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W. H. KELLER.

HANDLE FOR PNEUMATIC TOOLS.

APPLICATION FILED MAR. 5, 1904.

NO MODEL.

Fig. 1.

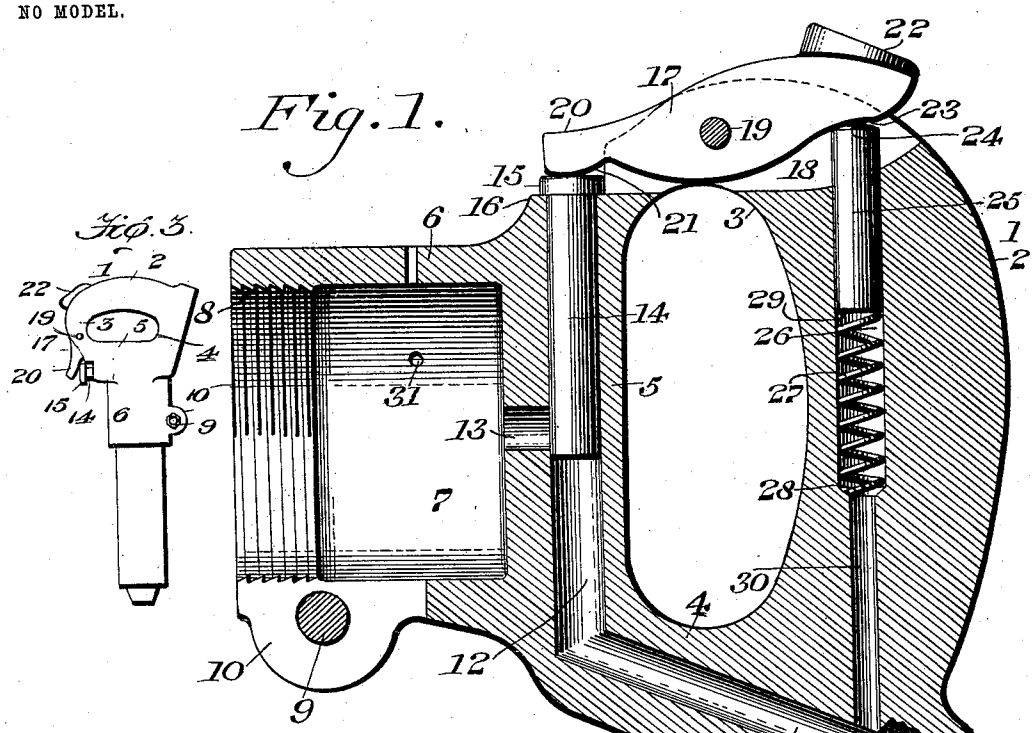
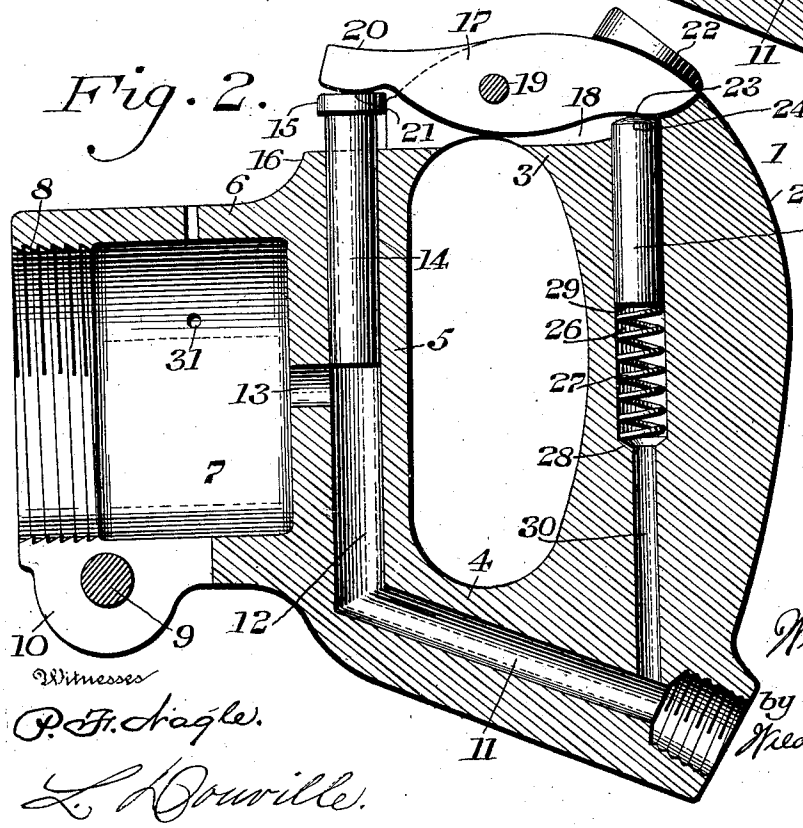


