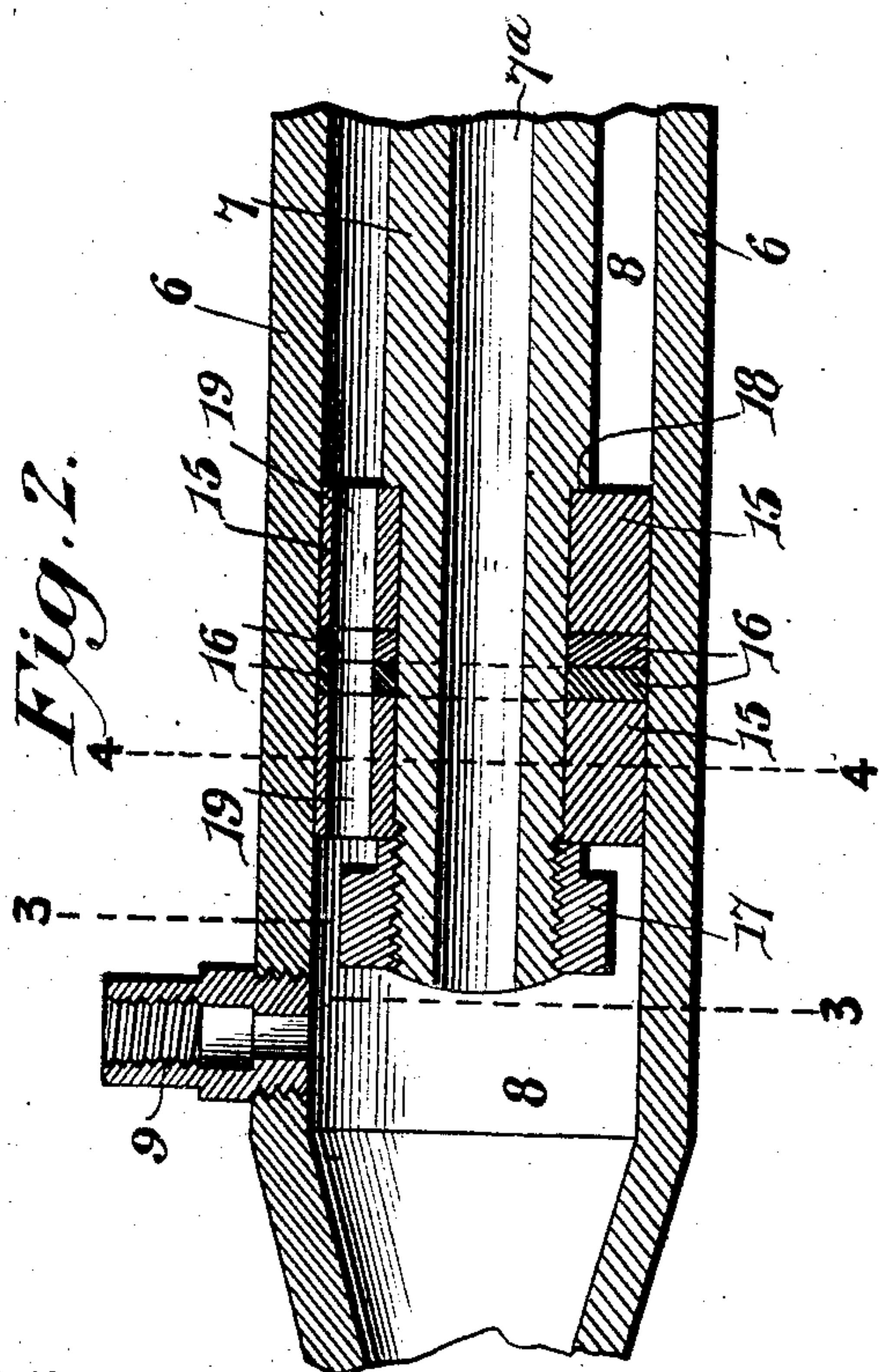
