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A. H. TAYLOR

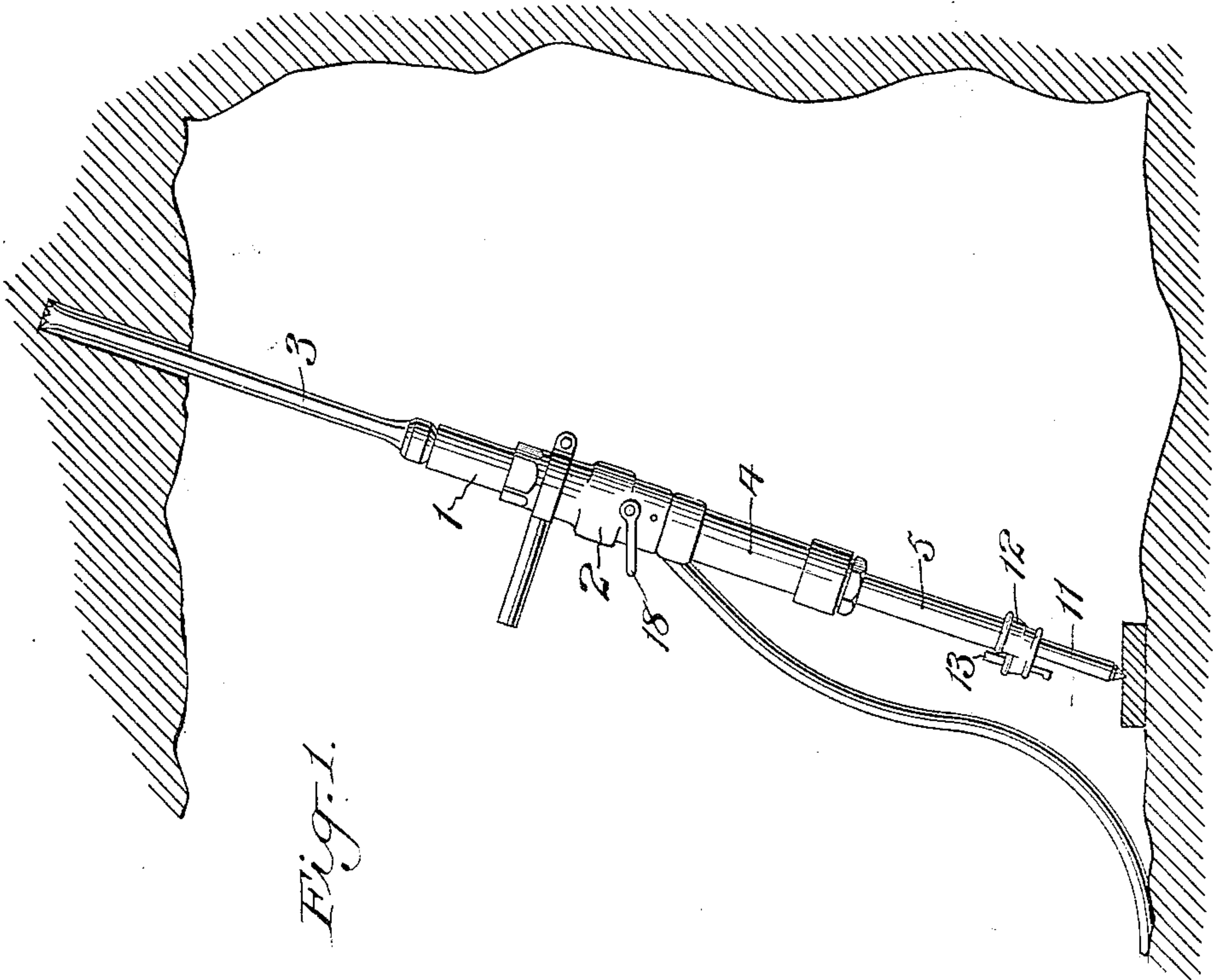
A. H. TAYLOR.  
HAMMER DRILL.

APPLICATION FILED MAR. 13, 1908.

898,702.

Patented Sept. 15, 1908.

2 SHEETS—SHEET 1.



Witnesses:  
F. George Barry.  
M. Gruber

Inventor:  
Albert H. Taylor  
by attorneys  
Brown & Seward

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2 SHEETS—SHEET 2.

