(No Model.) 3 Sheets—Sheet 1.

# J. JENNINGS.

## ROCK DRILLING MACHINE.

No. 342,605. Patented May 25, 1886.

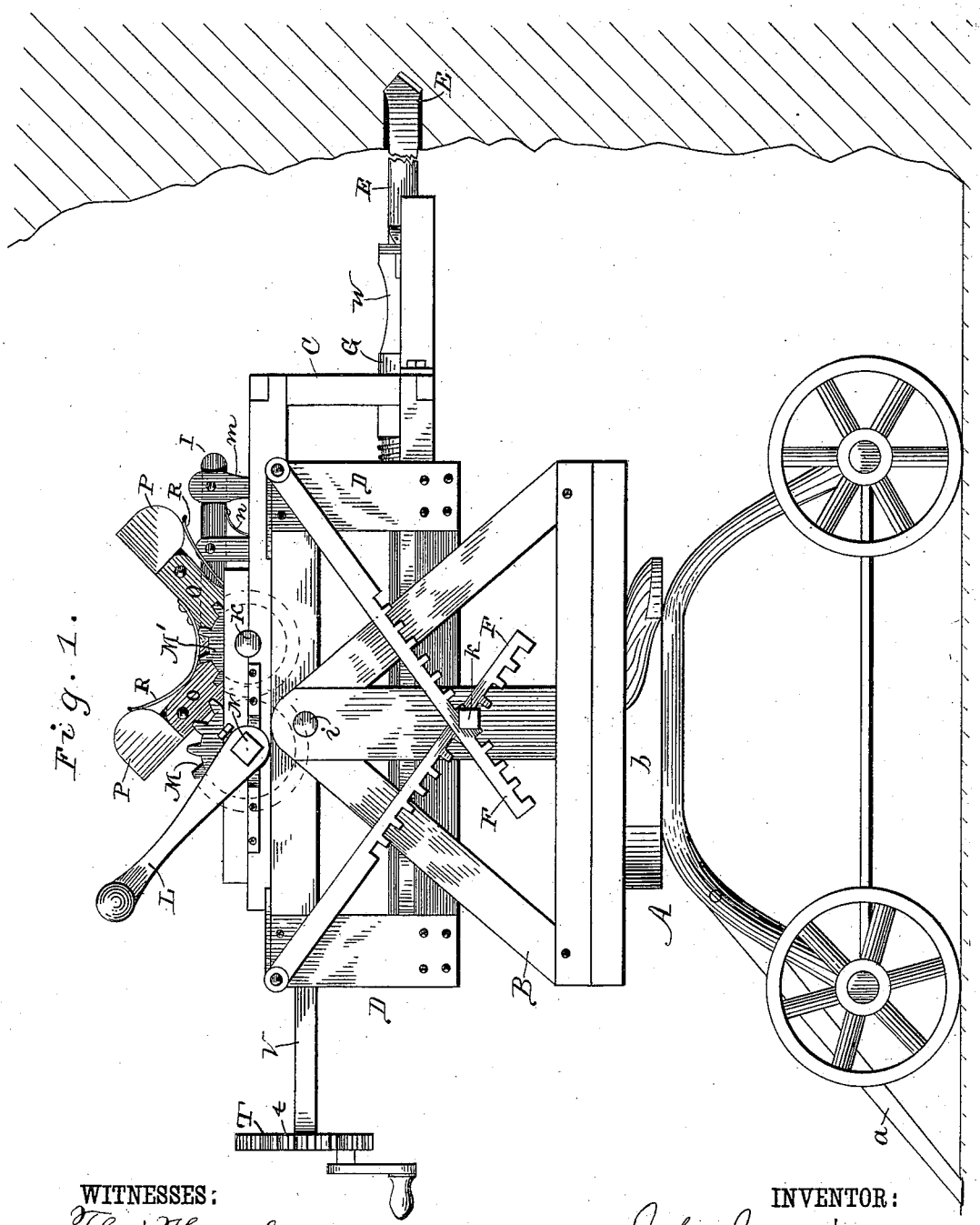


Fig. 1.

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Fig. 2.

