No. 710,196. Patented Sept. 30, 1902.

J. KELLER.

PNEUMATIC TOOL.

(Application filed Sept. 20, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 2.

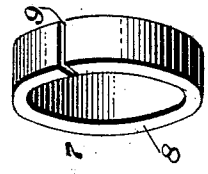
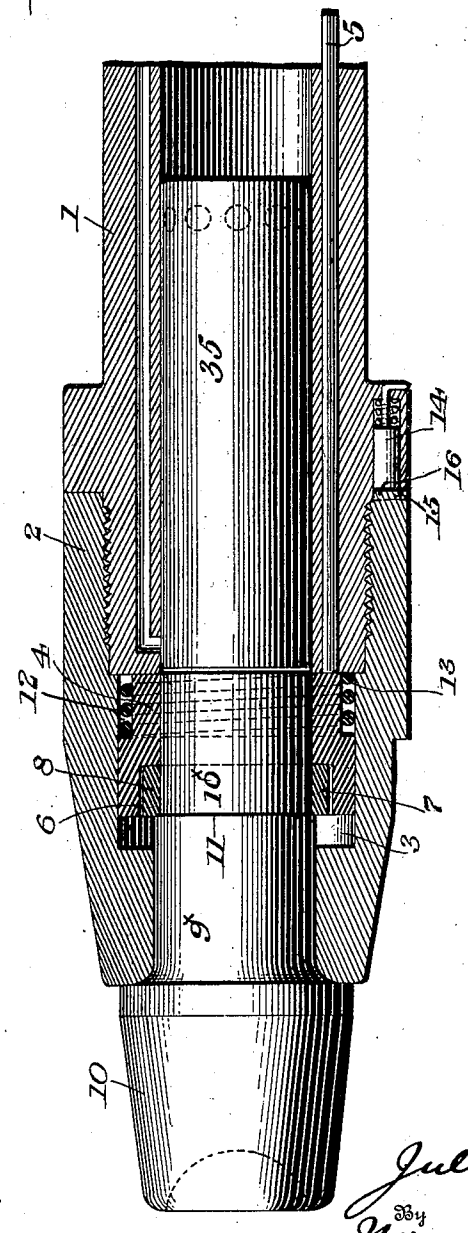


Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

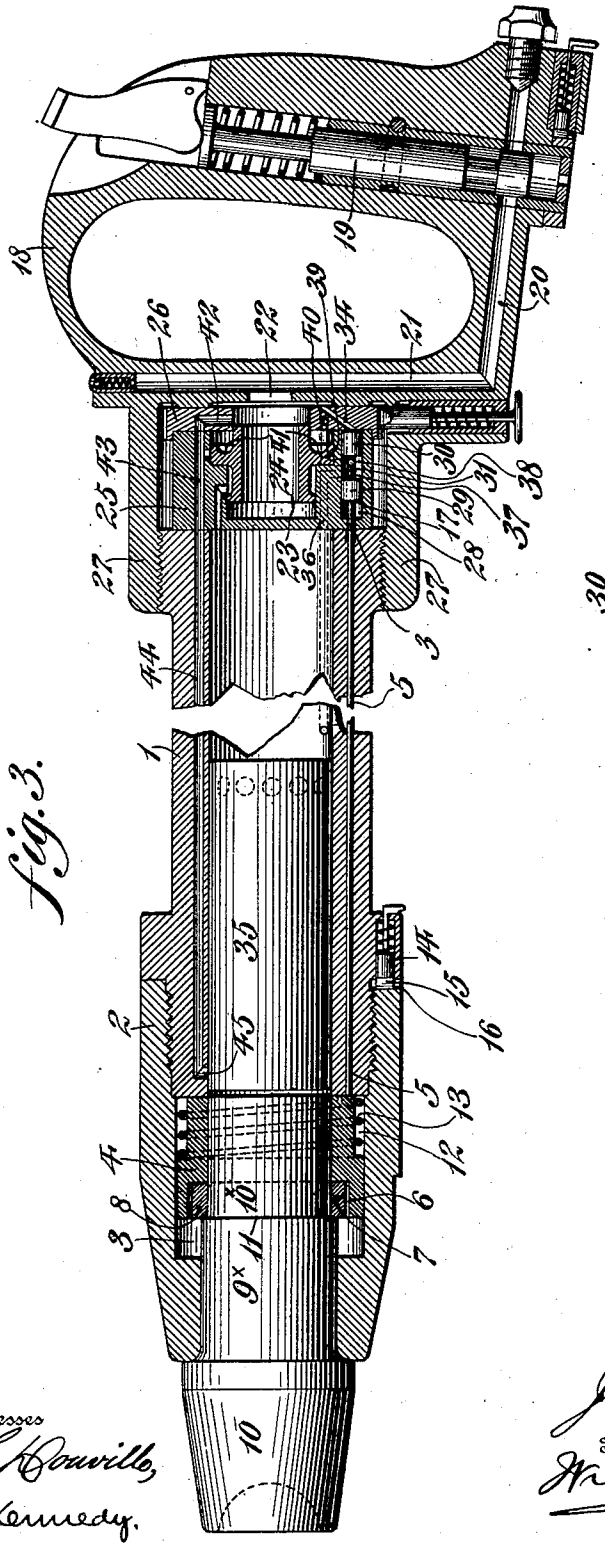


Fig. 3.

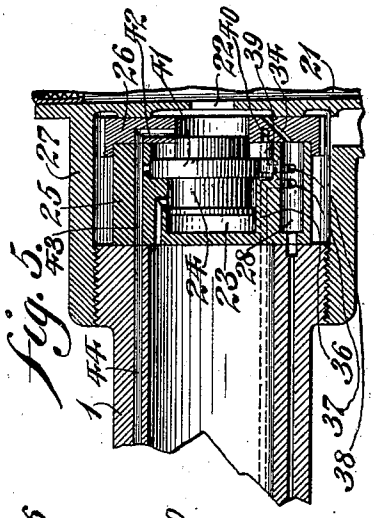


Fig. 5.

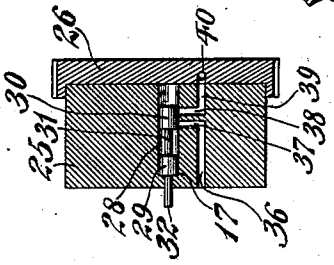


Fig. 4.

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UNITED STATES PATENT OFFICE.

JULIUS KELLER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO PHILADELPHIA PNEUMATIC TOOL COMPANY, A CORPORATION OF NEW JERSEY.

PNEUMATIC TOOL.

SPECIFICATION forming part of Letters Patent No. 710,196, dated September 30, 1902.

Application filed September 20, 1901. Serial No. 75,764. (No model.)

To all whom it may concern:

Be it known that I, JULIUS KELLER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Pneumatic Tools, of which the following is a specification.

My invention relates to a pneumatic tool of that class wherein the shank of the working tool is adapted to be loosely inserted in the nosepiece of the tool and capable of movement therein; and it consists more especially in a novel construction of a retaining device whereby the shank of said tool is normally retained in the desired position within said nosepiece and can be capable of movement therein and yet be readily withdrawn according to requirements, the retaining device being concealed within said nosepiece and adapted to coact with a stop-valve and its adjuncts, and the entire mechanism being capable of being cheaply manufactured and assembled and not likely to get out of order.

It also consists of a novel combination of a retaining device for the shank of the working tool and a stop-valve ring and its adjuncts with which said retaining device is adapted to coact.

It also consists of a novel manner of assembling the retaining device, the shank of the working tool, and the stop-valve ring within the nosepiece attached to the tool-cylinder proper, whereby said retaining device and its adjuncts are concealed and not liable to injury from external sources.

It further consists of novel details of construction, all as will be hereinafter described, and pointed out in the claims.

Figure 1 represents a longitudinal sectional view, partly in elevation, of a portion of a pneumatic tool embodying my invention. Fig. 2 represents a perspective view of the clamping-ring seen in Fig. 1 in detached position. Fig. 3 represents a longitudinal sectional view of a pneumatic riveter or other tool provided with a retaining device for the shank of a working tool embodying my invention and also having a handle provided with a manually-operated throttle-valve controlling the initial admission of the motive fluid to the tool. Fig. 4 represents a sectional view of a portion of the valve-box and stop-valve seen in Fig. 3. Fig. 5 represents a sectional view to be hereinafter referred to.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates the cylinder of a pneumatic riveter or other tool, having a nosepiece 2 screwed or otherwise secured to the end thereof, said nosepiece having the chamber 3 therein, within which is contained the stop-valve ring 4, whose rear portion is adapted to contact with a stop-valve rod 5.