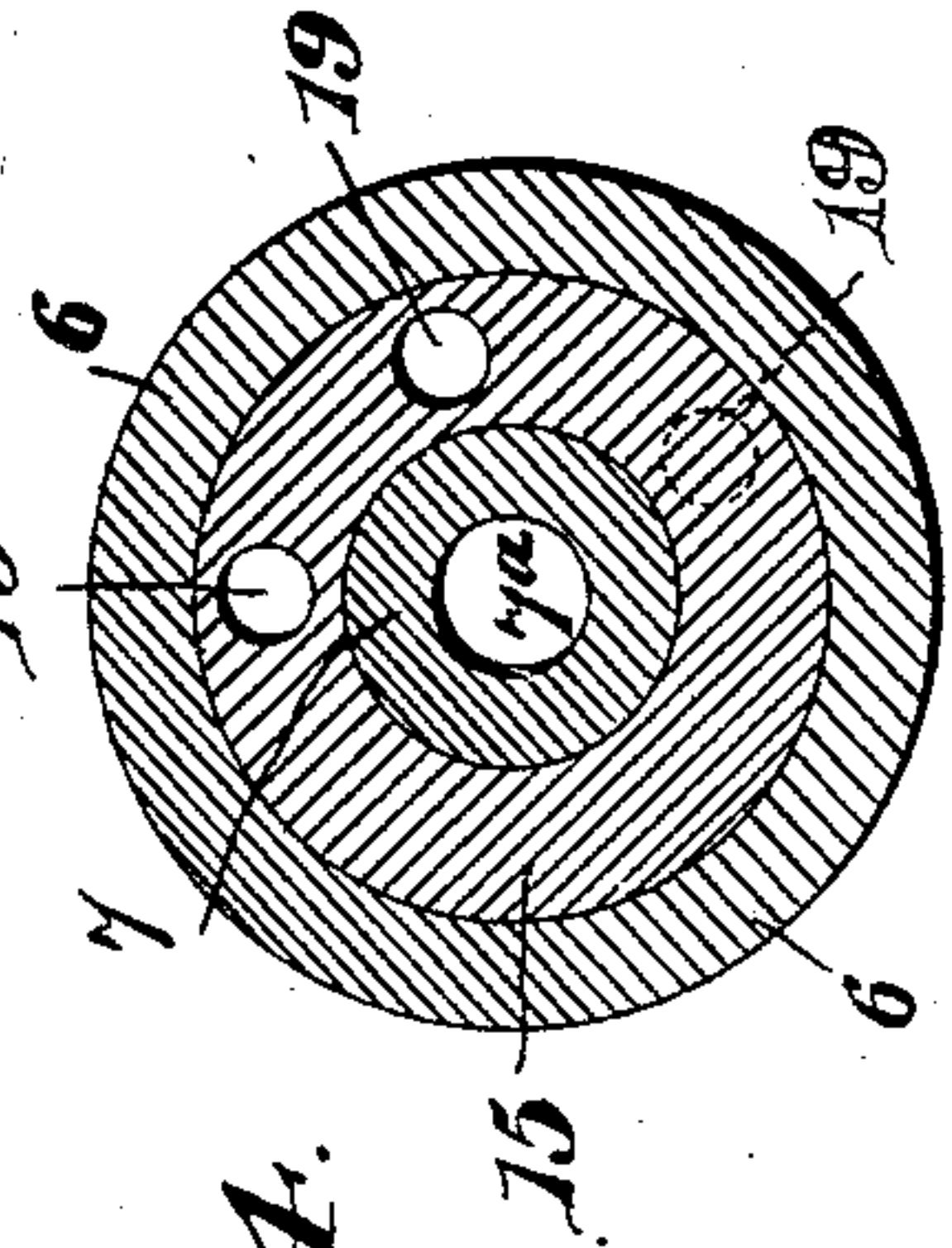
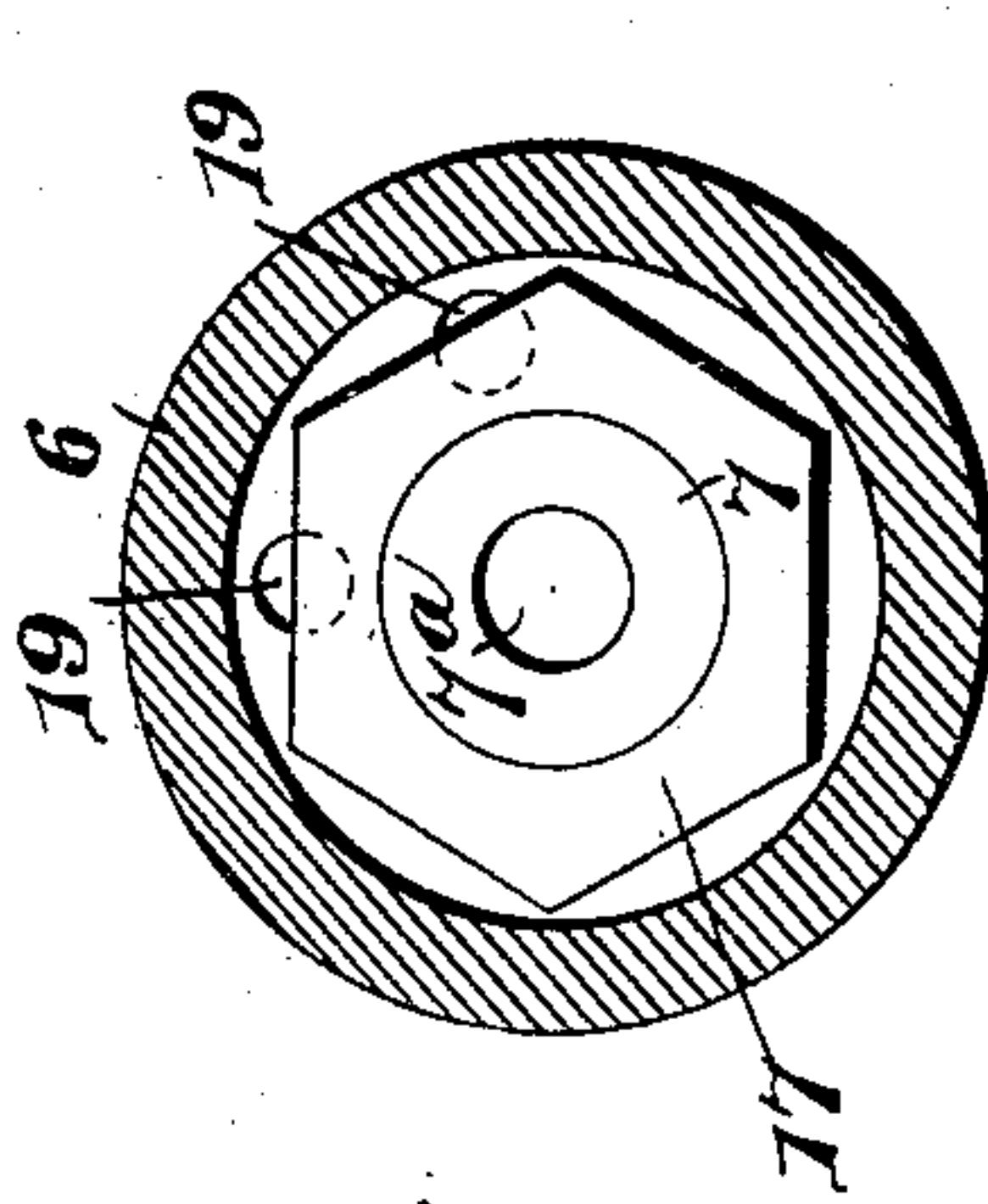