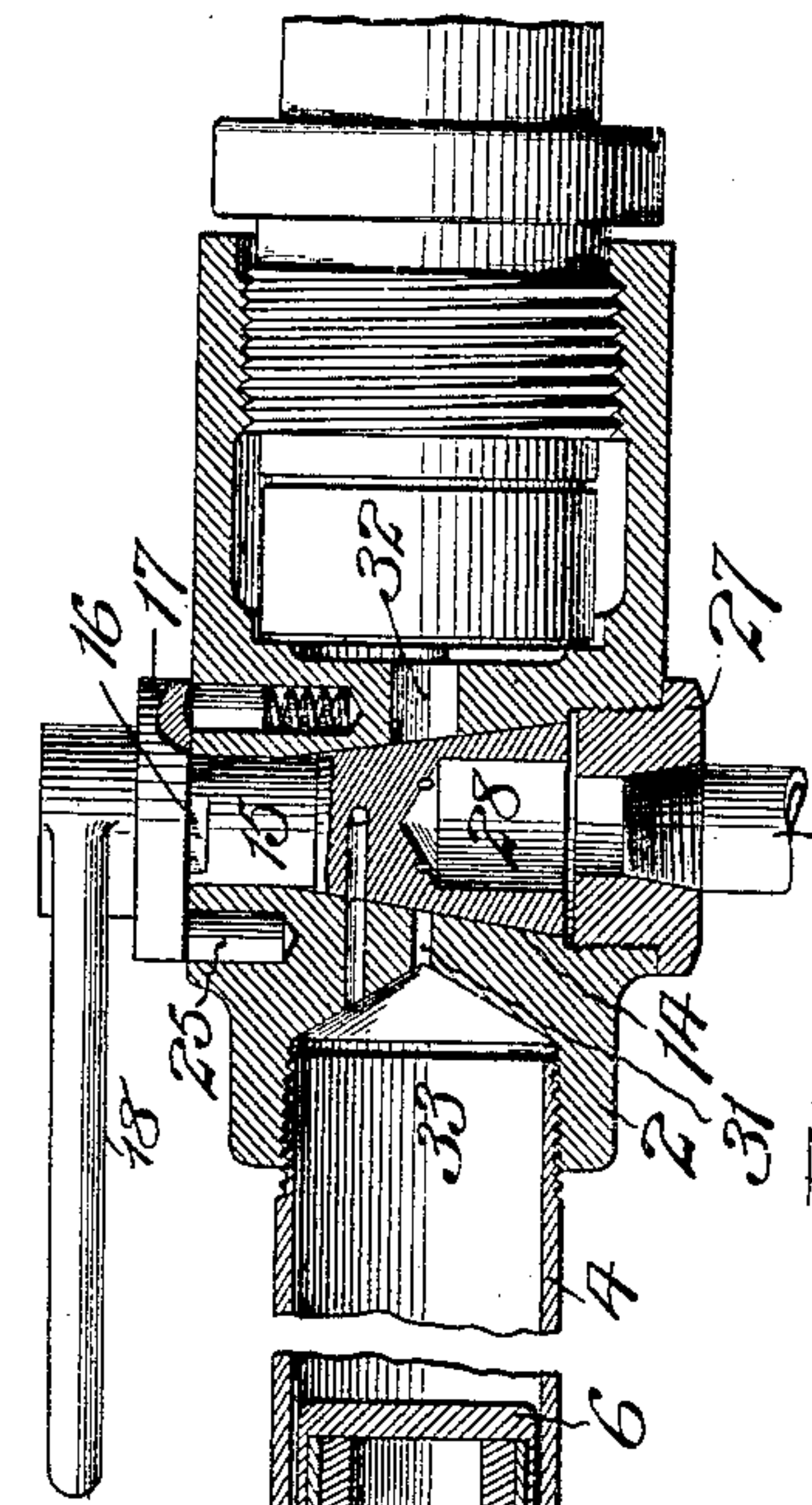


Fig. 2.

