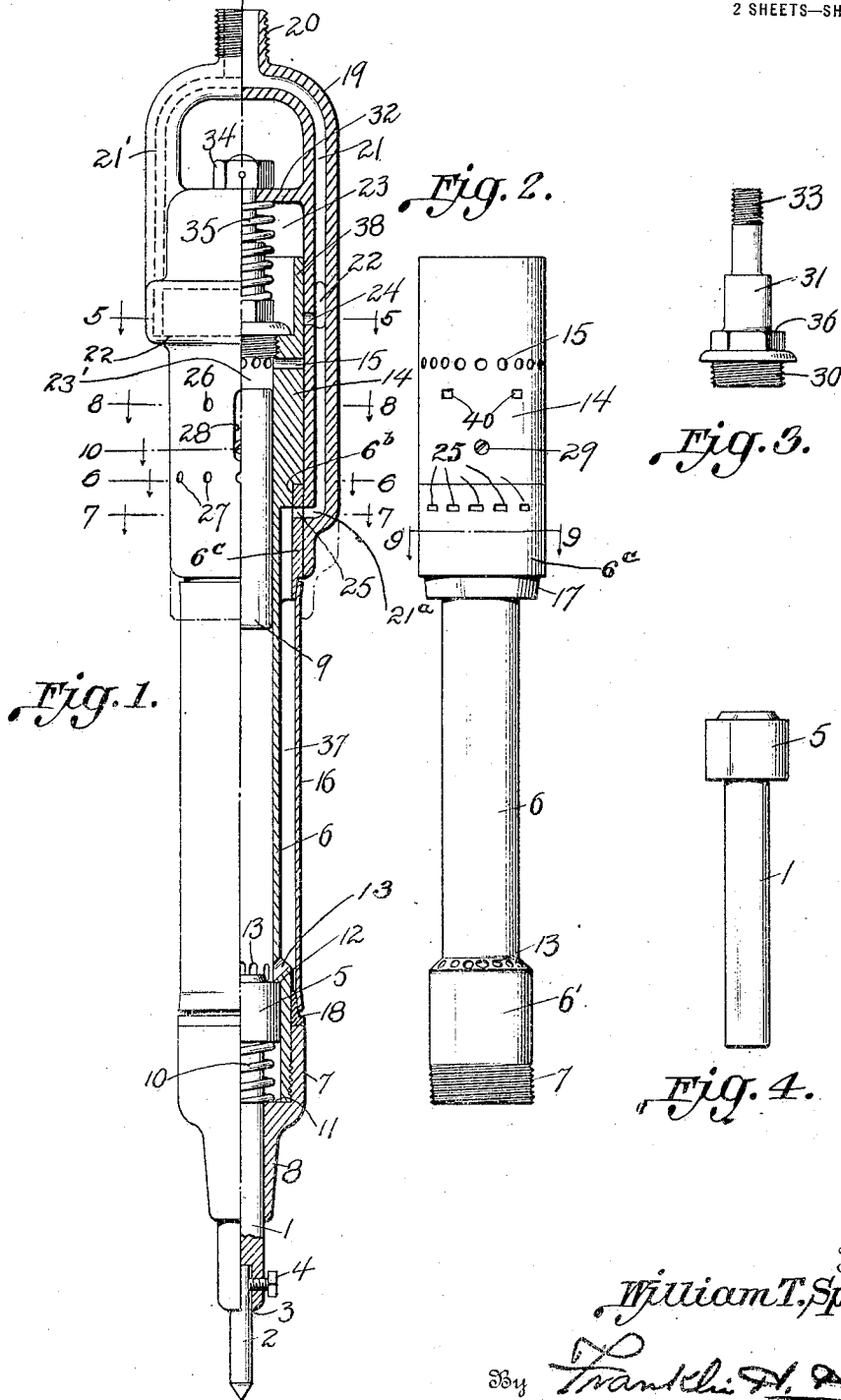


W. T. SPARROW,
PNEUMATIC CENTERING PUNCH.
APPLICATION FILED FEB. 13, 1920.

1,380,118.

Patented May 31, 1921.

2 SHEETS—SHEET 1



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1,380,118.

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2 SHEETS—SHEET 2.

Fig. 5.

