No. 782,429. PATENTED FEB. 14, 1905.

R. TEMPLE.

ROCK DRILL.

APPLICATION FILED DEC. 18, 1903.

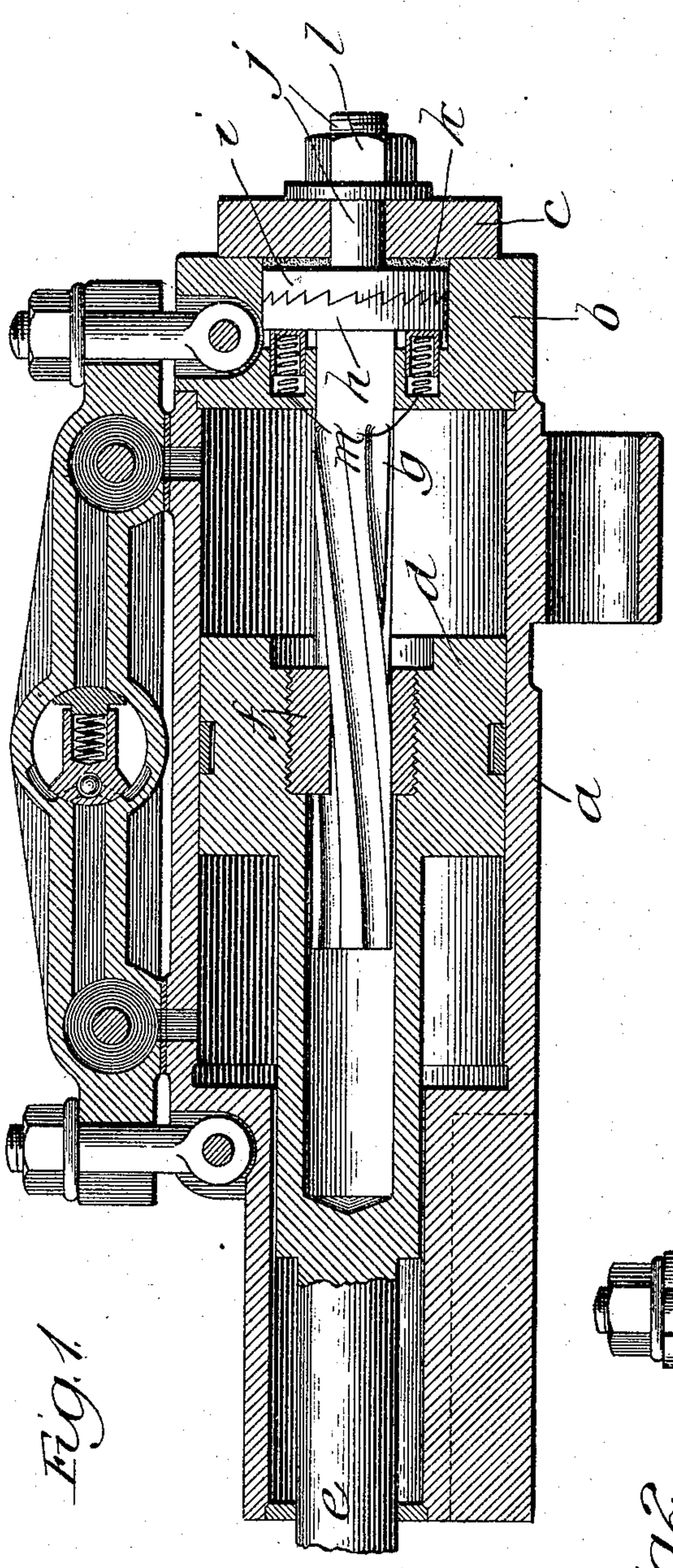

Fig. 1.

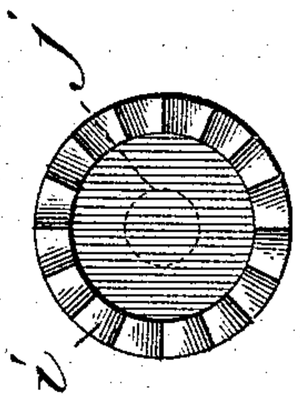

Fig. 4.

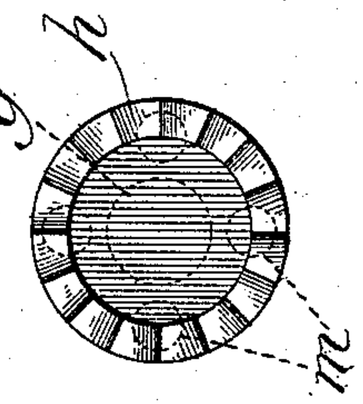

Fig. 3.

