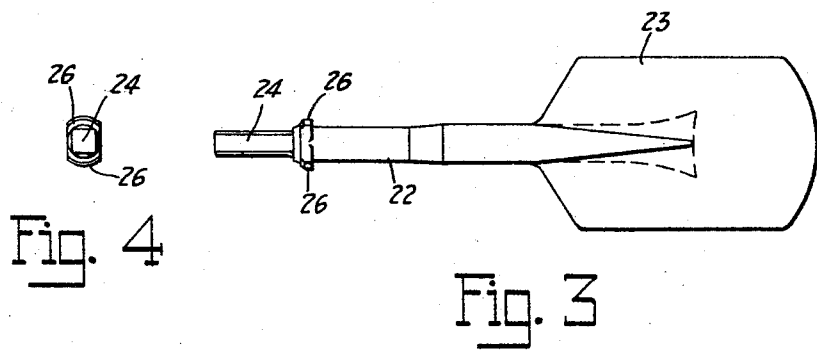
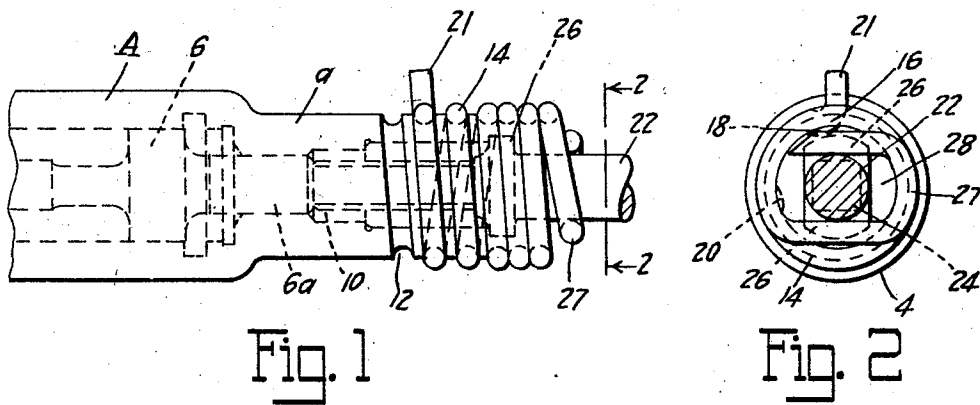


March 17, 1931.

E. W. STEVENS
COIL SPRING RETAINER
Filed March 1, 1928

1,796,487



INVENTOR.
Edward W. Stevens
BY
Ira L. Nickerson
ATTORNEY.

UNITED STATES PATENT OFFICE

EDWARD W. STEVENS, OF DETROIT, MICHIGAN, ASSIGNOR TO CHICAGO PNEUMATIC TOOL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY

COIL-SPRING RETAINER

Application filed March 1, 1928. Serial No. 258,187.

The present invention relates generally to percussive machines including pneumatic hammers and particularly to means for holding working tools in operative relation with such machines. More specifically it relates to coil spring retainers for such tools.

One object of the invention is to provide improved means for detachably securing to percussive machines working tools of all types, which means are quickly operative for removing or attaching the tool but which when in use securely hold the tool in place. Another object is to provide means for holding shanked tools in operative relation on such machines the means being arranged to permit the disposing of the tool in a plurality of positions at various angles with respect to the axis of the tool. Another object is to permit the removal or interchange of tools without removing the retainer. Other objects and advantages of the invention will be apparent from the detailed description which follows.

In order to illustrate the invention one concrete embodiment thereof is shown in the accompanying drawings, in which;

Figure 1 is a partial side view showing the device of the invention in position on a pneumatic hammer and holding in operative relation a working tool;

Figure 2 is a transverse section view taken along the line 2—2 of Figure 1 and looking in the direction of the arrows;

Figure 3 is a plan view indicating forms of tools which can be used with the tool holder of the invention, as shown in Figures 1 and 2; and

Figure 4 is an end view at the shank of the tool of Figure 3.

In all of the above described views similar characters of reference are used to designate corresponding parts throughout.

