

L. H. SMITH.
THROTTLE HANDLE FOR PNEUMATIC TOOLS.
APPLICATION FILED JULY 30, 1914.

1,150,641.

Patented Aug. 17, 1915.

Fig. 1.

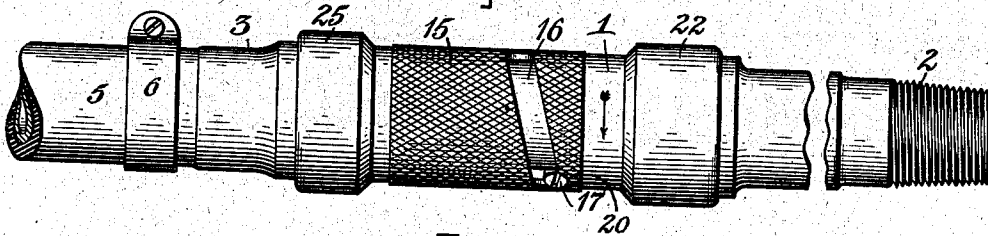


Fig. 2.

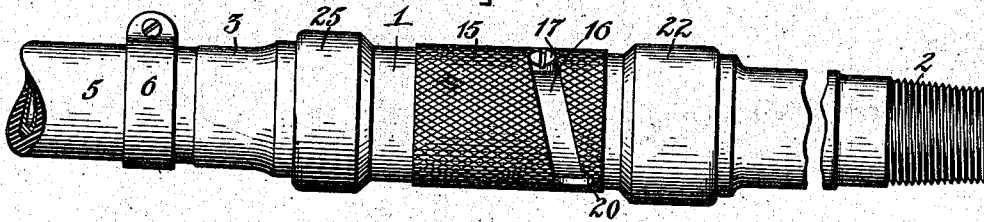


Fig. 3.

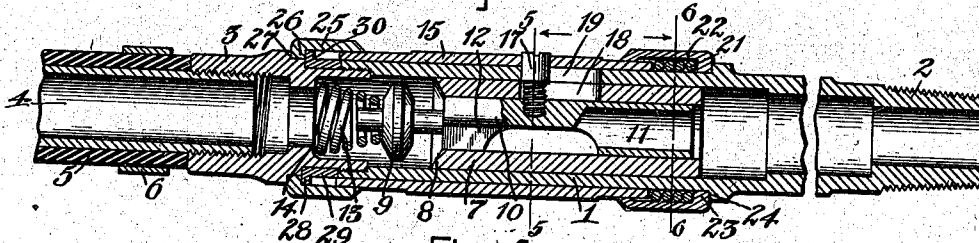


Fig. 4.

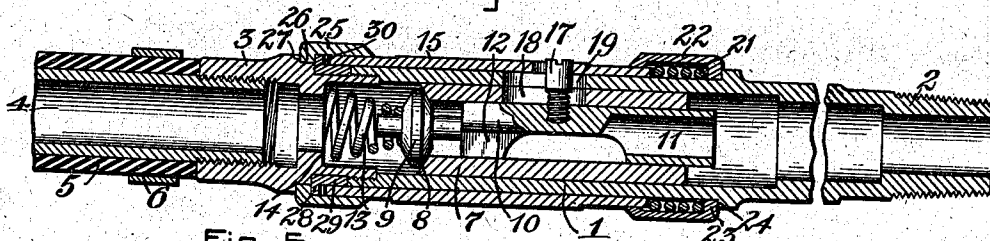


Fig. 5.

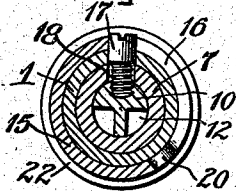
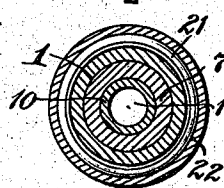


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

LEWIS H. SMITH, OF OLEAN, NEW YORK, ASSIGNOR OF ONE-THIRD TO THOMAS J. RIGGS AND ONE-THIRD TO JULIUS T. PLOESSEL, BOTH OF OLEAN, NEW YORK.

THROTTLE-HANDLE FOR PNEUMATIC TOOLS.

1,150,641.

Specification of Letters Patent.

Patented Aug. 17, 1915.

Application filed July 30, 1914. Serial No. 854,113.

To all whom it may concern:

Be it known that I, LEWIS H. SMITH, a citizen of the United States, residing at Olean, in the county of Cattaraugus and State of New York, have invented new and useful Improvements in Throttle-Handles for Pneumatic Tools, of which the following is a specification.

This invention relates to the throttle handles or valves employed for controlling the supply of the motive fluid to portable pneumatic tools or motors, such for example, as pneumatic drills, and more particularly to handles of this kind in which the valve is operated by a rotary sleeve having an oblique slot which receives a pin connected with the valve.