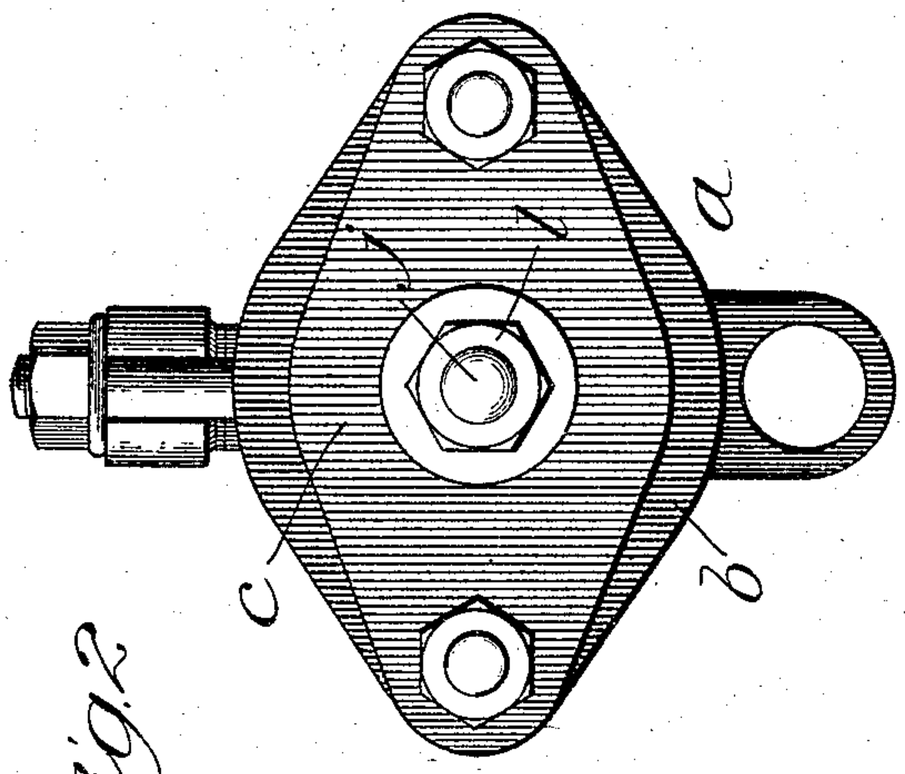

Fig. 2.

Witnesses:
Chas. E. Gaylord.
Geo. C. Davison.

Inventor:
Robert Temple,
By Thomas F. Sheridan,
Atty.

No. 782,429. Patented February 14, 1905.

UNITED STATES PATENT OFFICE.

ROBERT TEMPLE, OF DENVER, COLORADO, ASSIGNOR TO THE TEMPLE GAS ENGINE & MACHINE COMPANY, OF DENVER, COLORADO, A CORPORATION OF COLORADO.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 782,429, dated February 14, 1905.

Application filed December 18, 1903. Serial No. 185,702.

To all whom it may concern:

Be it known that I, ROBERT TEMPLE, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Rock-Drills, of which the following is a specification.

This invention relates to that class of rock-drills which are adapted to be used in connection with fluid under pressure, such as air or steam, for the purpose of reciprocating and rotating the drill proper, and is intended to be used in connection with the type of rock-drill illustrated in an application for Letters Patent of the United States, Serial No. 168,951, filed by me August 10, 1903.

The principal object of the invention is to provide a rock-drill with simple, economical, and efficient mechanism for rotating the drill proper.

Other and further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists principally in a rock-drill of the type referred to in which there are combined a cylinder portion, a piston reciprocatingly mounted therein, a rifled nut in said piston, a rifled bar in engagement with said nut and provided with a face-ratchet at the outer end, and a second face-ratchet in engagement therewith to rotate the piston in a step-by-step manner by and during the reciprocations thereof.

The invention consists, further and finally, in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a cylinder and piston portion of one type of rock-drilling machine constructed in accordance and fitted with these improvements; Fig. 2, an end view of the cylinder shown in Fig. 1; Fig. 3, an end view of the rifled bar with its face-ratchet, and Fig. 4 an end view of the friction-ratchet hereinafter more fully described.

In the art to which this invention relates it is well known that it is highly desirable to provide some simple and efficient mechanism by which the rock-drill proper may be rotated in a step-by-step manner at the end of each reciprocating cycle, all of which will more fully hereinafter appear.

