

F. L. SLOCUM.  
AIR FEED FOR PNEUMATIC TOOLS.  
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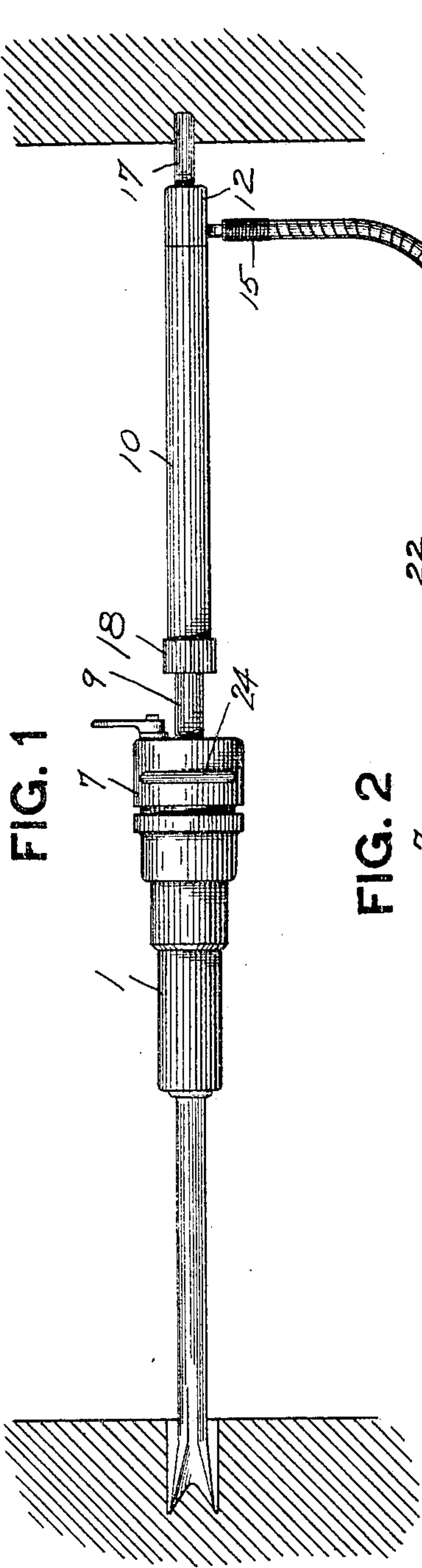


FIG. 1

FIG. 2

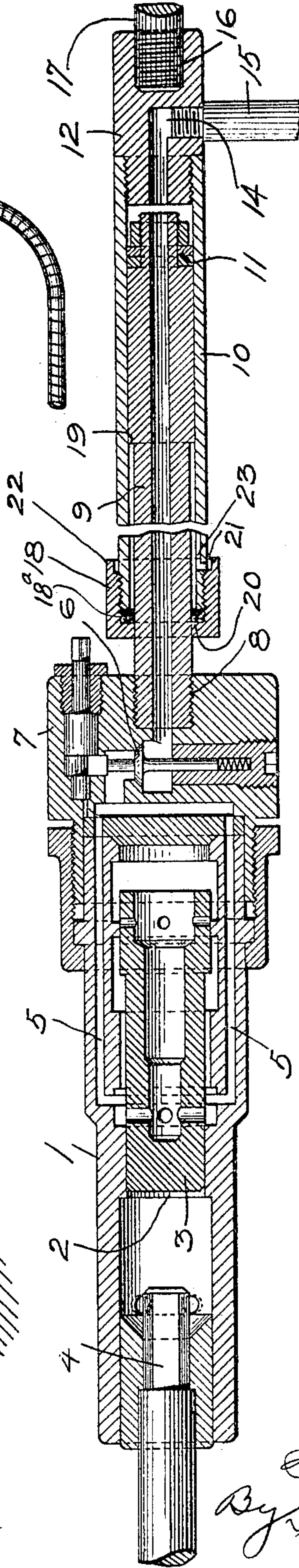
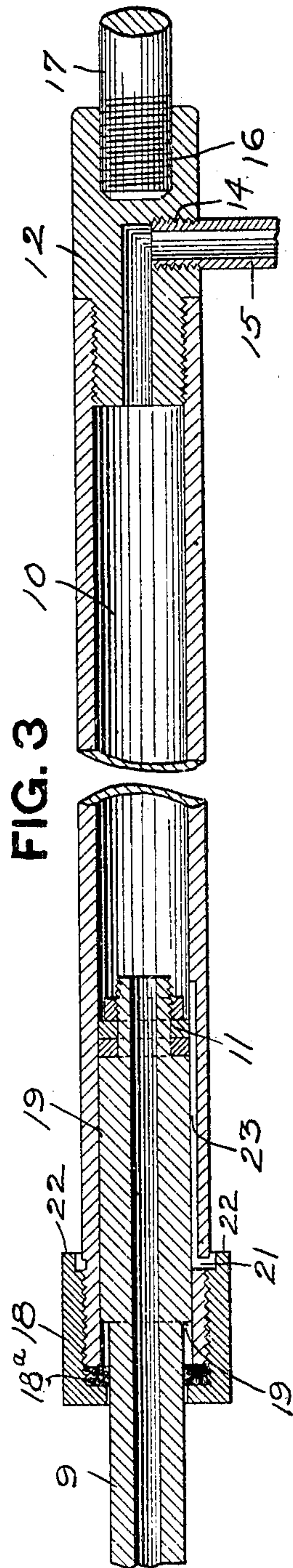


FIG. 3



WITNESSES.

