

W. O. DUNTLEY.  
PNEUMATIC TOOL HANDLE.  
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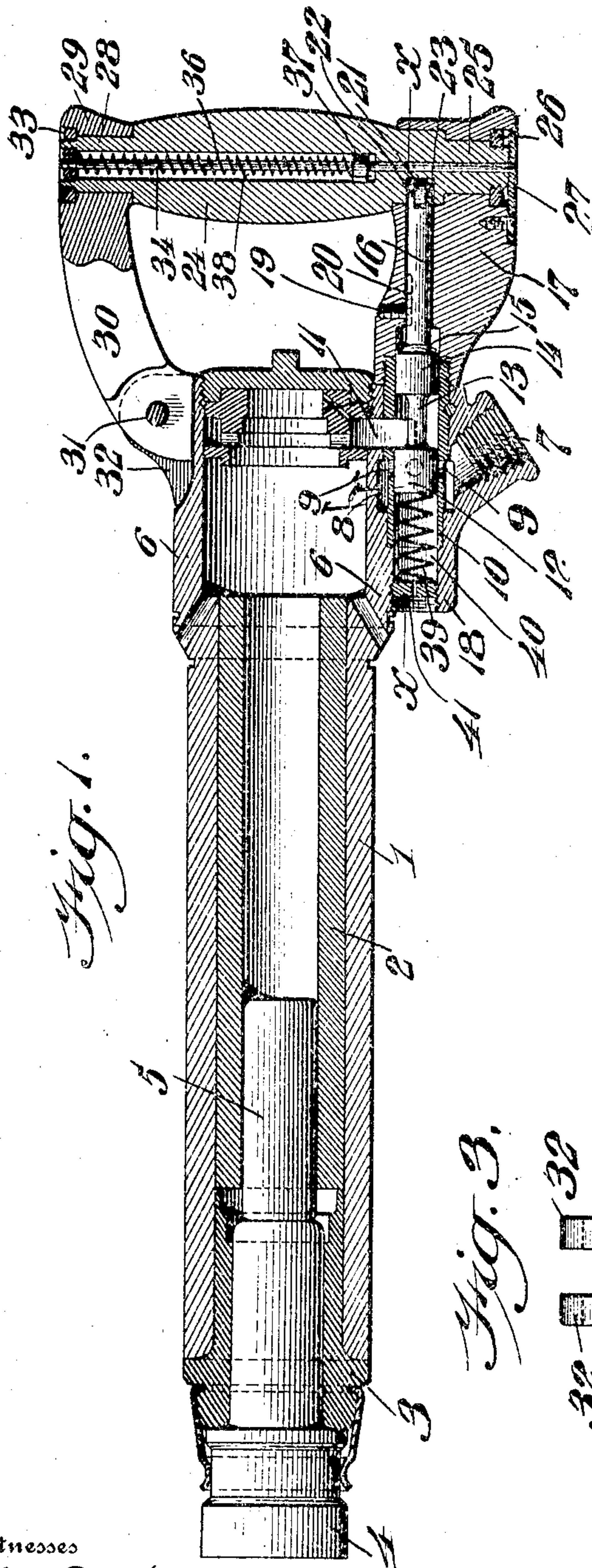


Fig. 1.

Fig. 2.