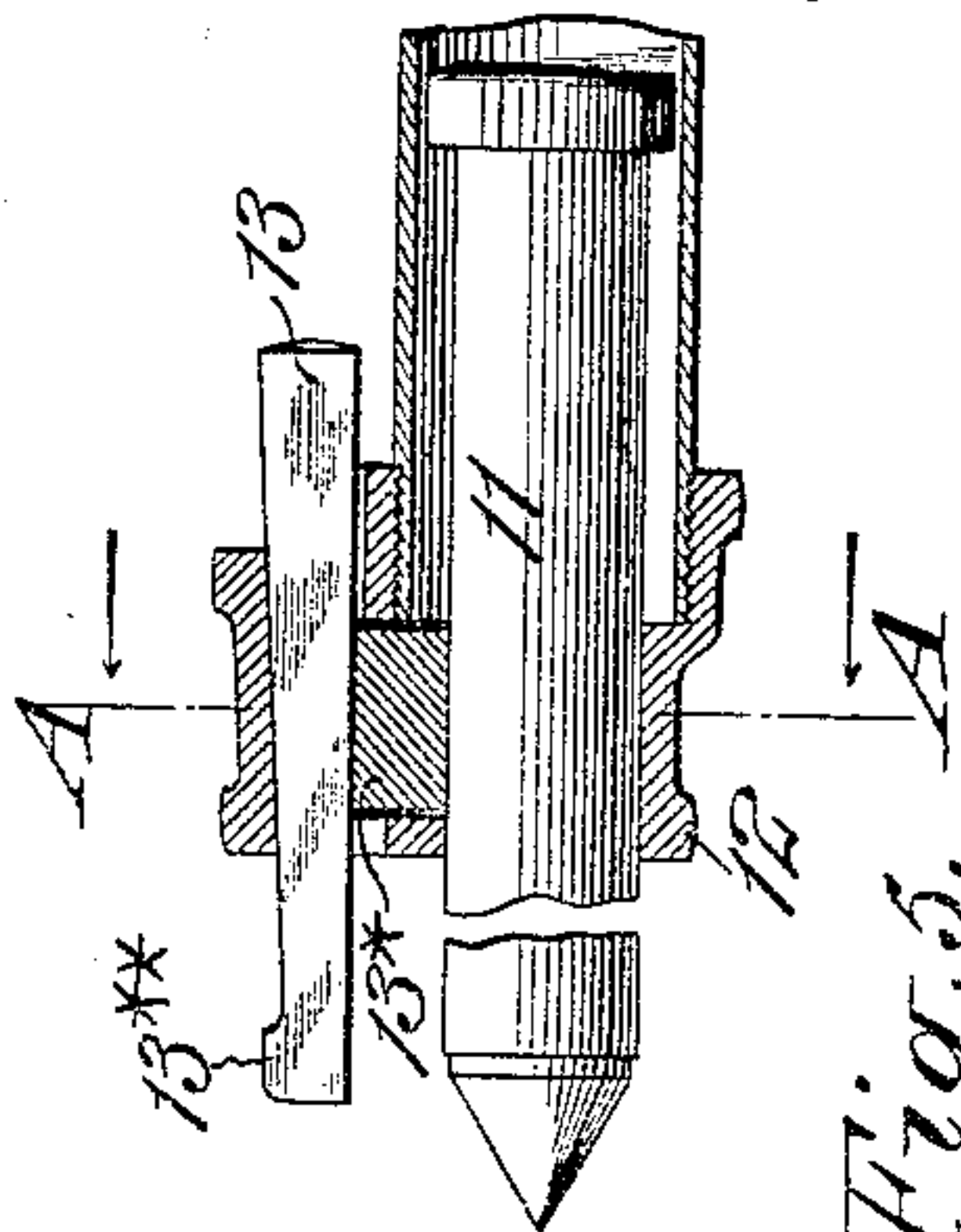


Fig. 5.

Witnesses:  
M. G. Guber  
J. George Barry.

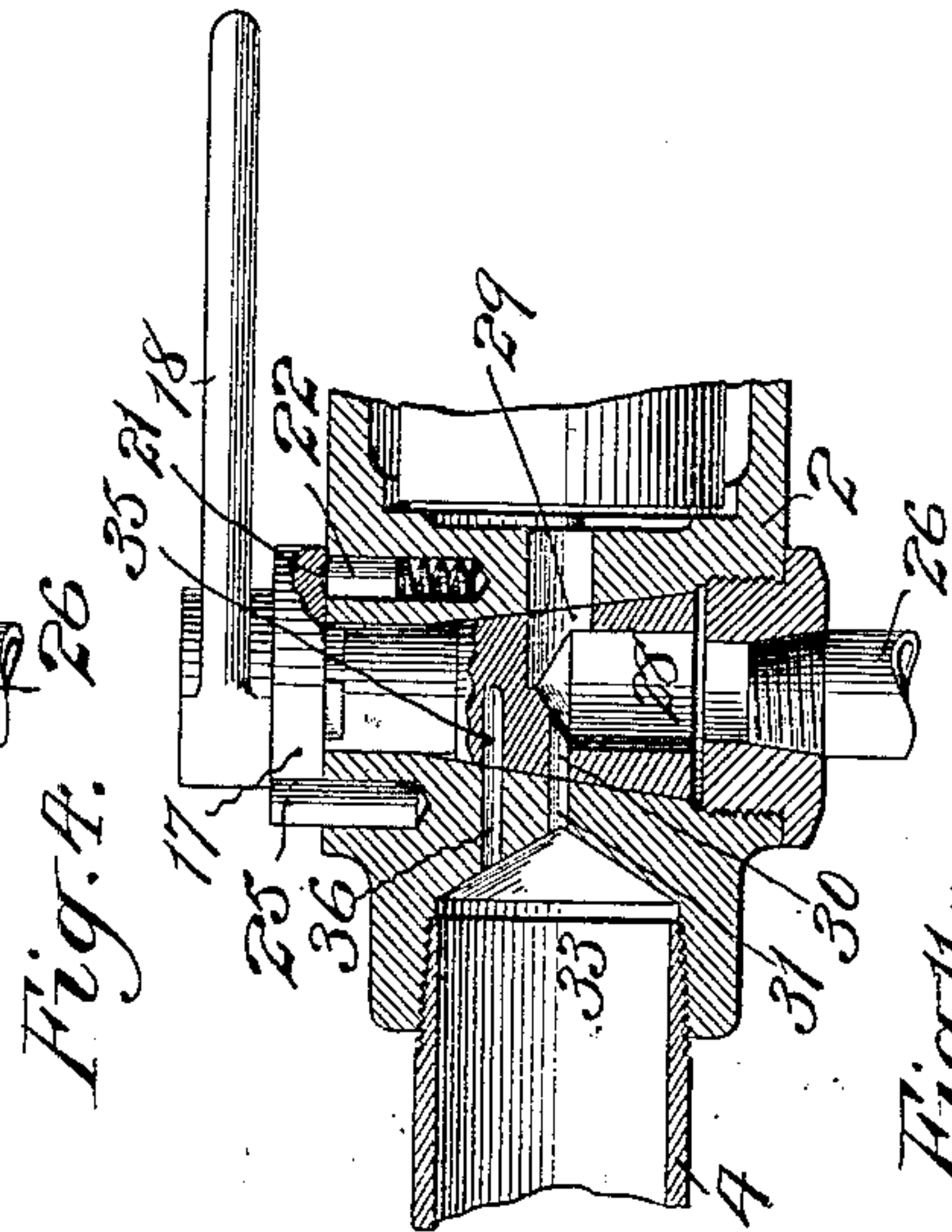


Fig. 4.