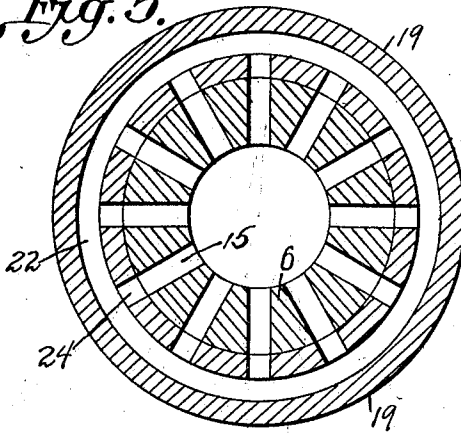


Fig. 8.

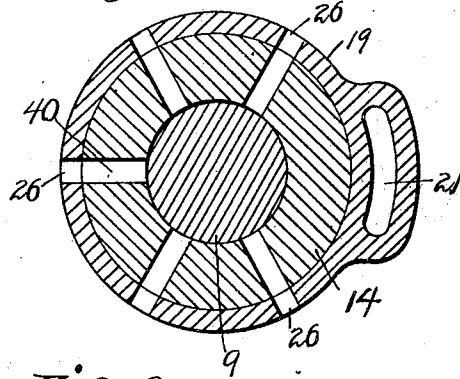


Fig. 6.

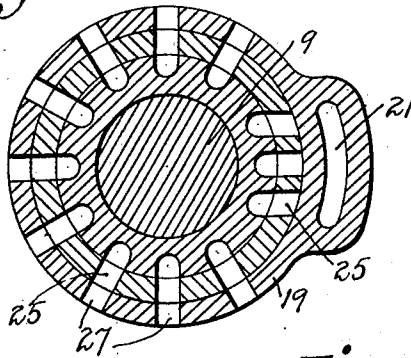


Fig. 9.

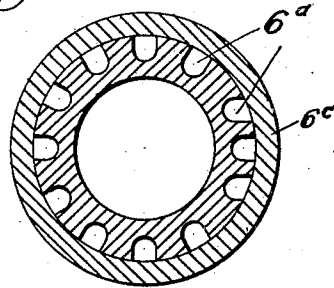


Fig. 10.

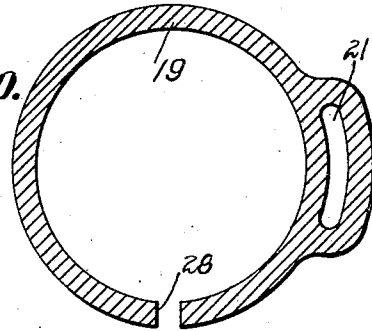
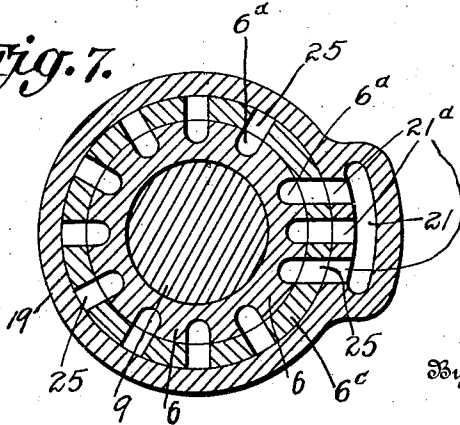


Fig. 7.



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PNEUMATIC CENTERING-PUNCH.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM T. SPARROW, a citizen of the United States, residing at Newport News, in the county of Warwick and State of Virginia, have invented certain new and useful Improvements in Pneumatic Centering-Punches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to a novel construction of a pneumatic centering punch, or the like, and the object is to provide a device of this character which may be used by the operator while standing in an erect position.

The invention is clearly shown in the accompanying drawings, in which:

Figure 1 is a view in side elevation, partly in section, of a pneumatic centering punch, constructed in accordance with my invention.

Fig. 2 is a detailed view in side elevation of the tubular member in which the hammer reciprocates.

Fig. 3 is a detached detail view in side elevation of the connection between the top of said tubular member and the sliding valve sleeve.

Fig. 4 is a detached detail view in side elevation of the tool socket member.

Figs. 5 and 6 are sectional views along the lines 5—5, and 6—6, of Fig. 1, the sections being taken with the slidable valve-member in "down" position.

Figs. 7, 8 and 10 are sectional views along the lines 7—7, 8—8, and 10—10 respectively of Fig. 1, and

Fig. 9 is a sectional view along the line 9—9 of Fig. 2.

