E. J. SHOFFNER.

PNEUMATIC TOOL RETAINER.

APPLICATION FILED OCT. 21, 1913.

1,099,670. Patented June 9, 1914.

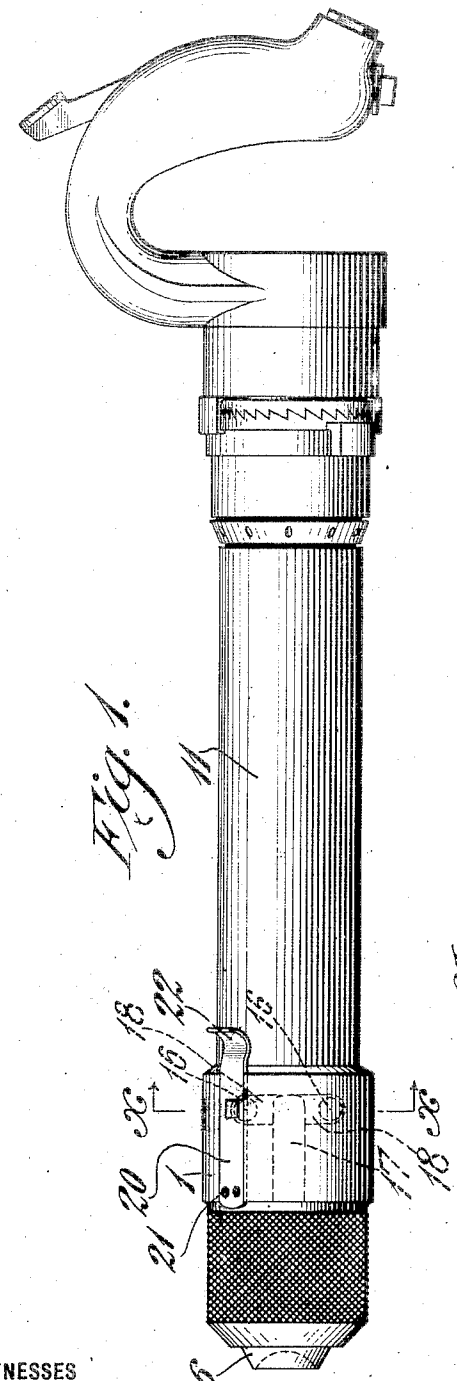


Fig. 1.

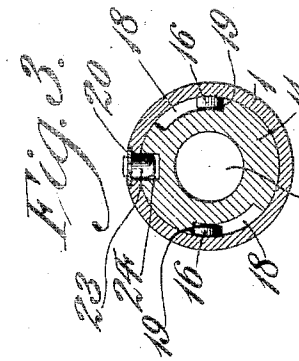


Fig. 3.

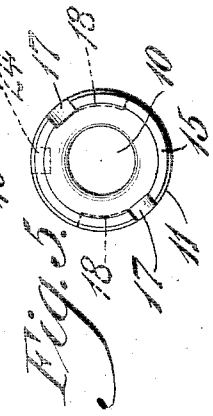


Fig. 5.

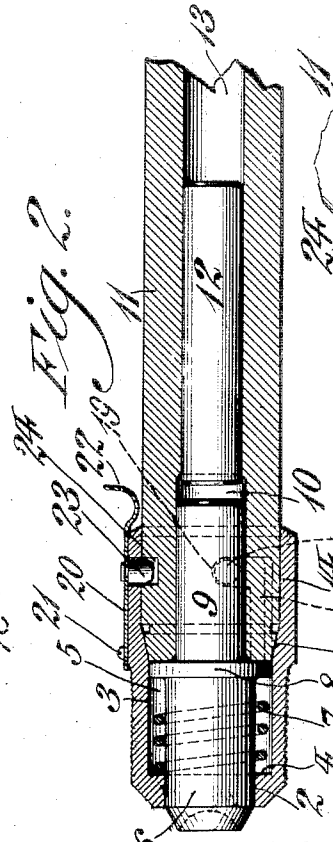


Fig. 2.

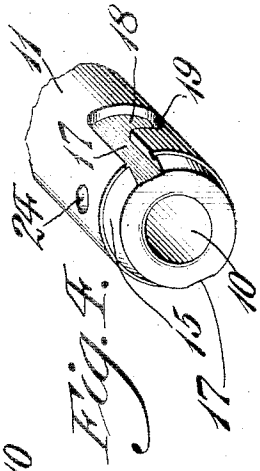


Fig. 4.

WITNESSES

L. Douville,

P. F. Nagle.

INVENTOR

BY Edward J. Shoffner,

Wiederhein Grain Banks.

ATTORNEYS

UNITED STATES PATENT OFFICE.

EDWARD J. SHOFFNER, OF ROANOKE, VIRGINIA, ASSIGNOR OF FIFTY-ONE ONE-HUNDREDTHS TO GURDON W. MERRELL, OF ROANOKE, VIRGINIA.

PNEUMATIC-TOOL RETAINER.

