E. W. RAIKES.

PNEUMATIC TOOL.

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1,067,756. Patented July 15, 1913.

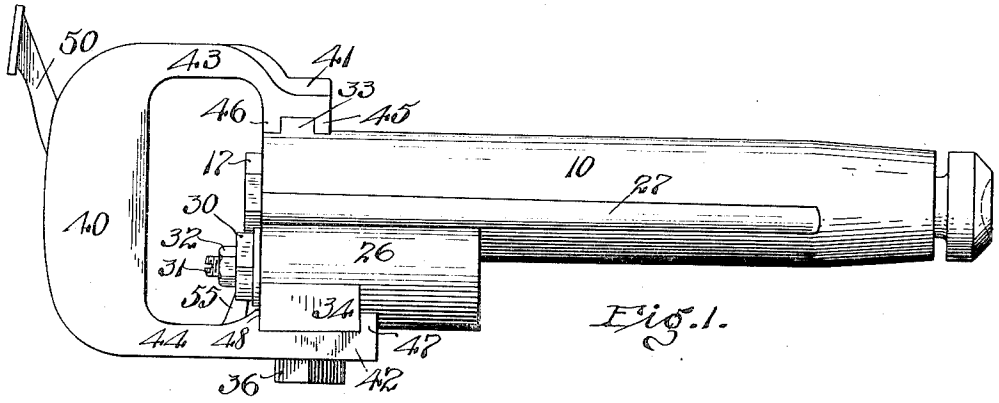


Fig. 1.

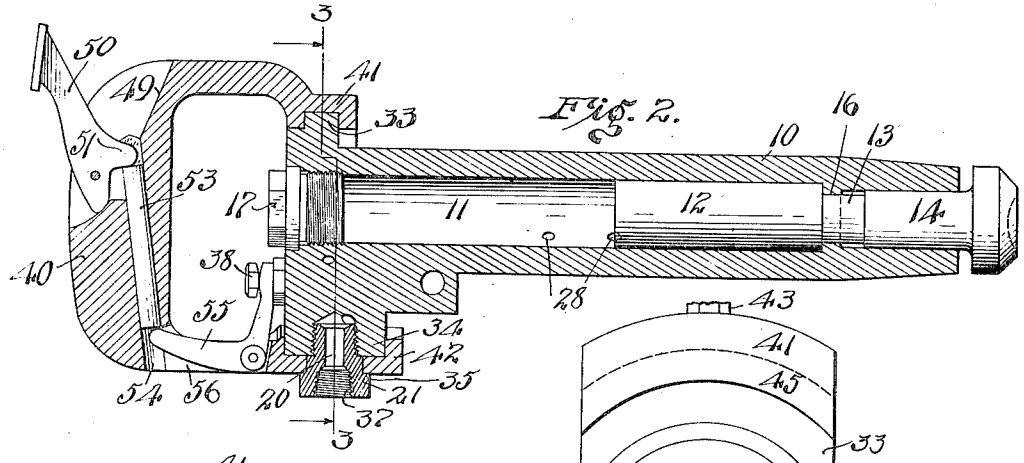


Fig. 2.

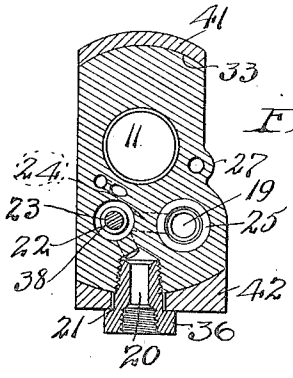


Fig. 3.

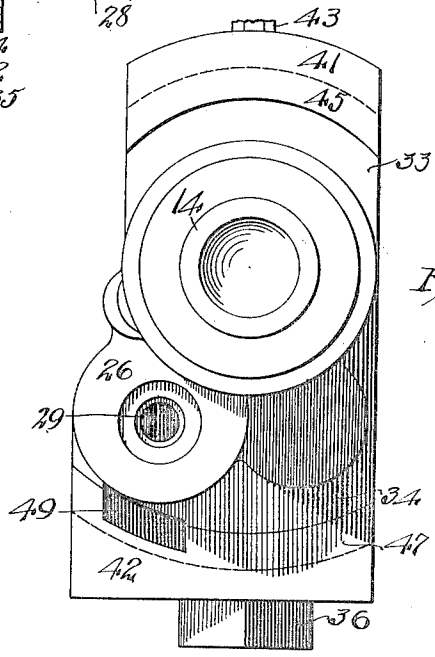


Fig. 4.

