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A. F. PITKIN.

MEANS FOR CONNECTING TOOLS TO SOCKETS.

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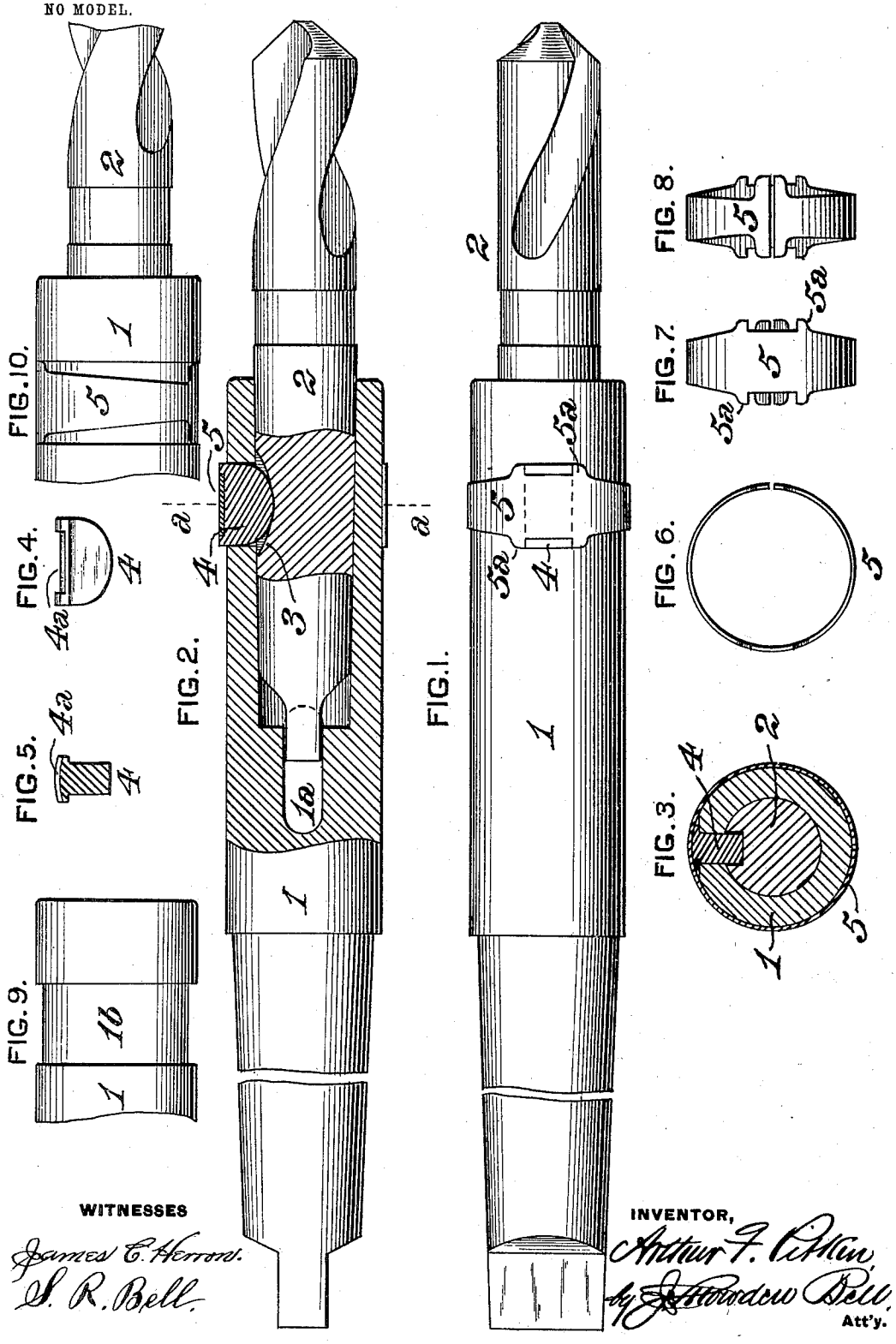
NO MODEL.



WITNESSES

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MEANS FOR CONNECTING TOOLS TO SOCKETS.

SPECIFICATION forming part of Letters Patent No. 722,324, dated March 10, 1903.

Application filed December 6, 1902. Serial No. 134,177. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR F. PITKIN, of Schenectady, in the county of Schenectady and State of New York, have invented a certain new and useful Improvement in Means for Connecting Tools to Sockets, of which improvement the following is a specification.

The object of my invention is to provide simple and effective means whereby a drill or other drill-press tool may be readily connected to and firmly held in its socket without liability to work or pull out of the same or to turn therein and which will present the further advantage of enabling tools whose tangs have been twisted or broken off to be utilized with the same facility as when their tangs are in their original condition.

The improvement claimed is hereinafter fully set forth.

A material and substantial defect of tool-sockets of the ordinary construction is presented in the fact that they permit the tool when under severe strain to turn in the socket, thereby loosening its taper fit therein and transferring the strain from the taper fit to the tang, which in many instances is twisted off, thus rendering the tool useless. Another defect manifests itself when the tool is run through a hole slightly smaller in diameter, in which case it will almost invariably screw down into the hole, pulling itself out of the socket and injuring the tang, as well as scoring the inside of the socket.