6 designates a recess in the forward end of the valve-ring 4, within which is contained the clamping-ring or retaining device 7, the same consisting of the body portion 8, having a split or cut 9 therein and said ring being adapted to engage the reduced portion $10^{\times}$ of the shank of the working tool, it being noted that said shank has the enlarged portion $9^{\times}$, which projects inwardly from the body 10 of the working tool, which may be constructed, as shown in the drawings, as a button-set, such as is used in conjunction with pneumatic riveters, or, if desired, other forms of working tools may be employed without departing from the spirit of my invention. The junction of the different diameters $9^{\times}$ and $10^{\times}$ of the shank of the working tool forms the shoulder 11, which is adapted to contact with the contiguous face of the clamping-ring or other retaining device 7.

12 designates a recess formed between the reduced rear portion of the stop-valve ring 4 and the contiguous wall of the nosepiece 2, in which is contained the coil or other spring 13, the function of which is to normally force the stop-valve ring 4 forwardly or to the left of the position seen in Fig. 1, it being understood that the parts assume the position seen in said figure only when the button-set or other working tool is pressed to the work.

In practice I prevent disengagement of the nosepiece 2 from the contiguous body portion of the cylinder 1 by means of the spring-pressed plunger 14, the forward extremity 15 of which is adapted to engage ratchet-teeth 16 on the contiguous portion of said nosepiece, said plunger 14 being seated in a suit-

able recess located in the forward end of the cylinder 1 and being readily manipulated from the exterior of the tool, as is evident.

It will thus be seen from the foregoing that the retaining device 7 snugly hugs the portion $10^{\times}$ of the shank of the working tool, thereby retaining the latter in position, and yet permitting the ready withdrawal of the working tool when desired. It will be understood that in Figs. 1 and 3 the parts are shown in the position they assume when the tool is pressed to the work, at which point the stop-valve rod has been actuated to the right, so as to move the stop-valve 17 to the desired extent, the movement of the ring 4 and rod 5 being effected by the contact of the shoulder 11 with the retaining device 7. When the tool is removed from the work, the tension of the spring 13 will move the ring 4, retaining device 7, and the working tool to the left of the position seen in Fig. 1, as is evident. The retaining device 7 being concealed within the nosepiece 2 is not liable to blows or injury from external sources, and the parts always being in alinement the action thereof will always be direct and positive no matter in what angle the tool-cylinder 1 may be held.

By locating the spring 13 in the position seen or in an analogous position it will be apparent that unnecessary shocks or jars caused by the application of the tool to the work is obviated, since said spring acts as a cushion or buffer between the end of the cylinder 1 and the stop-valve ring 4.

In Fig. 3 I have shown my invention as applied to a pneumatic tool having a distributing-valve, a piston, and ports and passages common thereto, the preferred arrangement being that shown in a prior patent granted to me April 10, 1900, and numbered 647,415, and as the general operation of a pneumatic tool of this type is fully set forth in said prior patent and will be familiar to those skilled in the art I have deemed it unnecessary to enter into a detailed description thereof in the present case, since it will be understood that the retaining device of the working tool, the stop-valve, and its adjuncts are applicable, broadly, to any type of pneumatic tool having a valve-controlled piston. In said Fig. 3 I have shown the cylinder 1 as provided with the grasping-handle 18, having the pressure-operated throttle-valve 19 therein, which is adapted to control the inlet-passage 20 for the motive fluid, which I preferably locate outside of the grasping portion of the handle, said inlet-passage communicating with the passage 21 and the port 22, whereby the motive fluid is led to the inner chamber 23 of the distribution-valve 24, which is contained within the valve-box 25, which is provided with the cap 26, said handle 18 being provided with the integral coupling-sleeve 27, whereby the valve-box, cap, valve, and their adjuncts are effectively retained in assembled position.

The valve-box 25 is provided with the recess 28, in which is contained the stop-valve 17, the latter consisting in the present instance of the heads 29 and 30, which are joined by the neck 31, said head 29 having the stem 32 projecting therefrom and adapted to be in contact with the rod 5. The stop-valve 17 is held in its forward position or moved to the left of the position seen in Fig. 3 by means of fluid-pressure acting thereon through the port 34, said port being in communication with the main supply-port 22, as will be evident from Fig. 3, although it is evident that a spring or other analogous means may be employed for moving the stop-valve from the position seen in Fig. 3 to the position seen in Fig. 4, if desired.

