Dec. 30, 1930. W. F. ZIMMERMANN 1,787,229

TOOL RETAINER FOR PNEUMATIC TOOLS

Filed Jan. 10, 1928

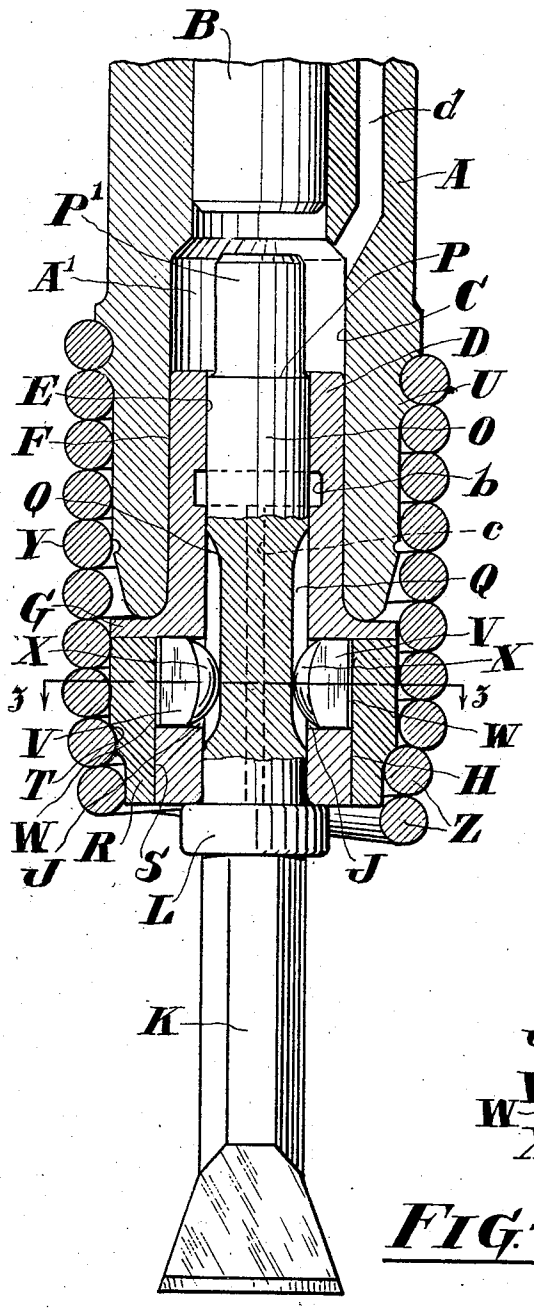
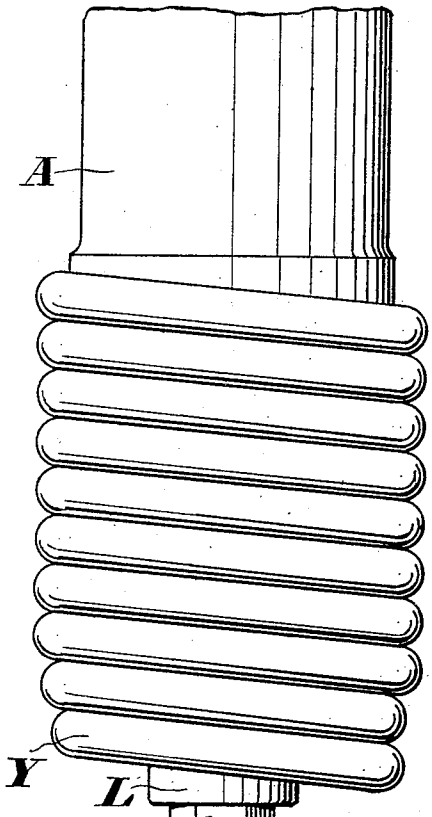


FIG.-1.

FIG.-2.



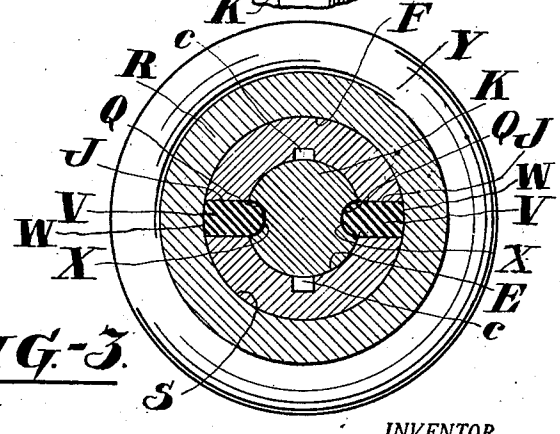


FIG.-3.