Witnesses
Nathan F. Fretter
Brennan B. West.

Inventor
Edmond W. Raikes.
By Albert G. Davis
Attys

UNITED STATES PATENT OFFICE.

EDMOND W. RAIKES, OF CLEVELAND, OHIO.

PNEUMATIC TOOL.

1,067,756. Specification of Letters Patent. Patented July 15, 1913.

Application filed October 28, 1910. Serial No. 589,576.

To all whom it may concern:

Be it known that I, EDMOND W. RAIKES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Pneumatic Tools, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide very simple, and at the same time, efficient means for securing the handle to the body of a pneumatic tool. The body of the tool may be a barrel-like structure and the handle of the spade-handle type. The body and handle are provided with coöperating recesses and projections adapted to interlock to hold the handle in place, while a clear space is provided to enable the separation of the parts. The interlocking projections and recesses are preferably surfaces about a common center, so that a rotation of the handle relative to the body about said center may effect the locking or unlocking of the parts. These, and other features, providing a simple and effective tool-frame, are comprised within my invention, which is illustrated herein and hereinafter more fully described.

In the drawings, Figure 1 is a side elevation of the tool complete; Fig. 2, a longitudinal section; Fig. 3, a cross section in a plane indicated by line 3—3 of Fig. 2, this plane being slightly offset for convenience of illustration; Fig. 4 is an enlarged end view, looking from the right hand end of Figs. 1 and 2.

Referring by reference numerals to the illustration of the drawings, 10 represents the body of my tool. This is shown as having a cylindrical bore 11 in which is mounted a reciprocating plunger 12. This plunger has a reduced forward extension 13 which is adapted to impinge against and deliver a blow to the member 14, movable in the outer end of the barrel. This member 14 is shown as a die block for a rivet, and is to be taken as illustrative of any driven member, irrespective of its form. An internal annular flange 16 provides an abutment for limiting the outward movement of the plunger. This plunger is put into the barrel through the open inner end thereof, which is afterward closed by the screw plug 17.

The present invention is independent of the particular system or location of the air passageways. For clearness and completeness, however, it may be stated at this point that air is admitted through a passageway 20 contained within a tubular plug 21, hereinafter referred to, and thence passes to the admission valve chamber 22, in which is the admission valve 23 (controlled by mechanism to be hereinafter described), and beyond this admission valve, the air passes via passageway 24 (Fig. 3) to the main valve chamber 25, which is provided by a suitable tubular casing within the body. In this chamber is a pneumatically operating valve 19, which controls the passageways to and from the cylinder. The valve chambers are in a boss 26 on the side of the main barrel 10. One of the admission passageways is direct from this boss into the barrel and the other leads to the other end of the barrel within a longitudinal enlargement 27. In Fig. 2, 28 indicates two ports within the barrel, which communicate with the main valve chamber 25. This valve chamber has two exhaust passageways, one terminating at the end of the boss 26 alongside of the barrel, as shown at 29, and the other at the side of the boss at 49, as hereinafter referred to.

Coming now to the parts with which the present application is specifically concerned, 40 indicates a handle of spade-handle form, which, in use, is tightly secured to the body. In order to enable the plunger to be removed at the inner end, it is necessary that this handle be removable. At the same time, as the handle is placed where the manual pressure is exerted to hold the tool to its work, the securement between the handle and the body must be firm and effective. In accomplishing the result of ready removability and tight securement of the handle, I form on the body opposed arc-shaped projections or ribs 33 and 34, which are integral with the body and having cylindrical surfaces struck about the same center. It will be seen that the rib 33 lies alongside of the barrel 10 while the rib 34 is formed on the outer side of the valve casings. Coöperating with the ribs 33 and 34

