

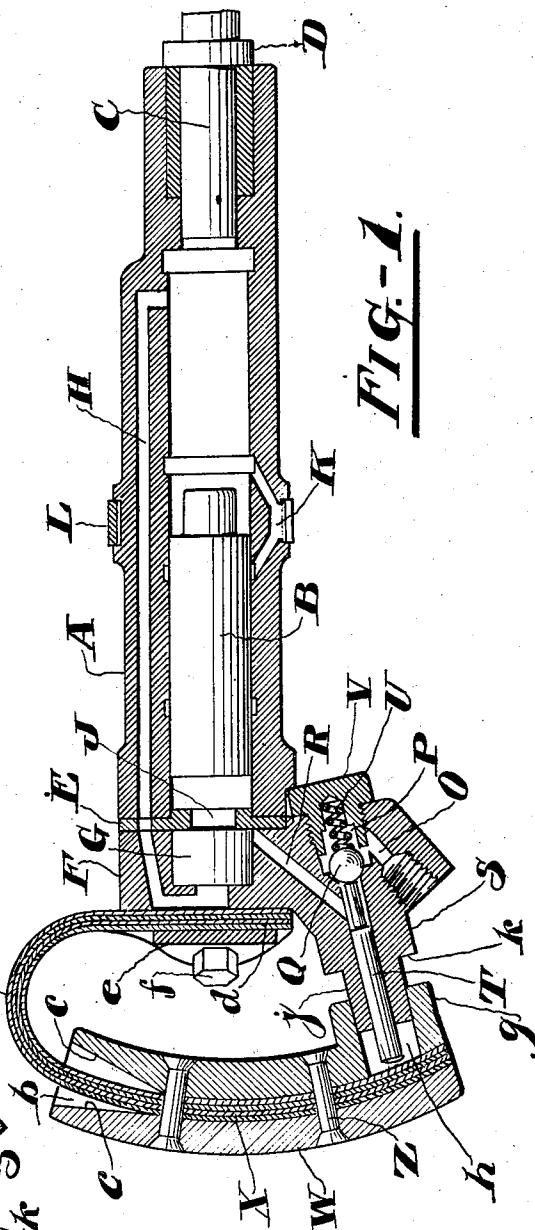
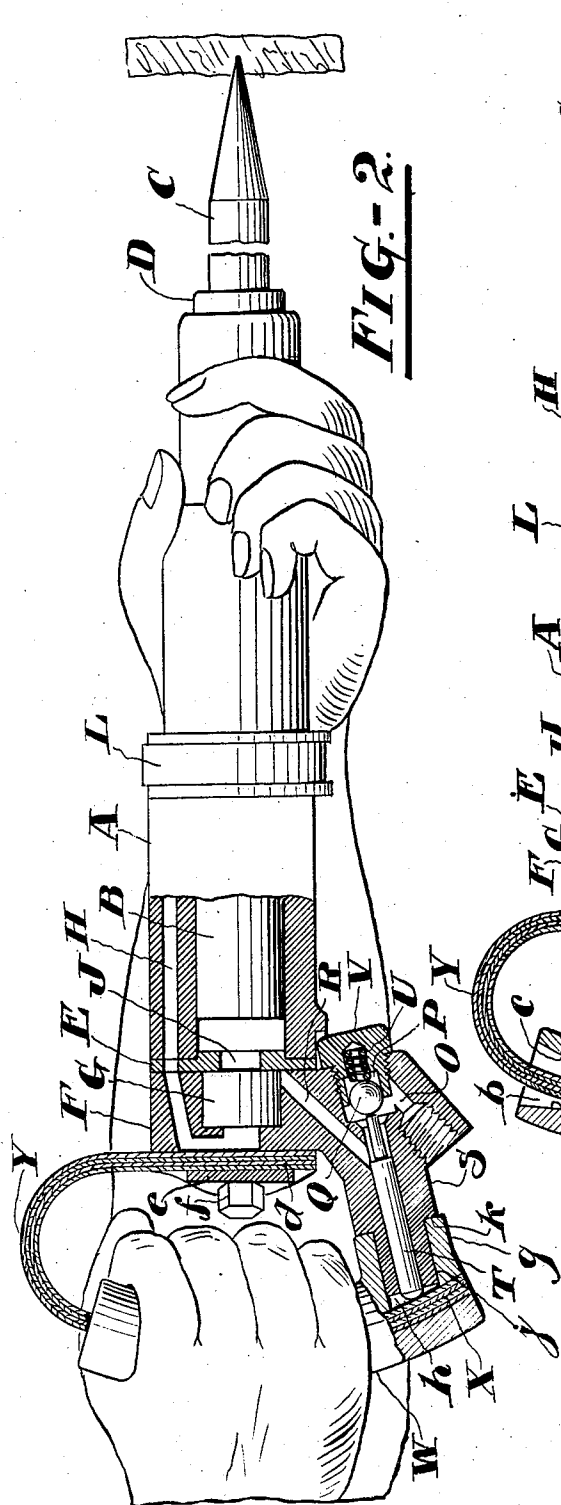
June 3, 1930.

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1,760,985

SPRING HANDLE FOR PERCUSSIVE TOOLS

Filed Jan. 11, 1927



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SPRING HANDLE FOR PERCUSSIVE TOOLS

Application filed January 11, 1927. Serial No. 160,396.

This invention relates to pneumatic tools, but more particularly to a spring handle for hand held pneumatic tools of the hammer type.

5 The objects of the invention are to protect the parts comprising the percussive element of the tool against injury, to protect the operator against the effects of the jars and shocks set up in the tool during its operation, and to simplify the means for controlling the admission of pressure fluid into the tool.