As I have already explained in a contemporaneously-pending application filed by me December 11, 1900, Serial No. 39,570, it will be understood that when the piston 35 has reached its forward position, as indicated in Figs. 1 and 3, it uncovers a suitable port, whereby live air is permitted to enter the passage 36 and to pass thence through the passages 37, 38, 39, and 40 to the larger pressure area 41 of the distribution-valve 24, whereby said valve will be forced forwardly into the position seen in Fig. 3, whereby live-fluid pressure can flow through the ports 42, passages 43 and 44, and the port 45 at the front end of the piston 35, whereby the latter will move to the right of the position seen in Fig. 3. It will thus be apparent that when the stop-valve 17 is in the position seen in Fig. 4 the port 38 is closed and the pressure from the piston-chamber which is in the passage 36 cannot go back to the ports 39 and 40 to the large pressure area of the distributing-valve until the button-set or other working tool is pressed against the work, so that the parts appear as seen in Figs. 1 and 3, whereby the stop-valve is moved into the position seen in Fig. 3, in which case the ports and passages 36, 37, 38, and 39 are thrown into communication by means of the connecting-neck 31 of the stop-valve and pressure freely imparted to the large pressure area of the differential distributing-valve, which will be forced into the position seen in Fig. 3, as I have explained in detail in my pending application, Serial No. 39,570, above referred to.

It will be evident that various changes may be made by those skilled in the art which will come within the scope of my invention, and I do not, therefore, desire to be limited in every instance to the exact construction as herein shown and described.

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

1. In a pneumatic riveter or other tool, the combination of a nosepiece adapted to have the shank of a working tool inserted therein, and a retaining device contained within said nosepiece and adapted to engage said shank, in combination with a distribution-valve, means for controlling said valve and mech-

anism intermediate said retaining device and said means for controlling said valve, whereby the latter is operated.

2. In a pneumatic riveter or other tool, the combination of a nosepiece and a cushioned retaining device within said nosepiece adapted to engage the shank of the working tool, in combination with a distribution-valve, means for controlling said valve and mechanism intermediate said retaining device and said means for controlling said valve, whereby the latter is operated.

3. In a pneumatic riveter or other tool, the combination of a nosepiece, and means within said nosepiece for encircling and engaging the shank of the working tool, whereby the latter is normally retained within said nosepiece, in combination with a distribution-valve, a stop-valve and mechanism intermediate said means and stop-valve.

4. In a pneumatic riveter or other tool, the combination of a nosepiece adapted to have the shank of the working tool inserted therein, and a clamping device contained within said nosepiece for retaining said shank therein, in combination with a distribution-valve, means for controlling said valve and mechanism intermediate said retaining device and said means for controlling said valve, whereby the latter is operated.

5. The combination of the nosepiece of a pneumatic tool, the shank of a working tool, a stop-valve ring contained within said nosepiece, and a retaining device carried by said stop-valve ring and adapted to engage the shank of said working tool.

6. The combination of a nosepiece of a pneumatic tool, the shank of a working tool, a stop-valve ring contained within said nosepiece, a retaining device carried by said stop-valve ring and adapted to engage the shank of said working tool, and tension devices for said stop-valve ring.

7. The combination of the nosepiece of a pneumatic tool, retaining devices for the shank of the working tool contained within said nosepiece and adapted to engage said shank, and means contained within the cylinder of the pneumatic tool for effecting the starting of the latter operated by suitable intermediate means when the shank of said working tool is pressed inwardly.

8. In a pneumatic riveter or other tool, the combination of a nosepiece, a retaining device for the shank of a working tool retained therein, a manually-operated throttle-valve controlling the initial admission of motive fluid to the tool, a piston, a distribution-valve therefor, and a stop-valve operated by suitable means actuated by the act of pressing the tool to its work for controlling the operation of the tool after motive fluid has been admitted thereto by the opening of the manually-operated valve.

9. In a pneumatic riveter or other tool, a nosepiece, a cushioned retaining device within said nosepiece adapted to engage the shank of a working tool, a manually-operated throttle-valve controlling the initial admission of motive fluid to the tool, a stop-valve operated by suitable means actuated by the act of pressing the tool to its work and controlling the admission of the motive fluid to the working parts of the tool and operating mechanism intermediate said throttle-valve and the working tool.

