PORTABLE RAIL DRILL

Inventor: Chris Stougaard, Racine, Wis.
Assignee: Racine Railroad Products, Inc.
Filed: Feb. 12, 1971
Appl. No.: 114,891

U.S. Cl. ......................408/78, 408/95, 408/102
Int. Cl. ......................B23b 45/08, B23b 45/14
Field of Search ..................408/78, 95, 101, 102

References Cited
UNITED STATES PATENTS
2,887,908 5/1959 Miller.........................408/78
2,201,032 5/1940 Everett..........................408/95
1,016,477 2/1912 Coulter..........................408/95

Primary Examiner—Francis S. Husar
Attorney—Hofgren, Wegner, Allen, Stellman & McCord

ABSTRACT

A portable rail drill having pre-set adjustments for different size rails to properly locate the center of the drill, improved clamping structure to securely lock the drill to the rail, and index means for locating the rail drill in a plurality of positions relative to a rail joint to drill a number of holes in the rail accurately located relative to each other.

7 Claims, 4 Drawing Figures
PORTABLE RAIL DRILL

BACKGROUND OF THE INVENTION

This invention pertains to a portable rail drill which can be used in railroad track work for the drilling of a plurality of holes adjacent a rail joint preparatory to attachment of plates to sections of rail abutting at said joint.

A rail drill of the general type disclosed herein is shown in U.S. Pat. No. 2,887,908, owned by the assignee of this application, wherein a rail drill is of a size and weight to be portable and is provided with a frame having legs for ground support and carrying a clamp structure for clamping to a rail. The rail drill shown in the patent has an impressive clamp structure which did not securely hold the unit to the rail during drilling of a hole. Additionally, the prior rail drill did not have a plurality of pre-set adjustments for different sizes of rail and had no index means providing for easy adjustment of the rail drill along the rail for drilling of successive holes in the web of the rail with the holes having accurate center-to-center distance.

The rail drill disclosed herein has a clamping structure providing secure gripping of a rail to hold the rail drill firmly locked in position during drilling. Additionally, accurate locating means for drilling of a series of holes are provided including a template secured to the rail and having detent notches coacting with a detent carried by the rail drill which accurately locates the rail drill. Means are provided for simply adjusting the rail drill unit to four different pre-set height adjustments to handle a plurality of different size rails which provide for repeated accuracy in height adjustment.

The foregoing features provide a rail drill with improved accuracy and speed of operation to facilitate drilling a number of holes in adjacent rail web sections, with accurate location of the height of the holes and the center-to-center distance thereof.

SUMMARY

An object of the invention is to provide a new and improved portable rail drill providing for faster operation and more accurate drilling of a plurality of holes in the web of adjacent rail sections, with the holes having accurate height location and center-to-center distance.

Still another object of the invention is to provide a portable rail drill having a plurality of pre-set height adjustments to adapt the rail drill to the size of different rails with which the unit may be used and, more particularly, wherein said adjustment includes at least one rotatable spacer block having a configuration to provide a number of different height settings depending upon the rotatable position thereof.

Still another object of the invention is to provide a portable rail drill with structure providing improved center-to-center distance of a plurality of drilled holes in the web of a rail including a template secured to the rail and having a series of indicators formed thereon and visible from the top with at least one of said indicators being aligned with the joint of a pair of adjacent rails and other indicator surfaces being in the form of detent notches to individually receive a detent member carried on the frame of the rail drill whereby location of the detent in a notch locates the drill lengthwise of the rail.

An additional object of the invention is to provide a portable rail drill with secure clamping structure therefor to hold the unit on a rail including a first clamp element engageable under the ball of the rail at one side thereof, a second surface engaging the top of the rail and a third clamp surface engageable with the web of the rail on the side opposite from said one side, and means for drawing the first and third surfaces toward each other whereby a secure lock on the rail is obtained.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of the portable rail drill shown in operative position in association with a pair of rail sections;

FIG. 2 is a vertical section, on an enlarged scale, taken generally along the line 2—2 in FIG. 1 and with a part of the rail shown in broken line;

FIG. 3 is a vertical section, on an enlarged scale, taken generally along the line 3—3 in FIG. 1; and

FIG. 4 is a front elevation of the template on a reduced scale.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The portable rail drill is shown generally in FIG. 1 wherein the drill casing, indicated generally at 10, mounts a gas engine, indicated generally at 12, to provide power. A supporting structure includes a pair of rods 15 and 16 which mount a pair of ground-engaging adjustable legs, one of which is shown at 17, and with each of the rods 15 and 16 extending beyond the casing 10 and fitting into a pair of openings formed in ears 20 and 21 of a clamp structure, indicated generally at 25. This general arrangement of structure is the same as that shown in U.S. Pat. No. 2,887,908, previously referred to and reference may be made thereto for a more complete description of the general frame structure.

