

UNITED STATES PATENT OFFICE.

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PNEUMATIC TOOL.

SPECIFICATION forming part of Letters Patent No. 777,681, dated December 20, 1904.

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To all whom it may concern:

Be it known that I, JOHN A. LINDSTROM, a citizen of the United States, residing at Easton, county of Northampton, and State of Pennsylvania, have invented a certain new and useful Improvement in Pneumatic Tools, of which the following is a specification.

My invention relates to a new and useful improvement in pneumatic tools, and has for its object to provide a device of this description in which the tool may be held securely within the holder and may be easily and quickly disengaged therefrom when desired; and a further and principal object is in providing an air-chamber in the holder which will equalize the air-pressure exerted upon the tool, so that the tool and holder will not be blown forward when the piston is forced backward, thus doing away with any recoil in the tool.

With these ends in view this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, the construction and operation will now be described in detail, referring to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical section through the forward end of a pneumatic tool having my improvements applied thereto. Fig. 2, a cross-section taken on the line 2 2 of Fig. 1.

A represents the cylinder, and B is the piston.

C is the tool, the shank of which fits into the cylinder.

D is the tool-holder, adapted to slide upon the outside of the cylinder, this tool-holder being cylindrical in form, the forward end having an inwardly-extending annular flange D', which flange is cut away at points equally distant from one another, as represented at D².

The tool C is provided with lugs C', extending outward from the same, which lugs are slightly smaller than the cut-away portions D² in the flange of the holder, and when the tool is turned in a certain position said lugs are adapted to register with the openings

through the flange, so that said lugs will pass through the openings, and then the tool may be turned so as to bring the lugs behind the solid portion of the flange D'.

E is a pin secured in the solid portion of the flange D' and extending a slight distance inward.

One of the lugs C' is provided with a semi-circular cavity or notch C², adapted to register with the pin E when the tool is turned to a certain position, and when the holder D is forced backward upon the cylinder said pin E will enter the notch C² and prevent the tool being turned, and thereby said tool cannot be removed until the holder is forced forward, so that the pin will be disengaged from the notch C².

F is a collar threaded upon the forward end of the cylinder, and this collar is adapted to come in close contact with the interior of the holder D.

G is a bushing threaded into the rearward end of the holder B and fitting tightly around the cylinder. In the space formed between the holder and the cylinder is located a coil-spring H, which is interposed between the forward end of the bushing G and the rearward end of the collar F. Thus said spring tends always to force the holder D backward to the limit of its movement, thus always holding the pin E in engagement with the notch C² and serving to return the tool to its normal position when the same is forward. The space I between the tool-holder and the cylinder and the collar F and bushing G, in which the spring H is located, I term the "tool-holder air-chamber."

J is the air-supply passage, from which a port J' leads to the interior of the cylinder for the purpose of forcing the piston B backward. K is another port leading from the passage J to the tool-holder air-chamber I. Thus when the air is admitted to the passage J for the purpose of forcing the piston backward the air-pressure will also be exerted against the inward end of the bushing G, and as the surface represented by this inward end of the bushing is greater than the surface of the inner end of the shank of the tool the holder and tool will be held backward in its

normal position by the air-pressure when the piston is forced backward. Thus it will be seen that as the tool will not be forced forward when the piston is forced rearward the recoil or vibration of the apparatus will be done away with by applying a pressure in the tool-holder recoiling against the pressure exerted upon the tool for the return of the piston, and by employing the interlocking tool-holding mechanism the tool is secured in the holder perfectly secure, and there is no danger of the same being blown out.

L represents packing-rings, which may surround the cylinder and be placed against the inward end of the bushing G and collar F if the device should leak after considerable use.

Of course I do not wish to be limited to the exact construction here shown, as slight modifications could be made without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is--

1. In a pneumatic tool, a cylinder, a piston adapted to reciprocate within said cylinder, a tool, the shank of which fits within the outer end of the cylinder, a cylindrical tool-holder surrounding the outer end of the cylinder, an inwardly-extending annular flange formed at the outer end of the tool-holder, cut-away portions formed in said flange from its inner periphery outward, lugs extending outward from the tool and adapted to pass through the cut-away portions and be turned with the tool so as to lie behind the solid portion of the flange, means for securing the tool against turning when in this position, an enlargement formed upon the outer end of the cylinder, the periphery of said enlargement coming in close contact with the inner wall of the tool-holder cylinder, the rearward end of the tool-holder coming in close contact with the outer surface of the cylinder, a spring coiled about the cylinder and interposed between the enlargement upon the outer end of the cylinder and the rearward end of the tool-holder, an air-supply passage, a port leading from said air-supply passage to the forward end of the piston, and a port leading from said air-supply passage to the space in which the spring is located, as and for the purpose specified.

2. In a pneumatic tool, a cylinder, a piston operating within the cylinder, a tool, the shank of which is adapted to fit within the outer end of the cylinder, a collar surrounding the outer end of the cylinder and projecting annularly from the same, a tool-holder in the shape of a cylinder surrounding the collar, a bushing secured in the rearward end of the tool-holder and coming in close contact with the cylinder,

a spring interposed between the rearward face of the collar and the forward face of the bushing tending to force the tool-holder rearward, an air-supply passage from which the outer ports lead for the operating of the piston, a port leading from the air-supply passage to the chamber in which the spring is located, an annular inwardly-turned flange formed upon the outer end of the tool-holder, said flange provided with cut-away portions at equal distances apart, lugs extending radially from the tool adapted to pass through said cut-away portions and be turned with the tool so as to lie behind the solid portion of the flange, means adapted to be operated through the agency of the spring for locking the tool in place against turning, as and for the purpose specified.

3. In a pneumatic tool, the combination of the cylinder, piston, air-supply passage, and ports for operating the piston with a tool, the shank of which is adapted to fit within the outer end of the cylinder, a tool-holder in the form of a cylinder surrounding the outer end of the piston-cylinder at a distance therefrom, an inwardly-extending annular flange formed on the outer end of the tool-holder, said flange provided with cut-away portions at equal distances apart, lugs extending radially from the tool and adapted to pass through said cut-away portions and be turned with the tool behind the solid portion of the flange, a pin secured in the solid portion of the flange and extending inwardly therefrom, a notch or opening formed in one of the lugs of the tool adapted to be engaged by said pin for the purpose of locking the tool against rotation until the tool-holder is forced forward relative to the tool, an annular collar secured upon the outer end of the cylinder and coming in close contact with the inner surface of the tool-holder, a bushing tightly surrounding the cylinder and secured in the rearward end of the tool-holder, thus forming a tool-holder air-chamber bounded by the inner wall of the tool-holder, the outer wall of the cylinder and the inner faces of the collar and bushing, a spring located within the tool-holder air-chamber and interposed between the bushing and the collar tending to force the holder rearward, and a port leading from the air-supply passage and connecting with the air-chamber of the tool-holder, as and for the purpose specified.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

JOHN A. LINDSTROM.

Witnesses:

H. J. MILLER,

J. S. CLINCH.