1,099,670. Specification of Letters Patent. Patented June 9, 1914.

Application filed October 31, 1913. Serial No. 796,383.

To all whom it may concern:

Be it known that I, EDWARD J. SHOFFNER, a citizen of the United States, residing in the city and county of Roanoke, State of Virginia, have invented a new and useful Pneumatic-Tool Retainer, of which the following is a specification.

My present invention relates to a novel pneumatic-tool retainer which is designed to be employed in conjunction with pneumatic tools of the riveter type wherein the piston has a length of stroke greater than its own length and reciprocates several hundred times a minute, in order to impart a hammering blow to a working tool or rivet set. In tools of this character a comparatively high pressure of the motive fluid is employed and the rivet set and piston are liable to be accidentally forced out of the pneumatic-tool and lost, with consequent increase in the cost of operation and to injury of persons who may be struck thereby, unless some means are provided for preventing such action.

In my prior Patent #885,537, granted to me on the 21st day of April 1908, I have described and broadly claimed a novel construction of a pneumatic-tool retainer and my present invention, while embodying some of the features disclosed in said patent, provides novel means for securing the pneumatic-tool retainer with respect to the barrel or cylinder of the pneumatic-tool.

With the above and other objects in view which will more clearly appear in the detailed description, my invention consists of a novel construction of a pneumatic-tool retainer and novel means for removably securing the same with respect to the barrel or cylinder of the pneumatic-tool.

It further consists of a novel construction of a retainer adapted to receive the rivet set or other working tool and provided with dowels adapted to be received in corresponding channels in the cylinder and also preferably provided with a novel construction of a lock which prevents relative movement of the retainer and cylinder when the parts are in assembled position.

It further consists of a novel construction of retainer having an outer inwardly turned flange through which the end or head of the button-set or other working tool projects, whereby a chamber is formed within said retainer for the button set shoulder and within said chamber is contained a spring which is of lesser length than the longitudinal distance between the shoulder of the button set and the inner wall of the inwardly turned flange of the retainer, said button set having its shank extending into the bore of the cylinder so as to receive the blows imparted thereto by the reciprocating piston, and said retainer being provided with novel means for interlocking the same with respect to the cylinder.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawing one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a side elevation of a pneumatic-tool having secured with respect thereto a pneumatic-tool retainer embodying my invention. Fig. 2 represents a longitudinal section of a portion of Fig. 1. Fig. 3 represents a section on line *x*—*x* Fig. 1. Fig. 4 represents a perspective view of the end of the pneumatic-tool cylinder. Fig. 5 represents an end elevation of the pneumatic-tool cylinder.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates a pneumatic-tool retainer embodying my invention, the same comprising a sleeve having an opening 2 through its forward end of less diameter than the inner bore 3 of the retainer. The forward portion of said bore 3 terminates in a wall 4 whereby a chamber 5 is formed between the wall 4 and the body of the button set 6 around which is located a spring 7 which is preferably of less length than the longitudinal length of the chamber 5. The button set 6 is provided with a shoulder 8 and a shank 9 which latter is adapted to extend into the bore 10 of the cylinder or barrel 11 of the pneumatic tool. The cylinder 11 is adapted to receive

a piston 12 which reciprocates therein and imparts a hammering blow to the inner end of the shank 9, and in the present instance the bore 13 is of less diameter than the diameter of the bore 10. The inner bore 14 of the retainer is shaped to conform to the outer periphery of the end of the cylinder 11 which latter, in the present instance, is tapered at its forward end as seen at 15.

16 designates dowels carried by the retainer 1 and extending inwardly and, in the present instance, I employ a plurality of such dowels, two of them being shown which are located on opposite sides of the retainer. These dowels are adapted to engage with longitudinally extending channels 17 in the cylinder 11 and also the laterally extending channels 18, so as to seat against the shoulder 19 of their respective channel.

20 designates a spring having one end fixed as at 21 to the retainer 1, the other end of said spring being inwardly and outwardly bent as at 22 in order to form a portion which may be engaged by the hand of the user.

23 designates a pin or dowel carried by the spring 20 and adapted to be seated in the aperture or recess 24 in the barrel 11 when the retainer has assumed its designed position with respect to the tool cylinder. The outer periphery of the retainer is preferably recessed in order that the outer face of the spring 20 will be substantially flush therewith.

It will be understood from the foregoing that in order to assemble the tool retainer with respect to the cylinder and assuming that the rivet set and spring are in position in the retainer, it is simply necessary to cause the dowels 16 to move into the channels 17 and then to partially rotate the retainer which will cause said dowels to enter the lateral recesses 18 and contact with the shoulders 19, whereupon the pin or dowel 23 will register with the aperture or recess 24 and owing to the action of the spring 20 will move into such aperture thereby forming a positive lock for the retainer and cylinder.

When the rivet set or other working tool is applied to the work and the piston strikes the end of the shank of the rivet set, it will be seen that the shoulder 8 is out of contact with the spring 7 so that by constructing the chamber 5, spring 7 and rivet set 6 in proper proportions, I am enabled to obtain the greatest efficiency from the hammering piston and to preserve the life of the retainer 1 and to also minimize vibration. The retainer 1 is preferably knurled in order that it may be more readily grasped by the operator.