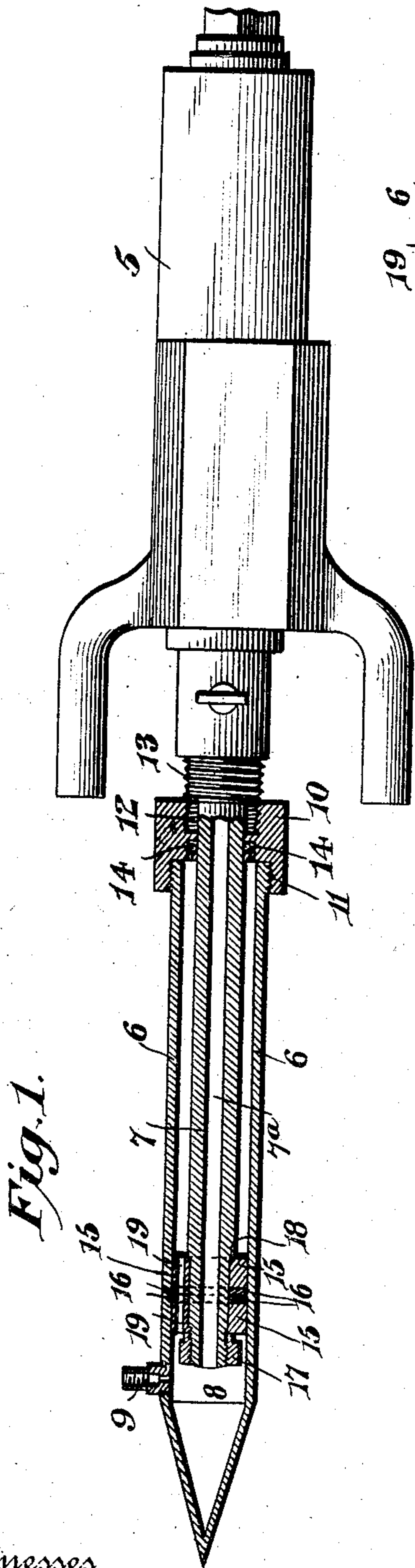