Referring now in detail to the drawings: 1 designates a socket member for a tool 2, said member being preferably a cylindrical rod provided at its lower end with a recess or pocket 3, for the reception of the tool 2, which may be frictionally held or clamped in said socket by a set screw 4 passing into said member, as shown in Fig. 1, and bearing against the tool 2.

The tool socket member 1 is provided at its top with a head or anvil 5, which re-

ciprocates in a cylindrical or tubular member 6, more particularly hereinafter described.

The tool socket member reciprocates in the holder, comprising a cross-sectionally enlarged head 7 and a tapering hollow shank 8.

As shown in Fig. 1, the tool socket member 1 is axially disposed in said holder 7, 8.

Suitable means are provided for automatically returning the tool socket member 1 to the limit of its upward movement after the same has been driven downward by contact with the anvil 5 of the hammer 9. In this instance, a coiled spring 10 is interposed between the anvil 5 and the bottom wall 11 of the head 7, the spring encircling the shank of the tool socket member 1, as shown in Fig. 1.

Means are provided for limiting the upward movement of the anvil, and in this instance such means preferably comprises an annular shoulder 12 internally of the tubular member 6. As shown in Fig. 1, the anvil 5, at the limit of its upward movement, contacts with said shoulder 12, thus limiting movement of the former. The tubular member 6 is provided toward its lower end with an enlarged portion 6', in which the anvil 5 reciprocates and which is externally threaded, at 7', see for instance, as shown in Fig. 2, so as to be screwed into the correspondingly internally threaded portion of the head 7, as shown in Fig. 1.

The top of said enlarged portion 6' of the tubular member 6 is provided with an annular series of ports 13, as most clearly shown in Fig. 2, whereby communication is afforded between the exterior and interior of the tubular member 6.

The tubular member 6 is also provided with an enlarged top portion 14 provided with an annular series of ports 15, with a circumferential recess 6^b at its lower end; and with a series of longitudinally extending grooves 6^a in the bottom of said recess and terminating short of the upper end of said recess (see Fig. 1). Disposed in said recess 6^b and suitably secured to the enlarged portion 14 is an annulus 6^c extending to the bottom of the head 14 and provided, preferably at a point adjacent the upper end of the grooves 6^a, with a series of openings 25, and at its lower end with a circumferential recess 17.

16 is a sleeve, the upper end of which is disposed in the upper end of the recess 17 and the lower end against a packing ring 18 disposed on top of the head 7 and encircling the enlarged portion 6' of the tubular member 6.

Slidable on said enlarged portion 14 of the tubular member 6 is a valve member 19, which, as shown, is tubular, and is provided at its upper end with a screw-threaded nipple 20. Said nipple is hollow, as shown, and communicates at its lower end with longitudinally extending ports 21, 21' in the wall of the valve member 19, the port 20 being of greater length than the port 21', said port 21' at its lower end, communicating with the port 21 by an annular passage 22 in the wall of the valve member 19. Communication is established between said annular passage 22 and the interior chamber 23 of the valve member 19 by means of an annular series of ports 24.

When the valve member 19 is in its uppermost position, as shown in Fig. 1, said port 21, at its lower end, communicates, through branches 21^a with the adjacent ports 25 in the annulus 6^c.

The valve member 19 is also provided with a plurality of openings 26 disposed in an annular series below the passage 22. Beneath said ports 26 the valve member 19 is also provided with a second series of openings 27 disposed in a substantially annular series.

Means are provided for preventing rotation of the valve member 19 with respect to the tubular member 6, and in this instance I have shown for this purpose a longitudinally extending slot 28, in which is disposed the head of a screw 29 carried by the enlarged portion 14 of the tubular member 6. By this means it will be seen that the valve member 19 may be rectilinearly reciprocated on the enlarged portion 14 of the tubular member 6, but is prevented from rotation relative to said member 6.

Threaded into the enlarged portion 14 of the tubular member 6 is the threaded end 30 of a member 31 which projects through the top wall 32 of the chamber 23 of the valve member 19. The top end of said member 31 is threaded, as shown at 33, for engagement with a nut 34. A coiled spring 35 encircles said member 31 and is disposed between said top wall 32 and an annular shoulder 36 on said member 31. It will be seen that the spring 35 automatically returns the valve member to upper position after it has been manually lowered.

