

(No Model.)

W. H. SOLEY.
PNEUMATIC TOOL.

No. 539,240.

Patented May 14, 1895.

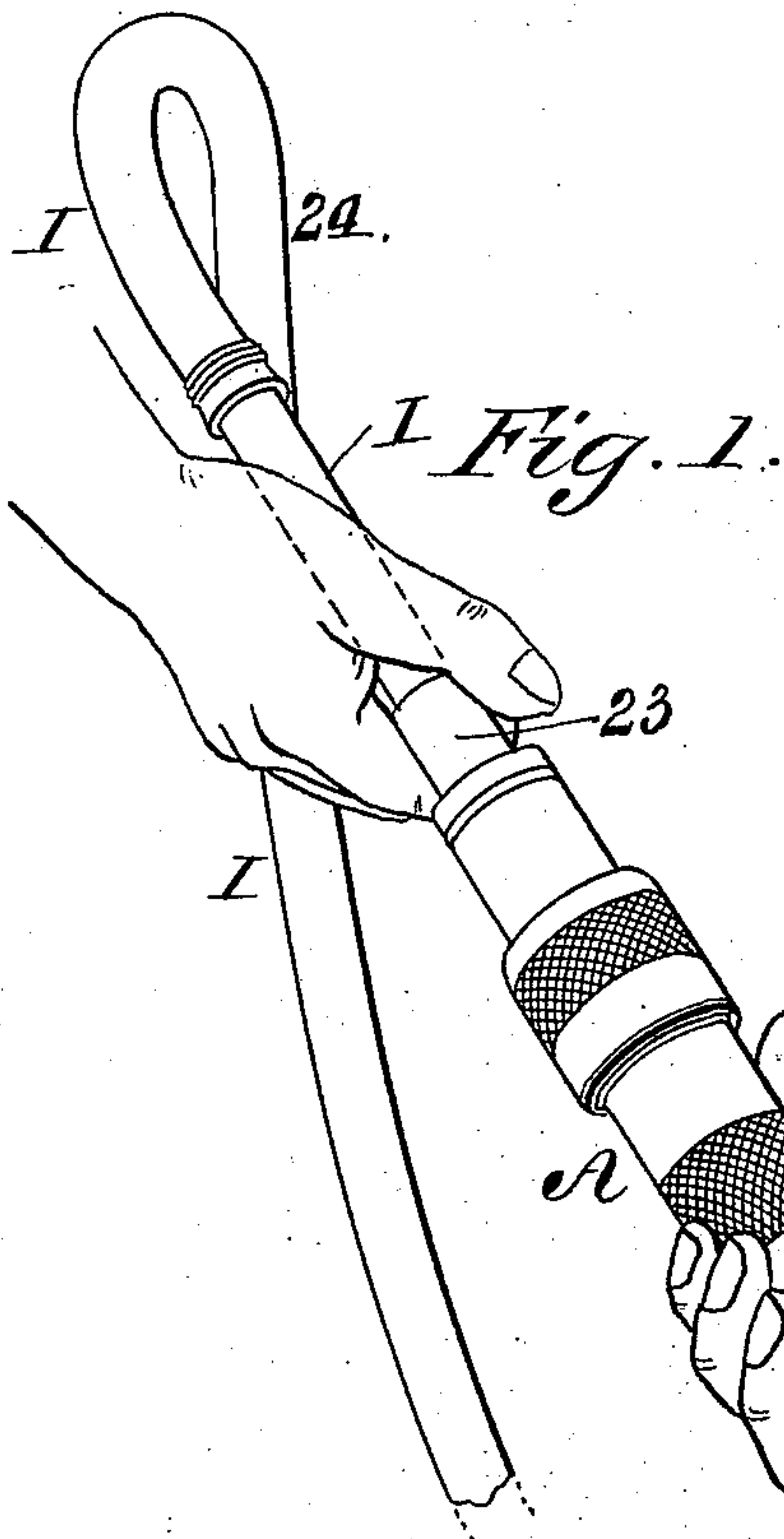


Fig. 2.

