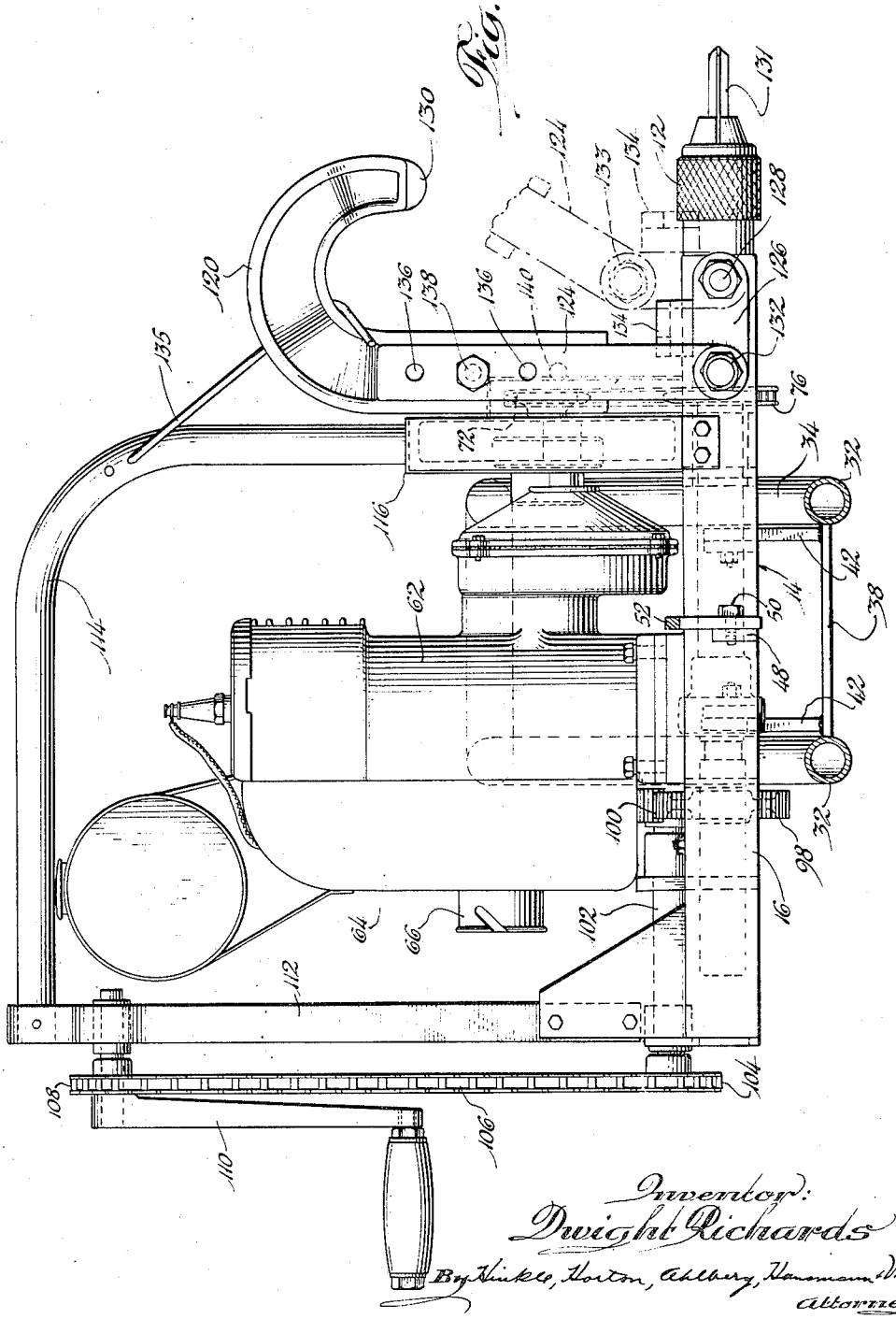
May 29, 1951 D. RICHARDS 2,555,246

POWER TRACK DRILL

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Fig. 1.