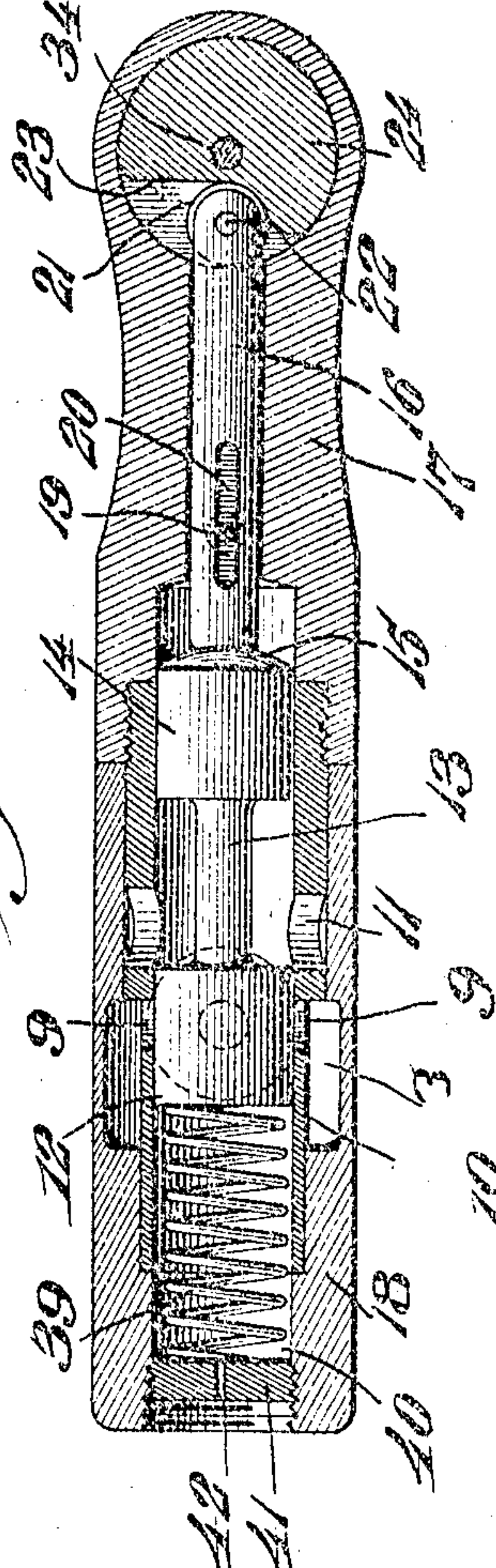
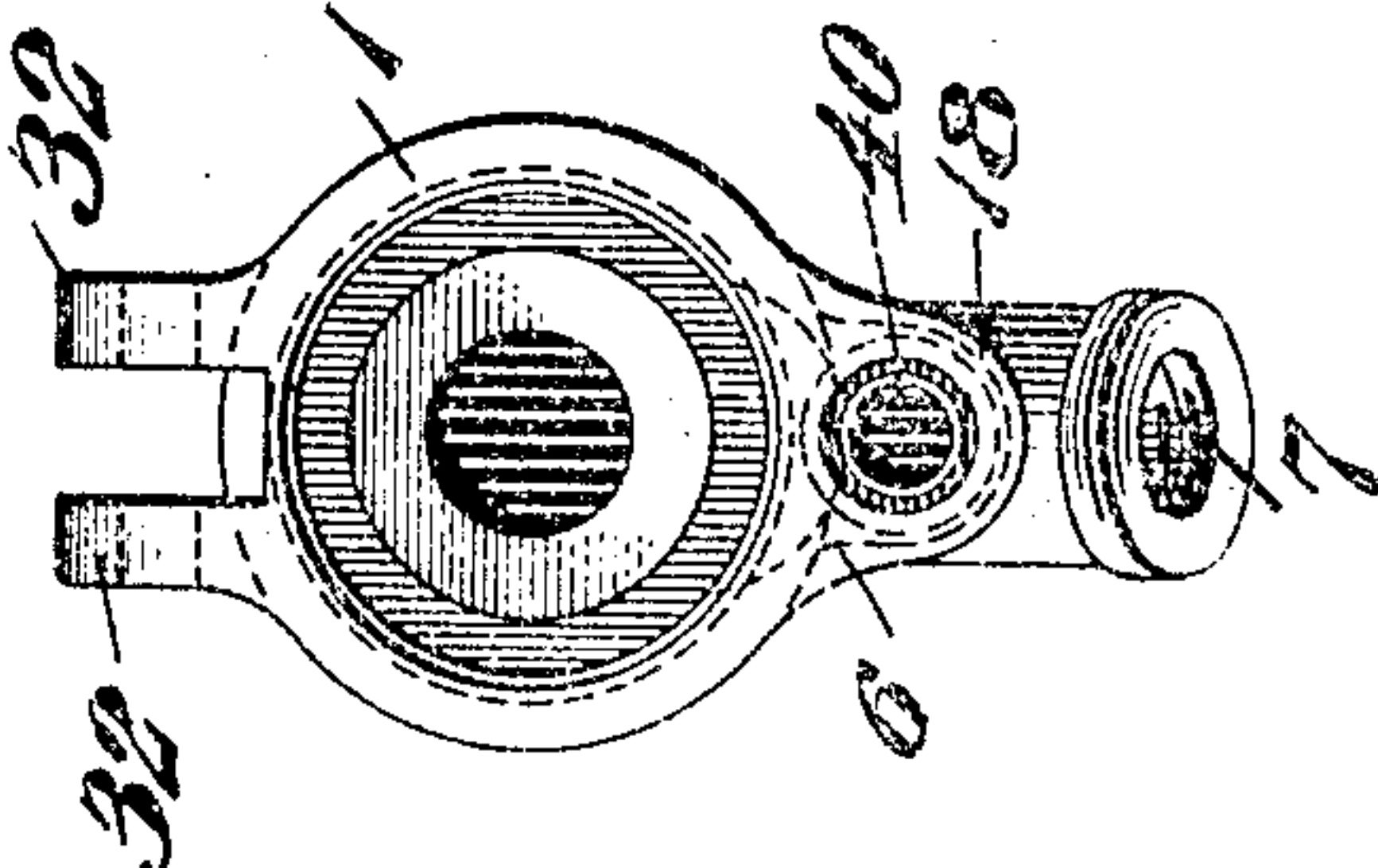


