

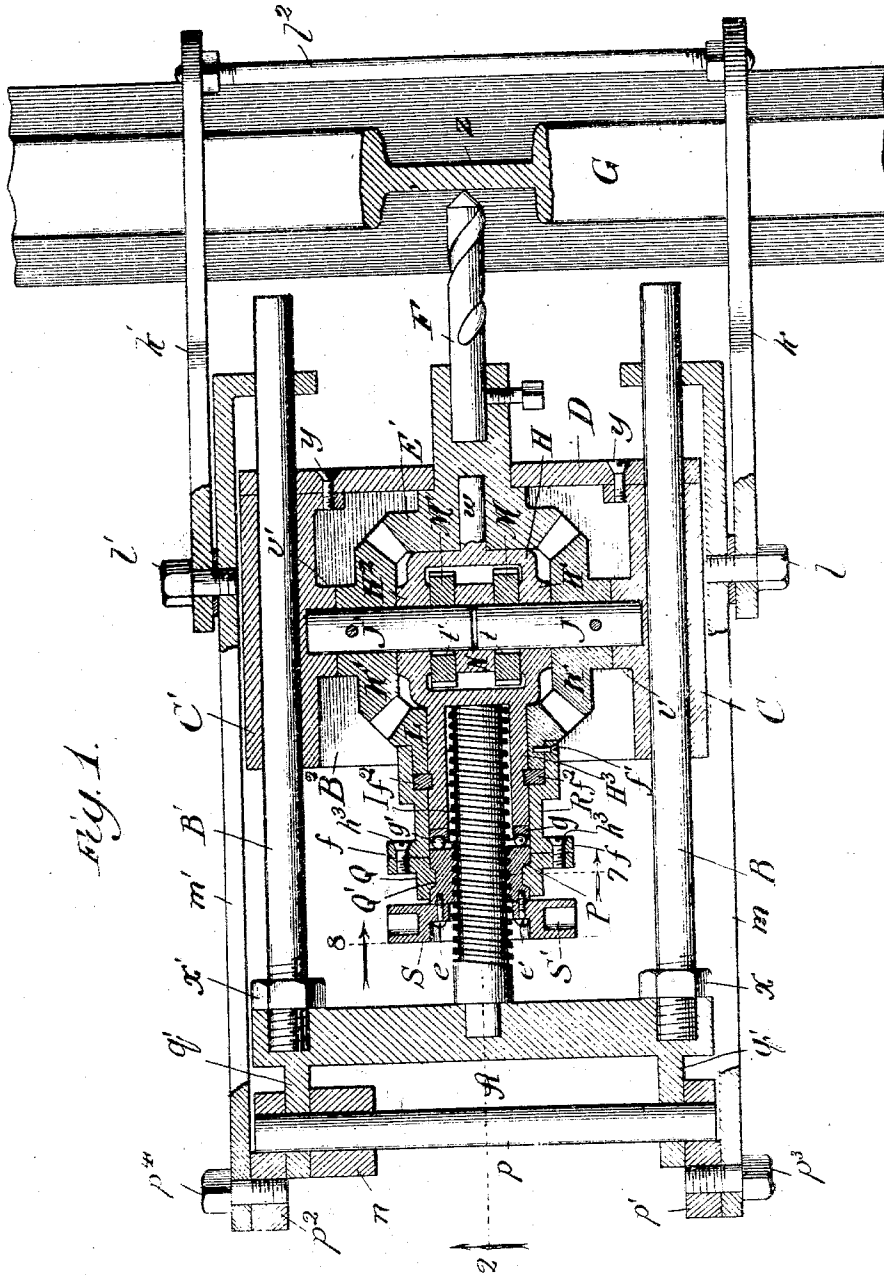
(No Model.)

4 Sheets—Sheet

M. M. MOORE.
RAIL DRILL.

No. 597,377.

Patented Jan. 11, 1898



Witnesses:
E. S. Chayford,
L. J. J. J.

Inventor:
Moses M. Moore,
by Dyrenforth & Dyrenforth,
Attys.