are arc-shaped recesses in a pair of diametrically opposite wings 41 and 42 formed on the inner ends of the shanks 43 and 44 of the handle. These recesses are grooves with abrupt walls at right angles to the base of the groove, provided by the inwardly projecting arcual flanges 45, 46, and 47, 48. The bases of the grooves are portions of a cylindrical surface of a diameter substantially the same as the external diameter of the cylindrical surface bounding the ribs 33 and 34. It follows, from the above construction, that by turning the handle about the axis of the ribs and grooves, it may be put in place or removed. To mount it, it is simply placed with the wings opposite the narrower portion of the body between the ribs 33 and 34 and with the grooves circumferentially alining with those ribs, and then the handle is turned about the axis referred to until the wings embrace the ribs, as shown in the drawings. The bushing 21, which has the main admission passageway, furnishes also means for locking the handle against displacement on the body. To effect this, the bushing is screwed through the wing 42 of the handle into the body and has a shoulder 35 bearing against the wing. The outer end of this bushing has an angular head 36 to enable it to be conveniently turned by a wrench. Its inner portion has exterior screw-threads as shown. Internally it has also a screw-thread 37 for the reception of the main admission pipe.

50, in Figs. 1 and 2, indicates a thumb lever carried by the handle for operating the admission valve. This thumb lever is pivoted in a recess 49 in the handle and has a toe 51, which bears against a rod 53 slidably mounted in a bore 54. The other end of this rod bears against a bell-crank 55 occupying a recess 56 in the handle shank, and pivoted therein, and at its other end forking around the stem 38 of the admission valve 23. Accordingly, when the thumb lever is pushed inward, the valve is moved in a position to open communication to the barrel.

As heretofore stated, the main valve is in a chamber provided by the casing 25. The inner end of this chamber is shown as closed by a screw plug 30, which holds the casing in place in the boss 26. The effective throw of the main valve may be regulated by a stop screw 31 screwing through the plug 30 and locked by a jam nut 32. It is convenient to have the exit for one of the exhausts through the side of the boss 26 at the cylindrical surface of the rib 34, and I accordingly provide a notch 49, (Fig. 4) in the inner and lower face of the wing 42, communicating with the exhaust passageway and forming an exit port, as shown.

It will be seen from the description heretofore given that, when the parts are in place, a very simple and convenient tool is provided, the handle being firmly held to the body and the admission valve easily operated by the hand grasping the handle. The adjustment of the main valve by the stop screw 31 may conveniently be made without removing the handle. When it is desired to remove the handle to clean or repair either the valves or the piston, or the other parts, it is simply necessary to knock out the pivot pin of the bell-crank 55, remove the bell-crank, screw out the plug 21, and give the handle a quarter turn about the axis of its wings.

Having thus described my invention, what I claim is:—

1. In a pnuematic tool, the combination of a barrel and a valve casing forming an oblong head on the barrel, of an arcual member on the casing and a second arcual member on the barrel and a handle having arcual members adapted to engage the first said arcual members to hold the handle rigid with the barrel.

2. In a pneumatic tool, the combination of a barrel and a valve casing forming an oblong head on the barrel, of an arcual member on the casing and a second arcual member on the barrel, said arcual members being struck on different radii about the same center, and a spade handle having separated arcual members adapted to engage the first said arcual members to hold the handle rigid with the barrel.

3. In a pneumatic tool, the combination of a body, a boss near its head, an arcual rib on said boss, an arcual rib on the body diametrically opposite and concentric with the rib on the boss, each rib being not more than a quarter of a circumference, a handle having a projection at each end, wings on these projections having arc-shaped recesses adapted to coöperate with arcual ribs, both said ribs and recesses being not more than one quarter of a circumference, and means whereby the wings may be locked with the recesses in engagement with the ribs.

4. In a pneumatic tool, the combination of a body, two diametrically opposite arcual ribs near its head end, each being not more than one quarter of a circumference, a spade handle, the projecting portions of which have arcual grooves coöperating with the ribs, and a plug for locking the handle with the grooves engaging the ribs having a central passageway for the reception of the main admission pipe.

5. In a pneumatic tool, the combination of a body, a boss near its head, an arcual rib on said boss, said rib having a partly cylindrical surface struck about the center of the body, a diametrically opposed rib having a partly cylindrical surface struck about the same center, a handle having a shank, wings

on said shank, arcual grooves in said wings, said grooves having partly cylindrical surfaces engaging the cylindrical surfaces on said ribs, flanges formed on the wings and extending inwardly to engage the sides of said ribs, and a plug having an internal passage and adapted to screw into the ribs on the boss and extend through the wing engaging said ribs, whereby the handle is locked to the body, such plug being threaded to receive the connection of the main admission pipe.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

EDMOND W. RAIKES.

Witnesses:

ALBERT H. BATES,

J. B. HULL.