Fig. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## PNEUMATIC-TOOL HANDLE.

No. 912,655.

Specification of Letters Patent.

Patented Feb. 16, 1909.

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*To all whom it may concern:*

Be it known that I, WILLIAM O. DUNTLEY, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a new and useful Pneumatic-Tool Handle, of which the following is a specification.

The pneumatic tool handles of the present day which are in practical use are, for the most part, provided with a throttle valve located in or partly in the grasping portion of the handle and said valve is actuated by means either of a thumb pressed lever pivotally mounted in a narrow slit in the outside of the handle or else by a finger latch pivotally mounted in the interior of the handle, suitable actuating or connecting mechanism being interposed between the thumb or finger operated lever and the throttle valve. While these devices give a certain degree of satisfaction so far as their operativeness is concerned, it has nevertheless, happened in many instances, that pneumatic hammers of this general character which are often subjected to much abuse and neglect and are left lying on the floors of the plants where they are in use, have frequently been accidentally started by the workman or attendant accidentally hitting the manually operated lever with his foot or other portion of his body in which case if air pressure happens to be on the tool the piston will commence its reciprocations with great rapidity thereby sometimes causing either the piston itself to shoot out with almost the velocity of a rifle bullet or the reciprocation of the piston may cause the chisel, button set or other implement or working tool to be propelled from the cylinder thereby inflicting serious injury to any person or object in the vicinity. Inasmuch as the pistons of these pneumatic hammers, as is well known to those skilled in the art, reciprocate at a high velocity ranging from six or seven hundred to twelve hundred strokes a minute under pressure of eighty to one hundred and ten pounds to the square inch, it can be readily seen that there is great liability of serious injury or damage in case the operation of one of these implements is accidentally caused.

In order to obviate the above disadvantages I have devised a pneumatic tool handle which can be very cheaply manufactured and assembled and wherein the parts are all

self-contained and wherein the operation of the throttle valve and its reciprocation from the handle of the piston is effected by a slight rotation of the grasping handle proper, the throttle valve being located wholly outside not only the grasping portion of the handle but the handle as well and being mounted on a suitable portion of the tool body which is specially fashioned to receive it. I also connect the inlet for the motive fluid directly to the tool body and make provision whereby the opening of the throttle valve can be readily and instantly varied or increased or diminished by a very slight movement of the workman's wrist.

In my novel construction of handle there is no manually operated thumb lever or inside finger latch which can be accidentally operated since all the parts are self-contained and there is no liability of dust, dirt, sand or grit entering or obtaining access to any of the working parts of the handle or throttle valve.

To the above ends my invention consists broadly of a novel construction of throttle valve having a tension device therefor in combination with a pneumatic tool handle having a rotatable grasping member and suitable mechanism intermediate said grasping member and throttle valve, whereby the latter can be readily opened and closed according to requirements, said throttle valve and its adjuncts being wholly located out of not only the grasping part of the handle but the handle as well and being located in a chamber or recess in the tool body.

