May 13, 1924.

1,493,550

W. H. KELLER

PNEUMATIC TOOL

Filed July 17, 1918

2 Sheets-Sheet 1

FIG. I.

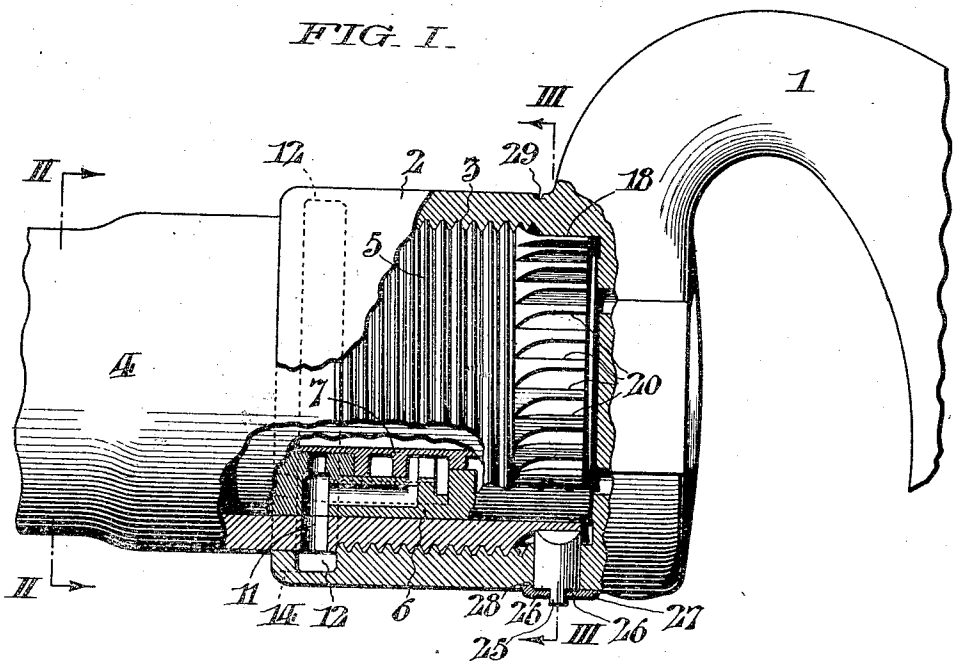


FIG. II.

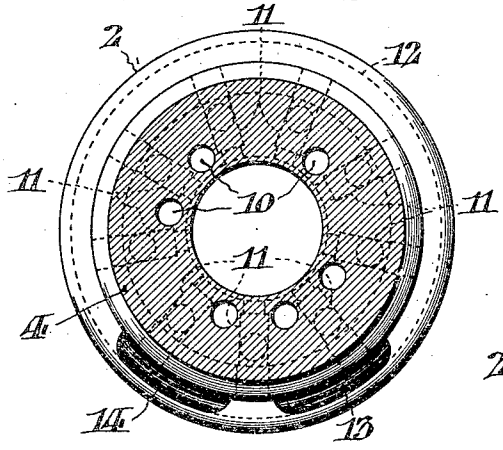
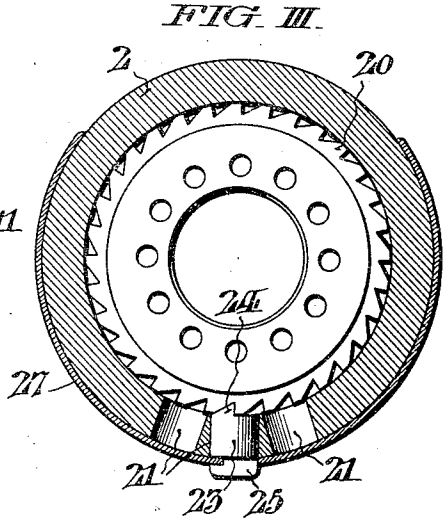


FIG. III.



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2 Sheets-Sheet 2

FIG. IV.