In operation, with the parts as shown in Fig. 1, the hammer 9 is at the limit of its upper movement. In this position of the parts, with the valve member 19 at the limit of its upward movement, and it being understood that air under pressure has entered

through the nipple 20, it will be seen that such air under pressure bears upward on the hammer 9, since in this position of the parts, communication is established through the port 21, registering port 21, and branches 21^a with registering ports 25 and 6^a, the latter communicating, at their lower ends, with the passage 37, between the sleeve 16 and the tubular member 6, said passage communicating by the ports 13, with the interior of the tubular member 6. It will also be seen that passage through the ports 24 is cut off by the cylindrical top 38 of the enlarged portion 14 of the tubular member 6. Air entering passage 37 cannot escape through the ports 6^a which register with ports 27 in the "down" position of the valve member 19, because in this "up" position of the valve member, said ports are out of registration.

To cause the hammer to drop on the anvil 5, the valve member 19 is manually reciprocated downward on the enlarged portion 14 to the position shown in dotted lines in Fig. 1. In this position of the parts, the ports 24 are brought into registration with the ports 15 and passage through the ports 25 is cut off, consequently air passes from the passage 22 through the registering ports 24 and 15 into the chamber in the tubular member 6 above the hammer 9. The travel of the air, beneath the hammer 9, in its escape to the atmosphere, when the hammer descends, is through the ports 13, upward in the passage 37, through the ports 6^a, through the registering ports 25 and, finally, through the outlet ports 27, which, in the lowered position of the valve member 19, are brought into registration with said ports 25. On the upward movement of the hammer 9, air escapes ahead of the hammer through the ports 26 and communicating ports 40 in the enlarged portion 14 of the cylindrical member 6. As is obvious, when the hammer passes above the ports 40, passage there-through is cut off.

What I claim to be new is:

1. A pneumatic centering punch comprising a tubular member with enlarged portions at its top and bottom, and provided with a circumferential series of openings at the top of said bottom enlargement, an anvil reciprocable in said bottom enlargement, a hammer reciprocable in said tubular member, said top enlargement being provided at its bottom with a circumferential recess, and with a series of longitudinally extending grooves in the bottom of said recess, an annulus disposed in said recess and provided with a series of apertures communicating with said grooves, a sleeve bearing at its upper end against the lower end of said annulus and, at its lower end, against said lower enlargement, forming a chamber between said sleeve and said tubular member,

said chamber communicating at one end with said grooves and at its other end with said openings at the top of the bottom enlargement, and a tubular valve member reciprocable on said top enlargement, and provided with a longitudinally extending port having branches communicating with said annulus apertures in the raised portion of said valve member.

- 10 2. A pneumatic centering punch comprising a tubular member with enlarged portions at its top and bottom, and provided with a circumferential series of openings at the top of said bottom enlargement, an anvil reciprocable in said bottom enlargement, a hammer reciprocable in said tubular member, said top enlargement being provided at its bottom with a circumferential recess, and with a series of longitudinally extending
15 grooves in the bottom of said recess, an annulus disposed in said recess, and provided with a series of apertures communicating with said grooves, a sleeve bearing at its upper end against the lower end of said annulus and, at its lower end, against said lower enlargement, forming a chamber between said sleeve and said tubular member, said chamber communicating at one end with said grooves and at its other end with said openings at the top of the bottom enlargement, and a tubular valve member reciprocable on said top enlargement, and provided with a longitudinally extending port having branches communicating with said annulus
20 apertures in the raised portion of said valve

member, and means for yieldingly holding said anvil in raised position.

3. A pneumatic centering punch comprising a tubular member with enlarged portions at its top and bottom, and provided with a circumferential series of openings at the top of said bottom enlargement, an anvil reciprocable in said bottom enlargement, a hammer reciprocable in said tubular member, said top enlargement being provided at its bottom with a circumferential recess, and with a series of longitudinally extending grooves in the bottom of said recess, an annulus disposed in said recess and provided with a series of apertures communicating with said grooves, a sleeve bearing at its upper end against the lower end of said annulus and, at its lower end, against said lower enlargement, forming a chamber between said sleeve and said tubular member, said chamber communicating at one end with said grooves and at its other end with said openings at the top of the bottom enlargement, and a tubular valve member reciprocable on said top enlargement, and provided with a longitudinally extending port having branches communicating with said annulus apertures in the raised portion of said valve member, said valve member being provided with a circumferential series of openings registering with said annulus openings in the lower portion of said valve member.

In testimony whereof I hereunto affix my signature.

WILLIAM THOMPSON SPARROW.