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POWER TRACK DRILL

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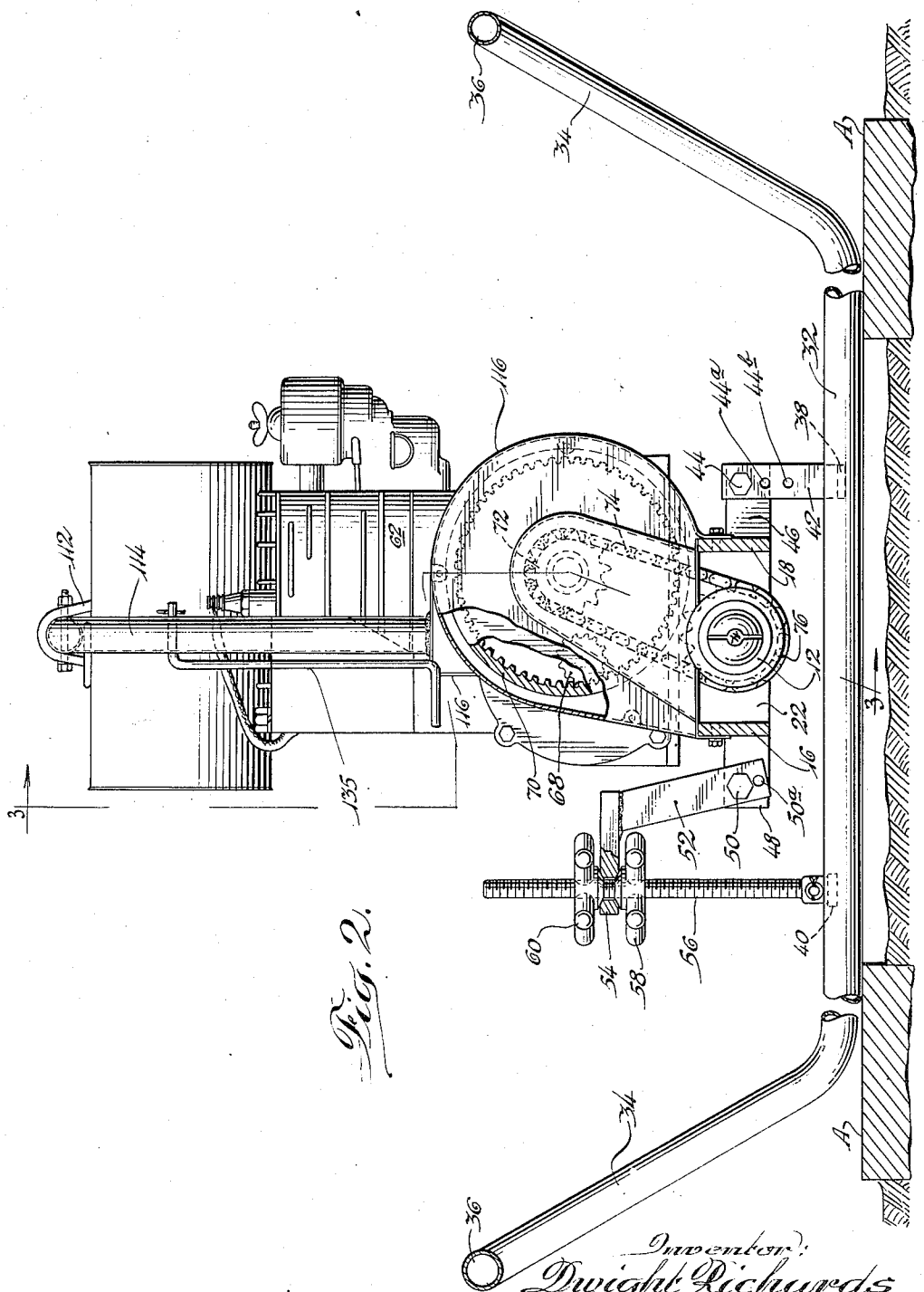


Fig. 2.

