S. A. DAVERN.

TOOL.

APPLICATION FILED APR. 29, 1920.

1,394,608.

Patented Oct. 25, 1921.

2 SHEETS—SHEET 1.

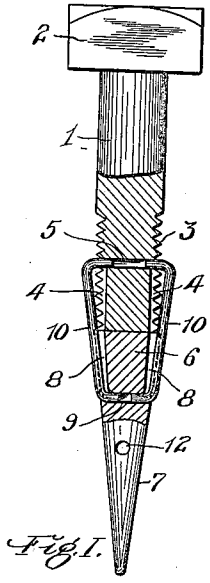


Fig. I.

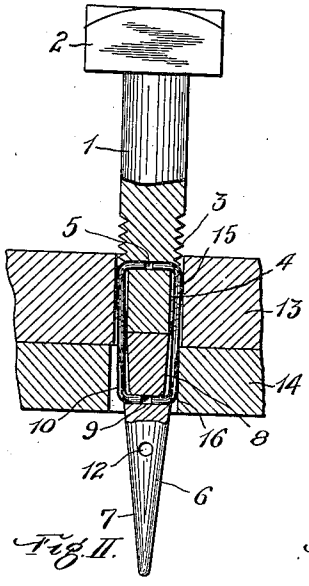


Fig. II.

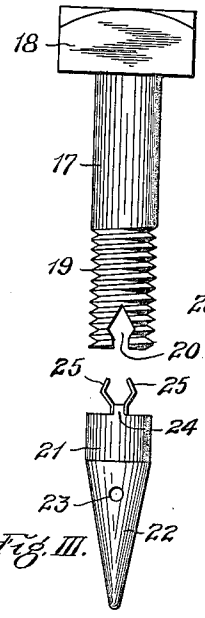


Fig. III.

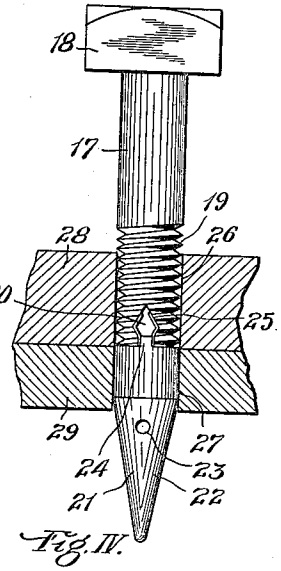


Fig. IV.

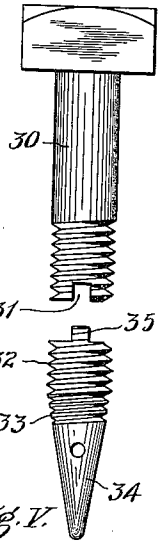


Fig. V.

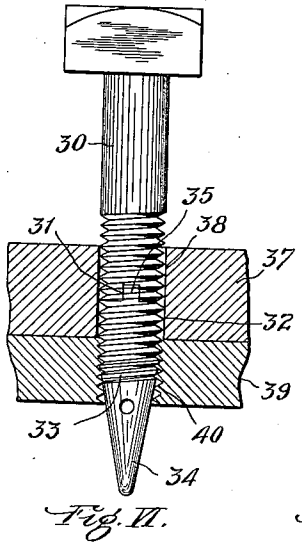


Fig. VI.

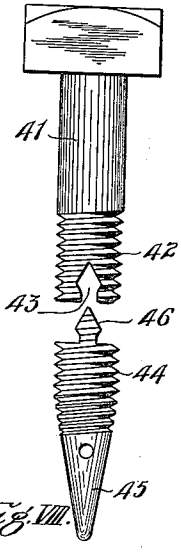


Fig. VIII.

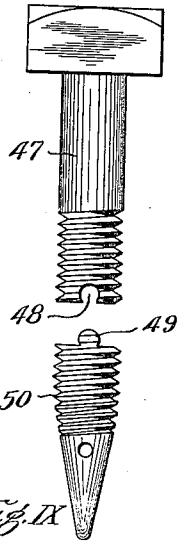


Fig. IX

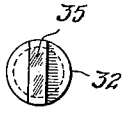


Fig. VII.

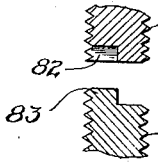


Fig. XVIII.

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TOOL.