No. 869,278.

PATENTED OCT. 29, 1907.

T. TURNER.
ROCK DRILL FEED MECHANISM.
APPLICATION FILED FEB. 13, 1906.

2 SHEETS—SHEET 1.



Witnesses
Jas. E. McLaughlin
B. J. Foster

Thomas Turner, Inventor

By *E. G. Siggers*
Attorney

No. 869,278.

PATENTED OCT. 29, 1907.

T. TURNER.
ROCK DRILL FEED MECHANISM.

APPLICATION FILED FEB. 13, 1906.

2 SHEETS—SHEET 2.

Fig. 5.

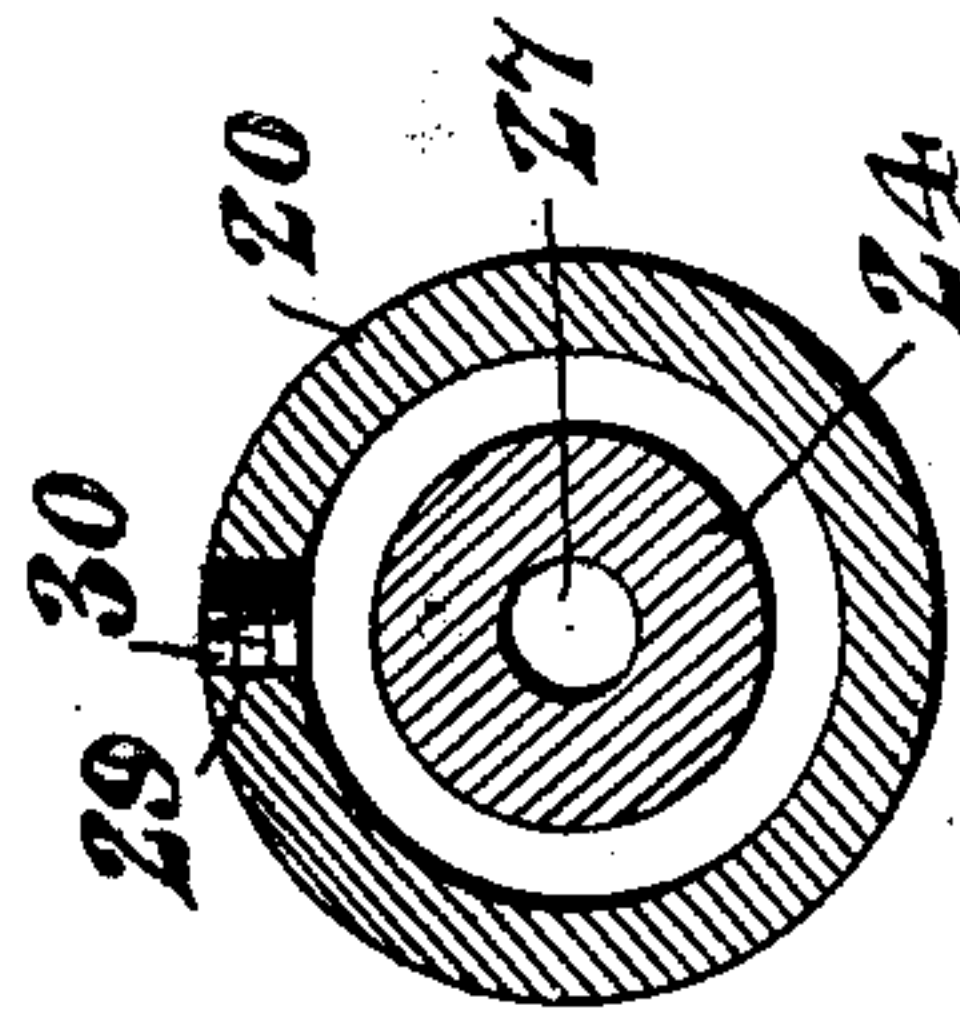
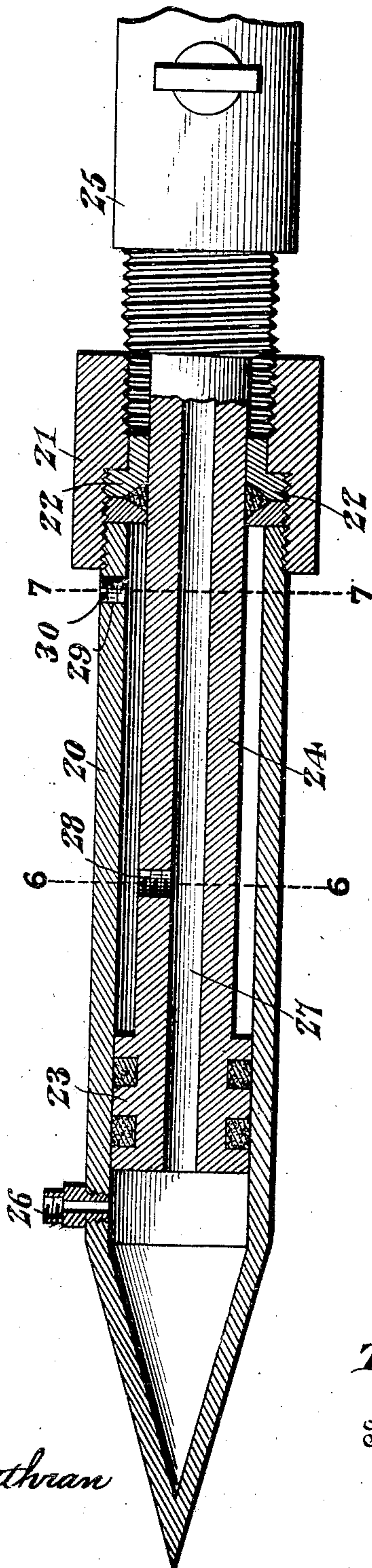


Fig. 7.

