

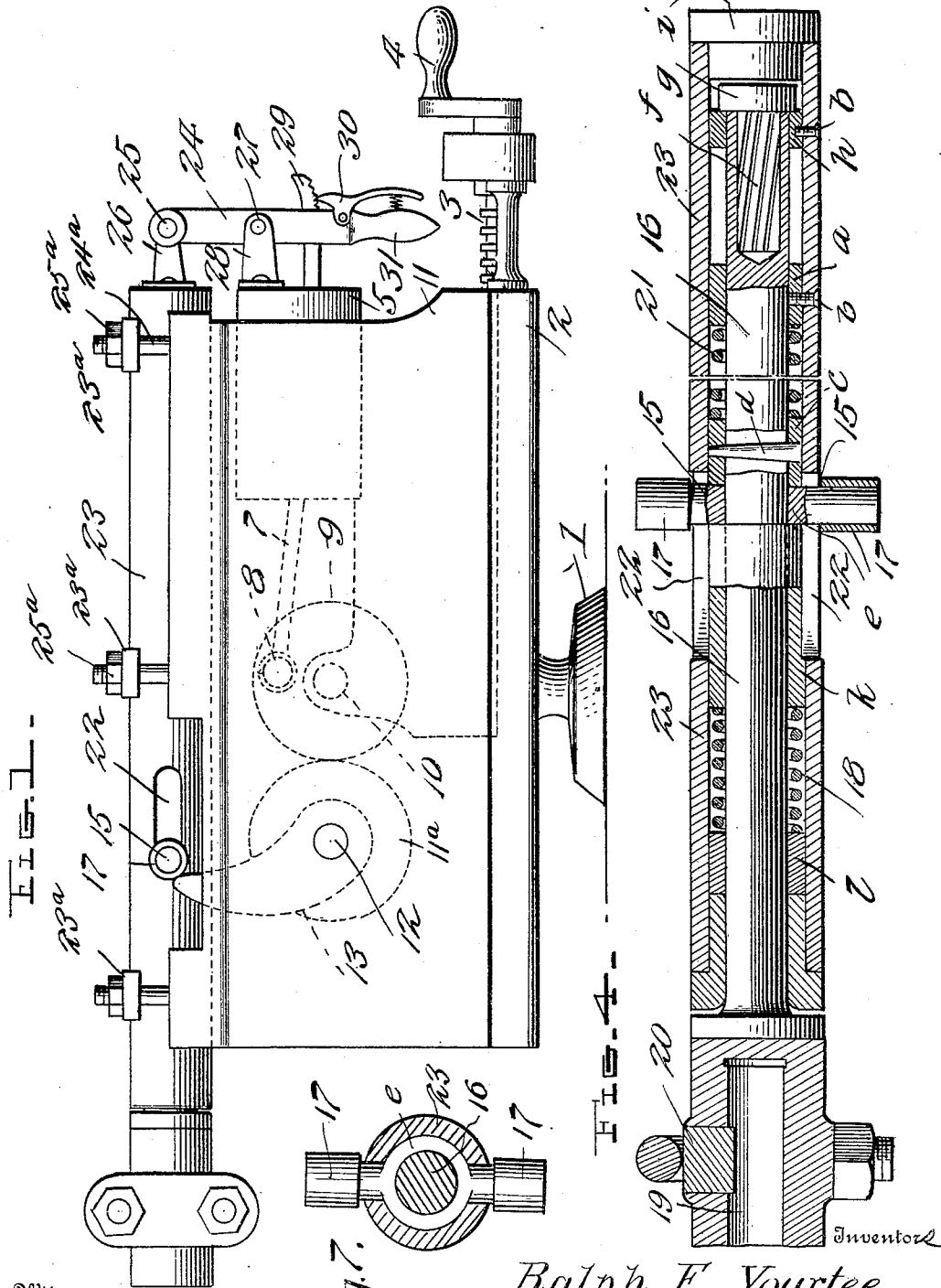
R. F. YOURTEE & W. E. MAULL.
ROCK DRILL.

APPLICATION FILED OCT. 15, 1907.

Patented Jan. 11, 1910.

3 SHEETS—SHEET 1.

946,420.



Witnesses
Frank Lough

R. F. Yourtee

Fig. 7.