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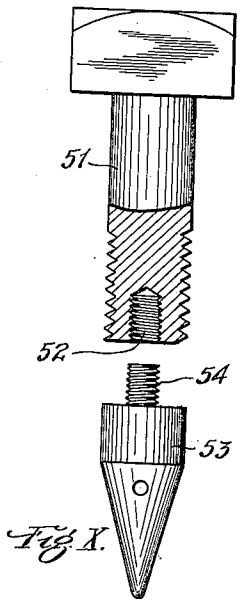


Fig. X.

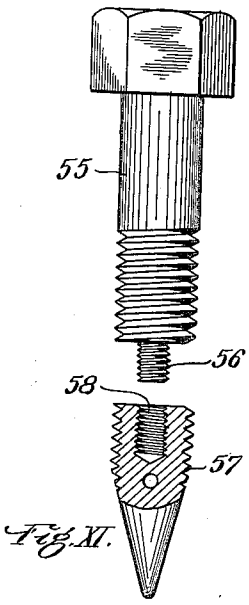


Fig. XI.

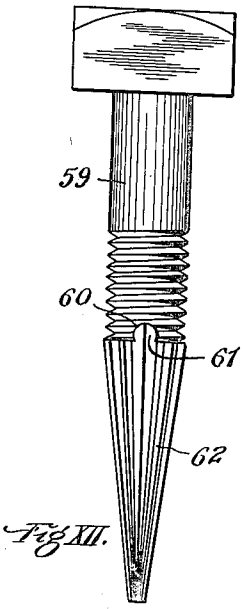


Fig. XII.

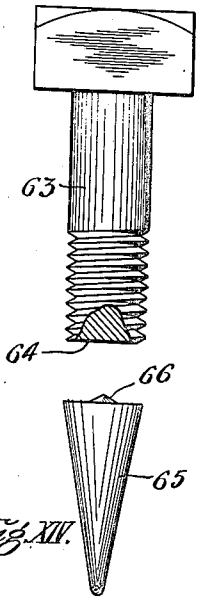


Fig. XIII.

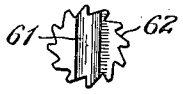


Fig. XIII.

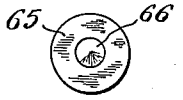


Fig. XV.

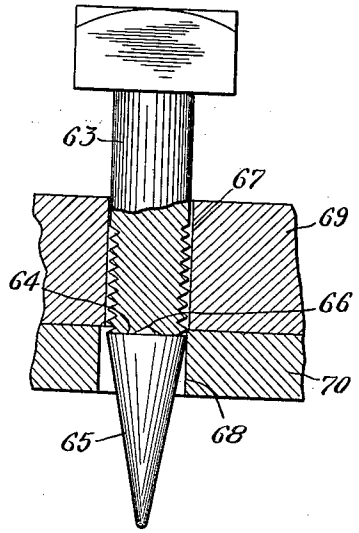


Fig. XVI.

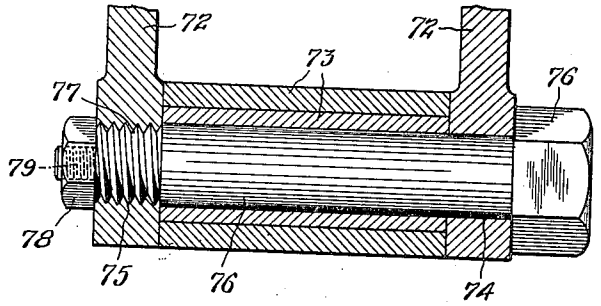


Fig. XVIII.

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UNITED STATES PATENT OFFICE.

STEPHEN A. DAVERN, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO FREDERICK E. BUCHSER, OF CLEVELAND, OHIO.

TOOL.

1,394,608. Specification of Letters Patent. Patented Oct. 25, 1921.

Application filed April 29, 1920. Serial No. 377,499.

To all whom it may concern:

Be it known that I, STEPHEN A. DAVERN, a citizen of the United States, residing at 703 E. 99th St., in the city of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Tools, of which the following is a specification, the principle of the invention being herein explained, and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention pertains to a bolt coöperating tool and more particularly to a device adapted to coöperate with the threaded end of a bolt so as to assist both in inserting bolts and to enable withdrawal of bolts more easily and more quickly without injuring them.