Fig. 3.

Fig. 2.



Witnesses

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No. 762,861. Patented June 14, 1904.

UNITED STATES PATENT OFFICE.

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HANDLE FOR PNEUMATIC TOOLS.

SPECIFICATION forming part of Letters Patent No. 762,861, dated June 14, 1904.

Application filed March 5, 1904. Serial No. 196,654. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. KELLER, of the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Handles for Pneumatic Tools, of which the following is a specification.

My invention consists of a novel construction of a handle for a pneumatic tool, wherein the motive fluid is conducted to the tool proper through a main pressure-supply duct located wholly outside of the handle proper, and particularly outside of the grasping portion thereof, the flow of the motive fluid to the pneumatic tool being controlled by means of a throttle-valve located wholly outside of the handle, and particularly outside of its grasping portion, provision being further made for limiting the movement of the throttle-valve and for effecting the ready actuation of the same by means of an operating-lever which is pivoted in a narrow slit or cut in the upper part of the handle, which projects slightly out of said slit at its upper end and is provided with a thumb-piece or pressure-piece adapted to underlie the thumb or finger of the workman's hand as he grasps the handle of the tool.

My invention further consists of a novel construction of balancing device for the manually-operated lever whereby the latter is rendered capable of easy manipulation.

My invention further comprises a novel arrangement of rectilinear passages for the throttle-valve and its balancing device, which can be readily drilled in the forging or casting, whereby the handle and its adjuncts can be cheaply constructed.

To the above ends my invention consists of a novel construction of a grasping-handle for a pneumatic tool having its throttle-valve proper located wholly outside of the handle proper as well as its grasping portion and wherein the main pressure-supply duct is also located outside of the grasping portion, the said handle also having means for balancing the manually-operated lever controlling said throttle-valve.

It further consists of other novel features of construction, all as will be hereinafter fully set forth, and particularly pointed out in the claims.

Figures 1 and 2 represent longitudinal sectional views of a pneumatic-tool handle embodying my invention, showing the throttle-valve in its closed and open positions. Fig. 3 represents an elevation of a handle, showing a tool in conjunction therewith.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates the handle, having its grasping portion 2 provided with an upper and lower neck 3 and 4, whereby the handle and its grasping portion is connected to the body 5, from which projects the sleeve 6, which is preferably made integral and is provided with a chamber 7 therein and exhaust-ports 31 for the reception of the valve-box of the pneumatic tool, the cylinder of which latter is adapted to be in engagement with the screw-threads 8, provision being made for clamping the handle in position with respect to the tool-cylinder by means of the bolt or other fastening devices 9, which are adapted to enter the lugs 10.

11 designates a main pressure-supply duct for the motive fluid, which is preferably compressed air, it being noted that said duct or passage 11 is located wholly outside not only of the handle proper, but of its grasping portion, the motive fluid passing from the duct 11 into the duct 12 and thence through the port 13 into the pneumatic tool proper. The duct 12 is adapted to be drilled through the upper portion of the body 5, and the upper portion thereof contains the throttle-valve 14, which in the present instance is a solid cylinder or plug provided with a head 15, whereby the downward movement of the valve is limited, since said head normally contacts with the wall 16.

17 designates a lever which is located in the slot 18 and fulcrumed upon the pin 19, the free end 20 of said lever having the rounded portion 21, which is adapted to contact with the upper surface of the head 15, while the opposite extremity of said lever is provided with the thumb-piece 22, which is adapted to underlie the thumb or finger of the workman's hand as he grasps the handle of the tool. The under side of the lever 17, which is substantially below the thumb-piece 22, is

provided with a slightly-curved surface 23, which is adapted to rest upon the upper rounded extremity 24 of the plunger 25, which is located in the chamber 26.