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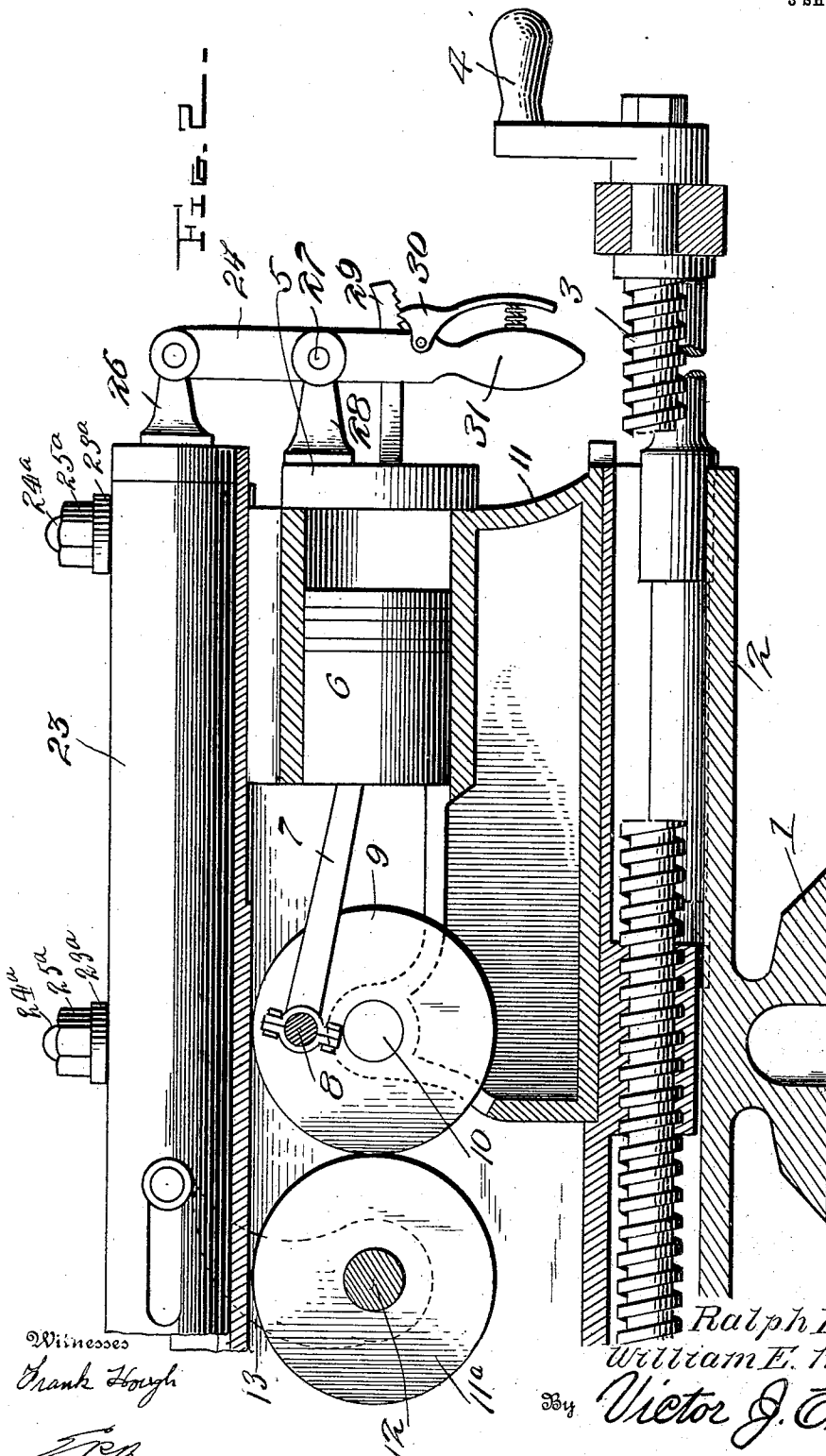
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FIG. 5—