Every mechanic has experienced the difficulty of withdrawing bolts especially without mutilating it or often destroying it whereby its re-use may not be possible. For example, if one of the leaves of an automobile spring become broken, necessitating its detachment, it is invariably an exceedingly difficult matter to drive out the bolt, partly because of wear, partly because of rust and partly because of the inaccessibility. The same difficulties are encountered when it is desired to again insert the bolt and these difficulties may be said to comprehend jacking and strenuous twisting or prying efforts to bring the several holes into proper registry. I know of one instance that required several hours' time to replace a single spring bolt involving a cost of several dollars for labor.

Accordingly, the object of my invention is to provide a labor saving tool enabling bolts to be more readily inserted or removed. Its cost should not be a factor if the trouble and time saved is taken into consideration.

Adverting to the drawings:—

Figure I is an elevation of a bolt showing my coöperating tool associated therewith.

Fig. II illustrates the parts of Fig. I being entered into two plates which it is intended to bolt together.

Fig. III is an elevation of a modified form of coöperating tool separated from a bolt.

Fig. IV shows the parts of Fig. III attached and inserted in registering holes formed in two members.

Figs. V and VI illustrates a further modification corresponding to the two previous pairs of figures.

Fig. VII is a top plan of one part of my invention which may be termed a pilot.

Figs. VIII, IX, X and XI are further elevations corresponding to Fig. III of two other modifications.

Figs. XII and XIII are a side elevation and a top plan of another modification.

Figs. XIV and XV are a side elevation and a top plan respectively of still another modification.

Fig. XVI shows the parts of Fig. XIV being placed in position.

Fig. XVII illustrates the manner of use of a bolt such as is shown in Fig. XI.

Fig. XVIII is a cross sectional view of a bolt and pilot similar to that shown in Fig. IX except that the tongue and groove run only half way through the bolt.

A bolt provided with a shank 1, head 2 and threaded end 3 is fashioned on opposite sides of its threaded section with a pair of longitudinally extending grooves 4 each terminating at one end which is nearest to the head 2 in a transversely directed hole 5, adapted for endwise abutment. Against the threaded end of the bolt is a pilot 6 having its free extremity tapered at 7 and likewise provided on opposite sides with grooves 8 adapted to come into alinement with the grooves 4 respectively. Each of the grooves 8 terminates in an opening 9. The bolt and pilot are held in abutting position by means of a pair of spring members 10 each of which has both of its ends bent at angles the arrangement being such that the interjacent position of each spring member may be compressed to occupy that one of the grooves 4 and that one of the grooves 8 which are alined, and such that the bent ends of each spring member occupy the holes 5 and 9 respectively. The tapered portion of the pilot 7 is provided with a cotter hole.

Two members 13 and 14 are provided with openings 15 and 16 adapted to be brought into registry. As will be readily understood, the attachment of the pilot 7 enables the holes 15 and 16 to be easily and quickly shifted so as to assume such a position thereby enabling the insertion of the bolt without difficulty. During such insertion movement the compression of the spring members 10 into the grooves 4 and 8 will

occur as is clearly shown in Fig. II. After a bolt has been so inserted and it is desired to withdraw it, its coöperating nut (not shown) must of course be first removed, then my pilot is attached and by means of a tool inserted in the cotter hole 12 given a few turning movements sufficient to loosen the bolt following which the parts may be withdrawn through the holes 15 and 16 either by both pull and rotation applied at the head of the bolt or by hammering the extremity of the pilot instead of as heretofore the extremity of the bolt with likelihood of injury to its threads.

The modification of Figs. III and IV consists of a bolt 17 provided with a head 18 and threaded portion 19 the end of which is fashioned with a diamond shape opening 20. A cylindrical pilot 21 having a conical extremity 22 provided with a hole 23 carries upon a projection 24 a pair of spring fingers 25 simulating in shape though normally expanded with reference to the walls of the opening 20. As clearly appears in Fig. IV the fingers 25 may be sprung into place in the opening 20 and thereafter the bolt readily inserted through two openings 26 and 27 formed in two members 28 and 29.

The modification illustrated in Figs. V and VII consists in providing a bolt 30 with a rectangular cut-out 31 and in providing screw threads 32 at one of the pilots and adjoining them tapped threads 33. The extremity of the pilot 34 is similarly tapered while the threaded extremity carries a rectangular projection 35 adapted to fit in the cut-out 31. A member 37 has a plain hole 38 and a member 39 is fashioned with a tapped hole 40. The intention in using this modification is to have the bolt together with its pilot screw into position through the member 37.