Referring now to the drawing Figure 1 shows the front end of a percussive machine such as a pneumatic hammer having a cylinder or barrel A, the forward end *a* of which is reduced in diameter. Within cylinder A is a reciprocable hammer or piston 6 having an impact end 6*a* which extends into said forward cylinder end *a*. At its outer end the

bore 10 of cylinder end *a* is broached into polygonal form, such as four sided or square with the corners at a bezel, to receive the similarly formed shank end of a working tool. The outer surface at said forward cylinder end *a* has formed therein a spiral groove or thread 12 which in cross section is substantially semi-circular. Said groove 12 extends to the very end of said forward end *a* and is adapted to receive thereon in threaded relation the coil spring tool holder 14. The end of said holder 14, that is in threaded engagement on said forward end *a*, is slightly inturned and then outturned at right angles to form a locking projection or lug 16. Near the inner end of said spiral groove 12 there are formed at ninety degrees apart from each other two depressions or indents 18 and 20 which are adapted to receive said lug 16 in releasable locking engagement. Their function is to keep said holder 14 from unscrewing and to place it in locked relation in correct position with respect to said squared bore 10. The inner end of said holder 14 adjacent lug 16 extends outwardly to form a handle 21.

The tool stem 22 of the working tool 23, such as a spade, chisel, tamper bar, drill steel, etc., has formed thereon adjacent to the squared shank 24 thereof a pair of oppositely placed lugs 26, 26 which are of the same width as said stem 22 and together therewith form a cross section which is substantially rectangular. The width of said square shank 24 is somewhat smaller than the width of said stem 22. Said holder 14 extends beyond said forward end A and its outermost turn 27 is formed to define a substantially rectangular opening 28 adapted to receive said stem 22 and said lugs 26, 26, but the width of said opening 28 is smaller than the distance between the outer ends of said lugs 26, 26.

In use said holder 14 is arranged to remain at all times on said cylinder A in threaded relation on said outer cylinder end *a* thereof. To insert a tool and lock it in place on said cylinder A said holder 14 is turned or rotated until said passageway has its greater dimension or axis aligned in the plane in which it

is desired to have the blade of the tool 23 extend when the latter is in place on said cylinder 2. The shank 24 and lugs 26, 26 are then passed through said opening 28 until
 5 said lugs 26, 26 are disposed inwardly thereof, whereupon said holder 14 is turned by means of said handle 21 to bring said lug 16 into locking engagement with the one of said
 10 indents 18 or 20 which is aligned with said lugs 26, 26. This brings the narrow dimension of said opening 28 adjacent said lugs 26, 26 which latter are thereby locked by the holder 14 against movement out of said
 15 cylinder end *a*. To remove the tool the holder is turned back to the position in which it was when the tool was inserted. The angular disposition of a tool in the cylinder A can be changed by removing the tool as above noted and then moving said handle 21
 20 through ninety degrees to the other indent, reinserting the tool, and then turning said holder 14 back to lock said lug 16 in the first of the indents 18 or 20.

While the invention has been disclosed
 25 herein in what is now considered to be a preferred form, it is to be understood that the invention is not confined to the specific details thereof but covers all changes, modifications and adaptations within the scope of the
 30 appended claims.

I claim as my invention:

1. The combination with a percussive machine having an exteriorly threaded barrel and a non-circular opening therein, of a working
 35 ing tool having a shank extending into and fitting said opening, a coil spring retainer for said tool threaded upon said barrel, and means providing for interchange of tools without removing said retainer from said barrel.
 40 rel.

2. The combination with a percussive machine having an exteriorly threaded barrel and a non-circular opening therein, of a working
 45 fitting said opening, a coil spring retainer for said tool threaded upon said barrel, and means providing for angular adjustment of said tool relative to said barrel without removing said retainer from said barrel.

3. The combination with a percussive machine having an exteriorly threaded barrel and a polygonal opening therein, of a working
 50 tool having a polygonal shank extending into said opening, a coil spring retainer for said tool threaded upon said barrel, and cooperating means on said tool and said retainer for
 55 releasing or securing said tool by a partial rotation of said retainer on said barrel.

