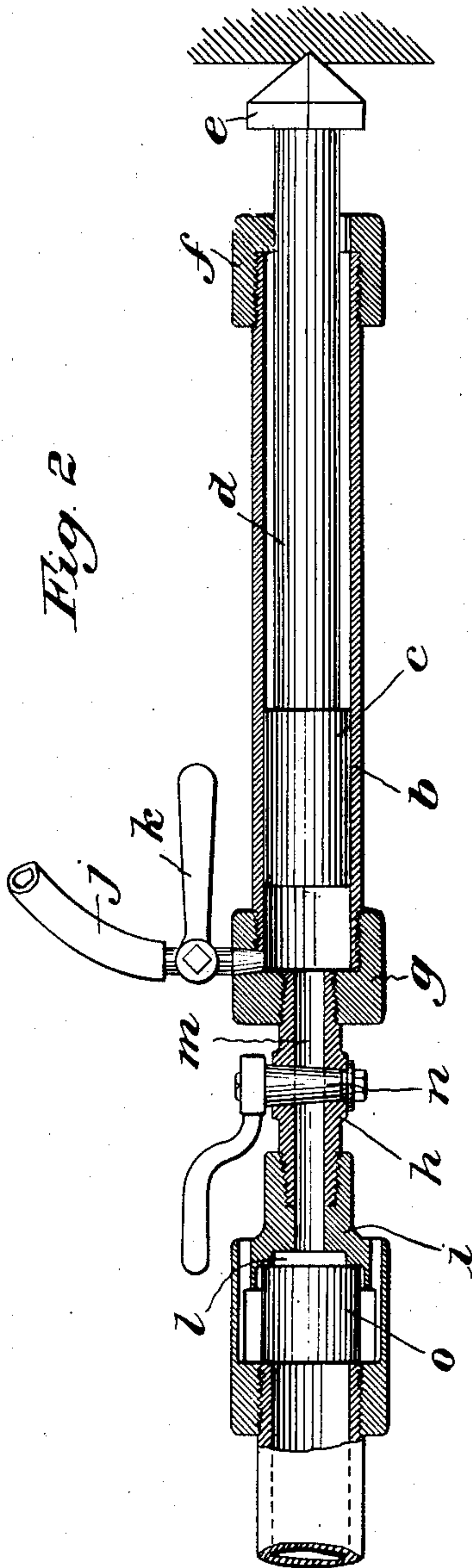
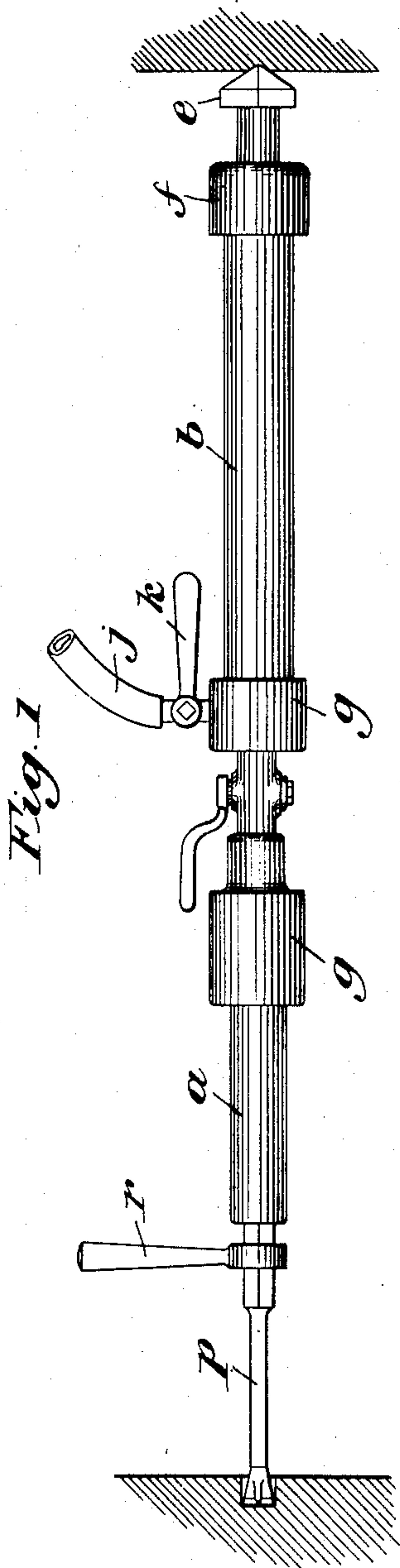


No. 866,720.

PATENTED SEPT. 24, 1907.

G. H. GILMAN.
PNEUMATIC DRILL FEED.

APPLICATION FILED DEC. 26, 1905. RENEWED JAN. 26, 1907.



Witnesses:

Horace A. Crossman
Robert H. Hamner.

Inventor:

George H. Gilman.
by Emory Smith & Son, Attys

UNITED STATES PATENT OFFICE.

