

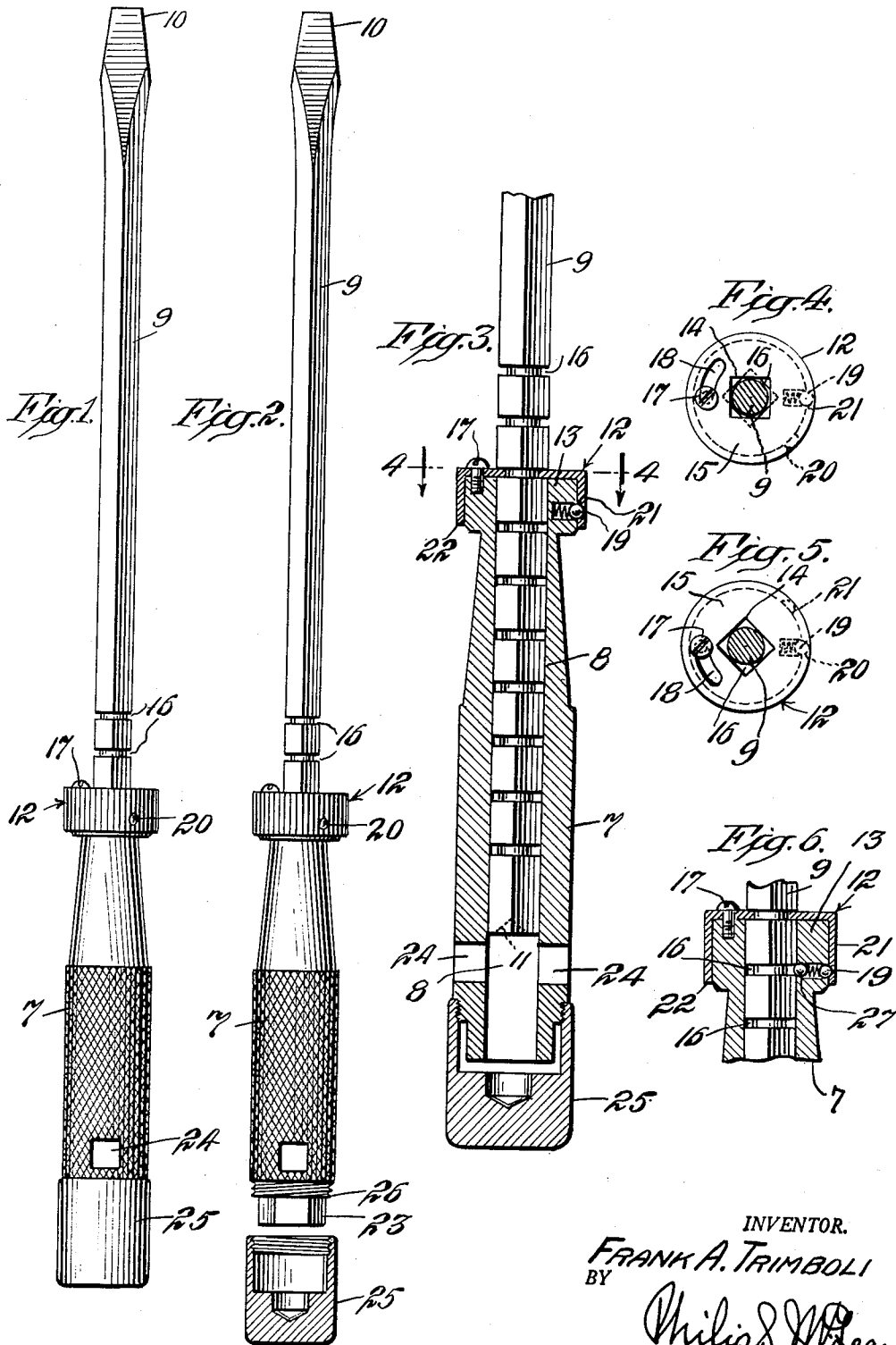
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RETRACTABLE TOOL

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RETRACTABLE TOOL

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2 Claims. (Cl. 145—64)

1

The invention herein disclosed relates to combination tools of the screw-driver type.

Objects of the invention particularly are to provide a construction in which a screw-driver blade may be lengthened or shortened according to different requirements, or be entirely removed and be replaced by a different type of tool such as a wrench, chisel, punch, drill, hammer, saw or the like.

