

No. 827,211.

PATENTED JULY 31, 1906.

S. A. CASPARIS.
DRILL.

APPLICATION FILED MAR. 28, 1906.

2 SHEETS—SHEET 1.

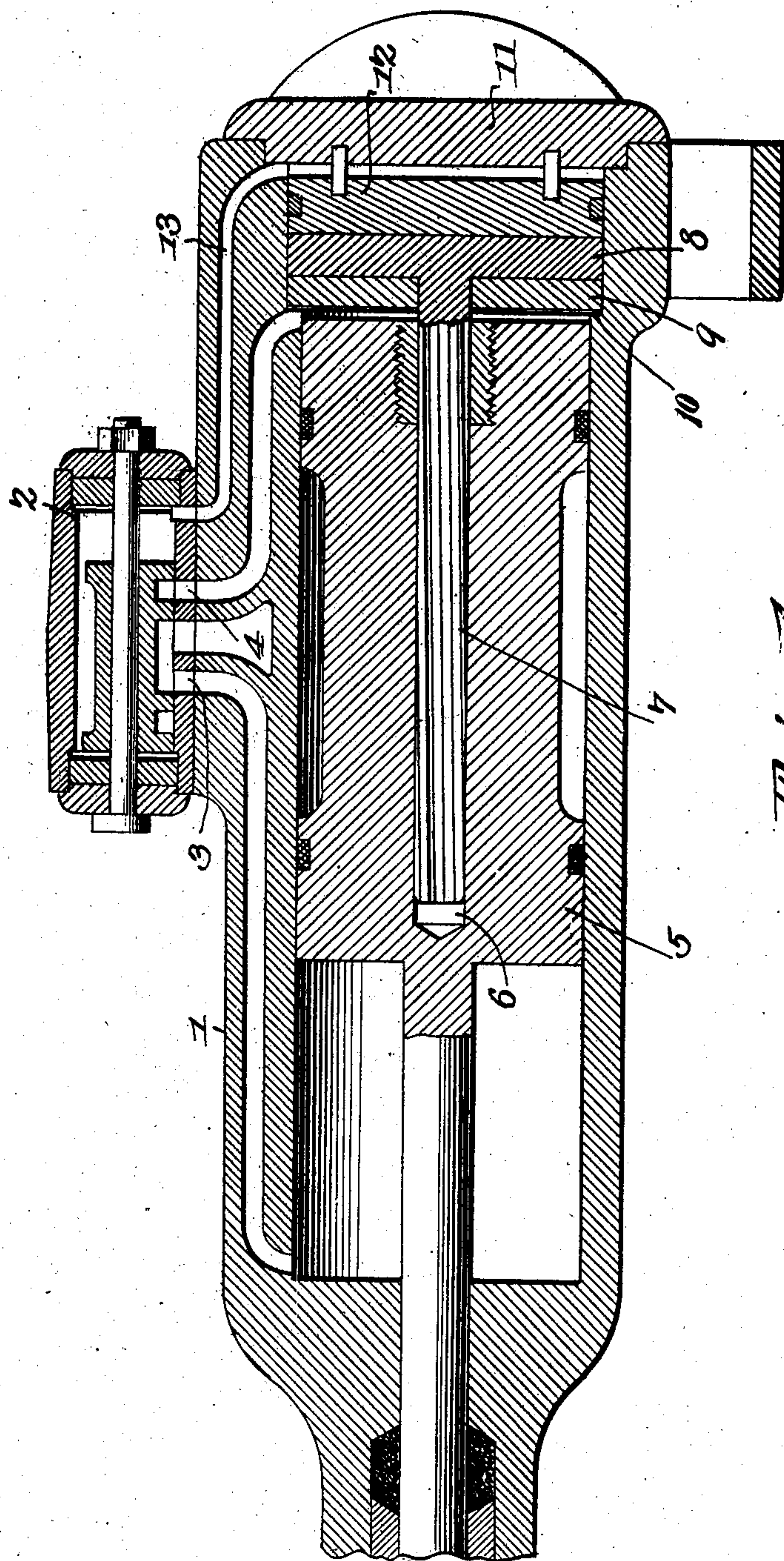


Fig. 1.