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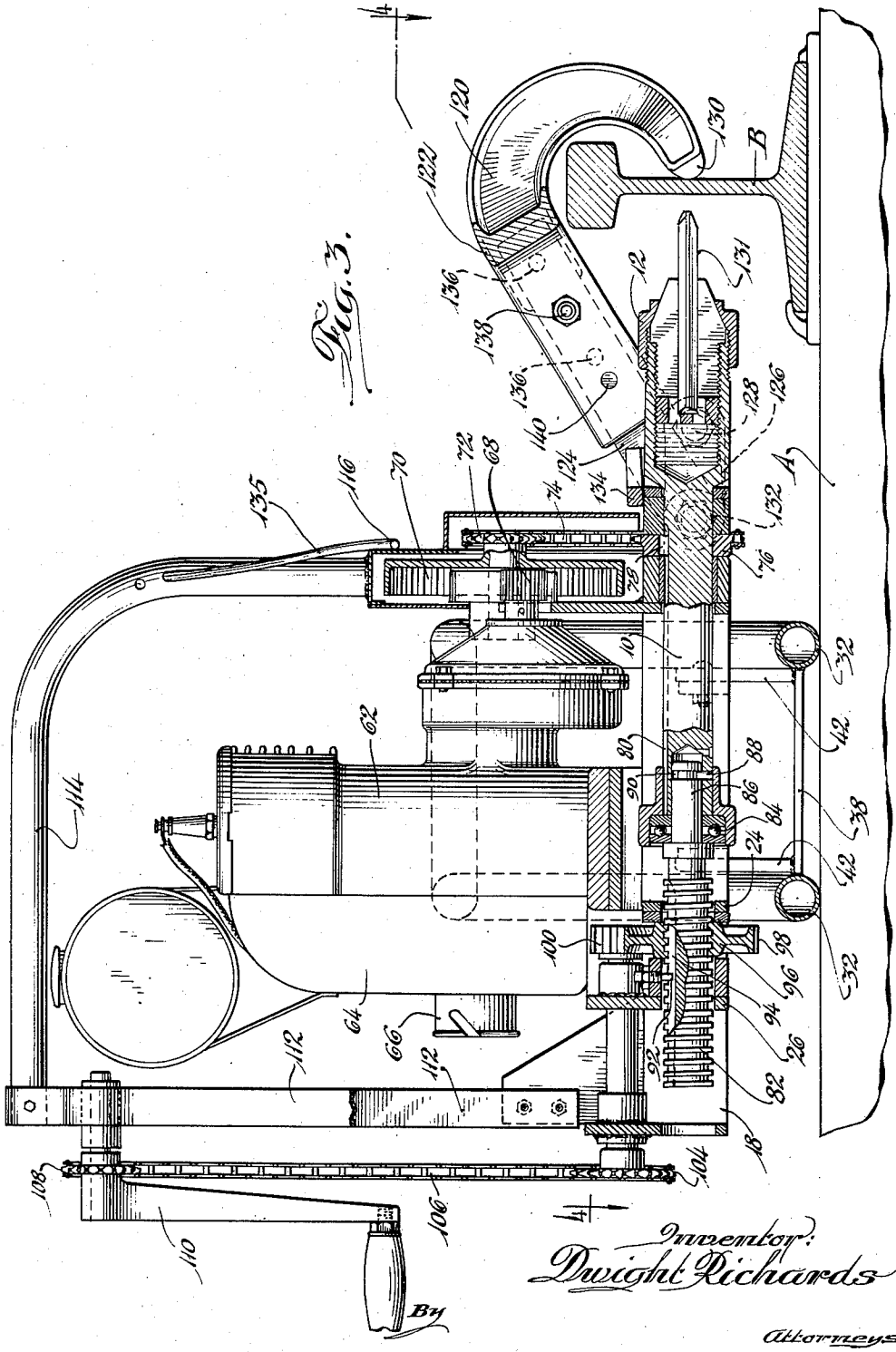


Fig. 3.