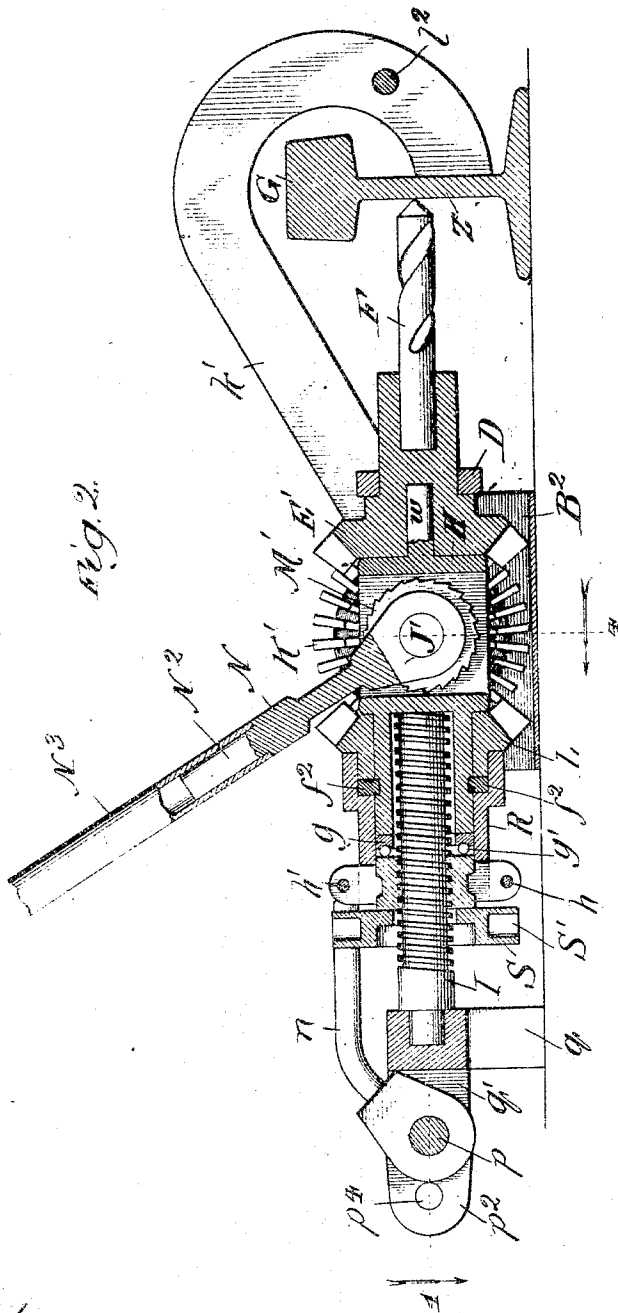
(No Model.)

4 Sheets--Sheet 2

M. M. MOORE.
RAIL DRILL.

No. 597,377.

Patented Jan. 11. 1898.



Witnesses:
Chas. E. England,
Atty. J. J. Allen.

Inventor,
Moses M. Moore,
By Dymforth & Dymforth,
Attys.