27 designates a spring whose lower extremity abuts against the wall 28, while its upper extremity 29 contacts with the lower end of the plunger 25.

30 designates a port or branch duct leading upwardly from the main pressure-supply duct 11 into the passage 26, whereby motive fluid is permitted to enter the chamber 26 and exert a pressure upon the under side of the plunger 25, whereby the lever 17 is balanced and can be readily operated by a slight pressure of the workman's thumb or finger upon the finger-piece 22.

The operation will be apparent to those skilled in the art, since it will be seen that when the parts are in the position seen in Fig. 1 live-air pressure is entering the main pressure-supply duct 11, which is located wholly outside of the handle, and particularly its grasping portion, said live-air pressure acting through the medium of the passage 12 upon the under side of the throttle-valve 14, while at the same time live-air pressure is also acting upon the under side of the plunger 25, so that the lever 17 is balanced in all positions it may assume, it being further apparent that through the medium of the spring 27 the throttle-valve 14 will normally appear in the position seen in Fig. 1.

When it is desired to operate the tool, it is only necessary for the operator to depress the thumb-piece 22 into the position seen in Fig. 2, whereby the free end 20 of the lever will be raised from the head 15, and the action of the live air on the under side of the throttle-valve 14 will raise the same, so that the parts appear in the position seen in Fig. 2, and the live motive fluid can freely flow through the port 13 to the desired point.

I am aware that it is a common right to locate a throttle-valve in the grasping portion of a pneumatic-tool handle, since such construction is shown in the British patent to Low, No. 1,778 of 1865, and also in the United States patent to Drawbaugh, No. 479,061, granted July 19, 1892, since in said Drawbaugh and Low patents, particularly the latter, the throttle-valve is shown as being located not only in the handle, but in the portion thereof naturally grasped between the thumb and finger of the operator in the normal application of the pneumatic tool to its work.

My present invention is also differentiated from the construction seen in the Boyer patent, No. 537,629, since in that device the throttle-valve is located in the grasping portion of the handle, whereas in my device, as above explained, the throttle-valve 14 is wholly outside not only of the handle, but of the grasping portion thereof, and the main pressure-supply ducts 11 and 12 are also located wholly outside not only of the handle, but the grasping portion thereof.

It will further be apparent that the plunger 25 is in no sense a throttle-valve and has no direct or indirect throttling action upon the motive fluid which is conveyed to the tool proper through the port 13. The sole function of the plunger 25 is that of a balancing device, and it will be clearly apparent to those skilled in the art that the duct 30 may be omitted altogether, as well as the plunger 25, and that the spring 27 may be continued throughout the length of the chamber 26 until it contacts with the under portion 23 of the lever 17 without departing from the spirit of my invention.

When the air-pressure is cut off from the main pressure-supply duct 11, it will be apparent that the throttle-valve 14 will seat itself in the position seen in Fig. 1, its downward movement being limited by the head 15.

It will further be apparent that handles in accordance with my present invention can be cheaply constructed, since it is only necessary to drill the two parallel passages 12 and 30, which can be done by a single operation, if necessary or desirable, and all of which operations can be done with great facility and rapidity.

It will further be noted that I am also enabled to dispense with a throttle-valve bushing surrounding the throttle-valve 14, which has heretofore been customary in devices of this general character, although it is to be understood I may, if desired, use said throttle-valve bushing if it seems expedient or necessary.

It will be apparent that the throttle-valve lever 17 may be pivoted in a different manner from that shown and that the manner of assembling said lever and throttle-valve and the form and construction of the throttle-valve may be varied by those skilled in the art without departing from the spirit of my invention.

I desire to direct especial attention to the fact that the spring-pressed plunger 25 is not a valve and has no valvular function, since the entire control of the flow of the motive fluid from the passage 12 to the port 13 is effected by means of the throttle-valve 14, which, as above explained, is wholly outside not only of the handle, but particularly of its grasping portion.