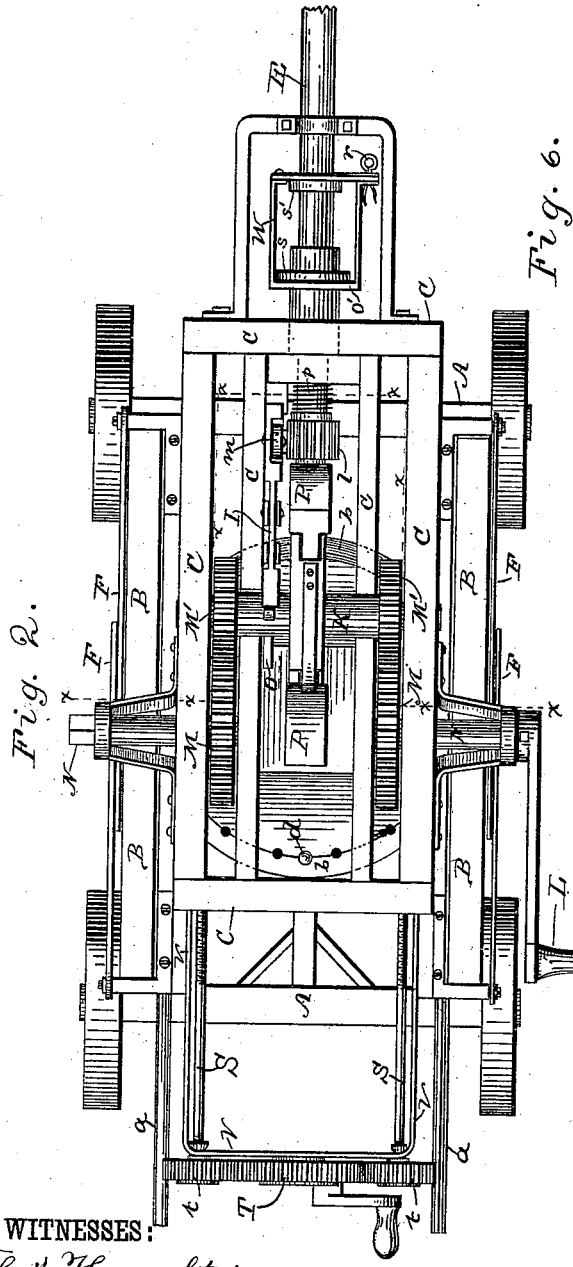


Fig. 6.

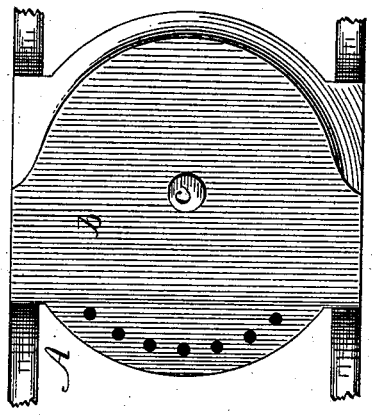
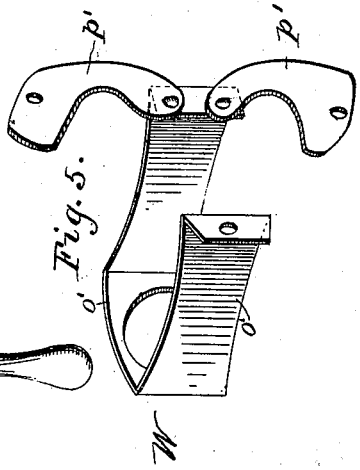


Fig. 5.