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Hubert D. Lawson

Silvio A. Casparis, INVENTOR.

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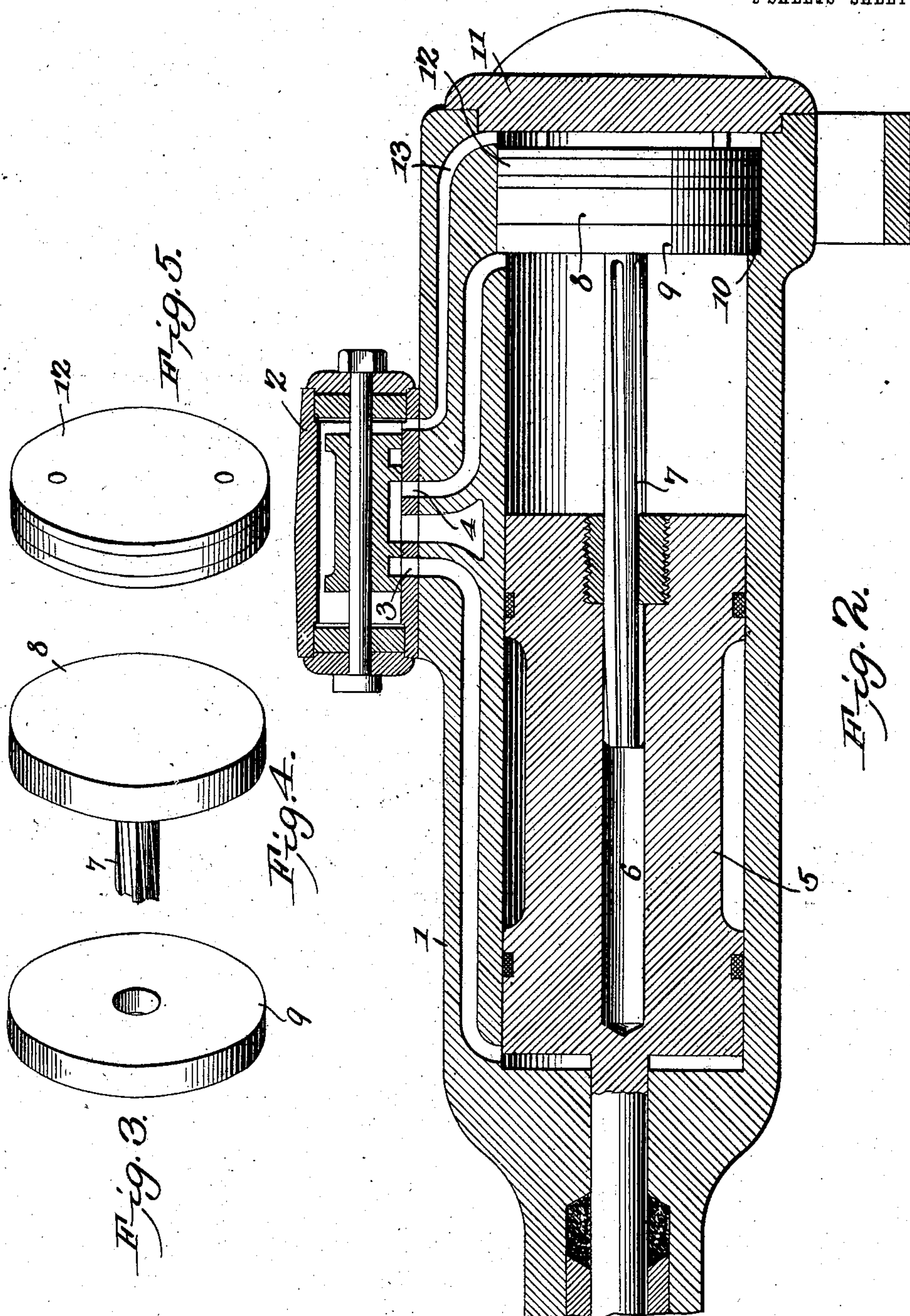
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E. H. Stewart
Herbert D. Lawson

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UNITED STATES PATENT OFFICE.