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POWER TRACK DRILL

Filed Dec. 21, 1946

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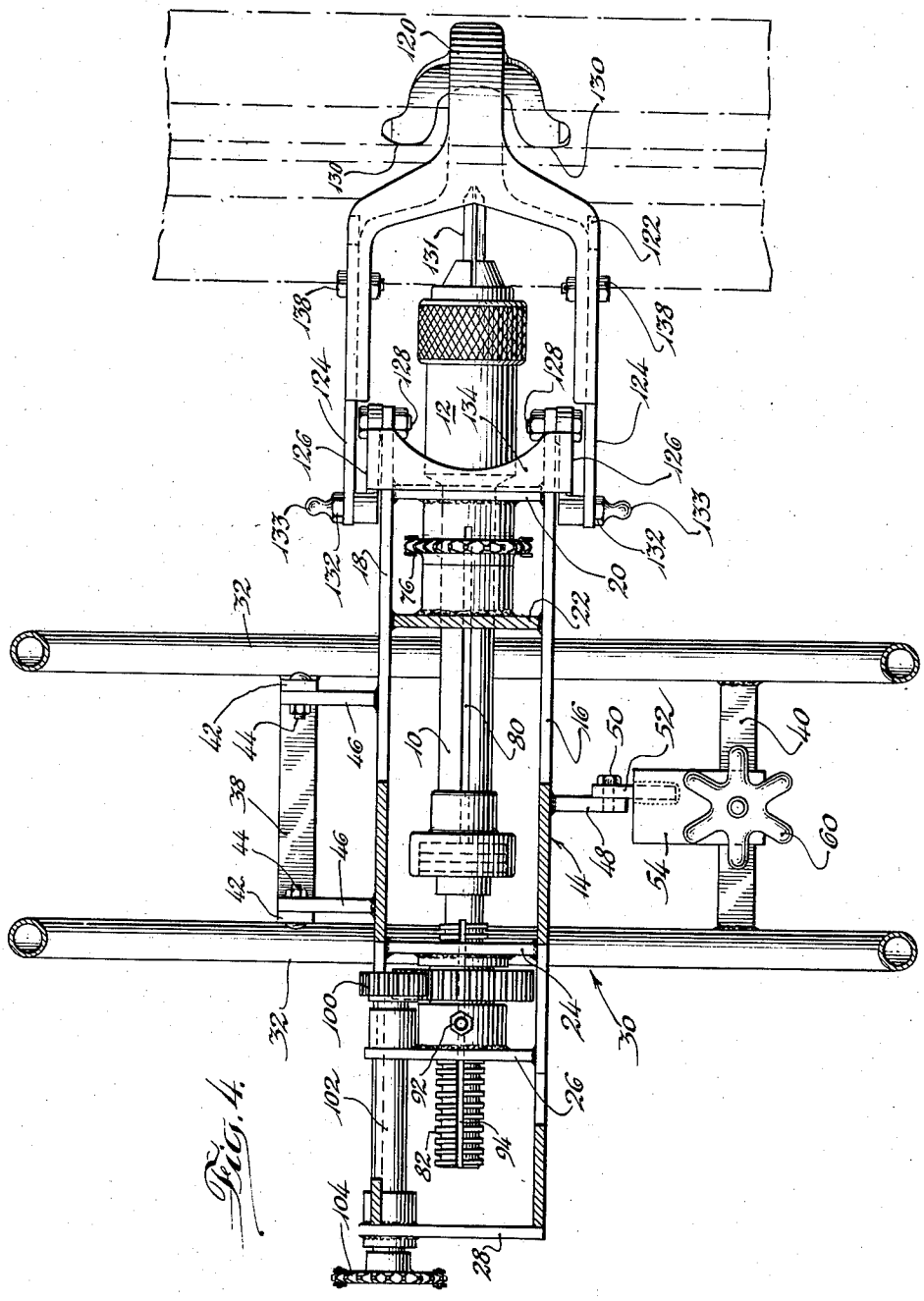


Fig. 4.