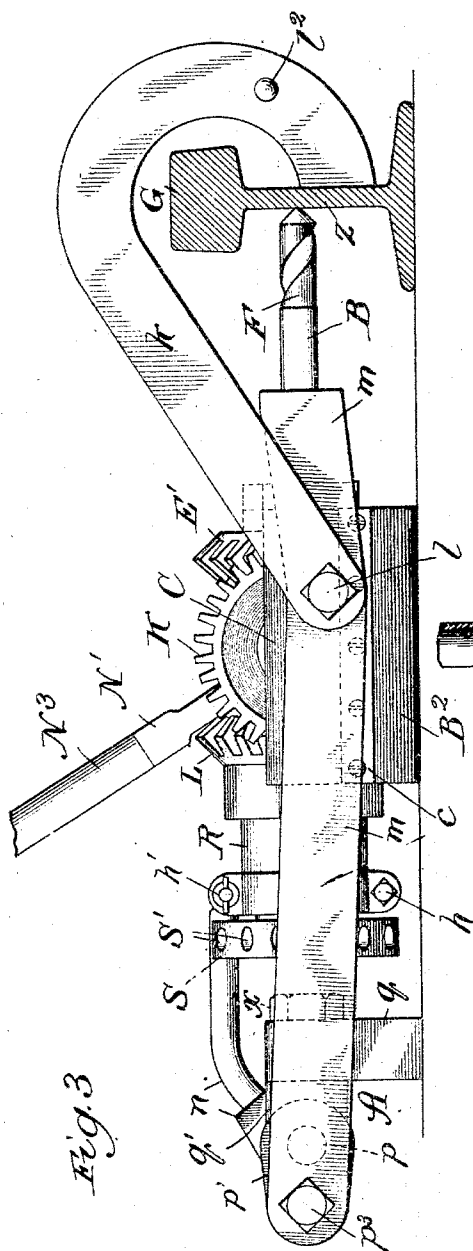
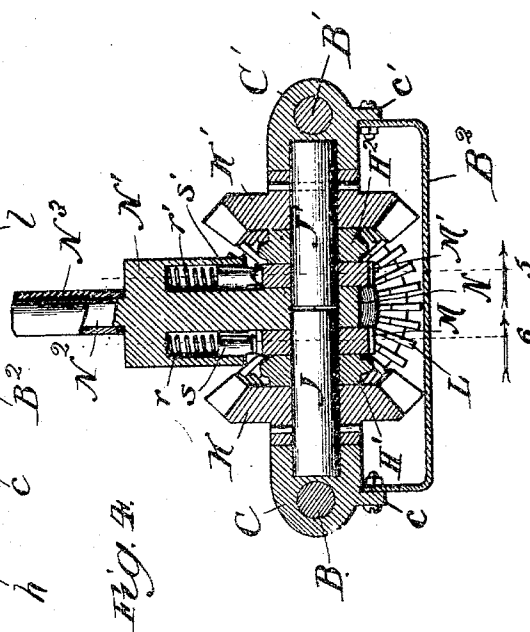
(No Model.)

4 Sheets—Sheet 3

M. M. MOORE.
RAIL DRILL.

No. 597,377.

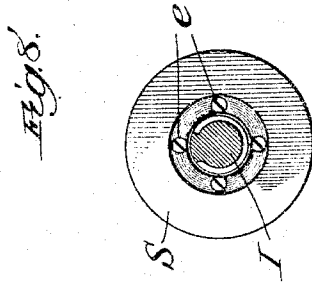
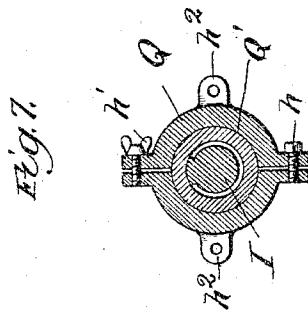
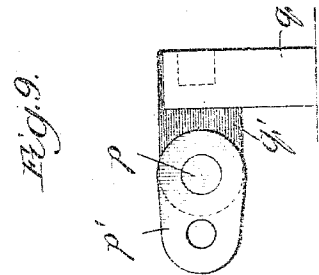
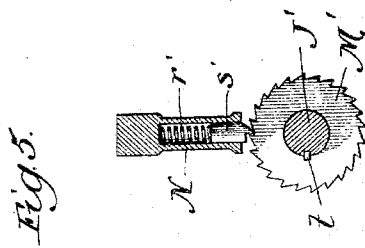
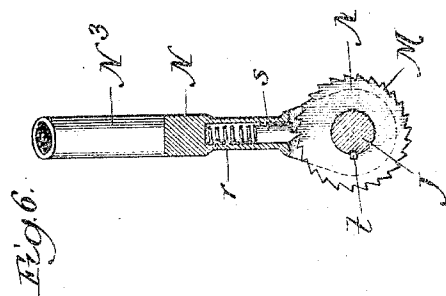
Patented Jan. 11, 1898.



M. M. MOORE.
RAIL DRILL.

No. 597,377.

Patented Jan. 11, 1898.



Witnesses:
Edw. Gaylord,
Lute J. Miller

Inventor:
Moses M. Moore,
By Dyrenforth & Dyrenforth,
Attys.

UNITED STATES PATENT OFFICE.

MOSES M. MOORE, OF CHICAGO, ILLINOIS.