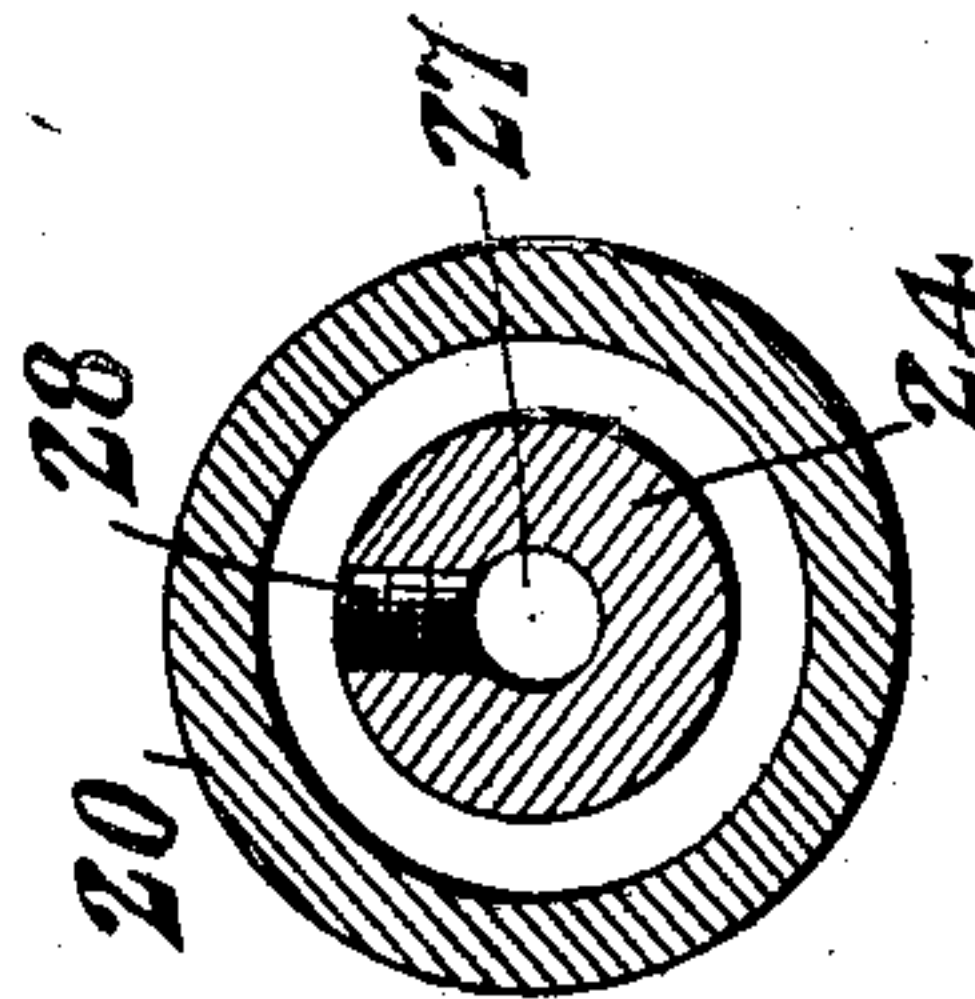


Fig. 6.

Witnesses
Jas. E. McLaughlin
B. G. Foster

Thomas Turner, Inventor

By

E. G. Siggers

Attorney

UNITED STATES PATENT OFFICE.

THOMAS TURNER, OF OTTUMWA, IOWA.

ROCK-DRILL-FEED MECHANISM.

No. 869,278.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed February 13, 1906. Serial No. 300,896.

To all whom it may concern:

Be it known that THOMAS TURNER, a citizen of the United States, residing at Ottumwa, in the county of Wapello and State of Iowa, has invented a new and useful Rock-Drill-Feed Mechanism, of which the following is a specification.

This invention relates more particularly to air or fluid pressure operated mechanism for feeding pneumatic hammer operated drills to their work, said invention though not limited to rock-drills, but being capable of successful employment in maintaining motors of various kinds, more especially pneumatic hammers to their work.

In rock-drilling, difficulty has heretofore been experienced in varying the pressure of the feed mechanism on the motor in order to secure the proper holding power in stone of different characters and in the necessarily different positions assumed by the drill. Thus when a hole is being drilled in hard rock, more pressure is required than in softer grades, and a pressure adequate and proper for the former will cause the drill to stick in the latter, so that trouble is experienced in turning the same. Also in drilling a hole upwardly more pressure is required than when drilling downwardly, for in the first instance, the weight of the hammer has to be raised, while in the latter case, the weight of the hammer is always against the drill.

The principal object of the present invention is to provide novel and simple mechanism, whereby the pressure upon the motor may be varied to suit different conditions of use without altering the pressure of the fluid supply.

