

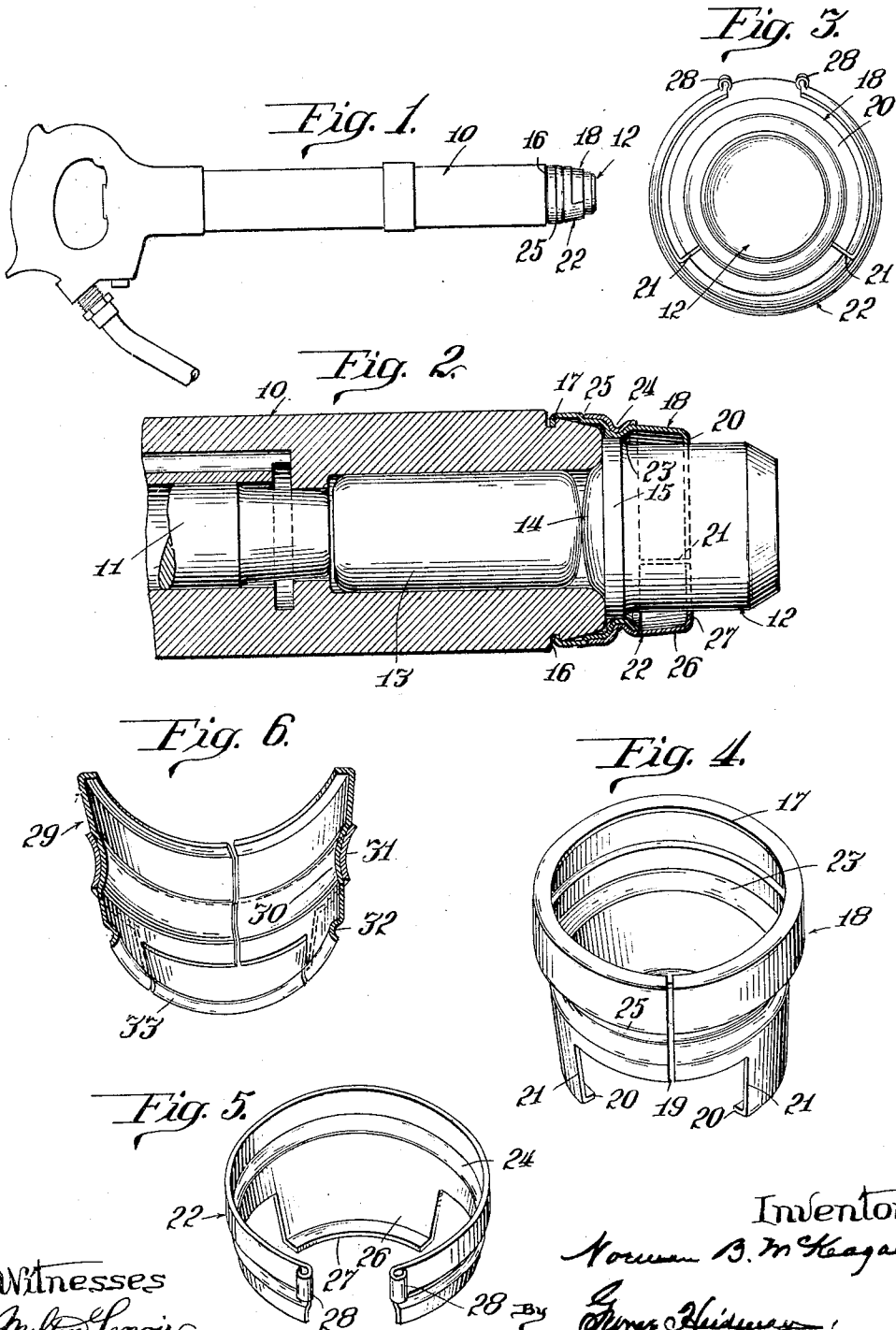
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PNEUMATIC TOOL

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PNEUMATIC TOOL

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My invention relates to pneumatic tools, and more particularly to pneumatic riveting hammers; the invention consisting more especially in means whereby the rivet-set or tool is retained in place and held against accidental displacement, while at the same time permitting the rivet-set to be easily removed when desired.