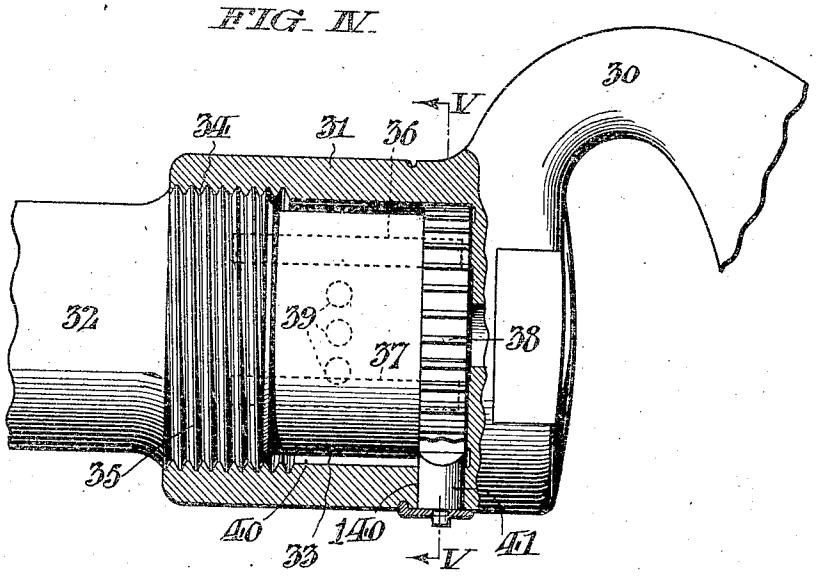
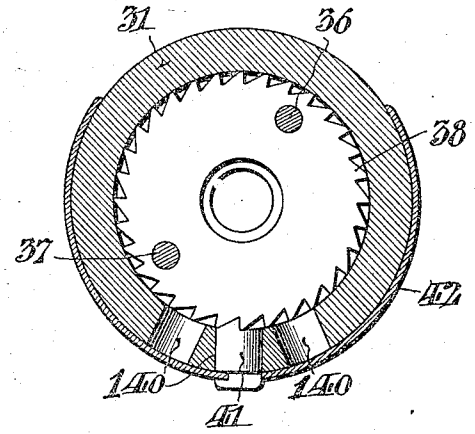


FIG. V.



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UNITED STATES PATENT OFFICE.

WILLIAM H. KELLER, OF GRAND HAVEN, MICHIGAN.

PNEUMATIC TOOL.

Application filed July 17, 1918. Serial No. 245,293.

To all whom it may concern:

Be it known that I, WILLIAM H. KELLER, a citizen of the United States, and a resident of Grand Haven, in the county of Ottawa and State of Michigan, have invented certain new and useful Improvements in Pneumatic Tools, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to that class of pneumatic tools which comprise a substantially cylindrical elongated casing (adapted to contain the piston, valve-box and valve), and a handle having a socket within which the casing is secured by means of screw threaded portions on the extremity of the casing and interior of the socket.

Ordinarily in these devices the compressed air, or other actuating medium, is introduced into the valve system through ducts formed within the body of the handle, but, as these inlet devices form no part of my invention, they are not shown in the accompanying drawings.

In the drawings, Fig. I, represents, partly in side elevation and partly in fragmentary section, a typical embodiment of my invention in connection with a riveter.

Figs. II, and III, are respectively transverse sections on the lines II, II, and III, III, of Fig. I.

Fig. IV, is a view, partly in side elevation and partly in fragmentary section of a modified form of the device.

Fig. V, being a transverse section on the line V, V, of Fig. IV.

Referring to the embodiment shown in Figs. I, II, and III, the handle 1, only a portion of which is indicated, is provided with a projecting socket 2, of hollow cylindrical form, the interior surface thereof being threaded as shown at 3. The rear extremity of the casing 4, is correspondingly threaded, as indicated at 5. Within this rear portion of the casing the valve-box 6, and valve 7, are contained. The general construction of these elements may be of any desired character, and they may be employed in connection with the usual passages, such as 10, in the wall of the casing. The exhaust from the valve-box 6, is distributed through a plurality of radial ports 11, which lead through the wall of the casing and communicate with an annular channel 12, formed in the wall of the socket adjacent to the front end thereof. Said channel is provided with an elongated outlet for ultimate discharge, two such outlets 13, and 14, being employed in this instance.

The discharge thus occurs on the lower side of the implement, in the normal position of use, and is directed forwardly, or away from the operator.

The rear extremity of the casing 4, is provided beyond the threaded portion 5, with an extension 18, preferably somewhat reduced in external diameter, which fits within the bottom of the socket 2. This extension is provided with ratchet teeth 20, the abrupt surfaces of the teeth facing in the direction of the rotative movement which corresponds with the unscrewing of the casing from the socket.

The ratchet teeth are symmetrical and arranged at similar intervals. At a plurality of points (preferably three, as shown), I form radial holes 21, through the wall of the socket, at the region which surrounds the ratchet teeth, these holes being located at angular distances apart, which do not correspond with the distance between two ratchet teeth, or with a multiple thereof. Hence the holes may be characterized as irregularly disposed, with relation to the teeth. A cylindrical stud 23, provided with a tooth 24, adapted to fit snugly within any one of the ratchet teeth, is removably inserted in any one of the holes 21, and when the abrupt face of the tooth 24. is in position to engage with one of the ratchet teeth, rotative movement of the casing in the direction for unscrewing will be absolutely prevented. The outer end of the stud is provided with a projecting flat finger-piece 25, on each side of which is a flat shoulder 26. A spring clip 27, of a length sufficient to embrace substantially more than a semi-circle of the outer periphery of the socket, and adapted to clamp closely the surface thereof, is employed to hold the stud in position, the clip being provided with a short slot to permit the passage of the finger-piece 25, and the tension of the spring being exerted upon the shoulder 26, of the stud. The spring clip is provided at one edge with an inwardly projecting peripheral flange 28, which engages in a shallow cavity 29, formed in the outer surface of the face of the socket, in order to prevent displacement of the clip in the direction of the axis of the socket. It will thus be seen that by reason of the irregular disposition of the holes 21, with re-