SILVIO A. CASPARIS, OF COLUMBUS, OHIO.

DRILL.

No. 827,211.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed March 28, 1906., Serial No. 308,490.

To all whom it may concern:

Be it known that I, SILVIO A. CASPARIS, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Drill, of which the following is a specification.

This invention relates to percussion-drills such as utilize elastic fluids and which are ordinarily employed for drilling rock and for similar purposes. In devices of this character heretofore constructed it has been customary to use in connection with the usual rifle-bar an arrangement of pawls, springs, and ratchets for the purpose of producing a partial or complete rotation of the drill subsequent to the stroke and during its return movement, said drill only rotating during its return stroke. The mechanism utilized for producing this result adds considerably to the cost of the tool and by reason of the number of parts utilized in its construction very often gets out of order.

The object of this invention is to dispense with mechanism of this character for producing the desired result and instead to utilize the elastic fluid for the purpose of causing the rotation of the drill during its return stroke and to permit it to move forward without this rotating movement.

With these and other objects in view the invention consists of a casing or body of any ordinary or preferred construction in which a bit-carrying piston is mounted to reciprocate.

A chest is mounted on the body for the purpose of directing elastic fluid against the ends of the piston and for exhausting it from the body, so as to produce the necessary movement of the piston. A rifle-bar such as ordinarily employed is also utilized, and the head of this bar bears upon a rotatable washer, which in turn contacts with a shoulder within the body. A holding-piston is interposed between the back head of the casing and the head of the rifle-bar, and a port extending from the steam-chest opens between the back head and the piston, so that the elastic fluid will exert a constant uninterrupted pressure upon the holding-piston. While the bit-carrying piston is being retracted or returned within the body, the elas-

tic fluid will be exhausted from between said piston and the washer and the pressure of the elastic fluid between the holding-piston and the back head will be sufficient to hold the rifle-bar and its head against rotation, so that the return movement of the bit-carrying piston will result in its rotation. When, however, elastic fluid is discharged between the washer and the bit-carrying piston for the purpose of propelling the bit forward, the pressure of the fluid upon opposite faces of the head of the rifle-bar will be equalized and the binding action of the washer upon the shoulder will be removed, and the rifle-bar will therefore be capable of rotating while the bit is going forward. As a result of this said bit will not rotate upon its forward stroke.

The invention also consists of certain other novel features of construction and combinations of parts, which will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings, Figure 1 is a section through the device, showing the positions of the parts prior to the forward stroke of the tool-carrying piston. Fig. 2 is a similar view showing the parts subsequent to the forward stroke. Fig. 3 is a detail view of the washer of the holding means. Fig. 4 is a similar view of a portion of the rifle-bar and of its head, and Fig. 5 is a detail view of the holding-piston.

It is to be understood that the mechanism constituting this invention is adapted for use in connection with any type of percussion-drill in which pawls and ratchets are now utilized, the same being designed as a substitute for said pawl-and-ratchet mechanism. For this reason it is not deemed necessary to enter into a detailed description of any of the parts of the tool other than those directly or coöperating with the parts constituting this invention.

In the drawings, 1 is the cylinder or body of the drill, the same having a steam-chest 2 thereon, from which elastic fluid is directed into opposite portions of the cylinder through ports 3 and 4. A bit-carrying piston 5 is mounted to reciprocate within the cylinder 1 and has a bore 6, into which projects a rifle-bar 7, such as ordinarily used, said rifle-bar

having a head 8, which bears against a washer 9, contacting with an interior annular shoulder 10, formed in the cylinder 1 between the port 4 and the back head 11 of the tool. A holding-piston 12, in the form of a disk which is loosely mounted on the head 8, is disposed within the cylinder between said head and the back head 11, and a port 13 extends from the chest 2 and opens between said piston 12 and the back head 11. The space between the head 11 and piston 12 is constantly in communication with the steam-chest 2 through the port 13, and therefore the piston 12 is pressed against the head 8, which in turn binds the washer 9 upon the shoulder 10.