One object of the invention is to provide means which may be readily applied to the cylinders or barrels of pneumatic tools at present in use, for the purpose of holding the head or outer end of the rivet set in place and prevent it from being thrown when the tool becomes fractured in such manner that the head of the rivet set becomes completely severed from the shank of the set.

As a further result of my invention, it is possible to employ a rivet-set which need not be provided with the usual elongated shank portion; the shankless rivet-set being secured in place against displacement or accidental removal by my improved means which, however, is of such construction as to permit easy manipulation or adjustment which will enable the rivet-set to be removed when occasion requires.

The objects and advantages of my invention will all be more readily comprehended from the detailed description of the accompanying drawings, wherein:—

Figure 1 is a side elevation of a pneumatic tool provided with my invention.

Figure 2 is a longitudinal sectional view of the outer end of a pneumatic tool provided with my invention, and illustrating the use of a rivet-set without an integral shank or stem portion, with portions shown in elevation.

Figure 3 is an end elevation of my improved tool-holding means, disclosed in Figures 1 and 2.

Figure 4 is a detail perspective view of one member of said means.

Figure 5 is a similar view of the other member of said means.

Figure 6 is a sectional view in perspective of a modified form of my improved tool holding means.

As my invention relates to means for holding the tool or rivet-set in place at the outer end of the cylinder of a pneumatic tool and does not relate to the general cylinder construction, the usual piston and air control valves, a specific description of such portions of the pneumatic tool will not be entered into, except to refer to the fact that the hammer or rivet-set usually consists of a head portion, principally located to the exterior of the cylinder or barrel, and a shank portion which extends into the cylinder and is adapted to be forcibly engaged by or acted upon by the reciprocating piston or plunger in the cylinder; the shank being of lesser diameter than the head. In practice, the rivet-sets frequently become fractured at the juncture of the head and the shank, with the result that the head of the tool is often thrown outwardly with considerable force and endangering the lives of the workmen.

In the specific exemplification of the invention as disclosed, the cylinder 10 may be of the usual well known construction and provided with the air operated hammer 11 which is adapted to exert its blow on the rivet-set with which the tool is provided; and as previously stated, in pneumatic tools as at present employed, the rivet-set is usually provided with an elongated shank adapted to enter the cylinder to receive the blow exerted by the hammer. In view of the construction of the rivet-set as above stated, breakage in the rivet-set at the juncture of the head and the shank is more or less frequent which not only endangers the lives of operators, but further use (before repair) of the device made impracticable.

In Figure 2 I show the rivet-set 12 made independent or separate from the anvil 13;

the inner end of the rivet-set being provided with an arcuate end 14 or outwardly curved or bulging boss substantially equal to the orifice of the cylinder 10; the arcuate end being adapted to be engaged by the arcuate end of the anvil 13; the curvatures of the rivet-set and adjacent end of the anvil being such that the blow of the anvil 13 on the rivet-set 12 (induced through the reciprocating action of the hammer 11 and its forcible engagement with anvil 13) will at all times be struck substantially at the longitudinal axis of the tool even though the latter may have been slightly misplaced.

The rivet-set 12, at what may be termed its inner end, is provided with a circumferential rib 15 which is adapted to seat against the outer end of the cylinder 10 while the arcuate portion 14 is so formed as to extend slightly into the end of the cylinder.

The end of the cylinder 10, adjacent to the outer end, is usually provided with a circumferential groove 16 which is utilized to receive the inturned edge or flange 17 of a sleeve or guard member 18. The member 18, which is formed out of suitable resilient metal, may be in the form of a continuous band if desired, but preferably consists of a split band as shown at 19, to adapt it to be readily sprung or forced onto and substantially encircle the outer end of the cylinder or barrel with the rim or flange 17 engaging in the circumferential groove 16 of the cylinder, which firmly secures the member 18 in place.