Further important objects are to construct the device so as to enable the greatest and most effective use of the particular implement employed at the time.

It is for these various purposes that the tool is constructed with a handle having an axial bore extending entirely therethrough so that the shank or bit of the tool may be shifted inward or outward to a maximum extent and the end of the bit or shank actually projected through and beyond the handle for direct action thereon, as with a hammer, wrench or the like.

The other novel features of the invention and other desirable objects attained thereby are set forth and will appear in the course of the following specification.

The drawing accompanying and forming part of the specification illustrates a present commercial embodiment of the invention. Structure, however, may be modified and changed as regards the immediate illustration, all within the true intent and scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawing is a side elevation showing the tool in use as a screw-driver, with the screw-driver bit partly extended;

Fig. 2 is a similar view showing the cap removed to expose the wrench head on the end of the handle;

Fig. 3 is an enlarged broken sectional view showing the locking ring turned on the handle into position securing the tool shank partly extended;

Figs. 4 and 5 are cross sectional views on the line 4—4 of Fig. 3, showing the ring first in the locking position and second in the release position, yieldingly retained in each of these positions by the spring detent;

Fig. 6 is a broken sectional detail showing the double spring detent for indexing both the length and the locking of the tool blade.

The handle of the tool shown at 7 may be of any desired size and shape to suit the general purposes of the tool, and it is provided with a rectangular or other polygonal cross section axial bore 8 extending entirely therethrough to sild-

2

ingly accommodate the correspondingly shaped angular shank portion 9 of the screw-driver or other tool element 10.

This construction permits the tool shank to be extended or to be retracted practically its full length. In the illustration, for example, the handle may be slipped down over the shank practically to the bit or blade portion of the screw-driver, a position where the maximum turning force may be applied closest to the work in hand. In such case the shank may project substantially full length from the back of the handle, but this may be no objection if space is available and in many cases it is an advantage, permitting a wrench or other turning implement being engaged with the projecting part of the tool shank.

This projection of the tool shank from the back end of the handle also is advantageous where it may be necessary to apply pressure to the end of the shank, as by means of some screw or leverage mechanism engaged with a center opening 11, Fig. 3, provided in the back end of the shank.

To secure the tool shank in variously projected positions there is provided in the illustration, a cap 12 rotatably sleeved over a cylindrical portion 13 at the inner end of the handle, said cap having a square or other correspondingly shaped opening 14 in the end wall portion 15 of the same to pass the shank, when aligned with the bore as in Fig. 5, and to interlock over the notched or grooved portions 16 of the shank, when turned to the position shown in Fig. 4.

This locking cap is shown confined over the cylindrical end portion of the handle by a screw 17 and as limited in its angular turning movement by an arcuate slot 18 in the end wall 15 through which the screw passes and which is just of sufficient length to permit the cap to be turned from the locking to the unlocking position, and vice versa.

To prevent the cap from turning and accidentally releasing the tool blade, a detent is provided in the illustration, shown as a spring pressed ball 19 seated in the cylindrical portion 13 of the handle and designed to project into holding engagement with detent seats 20, 21, provided inside the dependent flange or finger grip portion 22 of the cap or sleeve 12.

This flange portion of the locking element may be knurled or grooved as indicated in Figs. 1 and 2, to facilitate grip of the fingers thereon.

The spring detent, in addition to serving as a retainer for holding the locking sleeve in either the shank securing or release position, is also of

advantage as an index or feeler for indicating to the user that the sleeve is in either the shank securing or release position.

To enable the application of a wrench or other tool direct to the end of the handle, the latter is shown as having an angular head portion 23, Fig. 2.

Also, if desired, the outer end portion of the handle may have a transverse opening 24 extending entirely therethrough for reception of a lever for turning the tool, or a cross handle for applying end pressure on the tool.

To protect the wrench head portion 23 at the outer end of the handle and to close over the outer end of the bore when not required for extension of a tool shank, there is provided in the illustration, a screw cap 25 detachably engageable with a screw portion 26 on the handle at the base or inner end of the wrench head.

For all ordinary uses of the tool the screw cap 25 may remain in position, as shown in Fig. 1, closing the outer end of the bore in the handle and covering the angular wrench head portion 23 of the handle. In such position this closure cap prevents the tool shank from being accidentally projected through the back end of the handle, but if it is desired to project the shank back beyond the handle, this cap can be instantly removed to permit such use of the tool.