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UNITED STATES PATENT OFFICE

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TOOL RETAINER FOR PNEUMATIC TOOLS

Application filed January 10, 1928. Serial No. 245,717.

This invention relates to pneumatic tools, but more particularly to a tool retainer for pneumatic tools.

It is an object of this invention to provide a rugged tool retainer which is cheap to construct and consists of but few parts.

Other objects will be in part obvious and in part pointed out hereinafter.

In the drawings, forming part of the specification,

Figure 1 shows a vertical sectional elevation of the front end of a pneumatic tool of the type for which the retainer is designed,

Figure 2 is a view similar to Figure 1 but not in section, and

Figure 3 is a transverse sectional view of Figure 1 taken on the line 3—3 looking in the direction indicated by the arrows.

Referring more particularly to the drawings, A is a cylinder or barrel of a pneumatic tool in which is mounted a reciprocating hammer piston B. The forward end of the cylinder A has a cylindrical bore C into which is fitted a chuck or bushing D having a cylindrical bore E and a cylindrical outer surface F. This bushing D has a flange G near the forward end. Forward of the flange G is another cylindrical portion H. In the cylindrical portion H are formed slots or key ways J extending through the walls of the cylindrical portion H.

A chisel or similar tool K has a collar L and a shank O rearwardly of the collar L. In the drawing, this shank O is shown inserted into the bushing D. The rearward end of the shank is reduced forming a shoulder P and rearwardly of the collar L in the shank O are two spline milled slots Q. A sleeve R having an inner cylindrical bore S is adapted to fit over the cylindrical portion H of the bushing D. This sleeve R is provided at its outer forward end with a threaded portion T and a similar threaded portion is found on the barrel at U. The keys V having a curved surface W and a curved face X are provided to fit the key ways J.

The assembly and operation of the tool is as follows: The bushing D is inserted into the barrel A until it is stopped by the flange G. The drill steel or tool K then has its shank O inserted into the bushing D until it is stopped by the collar L. The keys V are then inserted into the keyways J so that the curved surfaces of the keys cooperate with the spline milled slots Q. The sleeve R is then slipped over the tool K and over the cylindrical portion H of the bushing D, thus making it impossible for the keys V to be backed out of the key ways J. A heavy helical spring Y having several coils Z of somewhat smaller diameter than the remainder of the spring is passed over the sleeve R and the forward end of the barrel A. The spring Y is then turned or rotated about the axis of the barrel until it engages the threaded portion of the barrel at U. The retainer is now in assembled position and it is impossible for the hammer piston B to drive the tool K out of the bushing D for when a blow of the piston is delivered to the steel when there is no resisting force on the chisel end of the tool, the tool will be driven forward until the rearward ends of the spline milled slots Q strike the keys V. The keys V are held against lateral movement by the sleeve R and the tool is thus prevented from being driven out. The shock of the blow is absorbed by the spring Y.

In order to prevent repeated heavy blows of the piston B upon the tool when the tool is not in contact with the work, a method of causing the piston to stop is provided. This is accomplished by cutting a ring groove *b* in the bushing D from this ring groove a slot *c* extends to the forward end of the bushing. Hence when the chisel has been driven as far forward as the keys V will permit, the shoulder P comes below the ring groove *b* and an air passage is thus formed extending from the opening A′ past the reduced portion P′ of the shank O into the ring groove *b* and to the atmosphere through the slot *c*. Thus, when pressure fluid is delivered to the forward end of the cylinder through the passage *d* it will escape through the passage described above and the hammer piston B will not be returned to the rearward end of the cylinder until the operator presses the tool K against the work. This will force the piston rearwardly and also bring the shoulder P rearwardly past the ring groove

b and pressure fluid will be prevented from escaping to the atmosphere and the tool will again become operative.

I claim:

In a tool retainer for a pneumatic tool, the combination of a barrel, a bushing extending slidably into said barrel and having a flange intermediate its ends, a working tool extending slidably into said bushing, key ways in said working tool and in said bushing, keys in the key ways of the bushing extending into the key ways of said tool for retaining said tool in the bushing, a sleeve disposed on the front end of said bushing to retain said keys in position, and a spring threaded to the sleeve and the barrel to hold the sleeve against the flange and thus provide a yieldable seat for the bushing.

In testimony whereof I have signed this specification.

WILLIAM FRANK ZIMMERMANN.