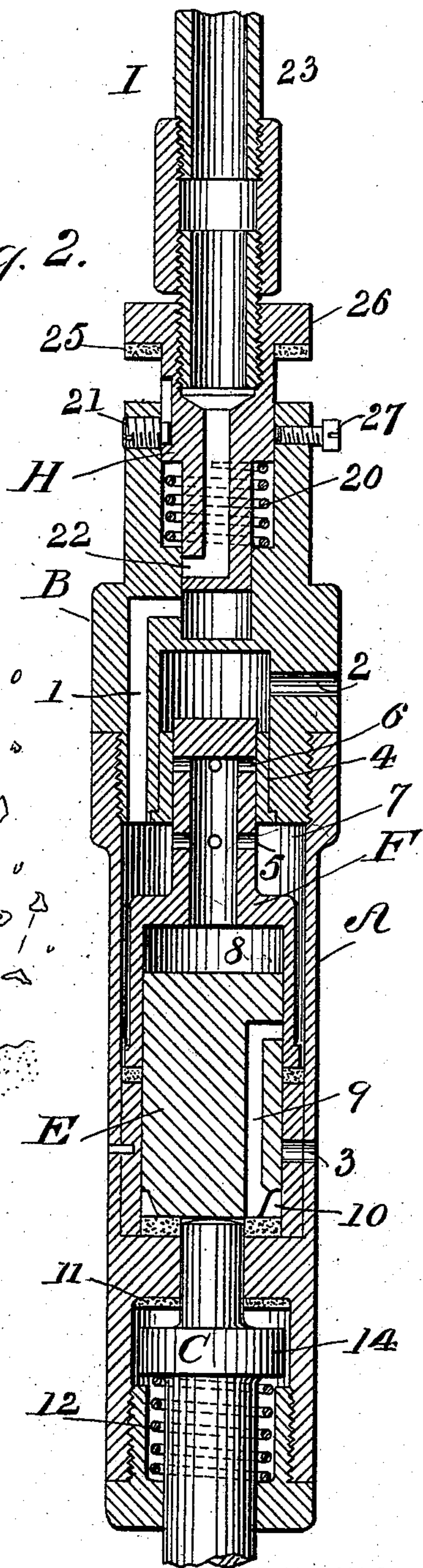
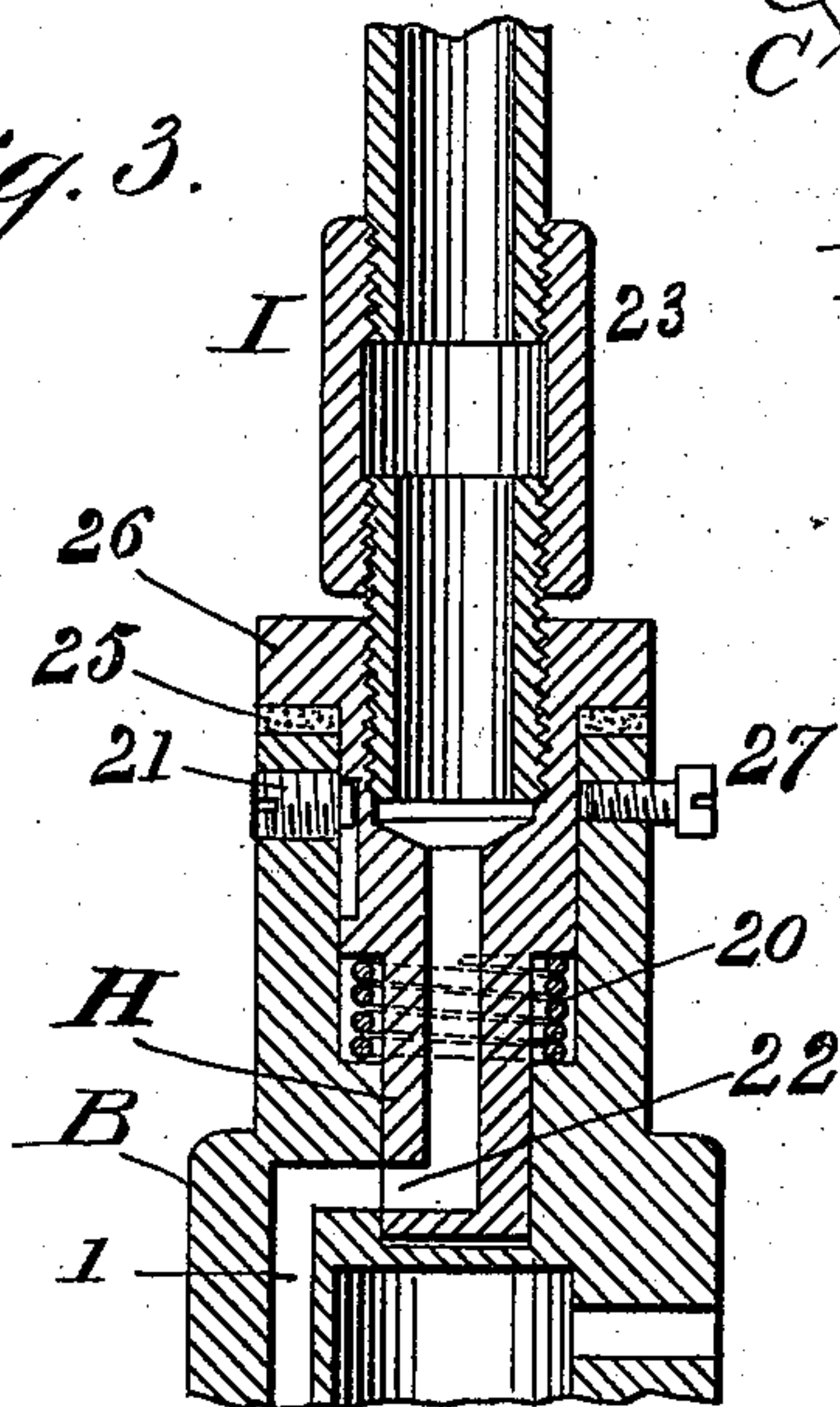