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# UNITED STATES PATENT OFFICE.

FRANK L. SLOCUM, OF CONCORD, NORTH CAROLINA.

## AIR-FEED FOR PNEUMATIC TOOLS.

No. 799,201.

Specification of Letters Patent.

Patented Sept. 12, 1905.

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*To all whom it may concern:*

Be it known that I, FRANK L. SLOCUM, a resident of Concord, in the county of Cabarrus and State of North Carolina, have invented a new and useful Improvement in Air-Feed for Pneumatic Tools; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to pneumatic and similar tools, and more especially to the means for supplying the fluid-pressure thereto.

The object of my invention is to provide air-feeding means for hand-guided tools of this kind, and more especially for air-drills, which is so arranged that the tool will be forced against its work by the air-pressure, and at the same time the tool can be freely rotated without twisting or straining the air connections.

In the use of hand-guided air-drills it is the practice to hold the same against the work by means of a rod connected to the tool and provided with a piston which works in a long air-cylinder, the outer end of the cylinder being braced against one rock wall or stull and the air-inlet being provided at said outer end to force the piston and its rod, together with the drill, against the opposite rock wall. The common practice is to supply the air to the tool by means of a hose or the like having a connection through the side of the drill-casing. With this arrangement it is difficult to rotate the tool, and this cannot be done without twisting or straining the hose or other air connection.

The object of my invention is to provide an arrangement for feeding a hand-guided drill and supplying air thereto whereby the drill will be free to be rotated and will also be fed forward by the air-pressure.

To this end the invention consists, generally stated, in supplying the air to the drill through the end thereof and through a hollow rod connected thereto, which rod at its other end is provided with a piston working in the long air-cylinder referred to. The piston-rod is freely rotatable in the cylinder, and the air supplied at the outer end of said cylinder serves not only to feed the drill toward its work, as heretofore, but also passes up through said hollow piston-rod to the tool and supplies the working pressure therefor.

In the accompanying drawings, Figure 1 is a side view showing a drill provided with my improvement. Fig. 2 is a longitudinal section through the same, parts being broken

out; and Fig. 3 is a longitudinal section of portions thereof on an enlarged scale.

The drill or other tool may be of any desired form, the only change necessary being that it will preferably be arranged to take the air in through the outer end. In the drawings the tool is shown at 1, it having a main casing and provided with a bore 2, in which works the piston-plunger 3, the inner end of which is adapted to deliver the blow to the tool-shank 4. This tool will operate in the usual manner of pneumatic tools, and further description is unnecessary.

The air for operating the tool is supplied to the bore in the casing preferably by means of a longitudinal passage or passages 5, formed in the main casing and controlled by a valve 6, mounted in a valve-casing 7 on the outer end of the main casing. The air-inlet port to the valve-casing is arranged, preferably, centrally thereof—i. e., in the axis of the tool—being shown as a threaded hole 8 in the outer end of said casing. In this threaded hole is rigidly secured the end of the rod 9, which is hollow from end to end and which projects into the long cylinder 10 and is provided at its outer end with a suitable piston 11, which works in said cylinder. The outer end of the cylinder 10 is closed by means of a fitting 12, which is threaded into said cylinder and which is provided with an inlet-opening at the side of said fitting, as at 14, and having connected thereto the air-supply pipe or hose 15. The outer end of this fitting 12 is provided with a suitable threaded socket 16, adapted to receive a sharpened pin or other foot 17, by means of which the cylinder may be braced against the stull or rock wall of the mine.

The inner end of the cylinder 10 is closed by means of a suitable cap-nut 18, having packing 18<sup>a</sup> applied thereto, so as to exclude dirt and the like. The rod 9 near its inner end is preferably provided with the enlarged portion 19, which will abut against an inwardly-projecting flange 20 on the nut 18, so as to prevent said rod and piston from being forced entirely out of the cylinder. The outer end of the cylinder is provided with a suitable vent to the atmosphere, so as to prevent the compressed air driving the piston 11 too far forward. This air-vent is shown at 21, located underneath an overhanging lip 22 on the nut 18, which protects the vent from dirt, so that it cannot easily clog up. This air-vent communicates with a groove 23, cut



in the inner face of the cylinder 10 and extending down the same to the point at which it is desired that the further feed of the tool shall cease. As soon as the piston 11 passes the end of the groove 23 the air will be vented to the atmosphere and the forward feed of the tool stopped. The tool itself is provided with a suitable handle or handles 24 for handling and turning the same.