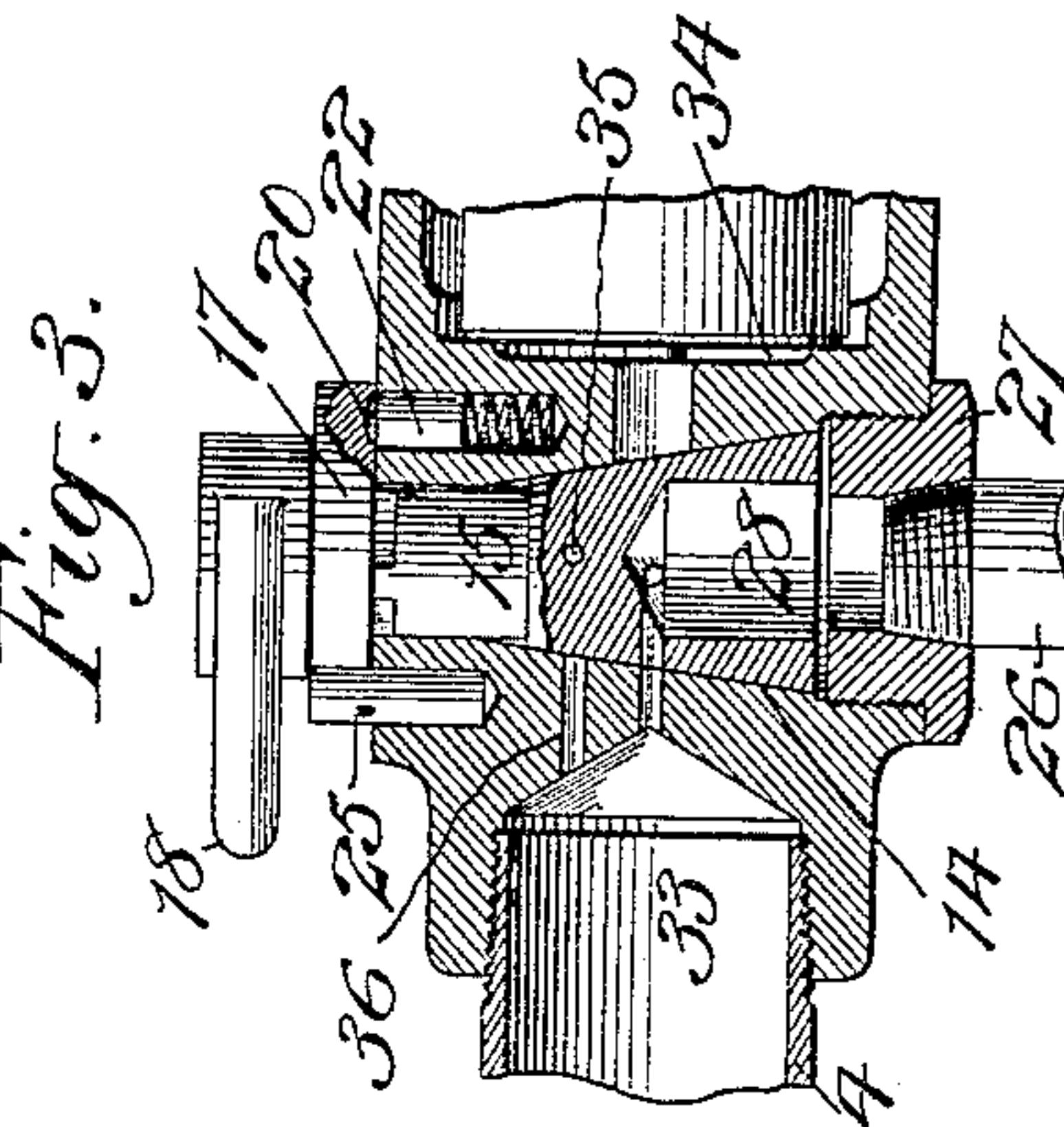


Fig. 3.