10. In a pneumatic riveter, a nosepiece, means within said nosepiece for encircling and engaging the shank of a working tool, whereby the latter is normally retained within said nosepiece, a manually-operated throttle-valve controlling the initial admission of motive fluid to the tool, a piston, a distribution-valve therefor and a stop-valve operated by suitable means actuated by the act of pressing the tool to its work and controlling the operation of the tool after the admission of the motive fluid to the working parts of the tool.

11. In a pneumatic riveter or other tool, the combination of a nosepiece, adapted to have the shank of a working tool inserted therein, a clamping device contained within said nosepiece for retaining said shank therein, a manually-operated throttle-valve controlling the initial admission of motive fluid to the tool, a stop-valve controlling the admission of the motive fluid to the working parts of the tool, and coacting mechanism intermediate the shank of the working tool and said stop-valve.

12. The combination of a nosepiece of a pneumatic tool, the shank of a working tool, a stop-valve ring retained within said nosepiece, a retaining device carried by said valve-ring and adapted to engage the shank of said working tool, tension devices for said stop-valve ring, a stop-valve, mechanism intermediate the latter and said stop-valve ring, and a manually-operated throttle-valve controlling the initial admission of motive fluid to the tool.

13. The combination of a nosepiece of a pneumatic tool adapted to have the shank of a working tool inserted therein, a shoulder on said shank, and a retaining device contained within said nosepiece and adapted to encircle said shank and be engaged by said shoulder, in combination with means for effecting the starting of the pneumatic tool when the shank of the working tool is pressed inwardly.

14. In a pneumatic riveter or other tool, the combination of a nosepiece, a shank for the working tool having a shoulder thereon and a cushioned retaining device within said nosepiece adapted to engage said shank and to contact with said shoulder, in combination with means for effecting the starting of the pneumatic tool when the shank of the working tool is pressed inwardly.

15. The combination with a nosepiece of a pneumatic tool, of a cushioned retaining device contained within said nosepiece and

adapted to encircle and engage the shank of a working tool, a shoulder on said shank against which said retaining device is adapted to abut, and means actuated by intermediate means when said retaining device is pressed inwardly for effecting the reciprocation of the piston of the tool.

16. In a pneumatic tool, a cylinder, a nosepiece secured thereto and adapted to have the shank of a working tool inserted thereinto, a retaining device within said nosepiece, and adapted to engage said shank, a grasping-handle, a valve-box retained between said handle and cylinder, a distribution-valve and a stop-valve contained in said valve-box, and operating mechanism intermediate said retaining device and stop-valve.

17. In a pneumatic tool, a cylinder, a nosepiece secured thereto, and adapted to have the shank of a working tool inserted therein, a retaining device within said nosepiece and adapted to engage said shank, a stop-valve ring, a piston, a distribution-valve therefor, and means intermediate said valve and stop-valve ring for the operation of said valve, when the working tool is pressed to its work.

18. In a pneumatic tool, a cylinder, a nosepiece secured thereto and adapted to have the shank of a working tool inserted therein, a retaining device within said nosepiece and adapted to engage said shank, a shoulder on the latter, a stop-valve ring, a piston in said cylinder, a distribution-valve therefor and means intermediate said valve and stop-valve ring for the operation of said valve when the working tool is pressed to its work.

19. In a pneumatic tool, a cylinder, a nosepiece secured thereto and adapted to have the shank of a working tool inserted therein, a retaining device within said nosepiece and adapted to engage said shank, a stop-valve ring adjacent to said retaining device, a cushioning device for said stop-valve ring, a piston in said cylinder, a distribution-valve therefor and means intermediate said valve and stop-valve ring for the operation of said valve when the working tool is pressed to its work.

20. In a pneumatic tool, a cylinder, a nosepiece secured thereto and adapted to have the shank of a working tool inserted therein, a retaining device within said nosepiece and adapted to engage said shank, a grasping-handle, a valve-box retained between said handle and cylinder, a distribution-valve in said valve-box, and means intermediate said valve and retaining device for the operation of said valve when the working tool is pressed to its work.