The wall of the sleeve or member 18 preferably tapers somewhat toward the outer end where the end of the skirt (in the exemplification in Figures 2 and 4) is turned inwardly as at 20. The inturned portion 20 is intended to come into close relation with the main portion of the rivet-set 12 and therefore describes a smaller circle than that described by the circumferential rib 15 of the rivet-set 12.

The skirt portion of the member 18 is segmentally cut away as shown at 21 in Figure 4 to an extent approximately equal to the diameter of the rib 15 of the rivet-set 12 so as to permit withdrawal of the rivet-set when desired.

The member 18 is provided with an encircling split band or ring 22 shown in Figure 5 which is rotatably held in place by means of the circumferential groove 23 formed in the sleeve or member 18 and the inwardly disposed circumferential rib 24 formed on the encircling band 22; the groove 23 being preferably formed by bending the member 18 inwardly at 23 at a point adjacent to the end of the cylinder 10, namely coincident with the flange 15 of the rivet-set 12 as shown in Figure 2. The band 22 is also bent inwardly as shown at 24 in Figure 2 to enter the groove 23, which holds the encircling member 22 rotatably in place; it being understood, however, that the inwardly bent portion 23 of the

member 18 is so formed as not to interfere with the freedom of the rivet-set 12. The member 18 is also preferably formed to provide a shoulder 25 (see Figure 2) against which the end of the ring 22 abuts.

This maintains the ring in proper position on member 18 and consequently keeps the segmental skirt portion 26 of ring 22 in proper position relative to the skirt of member 18 so as to have it coincident with the cut-out portion or gap 21; the skirt portion 26 being of dimensions substantially equal to the cut-out portion 21 of member 18. The segmental skirt portion 26 of the band 22 is also provided with an inturned flange 27 similar to the flange 20; and the skirt 26 is formed so as to snap or extend into the gap 21 when the band 22 is properly positioned; the flange 27 in conjunction with the flange 20, being intended to engage with the rib 15 of the rivet-set 12 to prevent further outward movement and therefore to hold the rivet-set in place.

The band 22, being of resilient metal, permits the segmental skirt portion 26 to spring or flex outwardly and to telescope with the skirt portion of member 18 when the band is rotated to move the skirt portion 26 out of register with the gap 21 at times when it is desired to remove the rivet-set or hammer 12; it being understood, however, that a firm frictional relation between members 18 and 22 is provided to prevent accidental rotation of member 22.

When the band 22 has been rotated on member 18 so as to uncover the gap 21, the rivet-set can be laterally forced into place through the opening or gap 21, after which the member 22 is rotated back to position where the segmental skirt portion 26 will move into and close the gap or opening in member 18, at which time removal of the rivet-set 12 is made impossible.

In order that the band 22 may be easily manipulated and at the same time permit the ends of the band to pass freely over the split 19 in the member 18, the ends of the band 22 are preferably slightly curled outwardly as shown at 28 in Figure 5.

In Figure 6, a longitudinal sectional view, in perspective of a modified form of my improved tool or rivet-set holding means is disclosed. The members are substantially similar to those shown in the other figures and heretofore described, except that the member 29 is dished inwardly intermediate of the top and bottom as shown at 30 to receive a similarly dished upper portion of the band 31, while the lower edge of member 29 is curled inwardly and outwardly at 32 instead of being flanged as shown at 20 in Figure 4; the curled portion 32 being intended to describe the segment of a smaller circle than the circle described by the flange 15 of the rivet-set 12 so as to prevent the

passage of the rivet-set through the outer end of the holding means. The band 31 is, of course, also provided with a skirt portion 33 which is given a similar curl at the bottom; the skirt portion 33 of band 31 being intended to enter the cut-away portion in the skirt of member 29 when the band 31 is properly positioned; the resiliency of the skirt portion 33, like the skirt portion 26 permitting said portions to flex outwardly when it is desired to rotate the bands to open the gaps; while the split member 18 or 29 will permit sufficient spread in the event that the rivet-set is slightly larger in diameter than the gap or cut-away portion.