It further consists of a novel construction of a rotary grasping handle having a cam surface therein, a throttle valve located outside of the handle and suitable mechanism intermediate said cam surface and throttle valve for effecting the reciprocations of the latter.

It further consists of novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously ar-



ranged and organized and that my invention is not limited to the precise construction and organization of these instrumentalities as herein shown and described.

5 Figure 1 represents a longitudinal sectional view of a pneumatic tool handle and its adjuncts embodying my invention; certain of the parts being shown in elevation. Fig. 2 represents, on an enlarged scale, a  
10 section on line  $x-x$ , Fig. 1. Fig. 3 represents an end view of Fig. 1, the handle and its adjuncts being detached from the cylinder.

Similar numerals of reference indicate  
15 corresponding parts in the figures.

Referring to the drawings: 1 designates the cylinder of a pneumatic tool, the same being provided with the lining 2, nosing 3, button set 4, and piston 5, and the other  
20 usual adjuncts. The cylinder 1 is provided with the enlargement 6 preferably integral therewith, within which is contained the valve box, and distribution valve (not shown).

25 7 designates a threaded inlet or boss for the attachment thereto of the air supply hose (not shown), the motive fluid passing into the annular chamber 8 and thence through the ports 9 of the bushing 10 into  
30 the main air inlet 11 to the working parts of the tool, assuming that the throttle valve 12 is open as will be explained. The throttle valve consists of the head or valve proper 12 having the neck 13 which is attached to the  
35 head 14, the latter having the rounded or convex extremity 15, against which contacts the end of the stem 16, which extends longitudinally in the arm 17, which may be integral with or suitably secured to the valve  
40 casing 18, within which the bushing 10 and valve 12 are contained. The stem 16 is prevented from improper turning or shifting by the engagement of the inner end of the pin 19 with the walls of the groove 20 as will  
45 be understood from Figs. 1 and 2.

21 designates a roller or other anti-friction device, rotatably mounted on the pin 22 which is secured near the end of the stem 16, said roller being adapted to bear against the  
50 cam face 23 of the handle 24 whose lower extremity 25 is stepped or otherwise rotatably secured in the extremity of the arm 17 and held in proper position by the disk 26, which is in threaded or other engagement  
55 with said extremity 25; the latter and said disk being concealed by the plate 27. The upper extremity 28 of the rotatable handle member 24 is rotatably mounted in the end 29 of the bar 30, which is movably mounted  
60 on the pin 31, carried by the lugs 32 attached to or integral with the cylinder portion 6.

33 designates a disk secured to the end 28, of the handle 24 and having also secured to it the upper end of the rod 34, said disk also  
65 having one end of the spring 36 secured

thereto, the lower end of said spring being secured to the head 37, the latter and said spring being contained in the chamber 38, while the lower end of said rod may if desired, extend through the lower end of the  
70 handle 24, the effect of the tension of the spring 36 being to normally retain the part 23 in the position seen in Figs. 1 and 2, as it will be apparent that the spring 36 cooperates with the spring 39, which is contained  
75 in the valve chamber 40, one end of said latter spring contacting with the head 12, and its other end abutting against the plate 41 having the port 42 therethrough.