lation to the ratchet teeth 20, the casing may be secured against rotation relatively to the socket when it has been inserted to the desired depth therein, since registration of the locking face of the stud-tooth with some one of the ratchet teeth, can readily be found.

Referring now to the type of device shown in Figs. IV, and V, the handle is indicated at 30, the internally threaded socket at 31, the casing at 32, and the valve-box at 33. Here it will be noted that the threaded portion 34, of the socket only extends throughout a comparatively short region, the threaded end 35, of the casing being of similar axial extent.

Instead of being contained within the rear portion of the casing 32, as in Figs. I, II, and III, the valve-box 33 here forms, in effect, a coaxial extension, continuation, or prolongation of the rear extremity of the casing beyond its threaded portion 34. —being, however, made as a separate piece for convenience in manufacture and secured against rotation relatively to the rest of the casing 32, by means of dowel pins such as 36, and 37. At its rear extremity, the valve-box portion 33 of the casing 32 is provided (like the corresponding reduced unthreaded extension 18 of the casing 4 in Figs. I, II, and III) with peripheral ratchet teeth, 38, which fit within the socket at the region adjacent to the inner end thereof. The discharge ports 39, of the valve box, indicated in dotted lines in Fig. IV, thus lead into the annular space 40, between the exterior surface of the valve-box, and the proximate face of the socket, which thus constitutes an annular channel, from which the ultimate discharge may be led out at any desired point. A plurality of radial holes 140, are formed through the wall of the casing, and a stud 41, which is adapted to engage with one of the ratchet teeth, fits removably in one of said holes, said stud being secured in position by means of a spring clip 42, as above described.

Having thus described my invention, I claim:

1. In a pneumatic tool comprising a handle having an internally threaded cylindrical socket and a casing having an externally threaded portion embraced by said socket when the casing is in operative position therein, the combination of a series of peripheral ratchet teeth arranged at a portion of the casing embraced by the socket, when the casing is in operative position therein, the abrupt surfaces of said ratchet teeth facing in a direction which corresponds with the direction of rotation for unscrewing said casing; said socket being provided with a plurality of radial holes arranged at the region embracing the ratchet teeth, but irregularly disposed with relation to the ratchet teeth; a stud adapted to fit in any one of said holes, and to engage one of said ratchet teeth; and means embracing said socket for retaining said stud in position against endwise displacement when in any one of said holes.

2. In a pneumatic tool comprising a handle having an internally threaded cylindrical socket and a casing having an externally threaded portion embraced by said socket when the casing is in operative position therein, a series of peripheral ratchet teeth arranged at the portion of the casing embraced by the socket when the casing is in operative position, the abrupt surfaces of said ratchet teeth facing in a direction which corresponds with the direction of rotation for unscrewing said casing; said socket being provided with a plurality of holes arranged at the region embracing the ratchet teeth, but irregularly disposed with relation to said ratchet teeth; a stud adapted to fit in any one of said holes and to engage one of said ratchet teeth; a finger-piece mounted upon the outer end of said stud; and a spring clip adapted to embrace and clamp the external surface of the socket and to engage the external end of the stud and retain it against endwise displacement when in any one of said holes, said clip being provided with an aperture to receive the finger-piece of the stud.

3. In a pneumatic tool, the combination of a casing, having an externally threaded rear portion; a handle provided with an internally threaded cylindrical socket, said threaded portion of the socket terminating at a substantial distance from the bottom thereof; a valve-box projecting beyond the threaded rear portion of the casing, said valve-box being provided with a series of peripheral ratchet teeth whose abrupt surfaces face in a direction which corresponds with the direction of rotation for unscrewing said casing, and said socket being provided with a plurality of holes, arranged at the region embracing the ratchet teeth, but irregularly disposed with relation to said ratchet teeth; a stud adapted to fit in any one of said holes and to engage with one of said ratchet teeth; and means embracing said socket for retaining said stud in position against endwise displacement when in any one of said holes.

In testimony whereof, I have hereunto signed my name at Grand Haven, Mich., this 11th day of July, 1918.

WILLIAM H. KELLER.

Witnesses:

ALBERT SHINKEZ,

M. MAXIMILIAN.