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM H. SOLEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
FOUR-FIFTHS TO JAMES WOLSTENCROFT, OF SAME PLACE.

PNEUMATIC TOOL.

SPECIFICATION forming part of Letters Patent No. 539,240, dated May 14, 1895.

Application filed August 31, 1894. Serial No. 521,785. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SOLEY, a citizen of the United States, and a resident of Frankford, (Philadelphia,) in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Tools, of which the following is a specification.

This invention relates to pneumatic tools for stone dressing, calking, riveting, cutting metals, and other purposes, in which the tool is actuated with very rapidly repeated reciprocations. Heretofore, such tools have been operated with continuous action only, irrespective of their intermitted application to the work, which manner of use, wastes air, and owing to continuous shaking, fatigues the workman.

The object of this invention is to provide means whereby the tool is given motion when in contact with the work, but is caused to cease its motion automatically when the tool is recovered, and the object is moreover to provide means whereby the speed of reciprocative movement or force of the blows, may be varied at will under the immediate control of the workman, and said invention consists in certain novel subject matter herein-after described and claimed.

Referring to the accompanying drawings, Figure 1 is a perspective view illustrating the operation of the tool; Fig. 2, an enlarged longitudinal sectional view of a pneumatic tool, showing the position of the novel parts when the tool is at rest; and Fig. 3, a partial similar view showing the position of the novel parts when the tool is applied to the work and in motion.

The invention may be adapted to pneumatic tools of any well known or other suitable character. I have illustrated its application herein to a tool of one among numerous other suitable constructions.

A is the cylinder; B, the cylinder head; C, the anvil or tool holder; D, the tool proper; E, the striker, and F the valve.

1 is the air induction passage, and 2 and 3 are exhaust openings.

The valve F is seated at its smaller diameter to slide in bushing 4, and is seated at its larger diameter internally to slide on

striker E. Ports 5 in the small diameter of the valve F, admit pressure from the pressure chamber 7 to the actuating chamber 8 at the back of the striker E, and ports 6 in the small diameter of the valve F, exhaust said pressure from chamber 8 to the atmosphere at 2, alternately. The valve F is actuated automatically by unbalancing of intermittent pressure in chamber 8, and constant pressure in chamber 7. The port 9 in striker E, is controlled by the valve F at its larger diameter, so as to admit pressure from the chamber 7 to the chamber 10 at the lower end of the striker E, alternately with the before described admission of pressure to the upper end of the striker, and the chamber 10, is exhausted by the port 3, controlled by the said striker E.

The anvil C, by means of its flange 14 is suspended between a leather washer 11, and a returning spring 12.

The parts thus far described do not form an essential part of my invention.