21. In a pneumatic tool, a cylinder, a nosepiece secured thereto and adapted to have the shank of a working tool inserted therein, a retaining device within said nosepiece and adapted to engage said shank and be actuated thereby, a stop-valve ring, a piston in said cylinder, a hollow differential distribution-valve therefor and means intermediate said valve and stop-valve ring for the operation of said valve when the working tool is pressed to its work.

22. In a pneumatic tool, a cylinder, a nosepiece secured thereto and adapted to have the shank of a working tool inserted therein, a retaining device within said nosepiece and adapted to engage said shank, a piston in said cylinder, a distribution-valve therefor, a stop-valve, a port adapted to be uncovered by said piston during its forward stroke, passages leading from said port to the larger area of said distribution-valve, said passages being controlled by said stop-valve and connections intermediate said stop-valve and retaining device whereby said stop-valve is operated when the working tool is pressed to its work.

23. In a pneumatic tool, the combination of a nosepiece, a retaining device for the shank of the working tool within said nosepiece and adapted to engage said shank, a piston in the cylinder of said tool and means for effecting the starting of said piston when the shank of said working tool is pressed inwardly, said means being operated in one direction mechanically and in the opposite direction by fluid-pressure.

24. In a pneumatic tool, a handle, an inlet-passage for the motive fluid in said handle, a manually-operated throttle-valve controlling the initial admission of motive fluid to said handle, a cylinder to which said handle is attached, a piston in said cylinder, a distribution-valve for said piston, a stop-valve for controlling the movement of said distribution-valve, a nosepiece attached to said cylinder, retaining devices for the shank of the working tool contained within said nosepiece and adapted to engage said shank, mechanism intermediate said retaining devices and stop-valve for operating the latter in one direction and a port for conducting live motive fluid to the opposite end of said stop-valve, whereby the latter is operated in the opposite direction.

25. In a pneumatic tool, a cylinder, a nosepiece attached thereto, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a stop-valve ring, a spring therefor, a stop-valve, a piston in said cylinder, a distribution-valve for said piston, a rod leading from said stop-valve ring to said stop-valve for operating the latter in one direction and means for operating said stop-valve in the opposite direction.

26. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a piston in said cylinder, a distribution-valve for said piston, a stop-valve, a port uncovered by said piston in its forward stroke, passages leading from said port to a large pressure area of said distribution-valve, said passages being controlled by said stop-valve, means intermediate said retaining device and stop-valve for actuating the latter in one di-

rection, and means for operating said stop-valve in the opposite direction.

27. In a pneumatic tool, a handle, a cylinder, a valve-box retained between said handle and cylinder, a piston in said cylinder, a differential distribution-valve in said valve-box, a nosepiece attached to said cylinder, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a port adapted to be uncovered by the piston during its forward stroke, passages 36, 37, 38 and 39 leading from said port to the larger area of said distribution-valve, a stop-valve for controlling the flow of fluid to actuate said distribution-valve and means for operating said stop-valve in either direction.

28. In a pneumatic tool, a cylinder, a nosepiece attached thereto, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a normally closed valve located within the body of the tool and means intermediate of said valve and working tool for opening said valve by the act of pressing the tool to its work.

29. In a pneumatic tool, the combination of a manually-operated throttle-valve controlling the initial admission of motive fluid to the tool, a cylinder, a nosepiece attached to said cylinder, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, and means intermediate said retaining device and stop-valve for controlling the operation of the tool after motive fluid has been admitted thereto by the opening of the manually-operated valve.

30. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a manually-operated throttle-valve controlling the initial admission of motive fluid to the tool, and mechanism intermediate said stop-valve and retaining device, said mechanism being operated by the act of pressing the tool to its work and controlling the admission of the motive fluid to the working parts of the tool.

31. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a manually-operated throttle-valve controlling the initial admission of motive fluid to the tool, a stop-valve intermediate said throttle-valve and the working parts of the tool, means interposed between said stop-valve and retaining device for opening said stop-valve by the act of pressing the tool to its work, and a port for leading live motive fluid to said valve to actuate the same in an opposite direction.

32. In a pneumatic tool, a cylinder, a grasping-handle at the rear end thereof, a manually-operated throttle-valve located in said handle for controlling the initial admission of motive fluid to the tool, a stop-valve located within the body of the tool, a nosepiece attached to a cylinder of the tool, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank and mechanism intermediate said retaining device and stop-valve whereby the latter is opened by the act of pressing the tool to its work, so as to admit the motive fluid to the working parts of the tool.

33. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a stop-valve ring adapted to be moved in one direction by its contact with said retaining device, means for moving said stop-valve ring in the opposite direction, a stop-valve located in the rear portion of the cylinder or body of the tool, and a rod extending longitudinally through said cylinder from said valve to said stop-valve ring at the front end of the tool, whereby said stop-valve will be moved rearwardly to permit the operation of the tool when the latter is pressed against the work.

34. In a pneumatic tool, a cylinder, a stop-valve located within the body of the tool near its rear end and normally pressed forward into position to obstruct the circulation of the motive fluid necessary to the operation of the tool, a nosepiece for said cylinder, a retaining device within said nosepiece for the shank of the working tool and adapted to engage said shank, a stop-valve ring adjacent to said retaining device, a shoulder on the shank of the working tool adapted to engage said retaining device and an actuating-rod extending longitudinally to the cylinder of the tool between said stop-valve and said valve-ring.

35. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a piston in said cylinder, a distribution-valve therefor, ports intermediate of said piston and valve, means for controlling said ports, mechanical devices for operating said means in one direction and mechanism for directing fluid-pressure upon said means in an opposite direction.

36. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a valve-box, a differential valve therein and a stop-valve in said valve-box for controlling said differential valve, said stop-valve being operated in one direction when the working tool is placed against the work and in the opposite direction when the working tool is removed from the work.

37. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nose-

piece and adapted to engage said shank, a piston in said cylinder, a differential valve therefor, a valve-box, and a stop-valve in said valve-box, said stop-valve consisting of heads joined by a neck and adapted to control the movement of said valve, said stop-valve being operated in one direction mechanically and in the opposite direction by fluid-pressure.

38. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a rod extending longitudinally of said cylinder, a distribution-valve, a stop-valve for controlling the latter, means for actuating said rod when the tool is placed against the work, and means for operating said stop-valve in an opposite direction.

39. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a rod extending longitudinally of said cylinder, a differential distribution-valve, a stop-valve for controlling the latter, means for mechanically actuating said rod and stop-valve in one direction and means for actuating said stop-valve in an opposite direction.

40. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a piston in said cylinder, a valve for controlling ports common thereto and to said piston, said valve consisting of a hollow shell, or cylinder the interior surface thereof being always open to fluid-pressure and a stop-valve for controlling the movement of said valve while live-fluid pressure is thereon, said stop-valve being operated in one direction mechanically and in the opposite direction by fluid-pressure.

41. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a piston in said cylinder, a valve controlling ports common thereto and to said piston, said valve consisting of a hollow shell or cylinder, the interior surface thereof being always open to fluid-pressure, said valve being located exterior to said hammer in alinement therewith and adapted to move in the same direction as said hammer and a stop-valve for controlling the movement of said valve while live-fluid pressure is thereon.

42. In a pneumatic tool, a cylinder, a nosepiece therefor, a retaining device for the shank of the working tool contained within said nosepiece and adapted to engage said shank, a piston in said cylinder, a valve adapted to move in the same direction as said piston, said valve consisting of a cylindrical shell having its interior surface always open to fluid-pressure and located out of the path of said piston, the movement of the latter terminating exterior to said valve and said valve being provided with opposing pressure areas against which the motive fluid acts to shift the valve in opposite directions, and means for controlling the movement of said valve while live-fluid pressure is thereon, said means being operated in one direction mechanically and in the opposite direction by fluid-pressure.

43. The combination of a nosepiece of a pneumatic tool, the shank of a working tool, a stop-valve ring contained within said nosepiece, a retaining device carried by said stop-valve ring and adapted to engage the shank of said working tool, and devices for controlling said stop-valve ring.

44. The combination of a nosepiece of a pneumatic tool, the shank of a working tool, a stop-valve ring retained within said nosepiece, a retaining device carried by said valve-ring and adapted to engage the shank of said working tool, devices for controlling said stop-valve ring, a stop-valve, mechanism intermediate the latter and said stop-valve ring, and a manually-operated throttle-valve controlling the initial admission of motive fluid to the tool.

45. In a pneumatic riveter or other tool, the combination of a nosepiece, a shank for the working tool having a shoulder thereon and a retaining device within said nosepiece adapted to engage said shank and to contact with said shoulder, in combination with means for effecting the starting of the pneumatic tool when the shank of the working tool is pressed inwardly.

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