The operation is as follows:—When the  
80 parts are in their normal position or as seen in Figs. 1 and 2 it will be apparent that the head or throttle valve 12 is held in substantially the position shown through the medium of the spring 39 which causes the anti-  
85 friction device 21 to seat substantially as indicated in Fig. 2, the proper position of the grasping handle 24 being assured by means of the spring 36. The motive fluid being conducted into the inlet 7 the operator grasps  
90 the portion 24 of the handle and having applied the working tool as  $\pm$ , which may be a button set, chisel blank, or other implement, to the desired point, it will be apparent that  
95 if a slight rotary movement is imparted to the member 24 that the contact of the anti-friction device 21 with the cam surface 23 will cause the valve 12 to advance or move to the left, thereby permitting the motive fluid  
100 to enter through the port 9 and flow past the neck 13 and thence through the main inlet 11 to the working parts of the tool. By turning the member 24 to a greater or less extent the amount of motive fluid entering  
105 the main inlet port 11 can be increased or diminished or otherwise regulated according to requirement. When the operator releases his grasp upon the rotatable member 24 the  
110 torsional action of the spring 36 coupled with the tension of the spring 39 will cause the parts to instantly assume the position seen in Figs. 1 and 2 as will be evident to those skilled in the art. Through the medium of the pin 19 and its co-action with the  
115 walls of the slot 20 in the stem 16, the latter will be prevented from improper turning and by making the surface 15 curved or arc shaped as indicated in Figs. 1 and 2, it will be apparent that the longitudinal movement  
120 of the throttle valve will be nicely regulated and that the frictional contact between the head 14 and the contiguous extremity of the stem 16 will be reduced to a minimum so that the throttle valve 12 will instantly respond to any rotation or adjustment of the  
125 handle 24.

The parts comprising the handle can be readily assembled and disconnected for the purpose of inspection or repairs since upon the removal of the pin 31 and the plate, or  
130



disk 33, the arm 30 can be elevated from the position seen in Fig. 1 and upon the removal of the disk 41 and the spring 39 the throttle valve and its stem 16 can be readily moved to the left whereupon the rotatable member 24 can be quickly and expeditiously disengaged from the arm 17.

If desired, it will be apparent that I can make the arm 17 integral with the enlargement or body portion 6 of the cylinder 1 and that various other changes can be made by those skilled in the art which will fall within the scope of my invention and I do not therefore, desire to be limited in every instance to the exact construction I have herein shown and described, since many changes may be made by those skilled in the art without departing from the scope and spirit of my invention.

So far as I am aware I am the first in the art to produce a concrete unitary structure having the advantages and characteristics above recited and my claims to these features are therefore to be interpreted with corresponding scope.

It will be apparent that my novel construction of handle is applicable to any form of pneumatic hammering implement irrespective of whether the same is of the valveless type or employs a distribution valve and that the handle will work with equal efficiency with the so-called long stroke riveters in use at the present time or in conjunction with the shorter stroke chipping or calking hammer or hammer adapted for stone work as my invention is not limited in its application but may be employed to advantage with any of the pneumatic hammering tools which are adapted to any of the purposes for which a hammer or mallet and chisel have been employed.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination of a pneumatic tool, a handle therefor, a rotatable grasping member carried by said handle, a throttle valve located wholly exterior to said handle and grasping portion, cam mechanism intermediate said throttle valve and rotatable member, whereby the rotation of said member effects the actuation of said throttle valve in one direction, and yielding means for effecting the movement of said throttle valve in a reverse direction.

2. The combination of a pneumatic tool cylinder, a throttle valve carried in said cylinder, arms attached to said cylinder one of said arms being pivoted thereto, a rotatable grasping handle member mounted in said arms, mechanism intermediate said rotatable member and throttle valve for effecting the actuation of said valve in one direction, and yielding means for effecting the actuation of said valve in the opposite direction.

3. A pneumatic tool handle having a rotatable grasping member, a cam face on said member, a throttle valve, a tension device therefor, and mechanism intermediate said valve and cam face for effecting the opening and closing of said valve.

4. The combination of a pneumatic tool having a cylinder provided with a throttle valve chamber therein, said chamber having an inlet for the motive fluid leading thereinto, arms attached to said cylinder, a grasping handle portion, a cam on said portion, a throttle valve mounted in said valve chamber, a valve stem intermediate said throttle valve and cam face and yielding means, for maintaining said stem in operating relation with respect to said cam.

5. The combination of a pneumatic tool having a cylinder provided with a throttle valve chamber therein, a grasping handle rotatably mounted upon said cylinder, a cam face on said grasping handle, a throttle valve in said valve chamber, a valve stem intermediate said valve and cam face, means for preventing said valve stem from turning, and yielding means co-acting the said valve for maintaining the latter normally in inoperative position.

6. A pneumatic tool handle having a rotatable grasping member forming the grasping portion of the handle, a cam on said member, a throttle valve, a tension device therefor, a stem intermediate said valve and cam, and an anti-friction device carried by said stem and contacting with said cam.