Figs. VIII and IX correspond to the preceding modification except for an alteration in the manner of connecting the bolt and pilot. Fig. VIII has a bolt 41 threaded at 42 and provided with what may be termed a triangular opening 43. A pilot 44 has a tapered end 45 and a projection 46 adapted for lateral insertion in the opening 43. In Fig. IX the screw threaded end of a bolt 47 is provided with a cylindrically surfaced opening 48 or bore opening through the end adapted to receive a complementarily shaped projection 49 on a pilot 50.

Fig. X is a further modification of the means for detachably securing a bolt and pilot. A bolt 51 has its screw threaded end fashioned with a tapped hole 52, whereas the pilot 53 has its cylindrical end fashioned with a complementarily screw threaded projection 54. Fig. XI is in part a reversal of the connection shown in Fig. X, a bolt 55 having its screw threaded end terminating in a relatively smaller screw threaded extremity 56, while an exteriorly threaded pilot 57 is provided with a tapped hole 58 adapted to receive the extremity 56.

Figs. XII and XIII illustrate a pilot fashioned as a tapered reamer. A bolt 59 has its screw threaded end provided with a transverse bore 60 in which a similarly shaped projection 61 formed upon the larger end of the reamer 62 is to be fitted. As will be readily understood this type of reamer pilot is intended to cut its way in response to turning movement applied at the head of the bolt.

Figs. XIV to XVI inclusive illustrate still another modification wherein a standard bolt 63 having a flat end surface 64 is to be used with a tapered pilot 65 fashioned centrally on its circular surface with a hardened point 66, adapted to be driven into the end 64 as shown in Fig. XVI when the bolt 63 is being forced through holes 67 and 68 in two members 69 and 70 respectively, which holes do not quite register. In hammering the bolt 63 in place the point 66 forms a recess 71 in the relatively softer end 64 of the bolt.

Fig. XVII shows how a bolt of a type shown in Fig. XI would be used, for example, as a shackle bolt. Two shackles 72 are held apart by spacers 73 and are fashioned with a plain opening 74 and a screw threaded opening 75 respectively. The shank of a bolt 76, somewhat elongated, is passed through the opening 74, the inner spacer or bushing 73 and its screw threaded end 77 turned through the screw threads 75 after which a nut 78 is secured upon the smaller screw threaded extremity 79.

If the bolt be threaded in a part other than a nut, by attaching the pilot, one is enabled to screw out the bolt by turning the pilot and hence the threaded end of the bolt. This is an advantage when, as frequently happens, such end of the bolt is more accessible than the head of the bolt.

I claim:—

1. A tool comprising the combination of a bolt and a member having a tongue and groove end to end connection, said member not exceeding in cross dimension the diameter of the shank of said bolt, the free end of said member being of reduced size and fashioned with an opening purposed for the insertion of an element whereby to effect the turning of said bolt when its head is inaccessible.

2. A bolt coöperating tool comprising the combination of a bolt, a member of no greater diameter than the diameter of the shank of said bolt, said member being tapered at one end and fashioned at such end with a transversely extending opening, the other end of said member being detachably connected against the end of said shank.

3. A bolt coöperating tool comprising the

combination of a bolt, a member of no greater diameter than the diameter of the shank of said bolt, said member being tapered at one end and fashioned in such end with an opening, and means for connecting said member end to end with a bolt.

4. The combination with a bolt having a shank, of a member adapted to have one end so connected with the end of said shank as to turn therewith and yielding means for detachably effecting such connection, the other end of said member being of progressively reduced size and fashioned with opening for the insertion of a tool to serve as an alternative turning agency.

5. A device of the character described comprising the combination with the shank of a bolt, of a member attachable so that its end abuts the end surface of said shank, the configuration of the abutting ends of said shank and member enabling such attachment, said member being of no greaer diameter than said shank and having its free end tapered and punctured for the purpose specified.

6. A device of the character described comprising the combination with the shank of a bolt, of a member having one end substantially corresponding in size to the end of said shank, said shank and member being detachably secured together in abutting and surface relationship, the free end of said member being tapered and additionally perforated for the purpose specified.

7. A tool comprising the combination with a bolt having a grooved shank, of a grooved member adapted to have one end abut one end of said shank, and connecting means occupying the grooves in said shank and member.

8. A tool comprising the combination with a bolt having a shank fashioned with a longitudinal groove, a tapered member adapted to form a continuation of said bolt and likewise fashioned with a groove adapted to aline with the first, and a yielding device adapted to occupy said grooves and to detachably connect the parts.

Signed by me, this 12th day of April, 1920.

STEPHEN A. DAVERN.