While I have disclosed my invention as applied to a pneumatic tool wherein the anvil 13 is separate from the rivet-set 12, it is clearly apparent that my improved holding means is equally as well adapted for use in connection with a tool wherein the rivet-set 12 is provided with an integral elongated shank; and in the event of the spindle being broken from the head of the rivet-set, the latter will still be held in place by my improved holding means, thus permitting continued use of the pneumatic tool, as my improved means will prevent the rivet-set being thrown from the cylinder through the action of the air-controlled reciprocating hammer; and as a result the danger heretofore encountered with tools of this character is entirely eliminated.

A further advantage of my improved means results from the fact that rivet-sets without the elongated shanks may be used, as shown in Figure 2, permitting a saving in metal and therefore cost of construction, as different types of rivet-sets may be substituted and employed with the supplemental anvil 13. Furthermore, by forming the ends of the rivet-set and the anvil as shown in Figure 2, with the arcuate portions, it is apparent that the blows will be delivered substantially at the longitudinal axis of the rivet-sets regardless of a slight sidewise shifting or displacement of the rivet-set.

I have shown the holding means as consisting of split bands or members for the purpose of presenting a construction which may be easily applied, to pneumatic tools now in use, by the user, as the members are preferably formed out of suitably tempered metal having sufficient resiliency to enable the members to be forced and sprung into place; but it is evident that the main member may be made continuous and secured to the end of the cylinder or barrel through the use of proper tools and the formation of the members may be somewhat varied; the preferred forms of the invention having been described in terms employed merely as terms of description and not as terms of limitation, as structural modifications are possible and may

be made without, however, departing from the spirit of my invention.

What I claim is:

1. In a pneumatic tool, a member adapted to be secured to the cylinder of a pneumatic tool and to receive the rivet-set, the side wall of the member being provided with an opening through which the rivet-set may be inserted, and a second member encircling the first member and rotatable thereon, said second member being adapted to close the side opening in the first member when rotated into proper position, the outer ends of both members being restricted to prevent passage of the head of the rivet-set.

2. In a pneumatic tool, a member adapted to be secured to the end of the cylinder of a pneumatic tool and to receive the rivet-set, the walls of the member being tapered toward the outer end and provided with an opening in the side to permit insertion of the rivet-set therethrough, and a second member rotatable on the first member and provided with a tapering side wall adapted to enter the opening in the side wall of the first member, the outer ends of both members being formed to prevent passage of the head of the rivet-set therethrough.

3. In a pneumatic tool, a split-sleeve flanged at the inner end to grip the cylinder of a pneumatic tool and formed with an intumed portion at the outer end describing the arc of a smaller circle than that of the head of the rivet-set, the side of the sleeve being provided with an opening adapted to permit insertion of the rivet-set therethrough, and a split band encircling the sleeve, the sleeve and band being formed with correlated surfaces to hold the band in place and permit rotation thereof, the band being provided with a side wall portion adapted to close the opening in the side of the sleeve, with the outer end of said side wall portion being intumed to cooperate with the intumed portion of the sleeve to prevent passage of the head of the rivet-set.

4. In a pneumatic tool, a member adapted to be secured to the end of the cylinder of a pneumatic tool and provided with an opening in the side wall adjacent to the outer end to permit insertion of the rivet-set therethrough, and a second member disposed about the first member, the two members being formed to prevent movement of the second member lengthwise of the first member but permitting rotation of the second member, said second member being provided with a resilient segmental portion adapted to seat in the opening in the side wall of the first member, the outer ends of the first member and of the segmental portion of the second member being formed to describe a smaller circle than that described by the head of the rivet-set, to prevent passage of the head of the rivet-set.

5. In a pneumatic tool having a cylinder, a rivet-set provided with an arcuate head, a member, secured to the end of the cylinder, having a segmental opening in the side wall adapted to permit insertion of the rivet-set therethrough, and a second member secured against movement lengthwise of the first member but being rotatable thereon, the second member being adapted to close the segmental opening in the first member, with the outer ends of both members being formed to provide a smaller passage than the diameter of the head of the rivet-set to prevent passage of the head therethrough.

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