4. The combination with a percussive machine having an exteriorly threaded barrel and a polygonal opening therein, of a working
 60 ing tool having a polygonal shank extending into said opening, a coil spring retainer for said tool threaded upon said barrel, cooperating
 65 ing means on said tool and said retainer for

releasing or securing said tool by a partial rotation of said retainer on said barrel, and means for locking said retainer in one position of angular adjustment.

5. The combination with a percussive machine having an exteriorly threaded barrel and a polygonal opening therein, of a working
 70 tool having a polygonal shank extending into said opening, a coil spring retainer for said tool threaded upon said barrel, cooperating
 75 ing means on said tool and said retainer for releasing or securing said tool by a partial rotation of said retainer on said barrel, and means for locking said retainer to said barrel
 80 in both its tool releasing and tool securing positions.

6. The combination with a percussive machine having an exteriorly threaded barrel provided with a polygonal opening in the end
 85 thereof of a coil tool retainer comprising a coil spring member in threaded engagement with said barrel, said retainer being formed with an elongate opening at its outer end in line with said barrel, and cooperating means
 90 on said retainer and barrel for locking said retainer in one position of angular adjustment.

7. The combination with a percussive machine having an exteriorly threaded barrel provided with a polygonal opening in the end
 95 thereof of a coil tool retainer comprising a coil spring member in threaded engagement with said barrel, said retainer being formed with an elongate opening at its outer end in line with said barrel, one coil of said retainer being
 100 deformed to provide a locking lug or projection, said barrel having a recess to receive said lug thereby to lock said retainer in one position of angular adjustment.

8. The combination with a percussive machine having an exteriorly threaded barrel provided with a polygonal opening in the
 105 end thereof of a coil tool retainer comprising a coil spring member in threaded engagement with said barrel, said retainer being formed with an elongate opening at its outer end in line with said barrel, one coil of said retainer being deformed to provide a locking
 110 lug or projection, said barrel having a plurality of recesses to receive said locking lug.

9. In combination, a pneumatic hammer having a spiral thread formed at the outer
 115 end of its cylinder and an indent sunk in said thread at an intermediate point thereof, and a tool holder therefor consisting of a heavy
 120 wire spring helically wound to adapt it to be threaded onto said thread on said cylinder end and having at its inner end a sharp turn inwardly and then outwardly to form an inner
 125 lug adapted to be locked by said spring into said indents, said spring being of a length to extend from said thread beyond said cylinder end and having, at the end opposite
 130 said lug, the wire thereof formed to define

a passageway longer in one dimension than in another.

10. In combination, a pneumatic hammer, a tool having a polygonal shank adapted to fit into a correspondingly shaped receiving opening in the end of the cylinder of said hammer, a pair of lugs oppositely positioned on said shank adjacent the portion thereof which enters the opening in said cylinder end, said cylinder end being threaded on its outer surface and having a pair of indents sunk into the bottom of said thread, one at ninety degrees from the other along said thread, and a tool holder consisting of a heavy wire spring helically wound to adapt it to be threaded onto the thread on said cylinder end and having at its inner end a sharp turn inwardly and then outwardly to form an inner lug adapted to be locked by said spring into one of said indents, said spring being of a length to extend beyond said cylinder when threaded thereon, and an outer turn of said spring being formed to define a rectangular passageway which is longer than it is wide, said outer turn being adapted to admit the passage of said tool shank and said lugs thereon when aligned therewith but to prevent the passage thereof when said shank lugs are transverse to the longer dimension of said passageway.

11. A tool holder for pneumatic hammers and the like consisting of a heavy wire spring helically wound, the wire of said spring at one end being turned sharply inwardly and then outwardly to form an inner lug and a handle member extending outwardly therefrom, the wire at said end being adapted to fit in threaded relation on a spiral thread, and the wire at the other end being formed to define an opening which is longer than it is wide.

12. A tool holder for pneumatic hammers and the like consisting of a heavy wire spring helically wound to define a longitudinal circular chamber, the wire of said spring at one end having a sharp turn inwardly and then outwardly to form an inner lug, the wire at said end being adapted to fit in threaded relation on a spiral thread, and the wire at the other end being formed to define an opening which is greater in length than in width.

Signed by me at Detroit, in the county of Wayne and State of Michigan, this 27th day of February, 1928.

EDWARD W. STEVENS.