The preferred embodiment of the invention is illustrated in the accompanying drawing, wherein:—

Figure 1 is a side elevation of a well known type of pneumatic hammer, showing the improved feed mechanism attached thereto, and in section. Fig. 2 is a detail sectional view on an enlarged scale, through a portion of said feed mechanism. Fig. 3 is a cross sectional view on the line 3—3 of Fig. 2. Fig. 4 is a cross sectional view on the line 4—4 of Fig. 2. Fig. 5 is a longitudinal sectional view through a modified form of structure. Fig. 6 is a cross sectional view on the line 6—6 of Fig. 5. Fig. 7 is a sectional view on the line 7—7 of Fig. 5.

Like numerals of reference designate corresponding parts in all the figures of the drawing.

In the embodiment disclosed, a pneumatic hammer 5 is shown. Insofar as the invention is concerned, said hammer may be of any suitable or desirable construction. The means for feeding this hammer or motor to its work consists of a cylinder member 6 in which is slidably mounted a piston member, comprising a piston rod 7, carrying a piston that is designated as a whole by the reference numeral 8. Air or other fluid under pressure is conducted to the cylinder from any suitable source, and is admitted through a suitable nipple 9 at

the rear side of the piston 8. The piston rod 7 is tubular, the passageway 7^a constituting means for conducting the fluid under pressure from the rear portion of the cylinder to the motor 5 in a manner well understood. The head of the cylinder 6, that is adjacent to the motor or hammer 5 is in the form of a nut 10, having a counterbore 11 in one side that is interiorly threaded to receive the cylinder 6, the opposite side being also counterbored, as shown at 12, to receive the stem 13 of the motor. Consequently it will be seen that if the stem is screwed into the counterbore 12, the cylinder and hammer can be secured against movement, but when released or detached, the hammer is movable toward and from the cylinder, and the piston rod 7 is slidable through the coupling nut 10. An air-operated packing 14 surrounds the piston rod 7.

Means are provided for varying the effective pressure area of the piston 8, and to this end, said piston is constructed of two relatively rotating collars or members 15, having suitable packing washers 16 interposed between them, and normally clamped against rotation by a nut 17, threaded on the rear end of the piston rod, and forcing the members towards each other and against an annular shoulder 18 formed on the rod. The two members 15 and the washers 16 are provided with passageways 19, which are movable into and out of alinement upon the relative rotation of the members, and when in alinement, constitute means for admitting the fluid under pressure from the rear side of the piston to the cylinder on the opposite side of said piston, as will be clearly apparent by reference to Figs. 1 and 2.

If the highest degree of pressure upon the motor is desired, the openings 19 are disposed out of alinement. Consequently, the air or fluid under pressure admitted through the nipple 9 will have the entire area of the piston and piston rod to operate against in feeding the motor and associated parts to their work. If less pressure is desired, however, it is only necessary to uncouple the cylinder 6 from the nut 10, remove the piston from the cylinder, loosen the nut 17, and relatively rotate the members 15 so as to bring one or more of the sets of openings into alinement. Consequently after the parts have been replaced, and air is admitted through the nipple 9, it will be apparent that the pressure on opposite sides of the members 15 will be equalized, and the effective area will be substantially that of the piston rod, so that the pressure upon the motor or hammer will be materially decreased. It thus will be apparent that simple means are provided, whereby the effective pressure area of the piston can be varied to suit the different conditions of use. The structure, moreover, can be varied considerably without departing from the spirit of the invention. Thus one or more sets of openings may be provided in the relatively rotatable members 15, and these members may be considered one as the piston proper and the other as the

means for controlling the passage of air through such piston.

