April 2, 1929. C. T. ZETTERVALL 1,707,947

VALVE PIN PLIERS

Filed April 19, 1927

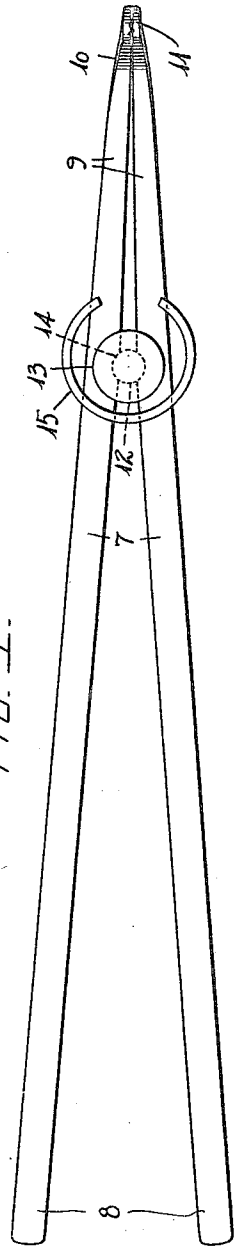


FIG. 1.

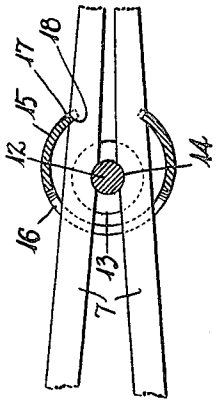


FIG. 2.

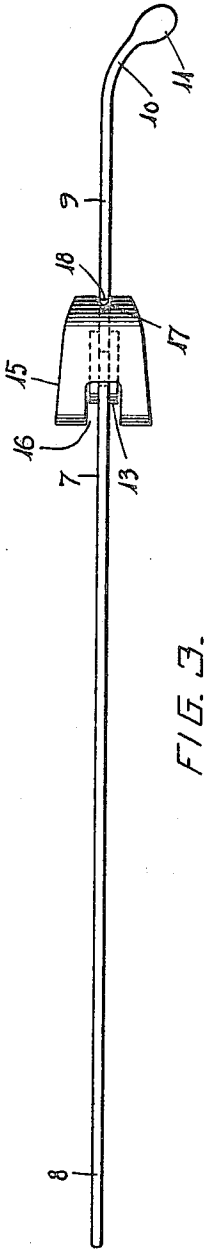


FIG. 3.

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UNITED STATES PATENT OFFICE.

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VALVE-PIN PLIERS.

Application filed April 19, 1927. Serial No. 185,023.

The present invention relates to pliers, and aims to provide a novel and improved pair of pliers which may be conveniently used for pulling and inserting cotter pins of poppet valve stems of internal combustion engines, and which may be used for other purposes also.

Another object of the invention is the provision of novel means for connecting the levers, and for assembling them with a spring in a simple and efficient manner.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts, as hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawing, wherein—

Figure 1 is a side elevation of the improved pliers.

Fig. 2 is a fragmentary elevation showing the joint member and spring in section.

Fig. 3 is an edge view, looking downwardly on the pliers as seen in Fig. 1.

The pliers comprise a pair of levers 7 formed from bars or strips of suitable metal, and have the long arms or handles 8 and the short arms 9. The terminals of the arms 9 are curved or bent toward one side, as seen in Fig. 3, and have the flat elliptical jaws 11 whose confronting spaces are toothed or roughened so as to firmly grip the pin or other element to which the jaws are applied. The jaws being offset to one side enable the pliers to be conveniently used for inserting and pulling the cotter pins of poppet valve stems, and the pliers may also be used in close quarters.

In order to connect the levers a pivot or joint member 12 is disposed between them, and is of circular cross-section. Said member has the side flanges 13 overlapping the levers, to hold them in the same plane. The adjacent edges of the levers 7 have curved notches 14 receiving the member 12, to retain said member in the proper position, and the levers may turn on said member, thereby providing a simple joint between the levers, without an aperture in either lever.

A curved spring 15 extending through more than one-half of a circle, surrounds the joint or pivot member, and has a slot 16 between its ends through which the long arms 8 of the levers extend, the ends of the spring being nearest the jaws 11. The spring is composed of a strip or plate of resilient metal and the ends of the spring engage the short arms 9 of the levers for moving the jaws together under considerable pressure, so as to clamp the cotter pin or other element between the jaws, for the convenient manipulation thereof. The ends of the spring 15 have notches 17 interengaging with notches 18 in the opposite edges of the arms 9, thereby maintaining the spring and levers in proper assembled relation. The spring 15 not only swings the levers to move the jaws together, but also holds the levers tightly in engagement with the pivot or joint member 12.

By swinging the handles or arms 8 toward one another, the arms 9 and their jaws 11 are separated, and the ends of the spring 15 are forced apart, so that when the pressure on the levers is released, the spring will swing the arms 9 together.

Having thus described the invention, what is claimed as new is:—

1. Pliers comprising a pair of levers, a pivot member between them having flanges between which the levers are disposed, said levers having notches engaging said member for turning movement, and a curved spring surrounding said pivot member and having a slot between its ends through which the corresponding arms of the levers extend, the ends of the spring and other arms of the levers having interengaging notches.

2. Pliers comprising a pair of levers, a pivot member between them having flanges between which the levers are disposed, and a curved spring surrounding said pivot member and its flanges and having a slot between its ends through which the corresponding arms of the levers extend, the ends of the spring contacting with the other arms of the levers to move them toward one another.

In testimony whereof I hereunto affix my signature.

CARL THEODOR ZETTERVALL.