RAIL-DRILL.

SPECIFICATION forming part of Letters Patent No. 597,377, dated January 11, 1898.

Application filed January 27, 1897. Serial No. 620,985. (No model.)

To all whom it may concern:

Be it known that I, MOSES M. MOORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Rail-Drills, of which the following is a specification.

My invention relates to an improvement in rail-drills for use more especially on railroad-tracks, where it is desirable to provide for the ready detachment of the drill from the rail to permit the passage of a train.

Other important objects of my invention, in addition to that above indicated, are to provide a readily-regulable friction-feed and to have the construction of the drill generally of so compact a nature that it may be left in its detached position between the rails without interfering with the passage of a train.

Generally stated my preferred construction, which is that shown in the accompanying drawings, comprises a tool-holder mounted in a suitable sliding frame connected through the medium of a feed-screw with a rear end plate, in which is in turn journaled a shaft provided with cranks carrying wrist-pins, upon which are mounted a pair of clamp-hooks, means for turning said shaft to set and release the clamp-hooks, and ratchet-operated gears for communicating motion to the tool and to the friction-feed employed.

In the drawings, Figure 1 represents, by a partly sectional plan view, my improved rail-drill in position for boring a rail, a portion of the tread of the rail being removed to expose the drill-point about to enter the web; Fig. 2, a vertical section taken on line 2 of Fig. 1 and viewed in the direction of the arrow; Fig. 3, a view of the same in side elevation; Fig. 4, a transverse vertical section taken on line 4 of Fig. 2 and viewed as indicated; Figs. 5 and 6, sectional details of the ratchet-wheels and operating-pawls employed, the sections being at the lines 5 and 6, respectively, of Fig. 4; Fig. 7, a sectional view of a friction-feed, the section being taken on line 7 of Fig. 1; Fig. 8, a rear view of a supplemental operating-wheel attached to the feed-nut, the section being taken on line 8 of Fig. 1 and viewed as indicated; and Fig. 9, a view in end elevation of the rear end piece of the frame with the crank in position, into

which are screwed the guides hereinafter described.

The moving parts of the drill device are mounted in and upon a frame comprising a rear cross-bar A and horizontally-disposed guides B B', preferably cylindrical in form and screwed into the cross-bar and secured therein by nuts $x x'$. Upon the guides B B' are mounted slides C C', connected by a cross-bar D, rigidly secured thereto, as by means of screws y . Journaled in the cross-bar C is a tool-carrying bevel-gear E', in which is removably secured the drill bit or tool F, shown in Fig. 1 as bearing against the exposed web z of a rail G.

The gear E' is provided centrally with a socket into which fits a stem w of a hollow cruciform casting or forging H, provided with lateral bearings H' H² and with a rearward-extending hub or shank H³, made hollow to receive the end of a feed-screw I, which latter is rigidly secured to the center of the rear cross-bar A.

The slides C C' are provided with inwardly-extending bearings $v v'$, which, together with the bearings H' H², serve to support shafts J J', upon which are rigidly secured bevel-gears K K', which mesh with the gear E' and with an outer gear L, journaled upon the shank H³ of the cruciform piece H. The shafts J and J' extend within the cruciform piece and carry removable ratchet-wheels M M', which are prevented from turning upon the shafts by splines $t t'$. The shafts at their inner ends fit loosely into an operating-lever N, pivoted thereon, as clearly shown in Fig. 4.

The purpose of the double ratchet is to communicate a substantially continuous motion to the drill-tool as the operating-lever is given an oscillatory movement. Accordingly the teeth of the respective ratchet-wheels extend in opposite directions, and the lever carries corresponding oppositely-beveled engaging pawls $s s'$, confined within sockets in an enlarged portion N' thereof and held in engagement with the ratchet-wheels by springs $r r'$. The operating-lever is provided with a stud N², (see Fig. 2,) over which fits a socketed handle N³. Figs. 5 and 6 show the manner in which the respective pawls engage the respective ratchet-wheels and make it clear that when the handle is moved away from the rail

a right-hand motion will be communicated to the drill-tool through the medium of the gear K', and when the handle is moved toward the rail motion in the same direction will be communicated to the tool through the medium of the gear K.