When the piston 5 is returning toward the back head 11, the elastic fluid is exhausted through the port 4, and as the rifle-bar and its head 8 are held against rotation by reason of the pressure exerted by the fluid against the piston 12 it is of course obvious that piston 5 will be rotated during its return movement. When, however, the limit of the return movement is reached and elastic fluid is directed through the port 4 and in rear of piston 5, the pressure upon the opposite faces of the washer 9, head 8, and piston 12 is equalized, and the rifle-bar is therefore free to rotate during the forward movement of piston 5, and as a result said piston and the bit carried thereby will not be rotated. This backward and forward operation of the piston can be continued indefinitely, and the employment of this mechanism will always result in the rotation of the piston 5 upon its return stroke and its non-rotation during its forward stroke. By the employment of the elastic fluid for effecting the proper binding and release of the rifle-bar a considerable saving in the cost of the tool is produced and the same is rendered more durable and effective, because there are no intricate parts which are liable to get out of order as a result of constant use. By utilizing elastic fluid for holding the rifle-bar against rotation it will be obvious that should the tool be held by some obstruction against rotation while moving in its return stroke the holding means will slip, and injury to the tool will thus be avoided.

While the device herein described is shown in connection with a percussion-drill, it is to be understood that the same may be utilized in connection with any device utilizing a rotatable element which it is desired to intermittently stop.

What is claimed is—

1. A tool comprising a body, a bit-carrying device therein, a rifle-bar, means separate from the rifle-bar and under constant pressure of motive fluid for holding the rifle-bar normally against rotation, and means for intermittently directing motive fluid upon the

holding means to equalize the pressure thereon and permit its rotation.

2. A tool of the character described comprising a body, a tool-carrying device movably mounted within the body, a rifle-bar, means separate from the rifle-bar for holding it against rotation, means for constantly directing fluid under pressure against said holding means, and means for intermittently equalizing the pressure upon the holding means to alternately hold and release the rifle-bar.

3. A tool of the character described comprising a body, a tool-carrying piston movably mounted therein, a rifle-bar, means for clamping the bar to hold it against rotation, means for constantly directing motive fluid against one face of the holding means and means for intermittently directing motive fluid between the piston and the holding means whereby the pressure on said holding means is equalized during the alternate strokes of the piston.

4. A tool of the character described comprising a body, a tool-carrying piston movably mounted therein, a rifle-bar, clamping means for holding the bar against rotation, said body having a port for constantly directing fluid against one face of the clamping means and having ports for directing motive fluid against opposite ends of the piston alternately and against the other face of the clamping means intermittently.

5. In a tool of the character described the combination with a body having a tool-carrying piston movably mounted therein; of a rifle-bar having a head, an interior projection in the body and overlapped by the head, a holding-piston bearing upon said head, means for constantly directing motive fluid under pressure against said holding-piston to clamp the head when pressure upon said head is not equalized and means for directing motive fluid between one end of the tool-carrying piston and the head intermittently to equalize pressure on the head.

6. A tool of the character described comprising a body having an interior shoulder, a tool-carrying piston mounted therein, means for conveying motive fluid to opposite ends of the piston, a rifle-bar having a head disposed beyond the path of the piston, a washer interposed between said head and the shoulder, a holding-piston movably mounted within the body and contacting with the head, and means for constantly directing motive fluid against said piston.

7. A tool of the character described comprising a body having an interior shoulder, a tool-carrying piston movably mounted within the body between the shoulder and one end of the body, said body having ports for

directing motive fluid against the ends of the
piston, a washer loosely bearing upon the
shoulder, a rifle-bar having a head bearing
on the washer, and a piston loosely mounted
5 within the body and bearing upon the head,
said body having a port for constantly direct-
ing motive fluid between the holding-piston
and the adjoining head of the body.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature 10
in the presence of two witnesses.

SILVIO A. CASPARIS.

Witnesses:

STEPHEN H. CHILCOTT,
W. O. TAYLOR.