In constructing a rock-drill in accordance with these improvements and describing, preferably, but one type a cylinder portion *a* is provided, having a head portion formed in two parts *b* and *c* at one end. A reciprocating piston *d* is provided and movably mounted in the cylinder portion, so as to be reciprocated as steam, air, or other motive fluid is admitted and exhausted alternately to and from each end of the cylinder. This piston portion is provided with a stem portion *e*, extending out of one end of the cylinder, to which the drill proper may be secured in any usual and well-known manner, preferably as shown in connection with my former application above referred to, and which therefore needs no further description or illustration herein. It is very desirable during the reciprocating movements of this piston to rotate it in a step-by-step manner in one direction, and preferably as the piston is being moved backwardly to the right, as shown in Fig. 1. In order to accomplish this result, the piston portion is provided with a rifled nut *f*, secured in threaded engagement therewith, as shown particularly in Fig. 1. A reciprocating rifled bar *g* is provided and engages with the rifled bore of the nut, as shown in such figure. One end of the rifled bar is provided with a face-ratchet *h*, having ratchet-teeth of a saw-tooth shape, as shown particularly in Fig. 1. A second face-ratchet *i* is provided and frictionally held in position in the cylinder-head portion *c* by having its stem portion *j* mounted therein and held against a fibrous friction-washer *k* by means of a nut *l*. A plurality of helically-coiled springs *m* is inserted in the cylinder-head and pressed against the smooth face of ratchet *h*, so as to hold it yieldingly in engagement with the second ratchet. An examination of Fig. 1 will show that the stem portion of the frictionally-held ratchet *i* ex-

tends through the head of the cylinder and is exposed to view, so that it provides for two things—first, a simple and economical means for frictionally holding the second ratchet in position, and, second, the immediate detection by the operator of any rotary movement. The latter is extremely important in that it enables the operator to secure the frictionally-held ratchet in position with just the required amount of friction to make it non-rotatable, while at the same time providing for immediate detection of any rotation thereof, all of which will be understood by those skilled in the art.

In operation during the forward movement of the piston the rifled nut carries the rifled bar forward for a short distance of its motion and during the remainder of its motion turns the rifled bar, with its face-ratchet, to the left against the turning of the hands of a clock, the helical springs normally holding its ratchet under tension. During the rearward movement of the piston the rifled bar is moved backwardly and the tendency is to turn the same to the right in the direction of the hands of a clock. The ratchet mechanism, however, prevents such a turning movement of the rifled bar, the consequence being that the piston, with its drill, is turned in the opposite direction and rotated in a step-by-step manner during its reciprocating cycle and while the piston is retreating.

I claim—

1. In a rock-drill of the class described, the combination of a cylinder portion, a reciprocating piston movably mounted therein, a rifled nut in engagement with said piston-head, a rifled bar in engagement with said nut and provided with a radially-arranged face-ratchet at its outer end, a second radially-arranged face-ratchet frictionally held in the cylinder-head, a stem portion therefor extending through the cylinder-head and provided with a threaded end portion, a threaded nut on the threaded end of said stem portion, a yielding washer inserted between the second ratchet and the cylinder-head to hold the same in frictional engagement with said cylinder-head, and spring mechanism engaging the first-named ratchet, so as to normally hold it and thereby the rifled bar in engagement with the second ratchet, substantially as described.

2. In a rock-drill of the class described, the combination of a cylinder portion, a piston reciprocatingly mounted therein, a rifled nut in said piston, a reciprocating rifled bar in engagement with said nut and provided with a radially-arranged face-ratchet at its outer end, and a second face-ratchet secured to the frame of the machine and adapted to be alternately thrown into and out of engagement with the ratchet of the rifled bar as the same is reciprocated, substantially as described.

3. In a rock-drill of the class described, the combination of a cylinder portion, a piston reciprocatingly mounted therein, a rifled nut in said piston, a rifled bar in engagement therewith and provided with ratchet mechanism at its outer end, a second ratchet frictionally secured to the frame of the machine and provided with an exposed part or portion by which any movement thereof may be detected, substantially as described.

4. In a rock-drill of the class described, the combination of a cylinder portion, a piston reciprocatingly mounted therein, a rifled nut in said piston, a rifled bar in engagement with said nut and provided with a radially-arranged face-ratchet, and a second ratchet frictionally secured to the head of the machine in engagement with the first-named ratchet to rotate the same and thereby the piston in a step-by-step manner and provided with exposed holding mechanism extending through the frame of the machine by which it is frictionally held in place and any movement thereof detected, substantially as described.

ROBERT TEMPLE.

Witnesses:
THOMAS F. SHERIDAN,
HARRY I. H. CROMER.