The construction disclosed enables the handle to be used with shanks carrying all kinds of tool elements, such as those first mentioned by way of example.

The structure is simple, the parts are few in number and durable and strong. The device may be produced at low cost because machining operations required are relatively simple and inexpensive.

In addition to indexing the locking sleeve, the spring detent mechanism may be and preferably is so designed as to index the tool shank in its length adjustment in the handle.

This is accomplished as shown in Figure 6 by locating the spring detent in the handle to line up with the grooves or notches 16 in the tool shank and by providing an additional spring pressed detent ball 27 to engage in said notches. With this construction, when the sleeve is turned to the unlocked position, Fig. 5, the shank may be slipped inward or outward in the handle, with the ball detent 27 indexing and yieldingly holding the shank in various positions of adjustment, lined up with the notches registering with the locking sleeve and ready to be secured in any one of these positions by rotation of this sleeve to the Fig. 4, locking position.

What is claimed is:

1. An extensible screw-driver or similar tool comprising a longitudinal tool shank of non-circular cross section and having longitudinally spaced cross notches therein, a hand grip form of handle having a correspondingly shaped, non-circular cross sectional passage extending entirely therethrough, open at opposite ends and slidably receiving said tool shank and thereby holding said handle and shank in non-rotatable relation in all positions of relatively longitudinal adjustment of shank and handle, a sleeve rotatably engaged on said handle and having a flange disposed over the inner end of the handle, said flange having an opening therethrough corresponding to the non-circular cross sectional shape of the passage through the handle, a spring ball detent recessed transversely in said handle within and covered by said sleeve and yieldably en-

gageable with the latter for retaining said sleeve rotated in position with said flange opening in register with the passage through the handle or out of register therewith to either permit relative sliding adjustment of the tool shank and handle or the securing of the tool shank in selected position in the handle by the engagement of the flange in a selected cross notch in the shank, a wrench head on the outer end portion of the handle for engagement with and application of a wrench or leverage applying tool thereto, the tool shank having sliding adjustment within the handle sufficient to project the end of the tool shank beyond the outer end of the handle and beyond said wrench head, with the handle and tool shank still coupled in non-rotatable relation whereby a leverage applying or other turning tool may be directly applied to the outer, exposed end of the non-circular tool shank and to said wrench head, and a cap removably engageable over the outer, open end of the handle and over said wrench head to form, when in place on the handle, a guard for preventing the projection of the tool shank beyond the end of the handle and to protect the hand gripping the end of the handle, from engagement by the outer end of the tool shank.

2. An extensible screw-driver or similar tool comprising a longitudinal tool shank of non-circular cross section and having longitudinally spaced cross notches therein, a hand grip form of handle having a correspondingly shaped, non-circular cross sectional passage extending entirely therethrough, open at opposite ends and slidably receiving said tool shank and thereby holding said handle and shank in non-rotatable relation in all positions of relatively longitudinal adjustment of shank and handle, a sleeve rotatably engaged on said handle and having a flange disposed over the inner end of the handle, said flange having an opening therethrough corresponding to the non-circular cross sectional shape of the passage through the handle, a spring ball detent recessed transversely in said handle within and covered by said sleeve and yieldingly engageable with the latter for retaining said sleeve rotated in position with said flange opening in register with the passage through the handle or out of register therewith to either permit relative sliding adjustment of the tool shank and handle or the securing of the tool shank in selected position in the handle by the engagement of the flange in a selected cross notch in the shank, a wrench head on the outer end portion of the handle for engagement with and application of a wrench or leverage applying tool thereto, the tool shank having sliding adjustment within the handle sufficient to project the end of the tool shank beyond the outer end of the handle and beyond said wrench head, with the handle and tool shank still coupled in non-rotatable relation whereby a leverage applying or other turning tool may be directly applied to the outer, exposed end of the non-circular tool shank and to said wrench head, and a cap removably engageable over the outer, open end of the handle and over said wrench head to form, when in place on the handle, a guard for preventing the projection of the tool shank beyond the end of the handle and to protect the hand gripping the end of the handle, from engagement by the outer end of the tool shank, said detent including two detent balls transversely aligned in the handle, one inside projecting into the passage through the handle to engage the cross notches in the

2,592,978

5

shank and the other projecting into engagement with the sleeve to hold the latter in the rotatably adjusted relations described.

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6

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