In throttle handles as hitherto constructed when the valve is closed and the tool temporarily laid aside, the rotary sleeve is liable to become displaced accidentally by jars or shocks, sufficiently to open the valve and actuate the tool, and when this occurs, the tool being uncontrolled, is moved in various directions by its vibrations, sometimes coming in contact with attendants and inflicting serious injury.

The object of my invention is the provision of a simple, reliable and inexpensive lock for the rotary sleeve or equivalent valve-operating member of the throttle handle, which shall prevent such accidental displacement of the sleeve and which at the same time permits ready unlocking thereof.

In the accompanying drawings, Figure 1 is a side elevation of the throttle-handle, showing the valve-operating sleeve locked. Fig. 2 is a similar view, showing said sleeve unlocked. Fig. 3 is a longitudinal section of the device, showing the throttle valve open. Fig. 4 is a similar section, showing said valve closed. Figs. 5 and 6 are transverse sections on the correspondingly numbered lines in Fig. 3.

Similar characters of reference indicate corresponding parts throughout the several views.

1 indicates the tubular shell or casing of the device having its front end 2 threaded to screw into a corresponding opening or socket of the drill-casing or other tool, not shown in the drawings. Screwed into the opposite end of the shell is a nipple 3 adapted

to receive a short pipe 4 upon which is secured the usual fluid-supply hose 5 by a suitable clamp 6.

Rigidly secured within the shell is a longitudinal guide tube or bushing 7 provided at its rear end with a conical or other suitable valve-seat 8 with which a corresponding throttle valve 9 coöperates. In the example shown in the drawings, the stem 10 of this valve is cylindrical and slides lengthwise in the bushing 7. This stem is provided with suitable longitudinal passages through which the compressed air or other motive fluid flows from the rear to the front end of the shell when the valve 9 is open. In the construction illustrated in the drawings, the stem is for this purpose bored in its front portion, as shown at 11, and provided in opposite sides of its rear portion with longitudinal grooves 12 which communicate with said bore.

13 indicates a spring, preferably of conical form, which tends to close the valve 9, as hereinafter more fully described. This spring bears at its front end against the valve and at its rear end against an internal shoulder 14 of the nipple 3.

Surrounding the central portion of the casing 1 is the valve-operating sleeve 15, preferably knurled or roughened to afford a firm grip and provided with an oblique slot 16 which receives the head of a shifting screw or pin 17 projecting from the valve-stem 10. This pin also passes through longitudinal slots 18 and 19 formed respectively in the bushing 7 and casing 1. The oblique slot 16 is provided with a locking notch or recess 20, preferably located in its front edge, at or near its front or leading end, and adapted to interlock with the pin 17 when the sleeve is turned forwardly to close the throttle-valve. For this purpose, the sleeve is mounted to slide lengthwise as well as rotate on the casing 1, and a spring 21 is arranged to shift the sleeve lengthwise toward the rear end of the handle to cause its notch to interlock automatically with the pin 17 when the sleeve is turned backwardly far enough to close the valve. This spring surrounds the casing and is housed by a collar 22 which overlaps the front end of the sleeve and is provided at its front end with an internal flange 23 which abuts against a

shoulder 24 of the casing, the spring being interposed between said collar-flange and the front end of the sleeve 15.

Surrounding the casing and overlapping the rear end of the sleeve is a similar collar 25 provided at its rear end with an internal flange 26 which is confined between a shoulder 27 of the casing and the outwardly projecting flange 28 of a ring 29. The latter surrounds the reduced portion of the nipple 3 between a shoulder 30 thereof and the rear end of the casing.

The operation of the device is as follows: When the valve is closed, as shown in Fig. 4, the front spring 21 is partly compressed and the valve-shifting pin 17 occupies the locking notch 20 of the sleeve 15, the notch and pin being held in this interlocked position by the pressure of said spring against the front end of the sleeve. The sleeve is thus locked against accidental rotation and the valve is reliably held closed, avoiding all liability of injury to attendants, or others, when the tool is laid down with the fluid-pressure turned on. To open the valve, the operator grasps the sleeve 15 and pushes it toward the front end of the handle to unlock its notch 20 from the pin 17 and then turns the sleeve forwardly or in the direction of the arrow in Fig. 1, the valve being fully opened when the rear end of the slot strikes said pin, as shown in Fig. 2. By this initial or sliding movement of the sleeve, the front spring 21 is fully compressed, as shown in Fig. 3, and acts practically as a rigid abutment for the front end of the sleeve. In order to effect the necessary longitudinal movement of the valve to open it by turning the obliquely-slotted sleeve, the latter must be held from sliding in both directions during its rotation. It is held against forward displacement by the compressed spring 21, and against rearward displacement both by the conical or rear spring and the fluid pressure when turned on, and by said rear spring alone when the pressure is turned off, this spring and the fluid pressure acting upon the sleeve through the valve, its stem 10 and the pin 17. In other words, the valve must be opened against said spring and fluid pressures which resist the tendency of the front spring to slide the sleeve rearwardly. For this purpose, the front spring is lighter or of less resistance than the rear spring, so as to be overpowered by it, so long as the valve remains fully or partly open. When, however, the valve closes by the backward rotation of the sleeve, the rear spring and the fluid pressure no longer oppose the front spring and the latter reacts and slides the sleeve rearwardly to interlock its notch with the pin 17, as above described.