The objections above stated, which are familiar to machinists, are completely obviated by the employment of my improvement, which is applicable at very slight cost to tools and sockets of the various descriptions used in drill-presses, and it also enables a material economy to be effected in rendering tools with broken tangs fully serviceable.

In the accompanying drawings, Figure 1 is a side view in elevation of a twist-drill and its socket, illustrating an embodiment of my invention; Fig. 2, a view partly in elevation and partly in axial section of the same, taken in a plane at right angles to that of Fig. 1; Fig. 3, a transverse section on the line *a a* of Fig. 2; Fig. 4, a side view in elevation of the key; Fig. 5, a central transverse section through the same; Fig. 6, an end view in elevation of the retaining-spring; Figs. 7 and 8, views in elevation of the same as seen from opposite sides, respectively; Fig. 9, a view in elevation of the outer end portion of a circumferentially-grooved socket, and Fig. 10 a similar view of the same with a drill connected thereto in accordance with my invention.

My present invention is herein shown as applied in connection with a socket 1 and twist-drill 2, each of which is, except as to the connecting means which constitutes my invention and which will be presently described, of the ordinary and well-known construction and which, as usual, are fitted together by an inwardly-tapering shank on the drill entering a correspondingly-formed bore in the adjoining end of the socket.

In the practice of my invention a short segmental longitudinal groove or keyway 3 is cut in the periphery of the drill 2 in such position on its shank as to stand when the drill is inserted in operative position in its socket at a distance from the outer end of the latter which will allow sufficient metal to be left in the inclosing shell of the socket between the outer end thereof and the adjacent end of a slot in the socket, which receives and fits neatly around a connecting-key 4 to insure ample strength in the portion of the socket between said slot and its outer end. The key 4 and the slot in the socket through which it passes are of rectangular transverse section, and the inner face of the key which abuts against the bottom of the keyway is convex or segmental and is curved on a shorter radius than that of the bottom of the keyway. A transverse groove or recess 4^a, which is curved concentrically with the periphery of the socket, is formed on the outer face of the key 4, said groove receiving a retaining-spring 5, which is a thin plate of elastic metal bent into the form of a split or divided ring adapted to surround the socket and the key 4 when the latter is inserted in its slot in the socket and in the keyway 3 of the drill. The portion of the spring 5 which is diametrically opposite its adjoining ends fits neatly in the groove 4^a of the key, the sides of the groove preventing it from sliding longitudinally off the key, and it is prevented from turning on the socket by lateral tongues 5^a, which abut against the ends of the walls of the groove 4^a. The ad-

joining ends of the retaining-spring are laterally extended, as shown in Figs. 7and 8, forming what may be termed "feet," which keep the spring square on the socket and prevent the key from rocking if there should be any play or looseness between it and its slot in the socket 1.

Figs. 9 and 10 illustrate the application of my invention in connection with a socket of larger diameter, having a circumferential groove or recess 1^b extending around the portion of its length at which the slot for the key 4 is cut. The retaining-spring 5 in this case fits in the groove 1^b so that its outer surface is flush with that of the socket 1.

In the operation of my improvement the drill or other tool is inserted in the socket in the ordinary manner. The key is ordinarily previously inserted in its slot and the retaining-spring fitted around it, so as to hold it in position therein. As the tool enters the socket its shank bears against the inner convex face of the key and pushes it and the retaining-spring outwardly until the tool is moved into its proper place, when the retaining-spring will force the key into the keyway of the tool and hold it therein. In extracting the drill from the socket a drift-pin is inserted in a transverse slot 1^a in the socket, and as the tool is pushed out the key and spring are again raised by the bearing of the segmental face of the keyway in the shank of the socket on the convex inner face of the key, thus permitting the withdrawal of the tool, after which the key and spring move inwardly to their normal positions.

A special advantage of my improvement is that the operation of the key and spring is wholly automatic and the tool may be inserted in and removed from the socket, as required, as readily and quickly as in the ordinary construction.

My improvement is applicable in connection with drills, taps, counterbores, or any other drill-press tools and may be used with sockets, drill-press spindles, horizontal and vertical milling-machines, and any spindle or socket receiving either a straight or a taper fit. The segmental form of the keyway in the shank of the tool and the projection of the key through the shell of the socket thereinto effectually prevent the turning of the tool in the socket without weakening the shank of the drill to any substantial or objectionable extent, as would be the case with a keyway extending entirely through the socket.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of a tool-socket, a tool fitting therein and having a segmental keyway on one side of its shank, a key passing through the shell of the socket and entering said keyway, a retaining-spring encircling the socket and bearing on the outer face of said key, and means for preventing rotation and endwise movement of the spring on the socket.

2. The combination of a tool-socket, a tool fitting therein and having a segmental keyway on one side of its shank, a key passing through the shell of the socket and entering said keyway and having a transverse recess on its outer face, a retaining-spring encircling the socket and fitting in the recess of the key, and lateral projections fixed on the spring and abutting on the end walls of the recess in the key.

3. The combination of a tool-socket, a tool fitting therein and having a segmental keyway on one side of its shank, a key passing through the shell of the socket and entering said keyway, a split or divided retaining-spring encircling the socket and bearing on the outer face of said key, and lateral projections fixed on the adjoining ends of the releasing-spring to prevent rocking of said spring on the socket.

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Witnesses:
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