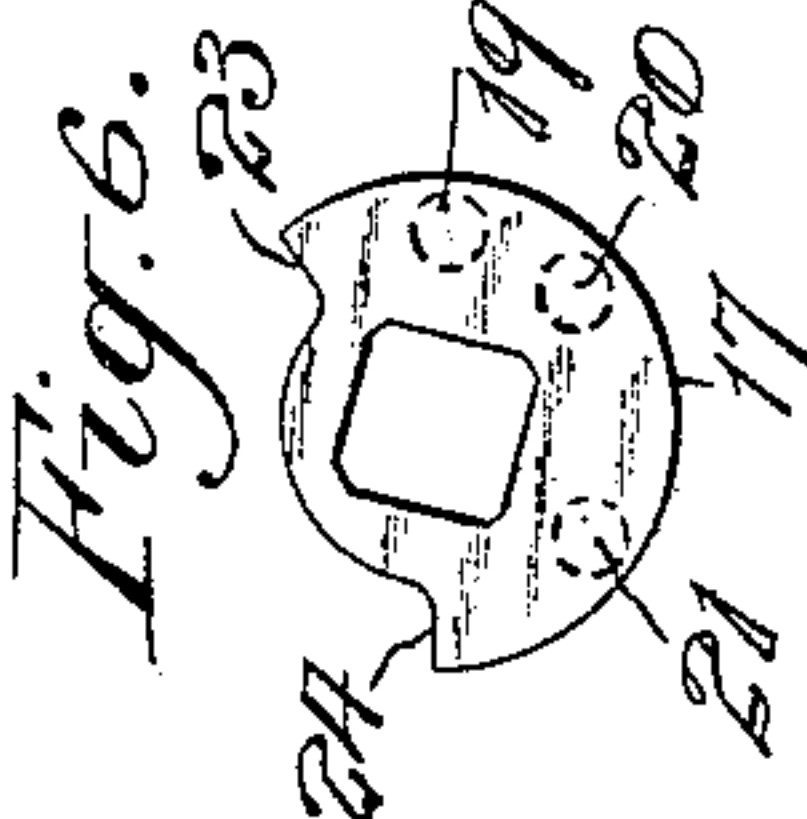
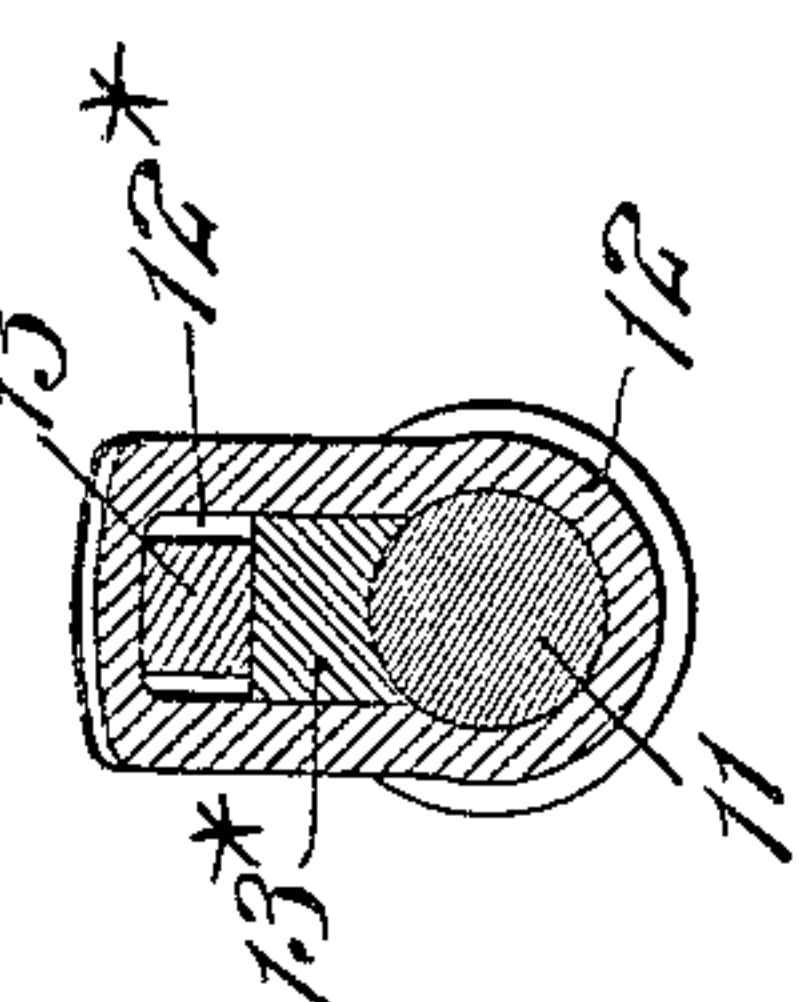


Fig. 6.

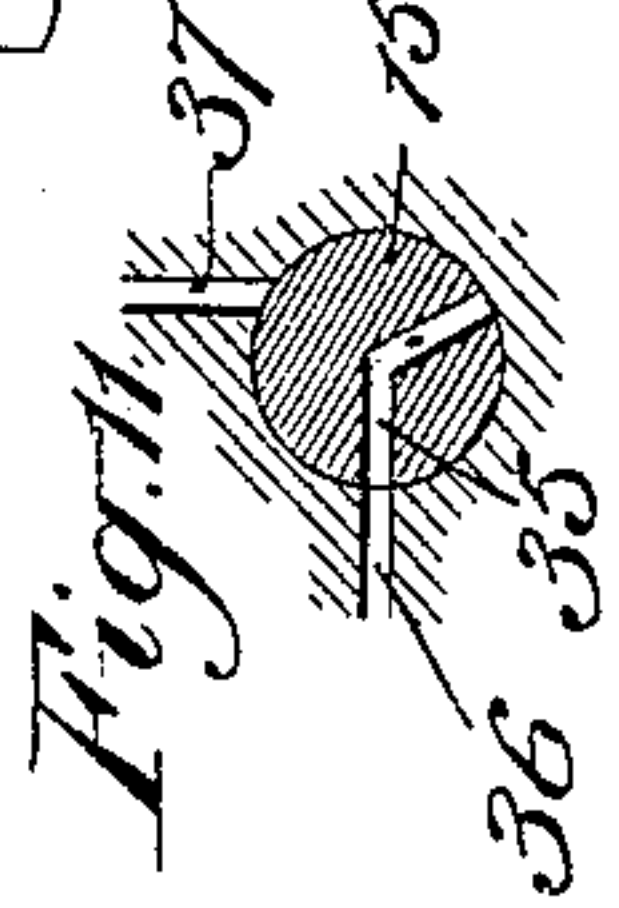


Fig. 11.

