No. 793,319. PATENTED JUNE 27, 1905.

C. F. PAUL, JR.

HAND ROCK DRILL.

APPLICATION FILED FEB. 28, 1905.

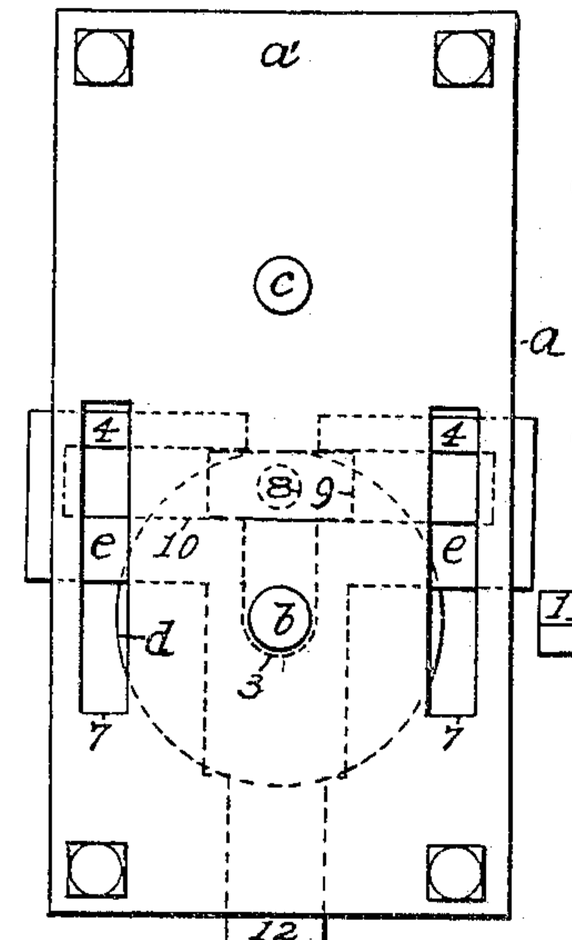

Fig. 1

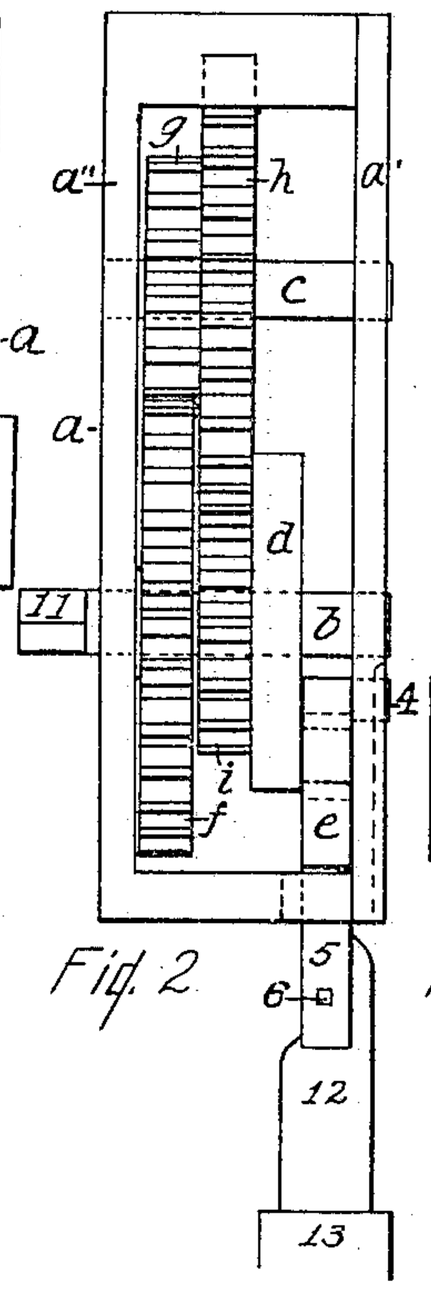

Fig. 2

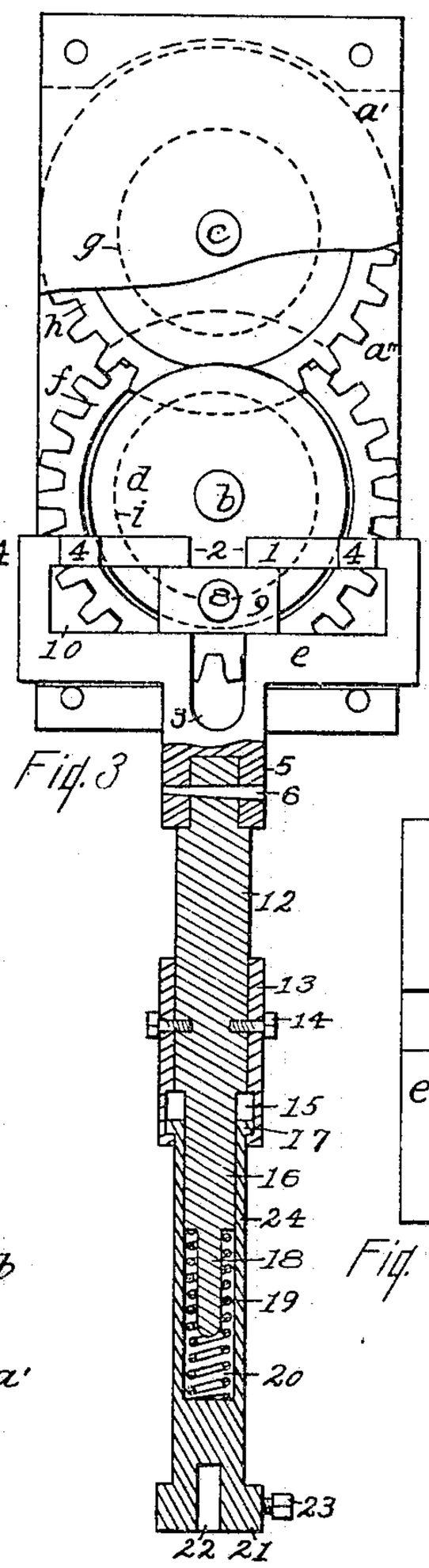

Fig. 3

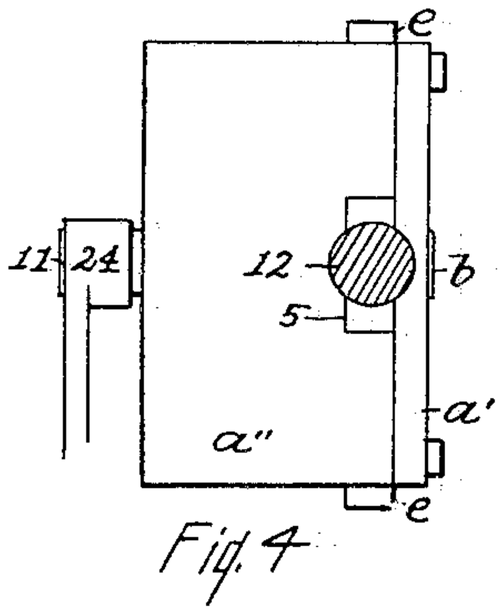

Fig. 4

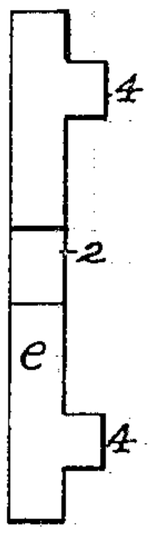

Fig. 5

Witnesses
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No. 793,319. Patented June 27, 1905.

UNITED STATES PATENT OFFICE.

CHRISTIAN F. PAUL, JR., OF PEEKSKILL, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HENRY AMLING, JR., OF NEW YORK, N. Y.

HAND ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 793,319, dated June 27, 1905.

Application filed February 28, 1905. Serial No. 247,670.

To all whom it may concern:

Be it known that I, CHRISTIAN F. PAUL, JR., a citizen of the United States, and a resident of Peekskill, in the county of Westchester and State of New York, have invented certain new and useful Hand Rock-Drills, of which the following is a specification.

This invention relates to rock-drills, and has for its object a drill-operating head comprising compact devices for operating the drill, the head to be attachable to a tripod, as with power-drills. The tripod-attachable means are not shown herein, as they are to constitute the subject-matter of another application for patent.

The object specified is attained by the means set forth in the specification and the accompanying drawings, in which like characters refer to similar parts throughout the several views.

Figure 1 is a front view of the drill-head. Fig. 2 is a side view of the drill-head. Fig. 3 is a front view of the drill-head, representing the front plate partly cut away, disclosing the mechanism and the spindle in longitudinal cross-section. Fig. 4 is a view of the bottom of the drill-head. Fig. 5 is a top view of the yoke attached to the spindle.

By reference to Fig. 3 it will be seen that the main spindle 12 is connected with a slotted yoke *e*. The sliding block 9 in the slot engages with the wrist-pin 8 in the disk *d*, so that revolving said disk imparts a reciprocating movement to the spindle 12.