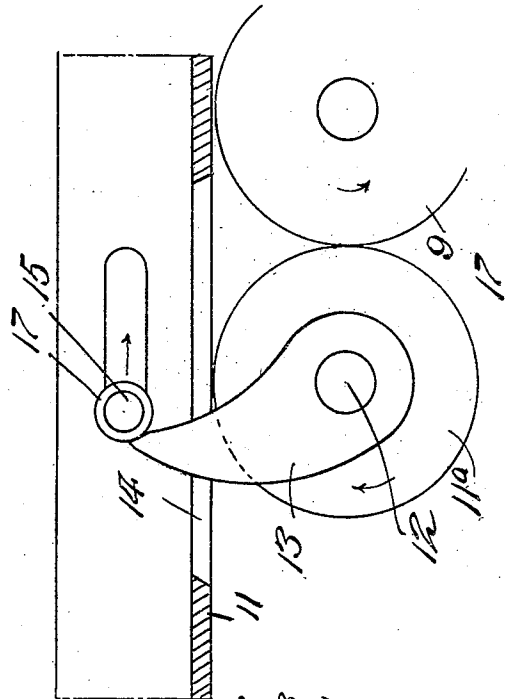


FIG. 6—

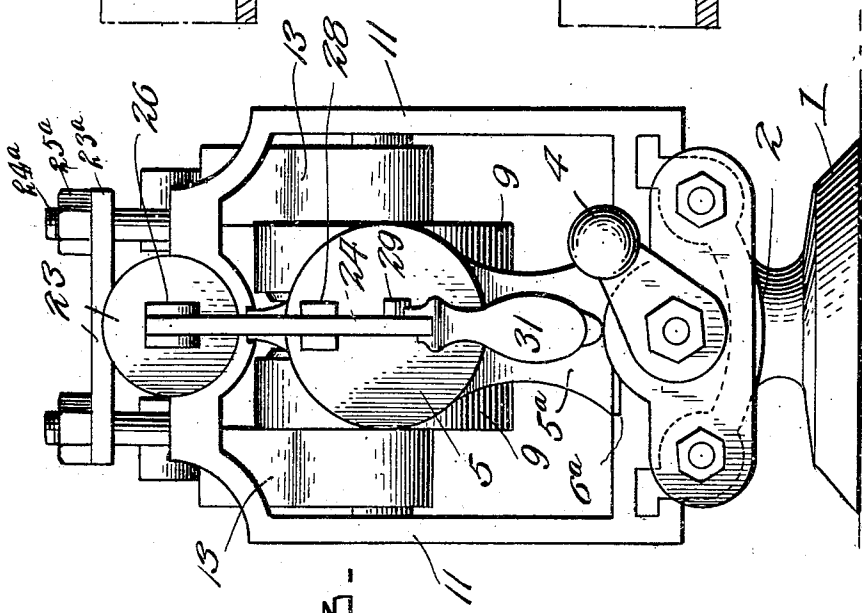
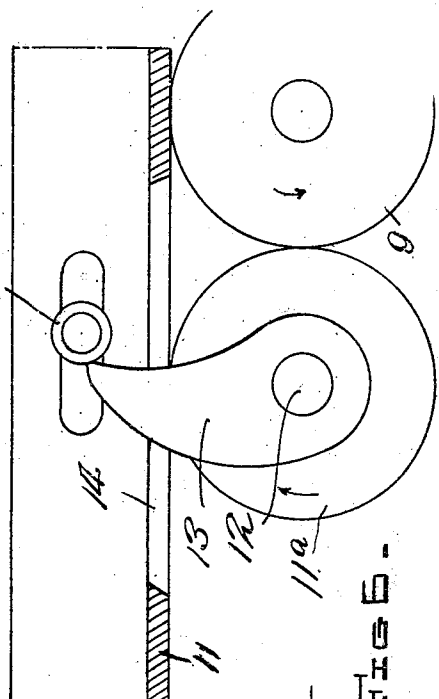


FIG. 7—

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UNITED STATES PATENT OFFICE.

RALPH F. YOURTEE AND WILLIAM E. MAULL, OF ST. LOUIS, MISSOURI.

ROCK-DRILL.

946,420.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed October 15, 1907. Serial No. 397,514.

To all whom it may concern:

Be it known that we, RALPH F. YOURTEE and WILLIAM E. MAULL, citizens of the United States of America, residing at the city of St. Louis, in the State of Missouri, have invented new and useful Improvements in Rock-Drills, of which the following is a specification.

This invention relates to rock drills, and one of the principal objects of the same is to provide a drill of comparatively light weight so that it may be carried from place to place without expensive moving machinery and which will operate rapidly and efficiently for its purpose.

Another object of the invention is to provide a rock drill designed to be operated by a small gasoline motor.

Still another object of the invention is to provide friction gearing for actuating the cams for retracting the drill against the spring.

These and other objects may be attained by means of the construction illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of a drill made in accordance with our invention. Fig. 2 is a longitudinal section part in elevation of the same on an enlarged scale. Fig. 3 is an enlarged end view of the same. Fig. 4 is an enlarged longitudinal section of the drill shaft. Fig. 5 is an enlarged view of one of the cams for operating upon the trunnions of the drill shaft, said cam being in one of its positions. Fig. 6 is a similar enlarged view showing the cam in another of its positions. Fig. 7 is a transverse sectional view of the drill shaft and its tubular bearing.

Referring to the drawings for a more specific description of our invention, the numeral 1 designates a suitable base having a longitudinal tubular guideway 2 mounted thereon, a feed screw 3 being disposed in the guideway and provided with a handle 4 for turning the same, these parts being of the usual or any suitable construction.