The rear cross-bar A is provided with downwardly-extending lugs or legs q and with rearwardly-extending lugs q' , in which is journaled a crank-shaft p , carrying at its ends rigidly-attached cranks $p^1 p^2$, provided with wrist-pins p^3 and p^4 . The shaft is further provided with an operating lever or arm n , rigid therewith and so disposed thereon as to lie close down in the plane of the horizontally-disposed frame when the grip-hooks are thrown back from the rail. Upon the wrist-pins are pivoted links $m m'$, having their inwardly-turned free ends provided with holes to fit loosely over and slide on the guides B B'. The links $m m'$ are in turn provided with wrist-pins $l l'$, upon which are pivoted clamp-hooks $k k'$, curved, as shown, and connected by a cross-rod l^2 , which is fastened to the hooks near their curved ends to permit the hooks to be folded back closely upon the drill-frame.

For the purpose of automatic feed I provide the feed-screw, which, as stated, is rigid with the rear cross-bar, with a steel nut P, provided with a circumferential groove, into which fits a corresponding annular ring Q' upon the inner surface of a separable friction-collar Q, (see Fig. 7,) provided with tightening-screws $h h'$ and with perforated ears h^2 for attachment, as by screws h^3 , to a sleeve R, hereinafter described. Between the nut P and the shank II³ of the cruciform piece II is an annular ring g , grooved, as shown, to afford a race for balls g' , upon which the nut bears. The sleeve R incloses the end of the shank II³ and the ball-bearing, and is provided with ears f for attachment to the friction-collar Q, and at its opposite end is enlarged to encircle the hub of the gear L, to which it is attached, as by screws f' . Longitudinal movement of these parts upon the shank of the cruciform piece II is prevented by means of a separable circular key f^2 , set into the shank and confined within the enlarged portion of the collar R.

A supplemental operating-wheel S, supplied with radial openings S' (see Fig. 1) for the insertion of an operating-handle, is secured to the nut by screws e and serves to withdraw the drill-tool after it has been fed forward and also to feed it in case the automatic feed is dispensed with or it is desirable to supplement it thus.

The slides C C' are provided with downwardly-depending lugs $c c'$, (see Fig. 4,) to which is attached an apron or cross-plate B², which extends beneath the gear mechanism and with the lugs on the rear cross-bar forms a base for the drill device.

The operation is as follows: The drill is placed in position at the desired point along

the rail to be drilled and the clamp-hooks are dropped over to loosely embrace the rail, when by means of the handle n the cranks $p^1 p^2$ are turned to draw upon the links $m m'$, and through them to cause the clamp-hooks to draw against and clamp the rail against the tool-point. In this movement of the lever n the cranks are turned to a dead-center with relation to the links and thus lock the clamp-hooks in the position of bearing firmly against the web of the rail. The operating-handle N³ is then worked back and forth, and through the medium of the pawls and ratchet-wheels, so disposed as described above, the drill-tool is given a practically continuous right-handed motion. Likewise the gear L is given a practically continuous rotation and with it the sleeve R and the friction-collar Q. The latter, by means of the screw h' , is caused to grip the nut with a pressure depending upon the strength of feed required, and as the nut is thereby fed forward it forces the whole gear mechanism to move forward, the movement being guided by the feed-screw and the guides B B'. If it is desired to retract the drill-tool, it may be done by means of the supplemental operating-wheel S. To permit the passage of a train, it is necessary only to raise the lever n and thus rock the shaft p , which carries the cranks connected with the clamp-hooks, when the latter are sufficiently loosened to permit them to be raised past the tread of the rail and dropped back by the side of the links $m m'$, the handle N³ having been previously removed from the stud N². The vertical height of the drill in this last position is so small as not to interfere with the passage of a train. It will thus be seen that the drill is especially adapted to use where the traffic is great and any delay of trains to be avoided.