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Patented May 29, 1951

2,555,246

UNITED STATES PATENT OFFICE

2,555,246

POWER TRACK DRILL

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Application December 21, 1946, Serial No. 717,675

2 Claims. (Cl. 77—8)

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This invention relates to a portable drill rig, particularly adapted for use in drilling railroad rails, or like structural members, in situ.

One object of the invention is to provide a relatively light and portable apparatus including a power plant for operating a drill. Another object of the invention is to provide a new and improved track drill having means by which it may quickly be engaged with or detached from the track at will.

Another object of the invention is to provide a track drill with a support on which it is readily adjustable to bring the drill point accurately to the correct height.

A further object of the invention is to provide a portable track drill having a supporting frame provided with handles for carrying the outfit from place to place and disposed so as to achieve a substantially balanced distribution of the weight of the equipment with respect to the handles.

The invention also provides the drill with a mechanical power plant, preferably in the form of a small internal combustion engine with direct gear connection between the engine and the drill spindle, and means for varying the engine speed to secure the desired speed of the drill.

Other objects and advantages of the invention will appear from the following description taken in connection with the drawings, in which:

Fig. 1 is a side elevational view of a power track drill embodying this invention;

Fig. 2 is a front elevation of the same with the rail hook and front portion of the supporting frame omitted to condense the view and with certain parts shown in section;

Fig. 3 is a side elevation similar to Fig. 1 but with portions of the mechanism shown in section substantially at the plane indicated by the line 3—3 on Fig. 2; and

Fig. 4 is a horizontal sectional view taken as indicated at line 4—4 on Fig. 3 and showing the supporting frame and the mechanism frame in plan.

The track drill shown in the drawings as illustrative of this invention includes a drill spindle 10 carrying a chuck 12 and journalled in a mechanism frame 14 which consists of horizontally extending parallel side frame members 16 and 18 connected by cross members 20, 22, 24, 26 and 28 and adjustably attached to a supporting frame 30. The supporting frame is shown as composed of a pair of tubular members 32, 32 having horizontally extending portions and end portions 34 which extend upwardly and which are connected by handles 36, as seen in Figs. 1 and 2. The

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members 32, 32 are also connected by cross members 38 and 40, and are spaced a width greater than the width of a track rail so that the drill may be placed on a track rail with the cross members 38 and 40 resting on the top of the rail and supporting the drill elevated from the track bed. In this position the drill may be moved from one location to another along the track by sliding the drill along a rail on the cross members 38 and 40. The member 38 has attached to it a pair of upstanding members 42 to which the mechanism frame is pivotally connected by pivot bolts 44 engaging lugs 46 which extend outwardly from the side member 18 of the mechanism frame. At the other side of said frame a lug 48 projects rigidly from the side member 16 and is connected by a pivot bolt 50 to the depending arm 52 of an apertured part 54 which is vertically adjustable upon the threaded rod 56 upstanding from the cross member 40 and may be locked in any position of adjustment between the threaded hand wheels 58 and 60. By thus tilting the mechanism frame 14 up or down about the pivots 44, the axis of the drill spindle 10 may be raised or lowered with respect to the supporting members 32 which, as shown in Fig. 2, will normally rest on the ties A of the track. To increase the range of adjustment, the upright members 42 may have additional pivot holes 44*a* and 44*b* for the bolts 44, and the member 52 may have an auxiliary pivot hole 50*a* for the pivot bolt 50, as seen in Fig. 2. This makes it possible to maintain the mechanism frame in a substantially horizontal plane and still provide a wide range of adjustment for positioning the drill as may be required with rails of different heights or in drilling holes at various special positions in the rails.