It is to be understood that while I have referred to my novel retainer as being designed for use with a pneumatic riveter that it is adapted to be employed in conjunction with any type of pneumatic or other impact or hammering tool, wherein it is desired to retain a working tool in position to receive the impact of a blow.

I have deemed it unnecessary to illustrate and describe in detail the manner in which the motive fluid is admitted to the tool through the grasping handle or the valve mechanism which controls the movement of the reciprocating piston, since such elements are well known to those skilled in the art and form *per se* no part of my present invention.

It will now be apparent that I have devised a novel and useful construction of pneumatic-tool retainer which embodies the features of advantage enumerated in the statement of invention and the foregoing description, and while I have in the present instance illustrated and described a preferred embodiment thereof, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination of a pneumatic tool cylinder having longitudinal channels extending from the end thereof and terminating in lateral channels, a tool retainer adapted to inclose the end of said cylinder, inwardly extending dowels on said retainer adapted to engage said channels, and devices for locking said retainer with respect to said tool cylinder after said dowels have been turned into engagement with said laterally extending channels.

2. The combination of a pneumatic tool cylinder having longitudinal channels extending from the end thereof and terminating in lateral channels, a tool retainer adapted to inclose the end of said cylinder, inwardly extending dowels on said retainer adapted to engage said channels, and spring pressed means for locking said retainer with respect to said tool cylinder after said dowels have been turned into engagement with said laterally extending channels.

3. The combination of a pneumatic tool cylinder having a locking recess in the forward portion thereof, and longitudinal channels extending from the forward end of said tool cylinder and terminating in lateral channels, a tool retainer adapted to inclose the forward end of said cylinder, inwardly extending dowels in said retainer adapted to engage said channels, a locking spring on said tool retainer the end of said spring extending beyond said retainer to form a grasping portion, and means on said spring for engaging said locking recess.

4. The combination of a pneumatic tool cylinder having a locking recess in the forward portion thereof, a tool retainer adapted to inclose the forward end of said cylinder, a locking spring secured to said tool retainer, and extending longitudinally thereof, said tool retainer having an opening therein, and a pin on said spring extending through said opening and adapted to engage said locking recess, in combination with other interlocking devices common to said tool retainer and tool cylinder, adapted to prevent relative longitudinal movement of said cylinder and retainer.

5. The combination of a pneumatic tool cylinder having longitudinal channels extending from the forward end thereof and terminating in laterally extending channels, and a tool retainer having a chamber therein provided at its forward portion with an internal shoulder, a working tool within said chamber and having a head of less diameter than said chamber and provided with a shoulder, a spring interposed between said internal shoulder and said working tool shoulder, said spring being of less length than the length of said chamber and said working tool having a shank projecting into the end of the working tool cylinder, and inwardly extending dowels on said tool retainer, said dowels being adapted to enter said longitudinal channels and to be turned into interlocking engagement with said laterally extending channels.

6. The combination of a pneumatic tool cylinder having longitudinal channels leading from the forward end thereof and terminating in laterally extending channels, said cylinder having a locking recess therein at the forward portion thereof and a tool retainer having a chamber therein provided at its forward portion with an internal shoulder, a working tool within said chamber, said tool having a head of less diameter than said chamber and provided with a shoulder, a spring interposed between said internal wall and said working tool shoulder, said spring being of less length than the length of said chamber, and said working tool having a shank projecting into the end of the working tool cylinder, inwardly extending dowels on said retainer adapted to enter said channels, a locking spring, and means carried by said locking spring to interlock with the walls of said locking recess when said dowels are seated in engagement with said laterally extending channels.

7. The combination of a pneumatic tool cylinder having longitudinal channels leading from the forward end thereof and terminating in laterally extending channels, said cylinder having a locking recess therein at the forward portion thereof and a tool retainer having a chamber therein provided at its forward portion with an internal shoulder, a working tool within said chamber and having a head of less diameter than said chamber and provided with a shoulder, a spring interposed between said internal shoulder and said working tool shoulder, said spring being of less length than the length of said chamber, said working tool having a shank projecting into the end of the working tool cylinder, inwardly extending dowels on said retainer adapted to enter said channels, a spring having one end fixed to said retainer and the other end deflected to be engaged by the operator, and a pin carried by said spring and moved into said recess thereby, when brought into alinement with such recess.

8. As an improved article of manufacture, a tool retainer consisting of a sleeve adapted to fit the end of a pneumatic tool cylinder, said sleeve having thereon inwardly extending dowels 16 and a longitudinally extending spring 20 attached to said sleeve, and provided with a pin 23 secured thereto and projecting inwardly through an opening in the body of said sleeve, and adapted to interlock with said cylinder.

EDWARD J. SHOFFNER.

Witnesses:
C. C. ELLIS,
B. L. SNEED.