hold upon the core thereby making the removing operation more laborious than it ought to be. The valve core sometimes sticks and inasmuch as the valve cap is frail the slotted end will twist out of shape and defeat the very purpose for which it is intended.

The improved tool is designed particularly for extracting and replacing the valve core. Although the illustrations are relatively large, in practice the tool will be small enough to conveniently get between the spokes of the wheel so that the operation may be carried out without difficulty.

It consists principally of a handle 1, shaft 2, core socket 3, return spring 4 and button 5 by means of which the shaft is made to turn either right or left. The spring 4 is disposed between a recess 6 in the handle body 7 and a cup-shaped ter-

minal 8 on the socket 3. The purpose of the spring is to return the handle 1 to the upper extremity of the shaft 2 at the end of a stroke, and in order that the handle may be limited the shaft is provided with a suitable stop collar 9.

A bore 10 in the body 7 houses the right and left hand nuts 11 and 12 through which the shaft passes. The nuts include toothed rims 13 and 14 with which the blades 15 and 16 of the double pawl 17 are respectively engageable. The double pawl occupies a lateral opening 18 extending from the bore 10. A barrel 19 fits around and is carried by the body, concealing and holding the double pawl in place. The barrel is retained by a screw 20.

Pintles 21 at the extremities of the double pawl have bearing in recesses 22 in the body 7. It is anticipated that the double pawl can be made to serve the same purpose as follows by appropriately twisting it out of a single piece of steel. Recesses 23 in the sides of the double pawl receive the ends of a curved leaf spring 24 the purpose of which is to hold the blades 15 and 16 in contact with the toothed rims of the respective nuts. The spring is attached to the mounting plate 25 (Figs. 5 and 6) which rides over and covers the slot 26 in the barrel in which slot the shank 27 of the button 5 is movable. The shank 27 is attached to the mounting plate which thus carries the button. Shifting of the button toward the extremities of the slot 26 will so change the tension of the ends of the spring that the double pawl 17 is made to rock upon its pintles 21 in one or the other direction so as to engage and lock one or the other of the nuts to the handle 1. Lugs 28 on the mounting plate are engageable with recesses 29 near the extremities of the slots to hold the button 5 in its adjusted positions.

Studs 30 and 31 on the interior of the nuts 11 and 12 engage in the spiral grooves 32 and 33 in the shaft 2. In Figure 2 the stud 30 is situated on the far side of the shaft 2, but the stud 31 is supposed to be on the near side. The studs are held in place in the handle body by means of a lock collar 34 which has spanner wrench holes 35 which permit application and removal thereof. The spring 24, mentioned before, occupies a curved slot 36 (Figs. 2 and 5) in the body 7,

which slot communicates with the aforesaid lateral opening 18 in the handle body 7.

The operation is readily understood. The valve core C (dotted lines in Fig. 1) includes a threaded guide 37 on top of which there is a narrow fin intended to be engaged by the slotted end of the ordinary valve cap. This fin is now engaged by the socket 3 when the tool is inserted in the end of the tire valve. The direction of turning of the shaft 2 is determined by the position of the button 5. The particular position adopted in Figures 2, 3 and 5 will produce a right hand turn of the shaft. The button 5 has been shifted over so that the shank 27 occupies the right end of the slot 26 in Figure 5, the direction of shifting the button agreeing with the direction of turning of the shaft which said shifting accomplishes.

The resulting buckling of the curved spring 24 puts it under tension but the double pawl 17 is rocked upon its pintles 21 so that the blade 15 engages the toothed rim 13 of the right hand nut 11. The pressure is applied to the double pawl below its pivotal mounting, and the aforesaid rocking of the double pawl results. The blade 15 therefore locks the nut 11 to the handle 1.