It will be apparent that the handle can be secured to the tool-cylinder in any suitable manner other than that shown, and while I have shown the sleeve 6 preferably integral with the body 5 and provided with the clamping device 9, passing through the lugs 10, other equivalent constructions may be employed without departing from the spirit of my invention.

It will further be apparent that the hose

which conducts the motive fluid to the tool proper may be connected at the lower portion of the body 5, so as to discharge directly into the duct 12, whereby the duct 11 may be omitted, in both of which cases, however, the pressure-supply duct is located wholly outside of the grasping portion of the handle, as is evident.

So far as I am aware I am the first in the art to employ a fluid-actuated balancing device of any character for balancing the throttle-valve lever, and I am also the first to employ the combination of a throttle-valve lever of any character fulcrumed between the throttle-valve and the balancing device, and my claims to this feature, therefore, are to be interpreted with corresponding scope.

It will be clear to those skilled in the art that the provision of the balancing device enables the valve-lever to be depressed by a very slight manual pressure of the operator, whereby a concrete unitary structure is produced of great superiority and efficiency.

It will be apparent to those skilled in the art that still further changes may be made 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 I have 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 device of the character named, a handle, a main pressure-supply duct located wholly exterior to the grasping portion thereof, a throttle-valve also located wholly exterior to said grasping portion and having live-air pressure acting on it, said valve being arranged to close by gravity when in normal position and when the supply of motive fluid is disconnected from said tool, and means for operating said throttle-valve.

2. In a device of the character named, the combination with the tool proper, of a grasping-handle secured thereto, a main pressure-supply duct located wholly outside of the grasping portion of said handle, a throttle-valve also located wholly outside of the grasping portion of said handle, a lever for actuating said throttle-valve and air-actuated balancing devices adapted to actuate said lever.

3. In a device of the character named, a grasping-handle, a main pressure-supply duct located wholly outside of the grasping portion of said handle, a throttle-valve also located wholly outside of the grasping portion of said handle, a lever for actuating said throttle-valve and balancing devices for said lever operated by the motive fluid which operates the tool, said balancing devices coöperating with said lever.

4. In a device of the character named, a handle, a sleeve attached to said handle, a body portion attached to the latter, an inlet-port extending through said body portion, a grasping-handle, necks for connecting said grasping-handle to said body portion, a throttle-valve located wholly outside of said grasping portion and extending transversely to said body portion, a head on the outer portion of said throttle-valve to limit its downward movement, an air-actuated balancing device for said throttle, and means for actuating said throttle-valve.

5. In a device of the character named, a handle, a sleeve attached to said handle, a body portion also attached to the latter, an inlet-port extending through said body portion, a grasping-handle, necks for connecting said grasping-handle to said body portion, a throttle-valve located wholly outside of said grasping portion, a head on the outer portion of said throttle-valve to limit its downward movement and means for actuating said throttle-valve, in combination with a balancing device for said throttle-valve.

6. In a device of the character named, a sleeve, a body portion attached to the latter, an inlet-port extending through said body portion, a grasping-handle, necks for connecting said grasping-handle to said body portion, a throttle-valve located wholly outside of said grasping portion, a head on the outer portion of said throttle-valve to limit its downward movement and means for actuating said throttle-valve, said throttle-valve being adapted to seat by gravity, in combination with a balancing device for said lever and a spring for operating said balancing device.

7. An attachment for a pneumatic tool, comprising a body portion, a throttle-valve located in said body portion and wholly exterior to the grasping portion of said attachment, a main pressure-supply duct leading to said body portion and located wholly outside of said grasping portion, a slit in the upper part of said grasping portion, a lever pivoted in said slit and projecting from its upper portion, a pressure-piece upon said lever adapted to underlie the operator's thumb or finger as he grasps said handle and a balancing device for said lever.

8. In an attachment for a pneumatic tool, a body portion, a grasping portion, necks connecting said grasping portion to said body portion, a pair of parallelly-arranged passages located in said body portion and said grasping portion respectively, a throttle-valve in said body portion, an operating-lever for said throttle-valve and a balancing device for said lever.