A suitable motor 5 provided with a piston 6 is utilized for actuating the drill. The motor 5 is mounted upon a standard 5^a, and the standard 5^a is supported in a guideway 6^a at its base to permit the motor to slide in and out of the frame 11. The piston 6 has connected to it a piston rod 7 connected to a crank shaft 8 extending across between two friction gear wheels 9 mounted upon a shaft 10 journaled in a frame 11. A similar pair

of friction wheels 11^a are journaled on an axle 12 mounted in the frame, and the peripheries of said friction wheels are normally in contact so that rotary motion is communicated to the wheels 11^a from the wheels 9.

On the shaft 12 cams 13 are secured, said cams being rotated with said shaft 12. The cams 13 extend through a slot 14 in the frame work 11 and come into contact at each revolution with a pair of trunnions 15 on the drill shaft 16. The trunnions 15 are provided with rollers 17 to reduce the friction upon the cams 13. The drill shaft 16 is surrounded by a recoil spring 18, and connected to the shaft 16 is a drill holder 19 provided with a clamp 20 for securing the drill tool in place.

A projecting spring 21 surrounds the shaft 16, one end of said spring bearing against a collar *a* connected to an inclosing tube 23 by a screw *b*, while the opposite end of said spring bears against a collar *c* secured to the shaft 16 by a pin *d*. Slots 22 are formed in the tube 23, and the trunnions 17 project through these slots, said trunnions being formed upon a sleeve *e* mounted loosely on the shaft 16. A rifle bar *f* is disposed in a recess in the end of the shaft 16, said rifle bar having a head *g* adapted to contact with a stop collar *h* secured to the tube 23. Fitted in the end of the tube 23 is a plug *i*, against which the head *g* of the rifle bar *f* bears when the shaft 16 is in its retracted position. A recoil spring 18 surrounds the shaft 23 and bears at its ends against collars *k*, *l* secured in the tube 23.

The tube 23 is secured to the frame 11 by means of plates 23^a through which bolts 24^a extend, the heads of said bolts being connected to the frame 11, and nuts 25^a being adjustable upon the ends of said bolts.

In order to move friction wheels 9 and 11^a out of contact, we have provided a lever 24 pivoted at 25 to a bracket 26 on the end of the tube 23, said lever being pivoted at 27 upon a bracket 28 connected to the motor 5. A rack bar 29 provided with rack teeth is also secured to the motor, and a spring pawl 30 connected to the handle 31 of the lever 24 is adapted to engage the teeth of the rack bar. The lever 24 is operated to move the friction wheels 9 and 11^a into and out of contact.

The operation of the machine may be briefly described as follows: When the fric-

tion wheels 9 and 11^a are in contact, the cams 13 rotate in the direction indicated by the arrows in Figs. 5 and 6, said cams coming in contact with the rollers 17 of the trunnions 5 15 will push said trunnions backward against the tension of the spring 21, and when released, as the cams pass the trunnions, the drill tool is driven forward by the expansion of said spring, and the drill tool 10 strikes the bottom of the hole in the rock. When the trunnions are being moved backwardly, the head *g* of the rifle bar is brought into contact with the plug *i* with sufficient stress to create friction between said head 15 and plug and hold the head against turning during the final backward movement of the drill shaft. During the time the rifle bar is held against rotation, the drill shaft is moved or rotated sufficiently to give the drill 20 tool a turn in the drill hole.

Our invention is of simple construction, is light in weight, operates quickly and efficiently for its purpose, and can be manufactured at comparatively slight cost.

25 Having thus described the invention, what is claimed as new, is:—

1. In a rock drill, the combination of a frame, a motor provided with a piston rod, a pair of friction gear wheels connected to 30 said rod, a shaft journaled in the frame, friction gear wheels mounted on the shaft, cams on said shaft, a drill shaft provided with oppositely disposed trunnions, a slotted tube

for supporting said shaft, a spring within said tube, and means for moving said motor, 35 piston rod and friction gear wheels connected thereto for throwing the drill into and out of operation.

2. In a rock drill, the combination of a frame, a guideway on the frame, a motor 40 mounted to slide in the guideway, a piston rod, friction gears connected to said piston rod, a shaft, cams on said shaft, friction gear wheels on said shaft, a drill shaft provided with oppositely disposed trunnions to 45 be actuated by said cams, and a lever for sliding the motor, piston rod and friction wheels into and out of contact with the friction wheels on the cam shaft.

3. In a rock drill, the combination of a 50 motor, friction gear wheels actuated by said motor, a cam shaft, friction gears on the cam shaft, means for shifting the motor and friction gear wheels connected thereto into and 55 out of contact with the friction wheels on the cam shaft, a drill shaft, and trunnions connected to the drill shaft in the path of movement of said cams.

In testimony whereof we affix our signatures in presence of two witnesses.

RALPH F. YOURTEE.
WILLIAM E. MAULL.

Witnesses:

WILLIAM E. CAULFIELD,
JOHN M. KELLY.