The operator now grasps the handle 1 and pushes down. It is assumed that the socket 3 has been set in place upon the valve 4. The stud 30, being locked, to the handle will move in a rectilinear line, causing such displacement, so to speak of the spiral groove 32 that the shaft 2 will turn in the clockwise direction, looking down upon the tool. Upon the return stroke of the handle 1 the toothed rim 13 will simply ride over the blade 15 of the double pawl with a ratchet motion in the event that the sprocket 3 is held in position where the last turning effort of the shaft left it. To this end it is necessary that the socket 3 be swivelly carried by the shaft. The foregoing operation will serve to drive the core C into place in the valve stem. Upon shifting the button 5 to the opposite extremity of the slot 26 the reverse action will take place. The tension is then transferred to the opposite extremity of the slot 26; the reverse action will take place. The tension is then transferred to the opposite end of the spring 24 so that the double pawl 17 rocks until the blade 16 engages and holds the toothed rim 14 of the nut 12. This nut 12 is then locked upon the handle 1, and a push upon the handle causes the stud 31 (Fig. 2) to move in the rectilinear direction causing such displacement of the groove 33 as will turn the shaft 2 in the counterclockwise direction, looking down upon the tool. This motion will extract the core C from the automobile tire air valve.

While the construction and arrangement of the improved valve core extractor is that of a generally preferred form, obviously

modifications and changes may be made without departing from the spirit of the invention or the scope of the claims.

I claim:

1. A tool comprising a shaft having a pair of spiral grooves running in opposite directions, a handle reciprocable upon the shaft and having a bore with a lateral opening, a pair of nuts occupying the bore and having studs engaging the respective grooves, a double pawl occupying the lateral opening and being pivotally mounted upon the handle, a button which is shiftable to produce the direction of turning of the shaft desired, resilient means including a curved spring engaging the sides of the pawl so that shifting of the button and the resulting action of the spring rocks the pawl upon its pivots and locks one or the other nuts upon the handle, the other nut remaining loose and idle, a socket swivelly carried by the shaft to engage a tire valve core, and a spring interposed between the socket and the handle to resist the movement of the handle along the shaft in one direction when said shaft is turned by virtue of the operation of said locked nut.

2. A tool comprising a shaft having a pair of spiral grooves running in opposite directions, a handle carrying a shiftable button, a pair of nuts carried by the handle and having studs engaging the respective grooves and having toothed rims, a double pawl pivotally mounted in the handle and having a recess at each side, a curved spring carried by the button having its extremities engaging the respective recesses so that shifting of the button will rock the pawl upon its pivots and lock one or the other of the nuts upon the pawl, a socket swivelly carried by the shaft, and a spring interposed between the socket and handle to resist movement of the handle along the shaft in one direction.

3. A tool comprising a shaft having spiral grooves running in opposite directions, a handle body carried by the shaft and having a bore with a lateral opening and having a curved slot communicating at its ends with said lateral opening, a pair of nuts situated in the bore each having a stud engaging a respective groove and having a toothed portion, a shiftable button, a double pawl occupying said lateral opening and having pintles journaled upon the handle body, a barrel engaging the body to conceal the double pawl and having a slot thereon, a shank carrying the button extending through and being carried by the slot, and a curved spring carried by the button and having the opposite end extending around the curved slot into engagement with the sides of the pawl to accomplish rocking of the pawl upon its pintles as the button is slid in the slot whereby to lock one or the other of the nuts

upon the handle for turning of the shaft in a given direction.

4. A tool comprising a shaft having spiral grooves running in opposite directions, a
5 handle body reciprocable upon the shaft and including a barrel, there being a slot in the barrel with recesses adjacent to the ex-
tremities of the slot; a pair of nuts carried
10 by the handle and having studs engaging the respective grooves, a double pawl carried by the handle and having recesses at the sides, a curved spring carried by and actu-

ated by the button to rock the double pawl and lock one or the other of the nuts upon
the handle, the extremities of the spring en- 15
gaging said pawl recesses, and a mounting
plate carrying the button to which mount-
ing plate the spring is applied, said plate
having lugs engageable with one or the other
of the recesses in the barrel thereby to hold 20
the button in its adjusted position along the slot.

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