7. A pneumatic tool handle having a rotatable grasping member forming the grasping portion of the handle, a cam on said member, a throttle valve, a tension device therefor, a stem intermediate said valve and cam, and an anti-friction device carried by said stem and contacting with said cam, the surface of said valve juxtaposed to said stem being convex.

8. A pneumatic tool handle having a rotatable grasping member forming the grasping portion of the handle, a cam face on said member, a throttle valve located wholly outside said handle and grasping member, a tension device for said valve, and a stem intermediate said valve and cam face.

9. A pneumatic tool handle having a rotatable grasping member, a plurality of arms in the ends of which said rotatable member is mounted, a throttle valve located wholly exterior to said handle and grasping portion, tension devices for said rotatable member and throttle valve, and mechanism intermediate said rotatable member and throttle valve for actuating the latter.

10. A pneumatic tool handle having a rotatable grasping member, a tension device carried by said member for normally rotating it into inoperative position, a throttle valve, a spring bearing thereon and mechan-



ism intermediate said rotatable member, and valve for actuating the latter.

11. A pneumatic tool handle having a rotatable grasping member, a tension device 5 located within said member for normally retaining it in inoperative position, when the grasp of the operator is removed therefrom, a throttle valve and mechanism intermediate said rotatable member and valve for operat- 10 ing the latter.

12. The combination of a pneumatic tool cylinder, a throttle valve chamber carried by said cylinder and having an inlet for the motive fluid leading thereinto, a bushing in 15 said valve chamber, a throttle valve located in said bushing, a tension device for said throttle valve, arms carried by said cylinder, a grasping handle member rotatably mounted in said arms, a cam surface on said 20 rotatable grasping member, a valve stem located intermediately of said cam surface and throttle valve, means for preventing said valve stem from rotating, and a tension device for effecting the rotation of said grasp- 25 ing handle member, when the hand of the operator is removed therefrom.

13. In a pneumatic tool handle, a rotatable grasping member, arms in which said grasping member is rotatably mounted, a 30 longitudinally extending recess in said grasping member, a rod located in said recess, a closure for the upper end of said recess, a spring having one end secured to said closure, and the other end to said stem, 35 whereby the rotation of said handle is effected, a cam surface on the lower portion of said rotatable member, a valve stem suitably supported and having an anti-friction device in one end adapted to be rotated by 40 said cam surface, a throttle valve composed of a plurality of heads joined by a neck, the extremity of said head which is juxtaposed to said valve stem being convex, and a pneumatic tool cylinder having a chamber 15 formed therein for the reception of said throttle valve, said chamber having also an inlet for the motive fluid supply.

14. In a pneumatic tool handle, a rotatable grasping member, arms in which said grasping member is rotatably mounted; a 50 longitudinally extending recess in said grasping member, a rod located in said recess, a closure for the upper end of said recess, a spring having one end secured to said closure, and the other end to said stem, 55 whereby the rotation of said handle is effected, a cam surface on the lower portion of said rotatable member, a valve stem suitably supported and having an anti-friction device in one end adapted to be actuated by 60 said cam surface, a throttle valve composed of a plurality of heads joined by a neck, the extremity of said head which is juxtaposed to said valve stem being convex, and a pneumatic tool cylinder having a chamber 65 formed therein for the reception of said valve, said chamber having also an inlet for the motive fluid supply, one of said arms being pivotally attached to said tool cylinder.

15. A pneumatic tool handle having a ro- 70 tatable grasping member, a throttle valve in the tool cylinder located wholly outside of said handle and grasping portion, and mechanism including an anti-friction device intermediate said rotatable member and throt- 75 tle valve for operating the latter when said member is rotated.

16. The combination of a pneumatic tool cylinder, a throttle valve chamber carried by said cylinder and having an inlet for the 80 motive fluid thereinto, a throttle valve in said chamber, a tension device for said throttle valve, arms carried by said cylinder, one of said arms being secured to said cylinder, a grasping handle member rotatably 85 mounted in said arms, a cam surface on said member, a valve stem located intermediately of said cam surface and throttle valve, and yielding means for maintaining said handle member in normal position.

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Witnesses:

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