Other objects will appear hereinafter and to all these ends the invention consists of the combination of elements and features of construction substantially as hereinafter described and claimed and illustrated in the accompanying drawings, in which

15 Figure 1 is a longitudinal sectional view of a percussive tool equipped with a handle constructed in accordance with the practice of the invention, the handle being shown in retracted position, and

25 Figure 2 is the longitudinal view of a percussive tool partly broken away, illustrating the position which the handle may assume during the operation of the tool for opening the throttle valve.

Referring to the drawings, the invention 30 is shown embodied in a percussive tool of the coal pick type having a cylinder A in which is disposed a reciprocatory hammer piston B adapted to deliver blows to a working implement C. The working implement C in this 35 instance extends into and is supported by the front end of the cylinder A and has a collar D which acts to limit the distance which the said implement C may extend into the cylinder. A plate E forms a closure for the rearward end of the cylinder A and on this plate E is seated a back head F which may be secured to the cylinder A in any suitable manner, such as the usual side or clamping bolts (not shown).

45 Disposed within the back head F is the distributing valve mechanism (not shown) but which may be housed in a valve casing G and from the rearward end of which to the front end of the cylinder A leads an inlet passage H for conveying pressure fluid to the front

end of the cylinder. Similarly, an inlet passage J is formed in the plate E for conveying pressure fluid from the front end of the distributing valve to the rearward end of the cylinder for impelling the piston B forwardly. 55

In the present instance the cylinder A is provided with a free exhaust port K about which is disposed a muffler or deflector L for deflecting the exhaust pressure fluid issuing from the exhaust port K. 60

Pressure fluid for actuating the hammer piston B may be conveyed by any suitable means from a source of supply (not shown) to a passage O in the back head F communicating with a bore P in which is disposed a ball type throttle valve Q for controlling communication between the passage O and a passage R leading from the bore P rearwardly of the throttle valve Q to the distributing valve mechanism. 70

In accordance with the present invention, the back head F is provided with a projection S extending in this instance in a rearward direction. In this projection S is formed a continuation of the bore P, although of somewhat smaller diameter, to receive slidably a valve stem or push rod T. The push rod T is preferably of such length that its outer end will extend rearwardly of the projection S when the throttle valve Q is in its closed position. In the construction shown, a spring U is disposed in the bore P to act with one end against the throttle valve Q and with its other end against the plug V for closing the throttle valve Q whenever the pressure necessary for opening the valve is relaxed. 85

Novel means are provided for actuating the throttle valve Q as well as to protect the operator against the vibrations caused by the reciprocatory action of the piston B. To this end a handle W whereby the tool may be manipulated is secured to a leg X of a U-shaped laminated spring Y. The handle W in this instance is secured to the spring Y by means of rivets Z and at that end of the handle into which the spring Y is introduced is formed a recess b having inclined walls c above and below the spring Y to permit free relative movement of the spring and the 100

handle. It is to be understood that the exact construction of the handle W shown in Figure 1 may be departed from without violating the spirit of the invention. In other words the inclined walls *c* of the recess *b* may be carried further into the handle W. In fact the handle W may be formed as a hollow shell secured to the spring Y at only a small portion of its length as far away from the curved portion of the spring Y as possible. The effect of constructing the handle W in this manner is of course to give the spring a greater useful length and therefore more resiliency and thus permitting the use of a rigid long wearing material such as aluminum for the handle. The opposite end *d* of the spring Y is seated on the back head F and, in the present instance, is secured thereto by means of a suitable clamping plate *e* and bolts *f*, only one of which is shown.

The handle W is provided with a projection or boss *g* at one end and in this boss is formed an aperture *h* to receive slidably a reduced portion *j* of the projection S. By thus reducing the end of the projection S a shoulder *k* is formed on the projection S to form an abutment for the boss *g*.

As will be observed, when the parts comprising the handle and the throttle valve mechanism are in their retracted positions, there will be sufficient clearance between the handle and the push rod T to enable the throttle valve Q to be at all times firmly pressed against its seat by the spring U.

In practice whenever necessary pressure is applied to the tool for holding it to the work, the handle W will be pressed in the direction of the back head F, thus unseating the throttle valve Q and admitting pressure fluid to the percussive element of the tool. In the event that resistance to the working implement C should cease as for instance when the working implement is driven into a pocket or seam in the work, the cylinder and other parts comprising the casing of the drill will jump forwardly and enable the handle W to assume its retracted position. In this way the pressure against the throttle valve Q will be released and the spring U will then act to close the said throttle valve and shut off the supply of pressure fluid to the cylinder A, thus preventing the piston from striking against the front end of the cylinder.

The present invention has been found particularly desirable when applied to the type of tools illustrated in the drawings. As is well known, these percussive tools are frequently used in places in which it is inconvenient for the operator to use both hands for manipulating the tool and this construction enables the operator to guide the tool and control the throttle mechanism with one hand.

A further desirable feature of this invention is that the shocks and vibration of the

tool are almost entirely absorbed by the spring Y so that the operator will suffer less fatigue than when operating tools having the usual solid type of handle.

I claim:

A pneumatic percussive tool comprising a cylinder and a back head, a projection on the back head having a bore, a throttle valve in the bore controlling the admission of pressure fluid into the cylinder, a push rod extending through said projection, a laminated spring secured at one end to the back head, a handle on the other end of the spring for manipulating the tool and for cooperating with said push rod to open the throttle valve upon the application of pressure to the handle for pressing the tool to the work, a boss on the handle having an aperture to slidably receive the projection on the back head for guiding the handle, said boss forming a hood for said projection whereby detritus is excluded from said bore, and a shoulder on the projection forming a stop for limiting the inward movement of the handle.

In testimony whereof I have signed this specification.

FRANCIS A. JIMERSON.