9. In a device of the character named, a grasping portion, a body portion, upper and lower necks connecting said grasping portion to said body portion, a sleeve attached to said body portion, parallel passages in said body portion and grasping portion respectively, a throttle-valve, a pressure-supply duct located wholly outside of the grasping portion of said handle, a passage leading from said duct to

the parallel passage in said grasping portion, a spring located in the passage in said grasping portion, a plunger located above said spring, and a lever pivotally mounted in said upper neck, one end of said lever being adapted to bear upon said throttle-valve and the other end of said lever being adapted to bear upon said plunger.

10. In a device of the character named, a grasping portion, a body portion, upper and lower necks connecting said grasping portion to said body portion, a sleeve attached to said body portion, parallel passages in said body portion and grasping portion respectively, a throttle-valve, a pressure-supply duct located wholly outside of the grasping portion of said handle, passage leading from said duct to the parallel passage in said grasping portion, a spring located in the passage in said grasping portion, a plunger located above said spring, and a lever pivotally mounted in said upper neck, one end of said lever being adapted to bear upon said throttle-valve, and the other end of said lever being adapted to bear upon said plunger, in combination with a head on said throttle-valve limiting its downward movement and a pressure-piece upon said lever.

11. In a device of the character named, a body portion, a grasping portion connected thereto, a passage located in said body portion and in said grasping portion, a lever fulcrumed intermediately of said passages, a throttle-valve operated by said lever and an air-actuated balancing device for said lever.

12. In a device of the character named, the combination of a throttle-valve, an air-actuated balancing device for said throttle-valve, and a lever fulcrumed between said valve and balancing device.

13. In a device of the character named, the combination of a throttle-valve located wholly outside of the handle, a head on the outer portion of said throttle-valve for limiting its downward movement, a balancing device, and a lever fulcrumed outside of the grasping part of the handle for operating said valve.

14. In a device of the character named, a throttle-valve located outside of the handle, a main pressure-supply duct also located outside of the handle and permitting live-air pressure to act on the extremity of said throttle, a lever for actuating said throttle, a plunger bearing on the under side of said lever, and a branch duct for permitting air-pressure on said plunger to balance said lever.

15. In a device of the character named, the combination of a throttle-valve and a pressure-actuated plunger, said valve and plunger being movable in parallel lines, and a valve-lever coacting therewith, and normally in contact with said valve and plunger.

16. In a device of the character named, the combination of a throttle-valve having a head on its extremity to limit its downward movement, and a plunger, each arranged in substantially parallel lines and a single valve-lever located outside of the grasping part of the handle, the extremities of said lever coacting with said plunger and valve.

17. In a device of the character named, a throttle-valve located outside the grasping part of the handle, a main pressure-supply duct located outside said grasping part, a valve-lever also located outside said grasping part, and a balancing device for said lever.

18. In a device of the character named, the combination of a throttle-valve and a balancing device arranged in parallelism and a valve-lever located exterior to the grasping portion of the handle and coacting with said valve and balancing device.

19. In a pneumatic-tool handle, the combination of a throttle-valve located outside the grasping part of the handle, and a balancing device arranged in parallelism therewith, with a valve-lever coacting therewith, said valve-lever being also located outside of the grasping portion of said handle.

20. In a pneumatic-tool handle, the combination of a throttle-valve, a balancing device, a lever coacting therewith, a main pressure-supply duct located outside of the handle, and a branch duct leading to said balancing device.

21. In a pneumatic-tool handle, the combination of a throttle-valve, a balancing device, a lever coacting therewith, a main pressure-supply duct, and a branch duct leading to said balancing device, said valve, lever and main duct being located outside of the grasping part of the handle.

22. In a device of the character named, the combination of a throttle-valve located outside of the grasping portion of the handle, a pressure-actuated plunger, both said valve and plunger being movable in substantially parallel lines and a valve-lever also located outside of the grasping portion of the handle, said lever being fulcrumed intermediately of said valve and plunger.

23. In a device of the character named, the combination of a throttle-valve for a pneumatic tool, an air-actuated balancing device for said throttle-valve and means for actuating said throttle-valve and balancing device.

24. In a device of the character named, the combination of a throttle-valve for a pneumatic tool and an air-actuated balancing device for said throttle-valve, located in the handle of said tool.

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Witnesses:
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