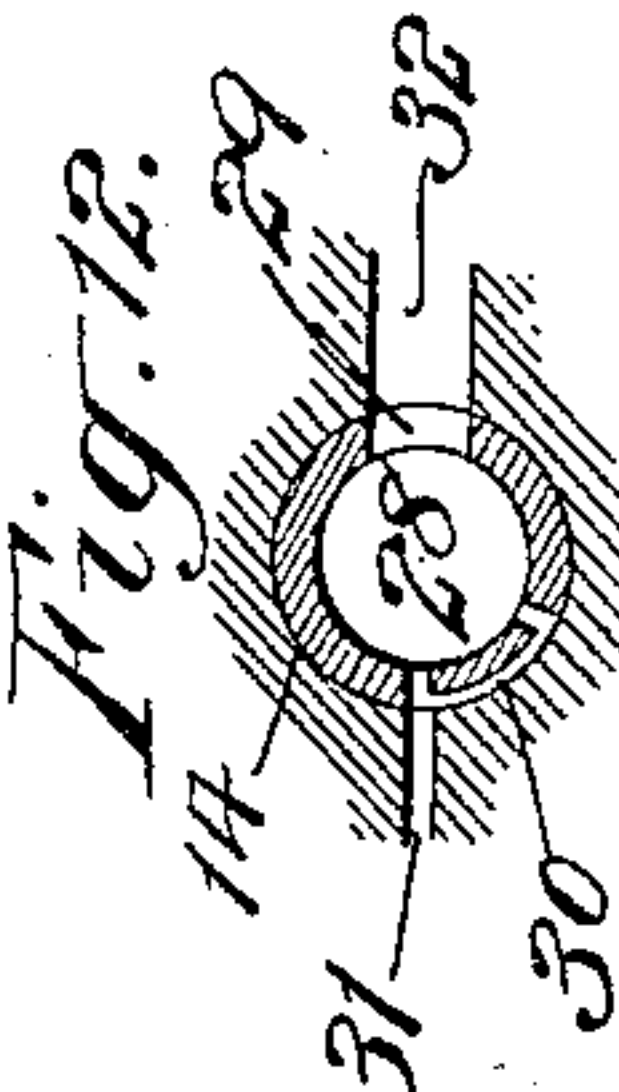


Fig. 12.

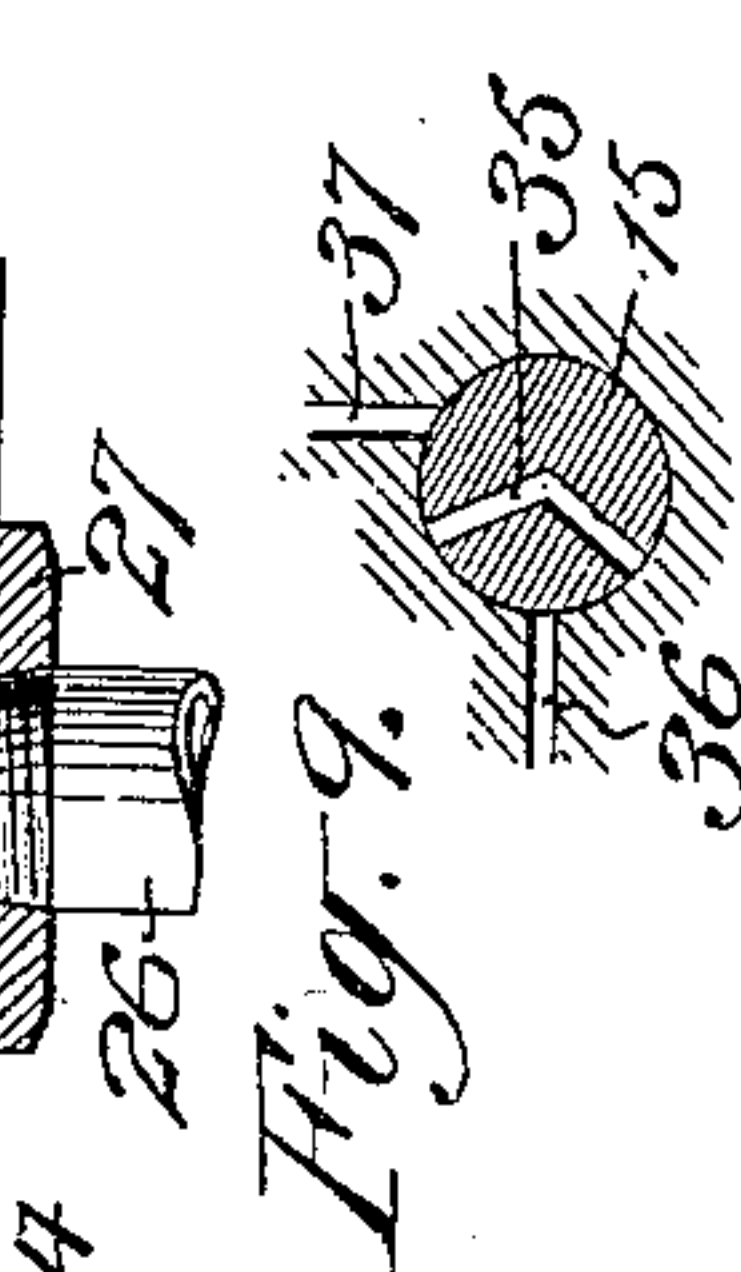


Fig. 9.



Fig. 10.

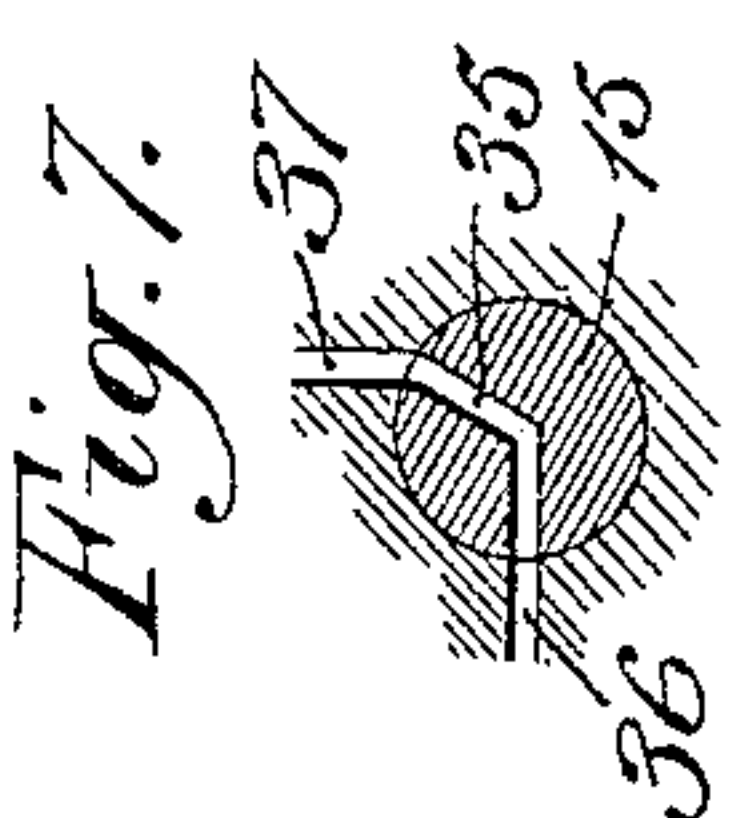


Fig. 7.