The construction may be modified in matters of detail without departing from the spirit of my invention. Hence I wish to be understood as in no sense limiting myself by the minute description of the construction shown, except as shall appear from the appended claims. For instance, it is desirable, but not necessary, to provide the intermediate links $m m'$ between the clamp-hooks and the crank-shaft p , and with slight changes in the clamp-hooks the device may be adapted to other purposes than a rail-drill.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a drill device, the combination with the drill-tool-operating mechanism and a horizontally-disposed frame therefor, of a shaft journaled in the frame, clamp-hooks eccentrically connected with said shaft bent to extend over and engage a rail, and a relatively short handle connected with said shaft to rock the same and throw the hooks into and out of engagement with the rail, substantially as and for the purpose set forth.

2. In a drill device, the combination with a horizontally-disposed frame having horizon-

tal guide-rods, and the drill-tool-operating mechanism mounted in said frame, of a shaft journaled in the frame, links eccentrically connected with the shaft and movable on said guide-rods, clamp-hooks pivotally connected with said links and bent to engage a rail, and a relatively short handle connected with said shaft for rocking the same to throw said hooks into and out of engagement with the rail, substantially as and for the purpose set forth.

3. In a drill device, the combination with the frame thereof, of a movable slide on the frame, a tool-carrying gear journaled in said slide, two oppositely-turning ratchet-operated bevel-gears engaging said tool-carrying gear and imparting a practically continuous motion thereto, and feeding mechanism for moving said slide, substantially as and for the purpose set forth.

4. In a drill device, the combination with the frame thereof, of a movable slide on the frame, a tool-carrying bevel-gear journaled in said slide, two oppositely-turning ratchet-operated bevel-gears engaging said tool-carrying gear, an outer gear located opposite said tool-carrying gear and engaging said oppositely-turning bevel-gears, a feed-screw rigid with the frame, a nut thereon, a friction-collar upon said nut and connected with said outer gear, and means for controlling the pressure of said collar to regulate the feed, substantially as and for the purpose set forth.

5. In a drill device, the combination with the frame thereof provided with guides, of a slide on said guides, provided with inward-extending bearings, a tool-carrying bevel-gear journaled in the slide, a hollow cruciform piece centered in said gear and provided with lateral bearings and a rearward-extending shank, shafts supported by said bearings and the bearings upon said slides, bevel-gears rigid with said shafts and engaging said tool-carrying gear, oppositely-beveled ratchet-wheels secured to the shafts, an operating-lever on the shafts, ratchet-engaging pawls on said lever, and feeding mechanism for the slide, substantially as and for the purpose set forth.

6. In a track-drill, the combination with a same having horizontally-disposed guides,

of a slide on said guides provided with inwardly-extending bearings, a tool-carrying bevel-gear journaled in the slide, a hollow cruciform piece centered in said gear and provided with lateral bearings and rearward-extending shank, shafts supported by said bearings and the bearings upon said slides, bevel-gears rigid with the shafts and engaging the tool-carrying gear, ratchet-wheels provided with oppositely-beveled teeth secured to the shafts, an operating-lever on the shafts, ratchet-engaging pawls on said lever, an outer gear journaled on the shank of said cruciform piece and engaging the gears on said shafts, a feed-screw rigid with the frame, a nut on said screw, a friction-collar upon said nut, connecting means between said friction-collar and said outer gear, a supplemental operating-wheel connected with the nut, a shaft journaled in the frame, cranks on said shaft, links pivoted on the cranks and slidable on said guides, clamp-hooks pivoted to said links for engaging a rail, and means for rocking the crank-shaft to throw the clamp-hooks into and out of engaging position, substantially as and for the purpose set forth.

7. In a drill device the combination with the drill-tool-operating mechanism and horizontally-disposed frame therefor, of a shaft journaled in the frame, clamp-hooks eccentrically mounted upon said shaft and bent to engage a rail, a rod joining said curved ends near their extremities, and a relatively short handle attached to said shaft to rock the same and throw said hooks into and out of engagement with a rail, substantially as and for the purpose set forth.

8. In a drill device, the combination with the frame, feed-screw in the frame, and drill-tool-rotating gear, of a traveling nut on the feed-screw, a friction-collar surrounding the nut and rotated by said gear and an annular tongue-and-groove connection between said collar and nut, substantially as and for the purpose set forth.

MOSES M. MOORE.

In presence of—

J. H. LEE,

R. T. SPENCER.