The means for revolving the disk *d* are more clearly shown in Fig. 2. The disk *d* has a spur-pinion *i* fastened to it, and the two turn upon the shaft *b*. The spur-wheel *f* is fast to the shaft *b*. The spur-pinion *g*, which is engaged by the spur-wheel *f*, and the spur-wheel *h*, that engages the spur-pinion *i*, are both secured to the shaft *c*, or they may be fastened together and revolve on the shaft *c*. Turning the shaft *b* will impart motion to the wheels *g h*, and they will cause the turning of the pinion *i* and the disk *d*, giving reciprocating motion to the spindle 12. The spur wheels and pinions described may be proportioned to give a desired number of strokes of the spindle to one turn of the shaft *b*. The shaft *b* is turned by means of a crank 24, Fig. 4, placed on the squared end 11 of the shaft *b*, Fig. 2.

In the construction of the yoke *e* the middle part of its top horizontal part is cut away, as at 2, Figs. 3, 5, to admit of its passing the shaft *b* and is notched for the same purpose in its lower part, as at 3. In Fig. 3 the yoke is shown as at the end of a downward stroke, and in Fig. 1 it is shown in broken lines in position to begin a downward stroke, showing how the yoke passes the shaft *b* and the sliding block 9 crosses the gaps made to accommodate the shaft. To steady the yoke in its reciprocating motion, projections 4 are provided on its face, as in Figs. 1, 2, 3, 4, which extend through parallel slots 7 7 in the front plate *a'*, as in Fig. 1. In addition to the steadying-supports the lower end of the yoke and the joining-spindle 12 have a bearing in the base of the frame, as shown in Fig. 4. The yoke is steadied from any side or wabbling movement by reason of its confinement between the face of the disk *d* and the inner surface of the plate *a'*, as shown in Fig. 2. The lower end of the yoke has an extension 5, into which the spindle 12 is inserted and secured by a key 6, as in Figs. 2 and 3. The inside of the front plate *a'* is recessed to admit of the upward passage of the spindle, as in Figs. 2 and 4. As will be seen in Fig. 1, when the yoke is at the top of its stroke only the spindle 12 takes a bearing in the base of the frame, but when at the bottom of the stroke, where its work is performed, the rectangular extension of the yoke affords the bearing-surface, as shown in Figs. 2, 3.

The drill-spindle consists of four parts—the main spindle 12, a clamping-sleeve 13, the drill-holding spindle 24, and a spiral spring 19. The main spindle 12 has a reduced point 18 to enter the spiral spring, a larger reduced portion 16 to receive the sleeve end of the drill-holding spindle. Upon the main spindle the clamping-sleeve, made in two parts, is held by bolts 14. At the ends of these clamps

are internal recesses, so that when in place they form a recess 15. A flange 17 on the end of the sleeve 24 is held within the recess. Another recess 20 is formed at the bottom of the bore in the drill-holding spindle, in which is a spiral spring 19. Thus a movement of the drill-holding spindle is allowed upon the main spindle the length of the unoccupied recess 15, and the spring keeps the inner shoulders of the two spindles separated, as shown. The spring acts as a cushion to take the recoil resulting from the striking of the drill. The socket 22 is for the drill, and the set-screw 23 for holding the drill. The enlarged end 21 of this spindle is for the purpose of giving it strength.

In constructing this machine it might be desirable to vary the forms of some of the parts herein shown, and so long as the principles of the invention are adhered to it is understood that such variation would be legitimate.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A hand rock-drilling mechanism comprising a frame, a drill-spindle having a bearing in said frame and attached to an operating-yoke therein, a slotted yoke notched in its central part to pass the driving-shaft, and having projections that move in slots in the frame, a sliding block in the slot in the yoke, a wrist-pin in the yoke-operating disk engaging with the sliding block, a pinion and the said disk fastened together and turning on the driving-shaft, the driving-shaft adapted for a crank on its outer end, a spur-wheel fast to said shaft, and back gears to engage with the said spur-wheel and the disk pinion, substantially as herein set forth.

2. In a hand rock-drilling mechanism as described, a reciprocating yoke attached to a drill-spindle and operated by a rotating disk, the middle part of the yoke cut away to pass the driving-shaft, projections on the face of the yoke to move in slots in the front plate of the frame, and the said front plate and the disk having contact with the sides of the yoke, substantially as herein set forth.

3. In a hand rock-drill as described a drill-spindle secured to an operating-yoke comprising a main spindle with reduced ends to receive a sleeve-drill-holding spindle and a spiral spring, the sleeve-drill-holding spindle with the spring end of the main spindle forming a recess for a spring, a spring in said recess, a flange on the sleeve end of the said drill-holding spindle inclosed within a recess formed by the reduced part of the main spindle and a recess in the clamping-sleeve, substantially as set forth.

Signed at Peekskill, in the county of Westchester and State of New York, this 20th day of February, A. D. 1905.

CHRISTIAN F. PAUL, Jr.

Witnesses:
MARVIN R. SMITH,
PHILIP F. SPARKS.