The power plant for driving the drill is shown as a small internal combustion engine 62 of the air cooled type which may have a blower incorporated in its flywheel and enclosed in the housing shown at 64. At one end the engine shaft is fitted with a drum 66 to receive a rope for starting the engine, and at the opposite end the shaft carries a driving pinion 68. This pinion meshes with an internal gear 70 with which there is rigidly associated a sprocket wheel 72 connected by a chain 74 with a sprocket wheel 76 which is journalled coaxially with the drill spindle 10. The sprocket wheel 76 is connected to the spindle 10 by a key 78 engaging a key slot 80 which extends for a substantial distance in the shaft of the spindle so that the latter can slide longitudinally through its driving sprocket 76 for advancing the drill into the

work and withdrawing it therefrom. This movement of the spindle is effected by means of a feed screw 82 mounted at the rear end of the drill spindle 10 and coaxially therewith, and connected with the spindle through a ball thrust bearing shown at 84 in Fig. 3. The feed screw 82 has a reduced end portion 86 telescopically fitted into the end of the drill spindle 10; and a pin 88 secured in the spindle 10 engages a groove 90 in said reduced portion 86. Thus the feed screw 82 advances the drill into the work by pressure applied through the thrust bearing 84 but withdraws it by means of engagement of the pin 88 in the groove 90. The feed screw 82 is held against rotation by pin 92 engaging a keyway 94 in the screw, and the screw is adjusted longitudinally by means of a feed nut 96 formed with gear teeth 98 which mesh with a gear 100, as seen in Fig. 4. The gear 100 is fixed to a shaft 102 having a sprocket wheel 104 at its rear end connected by a chain 106 with a driving sprocket 108 which is driven by a hand crank 110, as seen in Fig. 3. The gear 108 and its crank 110 are journalled at an elevated position within convenient reach of the operator and are supported by the legs 112, 112 of an A frame attached to the mechanism frame 14 at their lower ends and connected at the upper end to a tubular frame member 114 which extends horizontally over the engine and is then bent downwardly to an anchorage formed by a housing 116 which encloses the internal gear 70 and the sprocket 72. Thus, when the operator has adjusted the drill point to the proper height and has regulated the engine speed to secure the desired speed at the drill spindle, he can steady the machine by resting one hand on the tubular frame member 114 while the other hand operates the crank 110 to advance the drill in its work.

In preparing to drill a railroad rail, such as the rail shown at B in Fig. 3, the supporting frame 30 is set down on the ties A adjacent the rail and is engaged with the rail by means of overclutch hook 120 which extends integrally from the yoke 122, having its arm connected to side bars 124, 124 which in turn are pivotally attached to toggle links 126, 126 connected to the ends of the frame members 16 and 18 by pivot bolts 128. Preferably the hook itself is bifurcated and formed with two bearing portions 130, 130 which engage the web of the rail B at the side opposite that against which the drill point 131 is fed. The bearing portions 130, 130 of the hook are thus spaced apart far enough to permit the drill to bore through the web of the rail without contacting the hook. The hook is preferably adjusted so that it engages the web of the rail substantially at the plane of the drill axis, and, when it is thus engaged, the links 126 are rocked backwardly to a position at which the pivotal connections 132, 132 between said links and the side bars 124 are slightly "below center"; that is, a line connecting one of the pivots 132 with the bearing portion 130 of the hook will pass slightly below the axis of the pivot 128, as seen in Fig. 3. The links 126 are rigidly connected by a cross bar 134 which engages the upper edges of the frame members 16 and 18 to limit the backward swing of the links at this position, and in view of this relation of the parts, the pressure of the drill 132 against the rail acts to tension the side bars 124 and hold the terminals 130 of the hook 120 in firm engagement with the opposite face of the rail. The pivots 132 are formed with knobs or handles 133 so that to release the hold of the hook 120 it is only necessary to grasp one or both of these knobs 133 and swing the links 126 forwardly around the pivots 128 and through an arc of about 90°, thus shifting the hook 120 away from the rail so that it is free to be swung upwardly as to the position shown in Fig. 1 at which it may be retained by any suitable means such as the hook 135 which is attached to the frame member 114. This arrangement facilitates the quick release of the hook 120 whenever it is necessary to interrupt a drilling operation because of the approach of a train, and the relatively light weight of the machine makes it easy for a man to lift it quickly out of the way until the train has passed. It should be noted that the forward movement of the links 126 is limited by the cross bar 134, the central portion of which engages the forward end of the drill spindle assembly when the links have been moved to approximately vertical position as shown in phantom in Fig. 1.