I extend the head B, and provide therein a suitable throttle valve H, adapted to open, close, or control the admission of air through the induction passage 1. This throttle valve H, is movable in the direction of the length of the tool, or in other words, in the direction in which the hand of the workman is moved to apply the tool to the work.

The throttle valve H, may be variously constructed. It is herein illustrated of the plug valve type, movable lengthwise, and it has a returning spring 20, to produce its outward or closing movement, and a retaining screw 21 to prevent its being forced wholly out from its cylindrical seat in the cylinder head B. The valve H, contains a port 22, opening laterally toward the seat, and in the seat is located the opening of the induction passage 1, with which the port 22, coincides when the valve H, is pushed inward. The port 22 of the valve H is connected with the compressed air supply pipe I, having a rigid section 23, screwed into the valve plug H, which serves as a hand-hold, and said pipe has the usual flexible section 24, which permits the handling of the tool. A leather washer 25, is placed under the shoulder 26, of the valve plug H, for abutment against the extremity of the head B, when the said valve is moved inward

by the hand of the workman and thereby opened.

Fig. 3 illustrates the valve H, in an open position as also in Fig. 1, and Fig. 2 illustrates the valve H in a closed position.

In operation, the tool is held in the hands of the workman in the position shown in Fig. 1. When the tool is advanced against the work, the hand that grasps the valve pipe 23, while performing its share of the advancing force, will involuntarily, and without distracting the attention of the workman from his work, cause the automatic opening of the valve H, and the tool will respond by starting at full speed. When the tool is recovered, the spring 20, will cause the closure of the throttle valve H. The starting and stopping of the reciprocating motion of the tool D, is practically instantaneous. The spring 20 may be dispensed with, and the closing as well as the opening motion of the valve H may be performed by the hand. By voluntarily moving the valve H to any intermediate position, the amount of air admitted may be accordingly regulated, and the speed of the tool determined or varied at will without removing the tool from the work. By using a clamping screw such as 27, the throttle valve may be kept open and inoperative, or partly open at a desired position of adjustment.

What I claim is—

1. The combination with a pneumatic tool, of a throttle valve, fixed to a supply pipe, and movable longitudinally to the body of the tool, and controlling the flow of the motive fluid, and means for automatically moving the valve to a retractive closed position.

2. In a pneumatic tool, the combination of a cylinder adapted to be grasped by the one hand of the operator, a throttle valve movable lengthwise of the cylinder, and having a port opening laterally toward a seat, the latter having an induction passage with which the port coincides, and a supply pipe extending in the longitudinal axis of the tool to which the said valve is fixed and grasped by the other hand of the operator, substantially as set forth.

3. The combination with a pneumatic tool comprising a tool holding device and suitable

means for vibrating the tool by the flow of compressed fluid, of a fluid supply pipe extending in the longitudinal axis of the tool connected thereto and relatively movable in the direction in which the tool is fed to the work, said pipe forming a hand hold, and a throttle valve mechanically connected to said movable pipe, controlling the flow of the motive fluid.

4. In a pneumatic tool, the combination of a cylinder adapted to be grasped by the one hand of the operator, a throttle valve comprising a plug attached to the supply pipe movable lengthwise of the cylinder and adapted to be grasped by the other hand of the operator, and suitable ports controlled by said valve for admitting or shutting off pressure supply to the operating parts of the tool, substantially as described.

5. The combination with a pneumatic tool, of a throttle valve comprising a plug movable longitudinally in the axis of the tool, a supply pipe forming a rigid continuation of said plug in said axis and serving as a hand hold, the opening of said pipe continuing through said plug to a point near its inner extremity, then opening laterally toward the cylindrical seat in which the plug slides, and a controlled passage in said cylindrical seat, substantially as described.

6. The combination with a pneumatic tool, of a throttle valve comprising a plug movable longitudinally in the axis of the tool, a supply pipe forming a rigid continuation of said plug in said axis and serving as a hand hold, the opening of said pipe continuing through said plug to a point near its inner extremity, then opening laterally toward the cylindrical seat in which the plug slides, and a controlled passage in said cylindrical seat, and a spring for retracting the said valve to its normal closed position.

Signed at Frankford, in the county of Philadelphia and State of Pennsylvania, this 28th day of August, A. D. 1894.

WILLIAM H. SOLEY.

Witnesses:

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NEWELL M. BANCROFT.