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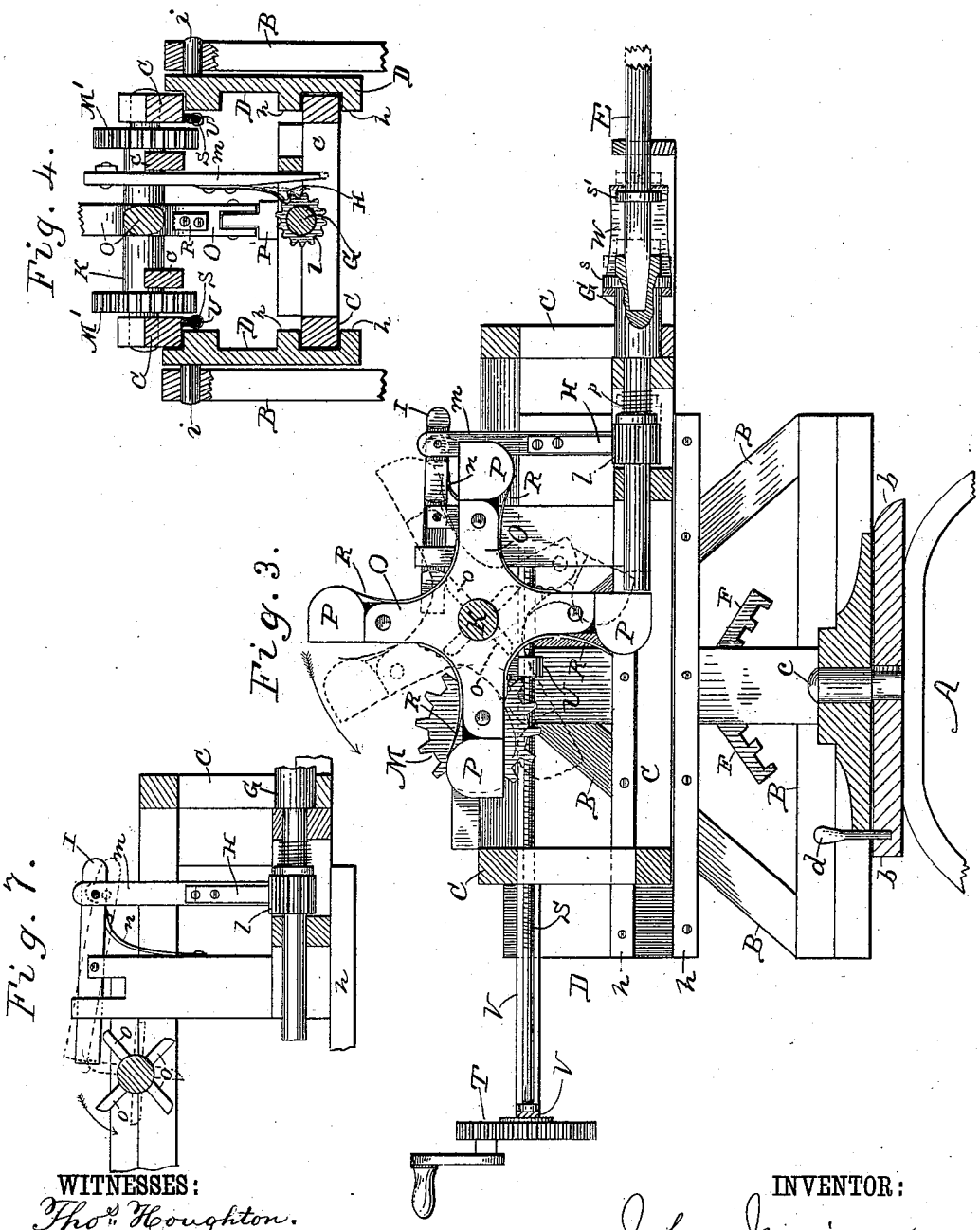


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# UNITED STATES PATENT OFFICE.

JOHN JENNINGS, OF CANON CITY, COLORADO, ASSIGNOR TO KITTIE C. JENNINGS, OF SAME PLACE.

## ROCK-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 342,605, dated May 25, 1886.

Application filed February 18, 1886. Serial No. 192,434. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN JENNINGS, of Canon City, in the county of Fremont and State of Colorado, have invented a new and useful Improvement in Mining-Drills, of which the following is a description.

My invention relates to improvements in drilling-machines designed for use in mining ore and coal and boring and tunneling rock. The improvements include mechanism for rotating and forcing the drill, also for feeding the drill-carriage and adjusting it at various angles and rotating it on a traveling turn-table, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side view of the entire machine. Fig. 2 is a plan view. Fig. 3 is a longitudinal section. Fig. 4 is a transverse vertical section on the irregular line *x x*, Fig. 2. Fig. 5 is a perspective view of the drill-coupling detached and enlarged. Fig. 6 is a detail plan view. Fig. 7 is a detail sectional view illustrating the construction and action of the drill-rotating mechanism.

The low-wheeled truck or traveling turn-table A serves as a support for the drill proper and as a means of transport from point to point. It is provided with hinged legs or pawls *a*, Fig. 1, that take into the foundation on which the truck stands, and serve to prevent backward movement of the latter when the drill is at work.

The drill-frame proper, B, rests on the flat top *b* of the turn-table A, and rotates in a horizontal plane around a central pivot, *c*, Fig. 3. Various devices may be employed to hold it fixed in any adjustment; but I prefer to use the pin *d*, Fig. 3, which enters any one of a series of holes in the table-top *b*, and engages one of the notches, Fig. 2, formed in the curved rear edge of the flat base *b* of the aforesaid frame B. The drill-carriage C is an oblong rectangular frame having lateral portions, Fig. 4 at top and bottom, which work in parallel guides *h*, formed on the oblong rectangular frame D. The latter is pivoted, by gudgeons *i*, at the middle of its length to the top portions of the main frame B. Its side portions hang parallel close to the vertical inner sides of the frame B, Figs. 2 and 4, and are adjustable in vertical planes on the pivots *i*, to enable their angle to the table-top *b* to be changed at will, as required, to direct the drill E in the direction it is to work.