To accommodate the hook 120 to various situations, its effective length is made adjustable by providing three holes 136 in each of the side bars 124 so that the connecting bolts 138 may be engaged in any one of these holes. A somewhat closer adjustment of the length is rendered possible by providing two holes 140 in each arm of the yoke 122 and spacing the holes 140 at a distance equal to one and one-half times the distance between two consecutive holes 136 of the side bars. Thus, the length of the hook may be varied in steps equal to one-half the distance between the consecutive holes 136, using the holes 140 of the yoke alternatively.

From the above it will be seen that the invention comprises a portable power-driven rail drill which may be readily adjusted for drilling rails of various sizes and which is sufficiently compact in construction so that it may be used in complicated track layouts where the rails may be close together as, for example, at places where switches are installed. Furthermore, the drill is sufficiently light in weight so that it may be readily carried from one location to another by two men using the carrying handles as suggested, or, if only one man is present, he may move it along the track from one location to another by mounting the drill on one of the rails with its weight supported by the cross-members 38 and 40 and then sliding the drill along the rail.

While I have shown and described a preferred embodiment of my invention, it will be apparent that numerous variations and modifications thereof may be made without departing from the underlying principles of the invention. I, therefore, desire by the following claims to include within the scope of the invention all such modifications and variations by which substantially the results of my invention may be obtained through the use of substantially the same or equivalent means.

I claim:

1. In a track drill for drilling track rail webs or the like, a supporting frame consisting of horizontally extending main tubular frame members spaced by cross-members and terminating in upwardly inclined ends and carrying handles on opposite sides of said drill, a mechanism frame consisting of a pair of parallel longitudinal side members and connecting cross members, said mechanism frame supporting a drill spindle assembly and a driving motor therefor with the

longitudinal axis of said parts disposed transversely of the supporting frame, means for securing said mechanism frame to said supporting frame with the axis of said spindle in a plane above the horizontal portion of said supporting frame, said means being adjustable to raise and lower the axis of said drill spindle, a manually operable feeding mechanism for advancing and retracting said drill spindle, a rail hook adapted to be engaged with a track rail when said drill is in operating position, and a toggle link connection for securing said rail hook to said mechanism frame, said toggle link connection being adapted to be rocked forwardly for moving said hook to extended position permitting engagement of the same over a track rail or disengagement therefrom and to be rocked backwardly to a position slightly beyond dead center for locking said hook in contracted position to hold a drill bit in said drill spindle assembly in firm centered engagement with the web of a track rail being drilled.

2. In a track drill, an elongated carrying and supporting frame comprising relatively closely spaced duplicate frame members having a straight horizontally extending intermediate portion of appreciable length merging at each end into upwardly and divergingly inclined portions, means to interconnect said frame members in parallel spaced relation including transversely extending cross frame members connecting the

horizontally extending portions of said frame members to form a bed, and handle-forming means connecting said inclined portions at a position conveniently to be grasped when the frame is to be carried, an elongated mechanism frame having its longitudinal axis transversely disposed with respect to the horizontally extending portions of said carrying frame and substantially medially thereof, a drill spindle and drill feeding mechanism supported in said mechanism frame in longitudinal alignment with the longitudinal axis of said mechanism frame, drill driving mechanism including a motor supported on said mechanism frame above said spindle, means upstanding from the cross frame members in said carrying frame for supporting said latter frame above said carrying frame for pivotal movement upon an axis disposed laterally of said mechanism frame to permit vertical adjustment of said drill spindle relative to the web of a rail.

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