GEORGE H. GILMAN, OF CLAREMONT, NEW HAMPSHIRE, ASSIGNOR TO SULLIVAN MACHINERY COMPANY, OF CLAREMONT, NEW HAMPSHIRE, A CORPORATION OF MAINE.

PNEUMATIC DRILL-FEED.

No. 866,720.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed December 26, 1905, Serial No. 293,198. Renewed January 26, 1907. Serial No. 354,312.

To all whom it may concern:

Be it known that I, GEORGE H. GILMAN, a citizen of the United States, residing at Claremont, in the county of Sullivan, State of New Hampshire, have invented an
5 Improvement in Pneumatic Drill-Feeds, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to fluid pressure tools, and more
10 particularly to feeding devices for maintaining such tools in desired relation to the work.

The object of my invention is to provide a feeding apparatus possessing simplicity of construction and at the same time efficiency in operation.

15 My invention will be best understood by reference to the following description when taken in connection with the accompanying illustration of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

20 In the drawings,—Figure 1 shows in side elevation one form of tool feeding apparatus embodying one form of my invention; Fig. 2 shows on an enlarged scale and in central sectional elevation the feeding cylinder, with its connections to the head of the tool.

25 Referring to the drawings, and to the embodiment of my invention there shown, I have illustrated the principles thereof by showing its application to a pneumatic hammer drill *a*, of ordinary and usual construction, the details of which are not shown. Associated
30 with the drill tool shown, and in alinement therewith, is provided feeding means for feeding the drill towards the work, the same comprising a cylinder *b* and the preferably imperforate piston *c*, the latter having the piston-rod *d* projecting through one end of the cylinder
35 and provided at its end with the foot *e* adapted to be braced against a vertical side wall of a mine or quarry in which the apparatus is used. The cylinder has threaded over opposite ends the cylinder heads, *f* and *g*, the former being perforated to permit the passage of
40 the piston-rod and the latter being threaded to receive the short connection *h*, the opposite end of which has threaded attachment to the head *i* of the hammer drill.

The pressure supply pipe *j* leading from the source of pressure supply (not shown) enters the forward or at-
45 tached end of the feeding cylinder to supply fluid pressure to the pressure space therein. The admission of pressure to the cylinder from the pipe is controlled by means of the hand throttle valve *k*.

Pressure admitted through the pipe to the feeding
50 cylinder will act between the pressure area presented by the piston and the area presented by the cylinder and tend to force the latter away from the piston carrying with it the tool. When placed in position, as indicated in Fig. 1, the tool will be automatically advanced

with the cutting of the hole by the constantly effective 55 pneumatic pressure in the feeding cylinder.

The pressure space of the feeding cylinder is directly connected with the pressure space *l* of the adjacent tool by the short passage *m* extending through the connection *h* and controlled by the hand-operated throttle 60 valve *n*. By this means the pressure is supplied jointly to the feeding cylinder and the tool through the pipe *j*, while that portion passing to the tool may be separately throttled or controlled, as required. The directness and ample size of the pressure passage *m* between the 65 closely adjacent pressure spaces of the feeding cylinder and the tool permits working pressure to be supplied to the latter without that diffusion or throttling which is incidental to circuitous or lengthy passages. From the tool pressure space *l* the pressure is admitted to the 70 usual valve passages (not shown) of the valve block *o*.

When the apparatus is in position, carrying the usual cutting tool *p* and tool-turning device *r*, feeding pressure is admitted to the cylinder, so that with the foot *e* 75 pressed against one wall, the cutting tool is pressed against the opposite wall. The throttle *n* being then turned, the drill is thrown into operation, while the feeding apparatus continues to feed the tool as is required.

For varying the limits of feeding movement, piston- 80 rods of different length may be employed or the foot *e* may be replaced by others of greater length.

It will be seen that the feeding apparatus requires the assemblage of a very few simply constructed, and easily united parts. At the same time, the supplied 85 pressure is caused to act jointly upon the tool and the feeding apparatus without, however, diminishing the directness of fluid supply to the tool cylinder.

Claim.

1. The combination with a fluid pressure actuated tool, 90 of a feeding cylinder connected with said tool by a pressure supply conduit constituting a straightaway connection therebetween, a piston in said cylinder having a piston rod projecting through the end of the cylinder opposite the tool, and means to supply pressure between the tool and 95 the piston head.

2. The combination with a fluid pressure actuated tool, of a feeding cylinder connected with said tool by a pressure supply conduit constituting a straightaway connection 100 therebetween, a piston in said cylinder having a piston rod projecting through the end of the cylinder opposite the tool, means to supply pressure between the tool and the piston head, and means for separately throttling the pressure supply of the tool.

3. A tool feeding and operating device having at one end 105 thereof a tool and at the opposite end a piston alined therewith and adapted to be braced against an abutment opposing the material to be operated upon, a cylinder wherein said piston is contained, means rigidly connecting said cylinder and said tool and affording a straightaway 110 fluid pressure connection between them, and means for supplying fluid pressure to said connection.