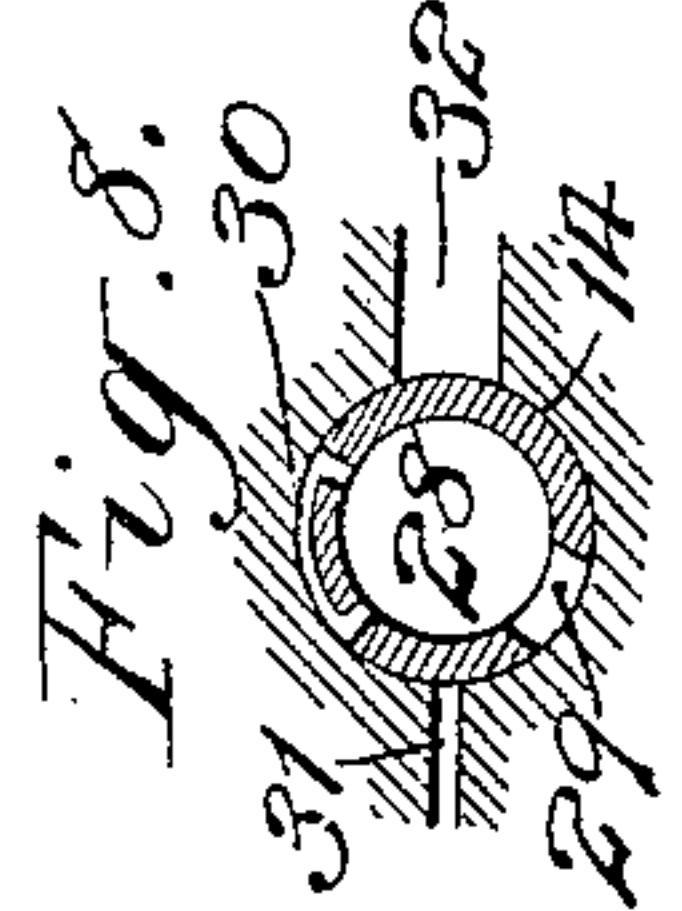


Fig. 8.

Inventor:  
Albert H. Taylor.  
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# UNITED STATES PATENT OFFICE.

ALBERT H. TAYLOR, OF EASTON, PENNSYLVANIA, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## HAMMER-DRILL.

No. 898,702.

Specification of Letters Patent.

Patented Sept. 15, 1908.

Application filed March 13, 1908. Serial No. 420,856.

*To all whom it may concern:*

Be it known that I, ALBERT H. TAYLOR, a citizen of the United States, and resident of Easton, in the county of Northampton and State of Pennsylvania, have invented a new and useful Improvement in Hammer-Drills, of which the following is a specification.

My invention consists in certain improvements in that class of pneumatic tools known as hammer drills, in which an air feed piston is provided for forcing the tool forward and holding it in its working position. In tools of this type which are used without mountings, it frequently happens that the distance from the rock face to be cut to the rock face against which the air feed piston rests, is greater than the length of the tool when fed to its extreme limit, thus requiring the building of a temporary backing for the feed piston sufficient to hold the tool in its working position and permit it to be forced forward to its work.

The object of my invention is to provide an adjustable extension for increasing the length of the air feed piston which forms the rear support for the tool, so as to obviate the necessity of building a temporary backing.

A practical embodiment of my invention is represented in the accompanying drawings in which

Figure 1 represents the tool as in use, Fig. 2 represents a portion of the tool on an enlarged scale partially in side elevation and partially in longitudinal central section, with my improved extension for the air feed piston applied thereto, the controlling valve being in position to close communication from the air supply both to the air feed and to the hammer, the air feed being in open communication with external atmosphere, Fig. 3 is a detail view partially in section and partially in side elevation, the controlling valve being shown in position to open the air supply to the air feed and close communication between the air supply and the hammer, the communication between the air feed and atmosphere also being shut off, Fig. 4 is a similar view with the controlling valve shown in position to open communication between the air supply and both the air feed and the hammer, communication between the air

feed and the atmosphere being closed, Fig. 5 is a transverse section taken in the plane of the line A—A of Fig. 2, looking in the direction of the arrows, Fig. 6 is a detail top plan view of the locking plate, Figs. 7 and 8 are detail sections showing the location of the several ports when the valve is in the position shown in Fig. 2, Figs. 9 and 10 are detail sections showing the location of the several ports when the valve is in the position shown in Fig. 3, and Figs. 11 and 12 are detail sections showing the location of the ports when the valve is in the position shown in Fig. 4.

The hammer cylinder is denoted by 1, its head block by 2 and its tool steel by 3. The air feed cylinder is denoted by 4 and it is attached directly to the head block 2. The hollow air feed piston, denoted by 5, telescopes within the cylinder 4 and is provided with a head 6 which loosely fits the bore of the said cylinder. This piston is fitted to slide through a collar 7 on the rear end of the cylinder 4 within which is placed a packing ring 8 and a soft packing 9 held in position by a gland 10. This piston forms the rear support for the tool.