10 In the use of the tool the compressed air admitted at the outer end of the cylinder 10 acts against the piston 11, thus forcing the rod 9, together with the tool carried thereby, outwardly against the work. This same compressed air will pass up through the bore of the rod 9 and will be admitted, by means of the valve 6, into the tool-casing to operate the latter. The tool and the rod 9 and piston 11 are freely rotatable in the cylinder 10. 20 As a result the tool can be easily rotated to any desired extent or in any direction during the operation of the same and without in any manner twisting or straining the air connections to the tool. As soon as the tool has been fed forward to such an extent that the piston uncovers the end of the groove 23 the air will be vented to the atmosphere and the forward feed, as well as the operation of the tool, stopped, this being an indication to the operator that the limit of the movement has been reached, and damage to the tool and its air connection is thereby avoided.

The arrangement shown is very much simpler than prior arrangements. The hose heretofore used for supplying the working pressure to the tool has been entirely omitted. With prior devices it has been necessary to use a cylinder 10, piston 11, and rod 9 for feeding the tool to its work; but heretofore the rod 9 has been solid, so that the air admitted to the cylinder 10 performed only the one function of feeding the tool to its work. By merely making the rod 9 hollow and making the air connections to the tool so that the air can be supplied from this hollow rod I make the air in the cylinder 10 perform the two functions of feeding the tool to its work and also operating said tool.

It is obvious that steam, compressed gas, or other fluid-pressure may be used in lieu of air.

What I claim is—

1. In a device of the character specified, the combination with a fluid-pressure tool adapted for bodily rotation, of a hollow rod connected thereto and extending in the axis of said tool and having its bore communicating with the supply-passages of the tool, a cylinder in which the outer end of said hollow rod has a close sliding fit, and a fluid-inlet into the outer end of said cylinder.

2. In a device of the character specified, the combination with a fluid-pressure tool adapted for bodily rotation and provided with a supply-inlet at its outer end, of a hollow rod

connected to said supply-inlet and extending outwardly in the axis of said tool, a piston on the end of said hollow rod, a cylinder in which said piston works, and an inlet to the outer end of said cylinder.

3. In a device of the character specified, the combination with a fluid-pressure tool adapted for bodily rotation, of a hollow rod connected thereto and extending outwardly in the axis of said tool and having its bore communicating with the supply-passages of the tool, a piston on the end of said rod, a cylinder in which said piston works, and an inlet to the outer end of said cylinder, said cylinder having a vent to the atmosphere located near its inner end and arranged to limit the forward feed of the tool.

4. In a device of the character specified, the combination with a fluid-pressure tool, of a hollow rod connected thereto and extending outwardly in the axis of said tool and having its bore communicating with the supply-passages of the tool, a piston on the outer end of said rod, a cylinder in which said piston projects, an inlet to the outer end of said cylinder, a packing-nut for closing the inner end of said cylinder, a vent formed in the cylinder near its inner end, and an overhanging lip or flange on said packing-nut covering said vent.

5. In a device of the character specified, the combination with a fluid-pressure tool, of a hollow rod connected thereto and extending outwardly in the axis of said tool and having its bore communicating with the supply-passages of said tool, a piston on the outer end of said hollow rod, a cylinder in which said piston works, an inlet into the outer end of the cylinder, a groove formed in the inner face of the cylinder and communicating with a vent located near the inner end of the cylinder, and a packing-nut for closing the inner end of the cylinder and provided with an overhanging lip or flange covering said vent.

6. In a device of the character specified, the combination with a fluid-pressure tool adapted for bodily rotation, of a hollow rod connected thereto and extending outwardly in the axis of said tool and having its bore communicating with the supply-passages of said tool, a piston on the outer end of said rod, a cylinder in which said piston works, an inlet to the outer end of said cylinder, and a socket on the outer end of the cylinder for receiving a holding-pin or similar device.

7. In a device of the character specified, the combination with a fluid-pressure tool, of a hollow rod connected thereto and extending longitudinally from the outer end of said tool and having its bore communicating with the supply-passages of the tool, a cylinder in which the outer end of said rod has a close sliding fit, and a fitting secured to the outer end of the cylinder and provided on its side with an inlet to the cylinder and on its outer end with a



socket for receiving a holding-pin or like means.

8. In a device of the character specified, the combination with a hand-guided freely-rotatable fluid-pressure implement, of a stationary cylinder, fluid-pressure connections thereto, a hollow piston and piston-rod working in said cylinder and connected at its outer end to the implement with its bore communicating with the chamber of said implement.

9. In a combined hammer-drill and feeder, the combination, with the feed-cylinder and piston, of means for admitting air to feed the piston forwardly, the drill-cylinder, the working tool, and connections from the drill-cylinder to the working tool and to the feed-piston whereby they are all rotatable together.

10. In a combined hammer-drill and feeder, the combination, with the feed-cylinder and piston, of means for admitting air to feed the piston forwardly, the hammer-drill rigidly secured to the feed-piston, and the working tool of the hammer-drill secured to the drill-cylinder so as to turn therewith, means to turn the drill-cylinder, working tool and feed-piston in unison, and means to feed the piston and hammer-drill forwardly.

In testimony whereof I, the said FRANK L. SLOCUM, have hereunto set my hand.

FRANK L. SLOCUM.

Witnesses:

F. W. WINTER,  
ROBERT C. TOTTEN.