4. A tool feeding and operating device having at one end thereof a tool and at the opposing end a piston aligned therewith and adapted to be braced against an abutment opposing the material to be operated upon, a cylinder wherein said piston is contained, means rigidly connecting said cylinder and said tool and affording a straightaway fluid pressure connection between them, means for supplying fluid pressure to said connection, and means for separately throttling the pressure supply to the tool.
5. A tool feeding and operating device comprising the tool *a*, the cylinder *b*, the connecting member between them having the straightaway passage *m*, the piston *d* within the cylinder having a piston rod projecting through the end of the cylinder opposite the tool, and the pressure supply *j*.
6. A tool feeding and operating device comprising the tool *a*, the cylinder *b*, the connecting member between them having the straightaway passage *m*, the piston *d* within the cylinder having a piston rod projecting through the end of the cylinder opposite the tool, the pressure supply *j*, and the throttling valve *n*.
7. A tool feeding and operating device adapted to be braced against opposing walls of a mine or the like and to be supported thereby, said device being of pillar or column-like formation in its entirety, and comprising a tool and a cylinder aligned therewith a straightaway fitting between the tool and cylinder affording an unobstructed pressure supply connection but having throttling means therein, a piston adapted to slide in said cylinder and having a piston rod projecting through the end thereof opposite the tool, and means to supply fluid pressure to said fitting.
8. The combination with a fluid pressure actuated tool of a feeding cylinder therefor, a tubular connection between the feeding cylinder and the tool cylinder of lesser diameter than the latter, means for supplying live pressure to that end of the feeding cylinder adjacent the tool cylinder, a piston slidable in said cylinder, presenting an active pressure area to the live pressure at the said attached end of the cylinder, a piston rod projecting through the end of the cylinder opposite the tool, said tubular member presenting a direct, straightaway pressure passage between the feeding cylinder and the tool cylinder, and a throttle for said passage.
9. The combination with a fluid pressure tool, of a feeding cylinder aligned therewith, a piston slidable in said cylinder and having a piston-rod projecting from the opposite end thereof for the support of said tool, a pressure supply pipe entering said cylinder at the end to which the said tool is attached, and a straightaway conduit leading directly from the pressure space of the feeding cylinder through the tubular connection to the pressure space of the tool and rigidly connecting said cylinder and tool.
10. A tool feeding and operating device adapted to be braced against opposing walls of a mine or the like and to be supported thereby and being without other means of support, said device being of pillar or column like formation in its entirety and comprising a tool and a tool feeding cylinder aligned therewith, said cylinder being adapted to keep said tool to its work during the application of operating pressure to the tool, a rigid connection between the tool and the cylinder, a piston mounted in the cylinder and having a piston rod projecting through the end thereof

opposite to the tool, a foot upon the end of the piston rod to engage the adjacent wall of the mine or the like, said cylinder being adapted to slide upon said piston and by means of said rigid connection to impart forward or feeding movement to the tool, a throttle valve in the connection, and means to supply cylinder and tool feeding and tool operating pressure between the tool and the piston head.

11. A tool feeding and operating device adapted to be braced against opposing walls of a mine or the like and to be supported thereby, said device being of pillar or column like formation in its entirety and comprising a tool and a tool feeding cylinder aligned therewith, a rigid connection between the tool and the cylinder, said rigid connection being of reduced diameter, a piston mounted in the cylinder and having a piston rod projecting through the end thereof opposite to the tool, a foot upon the end of the piston rod to engage the adjacent wall of the mine or the like, whereby the device is supported at opposite ends thereof and clear space is afforded beneath the same from end to end thereof when maintained in a non-upright position, and whereby when maintained in an upright position an unobstructed space is afforded about the same, the end of the piston toward the tool presenting an active pressure area to live pressure whereby the cylinder may be slid upon the piston, the latter being held stationary by the pressure upon the tool end of the head thereof, the tool being fed to its work by means of the rigid connection between it and the cylinder, means to supply pressure between the tool and the piston head, and a throttle valve in the reduced connection controlling the flow of pressure through the connection to operate the tool.

12. A tool feeding and operating device adapted to be braced against opposing walls of a mine or the like and to be supported thereby, said device being of pillar or column like formation in its entirety and comprising a tool and a tool feeding cylinder aligned therewith, a rigid connection between the tool and the said cylinder having means therein for throttling the tool operating pressure, a piston mounted in the cylinder and having a piston rod projecting through the end thereof opposite to the tool, a foot upon the end of the piston rod to engage the adjacent wall of the mine or the like, whereby the device may be supported solely by its ends and a clear space afforded about the same, the head of the piston presenting an active pressure area to live pressure at the end thereof toward the tool, whereby the piston may be held stationary and the cylinder, the rigid connection and the tool may be fed constantly toward the work, the piston and the cylinder being so relatively proportioned that a long feeding movement of the cylinder and tool may be afforded, and throttling means to admit feeding pressure in advance of the tool operating pressure.

In testimony whereof, I have signed my name to this specification, in the presence of subscribing witnesses.

GEO. H. GILMAN.

Witnesses:

E. J. BRUCHARD,
D. P. FLETCHER,
JAMES A. BRUCE.