Probably the preferred form of structure is illustrated in Figs. 5, 6 and 7. The cylinder member 5 therein disclosed comprises a cylinder 20 having a head 21, detachably secured to one end thereof and provided with a packing gland 22. In the cylinder member is slidably mounted a piston member comprising a piston 23 having a tubular stem 24 that slidably passes through the gland 22 and is connected in any 10 desired manner to the motor, a portion of which is shown at 25. The motive fluid is admitted to the cylinder on one side of the piston through a nipple 26, and is conveyed through the passageway 27 in the piston 15 and piston rod to the motor 25. A lateral port 28, located in the piston rod constitutes the means of communication between the passageway 27 and the interior of the cylinder on the opposite side of the piston to the inlet nipple 26. The walls of the port 28 are 20 threaded. A vent 29 is formed in the wall of the cylinder 20, and is of the same diameter as the port 28, the walls of said vent being correspondingly threaded. A closure in the form of a screw plug 30 is arranged to be threaded either into the vent 29 or the port 28 for the 25 purpose of closing either. With this construction if the full pressure of the motive fluid is desired upon the motor, the plug 30 is placed in the port 28, thereby leaving the vent 29 open. On the other hand, if it is desired to restrict the effective pressure area of the 30 piston, the plug is removed from the port 28 and is placed in the vent 29. As a result, the pressure in the cylinder on the opposite side of the piston to that against which the motive fluid is admitted is equalized, and the pressure area is thereby materially restricted.

35 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In feed mechanism of the class described, the combination with a motor, of means for feeding the same to its 40 work, said means comprising a cylinder and a piston operating therein, means for conducting and admitting fluid under pressure to the cylinder on one side of the piston, and means, located within the cylinder, for varying the effective pressure area of the piston acted on by such 45 motive fluid.

2. In feed mechanism of the class described, the combination with a motor, of means for feeding the same to its work, said means comprising a cylinder and a piston operating therein, means for conducting and admitting fluid 50 under pressure to the cylinder at one side of the piston, and means, located within the cylinder, for admitting said fluid under pressure to the cylinder on the opposite side of the piston to vary the effective pressure area of the piston.

3. In a feed mechanism of the class described, the combination with a motor, of means for feeding the same to its work, said means comprising a cylinder and a piston operating therein, means for conducting and admitting fluid under pressure to the cylinder at one side of the piston, and means, movable with the piston, for admitting the 60 fluid under pressure to the cylinder on the opposite side of the piston from the fluid admitting means.

4. In feed mechanism of the class described, the combination with a motor, of means for feeding the same to its work, said means comprising a cylinder member and a piston member operating therein, means for conducting and admitting fluid under pressure to the cylinder member on one side of the piston member, said piston member having a passageway for admitting the fluid under pressure to the cylinder member on the opposite side of the piston member, 70 and a device movable with the piston member for controlling the passageway, said device being detachable from the piston member to open the passageway.

5. In feed mechanism of the class described, the combination with a motor, of means for supplying motive fluid 75 to the motor for holding said cylinder to its work, said means comprising a cylinder, a piston operating therein, a piston rod connected to the piston and having a longitudinal passageway therethrough communicating with the motor, means for admitting fluid under pressure to the 80 cylinder on one side of the piston, said piston rod having a port communicating with the cylinder on the opposite side of the piston to the fluid admitting means and communicating with the longitudinal passageway, and a closure for the port.

6. In feed mechanism of the class described, the combination with a motor, of means for holding the same to its work, said means comprising a cylinder member and a piston member operating therein, said cylinder member having a vent and the piston member having a port, and a 90 common device for closing either the port or vent.

7. In feed mechanism of the class described, the combination with a motor, of means for holding the same to its work, said means comprising a cylinder member having a vent in its wall, a piston member operating in the cylinder 95 and having a port communicating with the interior thereof, and a common plug for closing either the port or vent.

8. In feed mechanism of the class described, the combination with a cylinder having a vent, of a piston operating in the cylinder, a piston rod connected to the piston, said 100 piston rod having a longitudinal passageway therethrough, and a lateral port communicating with the passageway and the interior of the cylinder, and a screw plug adapted to be threaded into the port or vent.

9. In feed mechanism of the class described, the combination with a cylinder having a vent, of a piston member 105 operating therein, said piston member having a piston and being provided with a passageway that communicates with the cylinder on opposite sides of the piston, and means for closing either the vent or passageway.

110 In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

THOMAS TURNER.

Witnesses:

DAN HANNAN,
C. A. HYATT.