The means I employ for securing or locking the guide-frame D, and thereby holding the drill-carriage in adjustment at any desired angle, are the notched bars F, which are pivoted to brackets projecting from its upper corners, and engage studs *k*, fixed in the sides of frame B. It is obvious that by lifting these bars out of engagement with said stud the guide-frame D and the drill-carriage C, which slides therein, may be easily and quickly turned on the pivots *i*, to set the drill at another angle.

The drill proper, E, is fixed in a holder, G, Figs. 2, 3, which is adapted to rotate and also to slide on its bearings in the drill-carriage C. It has a pinion or cylindrical ratchet, *l*, fixed on its rear portion, and with this a spring feed-pawl, H, engages, Figs. 4, 7, for the purpose of effecting the intermittent rotation of the drill-holder alternately with the feed of the drill. The said pawl H is a plate-spring, whose lower end is curved to adapt it to ride over the ratchet-teeth as the pawl rises. It is attached to a bar, *m*, working vertically in suitable guides, and pivoted to and pendent from a lever, I, arranged horizontally and pivoted centrally in the upper portion of the drill-carriage C, and supported by a spring, *n*. The rear or free end of this lever works in contact with tappets *o*, projecting from a transverse rotating shaft, K, having its bearings in said drill-carriage C, as best shown in Fig. 7. The required rotary motion is imparted by means of a hand-crank, L, and pinion M, fixed on its short shaft N, and meshing with a like pinion, M′, Fig. 2, fixed on the aforesaid shaft K. The shafts N have suitable lateral braces. The crank and pinions are duplicated on the other side of the carriage, so that the drill may be worked from either side, as convenience or necessity may require.

To drive the drill E, I employ a rotating hammer of peculiar construction. It consists of a series of radial arms, O, fixed in or formed solid with shaft K, and each having a block or hammer proper, P, jointed to its outer end, and held normally extended in radial position by means of its rule-joint and a supporting

plate-spring, R, that bears against its rear side. This hammer rotates in a vertical plane, and the flat faces of the pivoted blocks or hammers proper, P, strike successively on the rear end of the drill-holder G, the springs R allowing them to pass it at or after each blow, as illustrated in Fig. 3. In other words, the hammer O P delivers successive blows on the drill, thus causing it to advance intermittently and act on the ore or rock face in the desired manner. Alternately with this forward movement the drill-holder is rotated by the lever I and spring-pawl P, as before described. The drill is retracted by a spiral spring, *p*.

To feed the drill proper as it deepens the bore, I advance the drill-carriage C by means of screw-threaded rods or shafts S S, Figs. 2 and 3, and meshing gears T *t*. The said rods S S work in nuts U, Fig. 3, attached to the drill-carriage C, and are fixed as to lengthwise movement in an iron bar, V, which connects and extends from the rear portions of guide-frame D D. The small gears *t* are mounted on the rear ends of the rods S, and mesh with the larger crank-gear, T, arranged between them. By rotating the latter, T, the rods feed or retract the drill-carriage and drill, as will be readily understood.

To secure the drill E in its socket in holder G, I employ the following-described coupling W, Figs. 2, 5, which is a fixed attachment of the holder. It consists of a body or main portion, *o'*, and hinged jaws *p'*. The body *o'* is secured to the holder G by a collar, *s*, and the jaws *p'* are hinged to its outer end and held closed around the drill by means of a spring-pin, *r*. The drill also has a collar, *s'*, to prevent its withdrawal from the jaws.

I do not claim a drill-carrying frame which is pivoted so as to rotate horizontally on a suitable support and provided with means for locking it in any position to which it may be adjusted, nor do I claim adjusting a drill by by means of a screw-rod and gear.

What I claim is—

1. The combination, with the drill-carrying frame B and adjustable carriage-holders and guides pivoted thereto, of the notched bars pivoted to the ends of said guides and a stud with which the latter engage for the purpose of holding the drill-carriage fixed at any desired angle, as and for the purpose specified.

2. The combination, with the horizontal spring-retracted drill, of the rotating shaft K, the hammers P, attached to the arms of the latter by a rule-joint, and the springs R, whose free ends press the hammers forward until arrested by shoulders of the rule-joint, all as shown and described, to operate as specified.

JOHN JENNINGS.

Witnesses:
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C. C. DAWSON.