In the proper use of the throttle-handle when it is desired to turn off the pressure,

the valve 9 is closed by turning the sleeve backward before closing the usual stop cock (not shown) of the main or air supply line, in order that the pressure against the valve will prevent rearward displacement of the sleeve, as hereinbefore described. But, attendants sometimes carelessly close said stop cock before closing the throttle-valve 9, thus turning off the air-pressure from said valve, and in the absence of the stiff rear spring there would be no resistance to the backward displacement of the sleeve and the light front spring would therefore slide the sleeve backward, opening the valve instead of closing it, and holding it open. To guard against this improper action of the throttle-handle, the rear or valve-closing spring is employed, which acts as a substitute for the fluid-pressure under these conditions and resists such longitudinal displacement of the sleeve. This valve-closing spring also serves to press the pin 17 against the front edge of the sleeve-slot 16, forming a frictional retaining device which holds the valve open more reliably under the vibrations of the tool.

By the use of this automatic lock, it is impossible for the operator to close the valve without at the same time locking it in that position, thus effectually guarding against accidents of the character hereinbefore mentioned. While furnishing this safe-guard, the improvement is exceedingly simple and does not materially increase the cost of the device.

I claim as my invention:

1. A throttle-handle for fluid-pressure tools, comprising a casing, a throttle-valve therein, a rotary sleeve mounted on said casing and capable of sliding longitudinally thereon, said sleeve having means for operating said valve by rotation of the sleeve, and means for automatically locking the sleeve against rotation by longitudinal movement thereof.

2. A throttle-handle for fluid-pressure tools, comprising a casing, a throttle-valve therein having a shifting pin, and a rotary sleeve slidable longitudinally on said casing and having an oblique slot which engages said pin, said slot having a locking recess adapted to interlock with said pin by the sliding movement of said sleeve.

3. A throttle-handle for fluid-pressure tools, comprising a casing, a throttle-valve therein having a shifting pin, a sleeve mounted on said casing and having an oblique slot which engages said pin, said slot having a lateral locking recess adapted to interlock with said pin in the closed position of the valve, and a spring arranged to shift said sleeve lengthwise to engage its locking recess with said pin.

4. A throttle-handle for fluid-pressure tools, comprising a casing, a throttle-valve

therein having a shifting pin, a sleeve mounted on said casing and having an oblique slot which engages said pin, said slot having a lateral locking recess adapted to interlock with said pin, a spring arranged to shift said sleeve lengthwise in the proper direction to engage its locking recess with said pin, and a second spring of greater resistance than the first-named spring arranged to oppose longitudinal movement of the sleeve in the opposite direction.

5. A throttle-handle for fluid-pressure tools, comprising a casing, a throttle-valve therein having a shifting pin, a sleeve mounted on said casing and having an oblique slot which engages said pin, said slot having a lateral recess adapted to interlock with said pin, a spring arranged to shift said sleeve lengthwise in the proper direction to engage its locking recess with said pin, and a second spring of greater resistance than the first-named spring bearing against said valve and acting on the sleeve in opposition to said first-named spring.

6. A throttle-handle for fluid-pressure tools, comprising a casing, a throttle-valve therein, a movable sleeve mounted on said casing and operatively connected with said valve, and collars surrounding the casing and overlapping the ends of the sleeve. 25 30

7. A throttle-handle for fluid-pressure tools, comprising a casing, a throttle-valve therein having a shifting pin, a rotary sleeve slidable longitudinally on the casing and having an oblique slot which engages said pin, said slot having a lateral locking recess adapted to interlock with said pin by the longitudinal movement of the sleeve, a collar surrounding the casing and overlapping the front end of the sleeve, and a spring housed within said collar and bearing against the adjacent end of the sleeve. 35 40

Witness my hand this 27th day of July, 1914.

LEWIS H. SMITH.

Witnesses:

THOMAS J. RIGGS,
JULIUS T. PLOESSEL.