An adjustable extension 11 telescopes within the hollow piston 5, which extension is provided with a suitable pointed rear end for engagement with the part which forms the support for the tool and an enlarged head at its front end for preventing the extension from falling out of the hollow piston when released therefrom. This air feed piston extension 11 may be locked in any desired adjustment, as follows: The rear end of the hollow piston 5 has fixed thereto a collar 12 having a tapered socket 12\* therethrough for receiving a wedge key 13, the tapered face of the said key bearing against the outer wall of the slot and the other face of which key bears against a gib 13\* interposed between the key and the extension 11.

The head block 2 of the tool is provided with a hole therethrough, a portion of which forms a taper seat for the tapered portion 14 of a controlling valve. The cylindrical portion 15 of the said valve at the end of its tapered portion, is provided with an angular portion 16 on which is fixed the locking plate



17 and the handle 18 of the valve, exterior to the head block. This locking plate 17 has its inner face adjacent to the outer face of the head block and is provided with three shallow recesses 19, 20, 21, arranged to respectively receive and retain against unintentional removal, the rounded end of the spring guided sliding pin 22 mounted in the head block.

The locking plate 17 is further provided with shoulders 23, 24, arranged to engage the projecting end of a stop 25 on the head block for limiting the rotary movement of the controlling valve in both directions.

The air supply pipe 26 is secured to the head block 2 by a collar 27 having a screw-threaded engagement with the hole in the head block beyond its taper seat. The controlling valve is further provided with a chamber 28 in open communication with the air supply pipe 26.

Ports 29, 30 lead from the chamber 28 to the seat in the head block. Ports 31, 32 lead respectively from the seat in the head block to the air feed chamber 33 and the hammer feed chamber 34, said ports being in the same plane as the valve ports 29, 30. The valve is further provided with a through-port 35. Ports 36, 37, in the same plane as the through-port 35, lead from the valve seat respectively to the air feed chamber 33 and to the external atmosphere.

By manipulating the valve through its handle 18, it will be seen that the air supply may be brought first into open communication with the air feed chamber and secondly into open communication with the air feed chamber and the hammer, or the supply may be cut off from both the hammer and the air feed chamber. In this last position the air feed chamber is brought into open communication with the external atmosphere.

In operation, when the distance from the rock face to be cut to the face against which the air feed piston is to rest, is so great that the tool would not reach when extended to its limit, the locking key 12 of the extension 11 is released and the extension is moved rearwardly a sufficient distance to bring the tool steel into position for work with the air feed piston telescoped within its cylinder. The key is then driven into position to lock the extension to its piston. The valve may then be operated to manipulate the tool and the air feed.

By providing a packing ring 8, soft packing 9 and gland 10, the air feed cylinder 4 may be made of rough material with its interior unfinished, the head 6 of the air feed piston having only such a fit within the cylinder 4 as will insure the stability of the parts. The advantage of this construction is that it does away with packing the piston

head, which packing wears away very rapidly when used, and also will permit the piston to travel freely within the cylinder even if the cylinder should become bent or dented as oft times happens in actual service. Furthermore, by providing the key 13 with a head 13\*\* at its small end, the key cannot be driven entirely out of the collar 12. The gib 13\* and also the key 13, are permanently retained in position by the attachment of the collar 12 to the rear end of the piston 5.

While the invention has been described in connection with an air feed hammer drill, it is to be understood that any other fluid power may be utilized and any other type of tool may be employed in connection with this invention without departing from the spirit and scope thereof.

What I claim is:

1. A pneumatic tool, an air pressure feeding device therefor and an adjustable extension secured to said device, forming an end support for the tool.

2. A pneumatic tool, an air pressure feeding device therefor comprising a cylinder and its piston, and an adjustable piston extension forming an end support for the tool.

3. A pneumatic tool, an air pressure feeding device therefor comprising a cylinder and its piston, an adjustable piston extension forming an end support for the tool, and means for locking the extension to and releasing it from the piston.

4. A pneumatic tool, an air pressure feeding device therefor comprising a cylinder and its hollow piston, and an adjustable extension telescoping within the piston, forming an end support for the tool.

5. A pneumatic tool, an air pressure feeding device therefor comprising a cylinder and its hollow piston, an adjustable extension telescoping within the piston, forming an end support for the tool, and means for locking the extension to and releasing it from the piston.

6. A pneumatic tool, an air pressure feeding device therefor comprising a cylinder and a piston having its head loosely fitting the bore of the cylinder, a pressure tight joint between the rear end of the cylinder and the piston, an adjustable piston extension forming an end support for the tool and means for locking the extension to and releasing it from the piston.

7. A pneumatic tool, an air pressure feeding device therefor comprising a cylinder attached directly to the tool, a piston fitted to slide within the cylinder and an adjustable piston extension forming an end support for the tool.

8. A pneumatic tool, an air pressure feeding device therefor comprising a cylinder attached directly to the tool, a hollow piston

fitted to slide in the cylinder, an adjustable extension telescoping within the piston forming an end support for the tool and means for locking the extension to and releasing it from  
5 the piston comprising a gib engaging the extension and a wedge key engaging the gib.

In testimony, that I claim the foregoing as

my invention, I have signed my name in presence of two witnesses, this eleventh day of March 1908.

ALBERT H. TAYLOR.

Witnesses:

RUSSELL H. WILHELM,  
WARD RAYMOND.