The clamp structure 25 includes a base plate 30 having the ears 20 and 21 and, as shown in FIG. 3, is of a height to extend both above and beneath the ball of the rail. The rail has a base 31 with a web 32 extending upwardly therefrom and the ball 33. The clamp structure 25 further includes a pair of spaced-apart generally L-shaped clamping members 35 and 36 of the same construction with a downwardly extending leg 37 and 38, respectively, each having an outwardly turned end 39, as shown for leg 37 in FIG. 3, which carries a wear plate 40 engageable under the lower corner of the rail ball 33. Each of the clamping members has a forwardly extending leg 41 and 42, respectively, which overlies the ball of the rail. Each of these forwardly extending legs carries a rotatable roller 43 ad 44, respectively, which rests on the rail and facilitates movement of the rail drill along the rail. The wear plates and rollers provide two points of contact at two different locations spaced along the length of the rail and coact with a clamp bar 50 to securely clamp the structure to the rail. The clamp bar 50 extends vertically at the side of the rail opposite from the L-shaped clamp members 35 and 36 and has a lower end 51 which engages the web of the rail on the side opposite from the wear plates 40. This clamp bar has a first opening 52 at its upper end to loosely fit onto a
threaded rod 53 extending forwardly from the clamp base 30 and with a pair of abutment nuts 54 limiting the movement of the clamp bar 50 on the threaded rod 53.

A second opening 55 in the clamp bar receives loosely a threaded rod 56 extending outwardly from the clamp base 30. A ball handle 58 threaded onto the threaded rod 56 acts against a washer 59 fitted against the outer surface of the clamp bar 50. With the structure shown assembled in 53, tightening of the ball handle causes the upper end of the clamp bar to abut against one of the abutment nuts 54 and draw the lower end 51 of the clamp bar against the web of the rail, with the forces reacting against the wear plates 40 on the lower end of the clamping members 35 and 36. The angled relation of the wear members engaging under the lower corner of the ball results in the clamp structure being tightly locked to the rail.

The clamp members 35 and 36 are releasably adjustable relative to the clamp base 30. Clamp base 30 has a pair of raised ribs 60 and 61 defining a vertical guide channel for the clamping member 35 and a second pair of ribs 62 and 63 defining a vertical channel for the clamping member 36. The vertical height of the clamping members relative to the clamp base 30 can be adjusted by positioning thereof in the guide channels and, as shown for the clamp member 35, the position thereof is maintained by a releasable bolt 65 which is threaded into the clamping member 35 and can move along a vertical slot 66 formed in the clamp base 30 and with a washer 67 of a diameter greater than the width of the slot enabling tightening of the bolt 65 to firmly hold the clamping member 35 in position. Similar structure is provided for the clamping member 36.

For maximum utilization of the rail drill, it should be quickly adjustable to provide for drilling of holes in the rail web at a height required for the particular size rail. Commonly used rail sizes are 112, 115, 119, 132 and 136 pound rail. Rather than using an empirical method of adjusting the height for each size rail, provision is made for pre-set adjustments as provided by a pair of spacer blocks 70 and 71 having different height and width dimensions. As shown in FIG. 3, each of the spacer blocks has a large interior opening and each is held on the clamp base 30 by a bolt 72 threaded into the clamp base and with the head thereof engaged against a washer 73 of a size larger than the central opening 74 of the block. The spacer block 70 is positioned between the top surface of the forwardly extending leg 41 of the clamping member 35 and a threaded member 75 threaded into an overhanging extension 76 of the clamp base 30.

Referring to FIG. 2, the spacer block 70 has the four operative surfaces, 80, 81, 82, and 83, with the latter two surfaces being provided by recessed indentations in the side of the block. The dimension of the spacer block 70, as shown in FIG. 2, is greater from right to left than from top to bottom and with the recessed indentations 82 and 83 four different effective heights are provided by rotative positioning of the block. This is accomplished by the use of the threaded member 75 which, as shown in FIG. 2, fits into the recess 83. However if the spacer block is rotated 180° from the position shown, the surface 81 will be next to the threaded member 75 to provide a different height adjustment than that shown with the parts as positioned in FIG. 2. Similar action occurs with respect to operative surfaces 80 and 82 of the spacer block. The foregoing structure of the spacer block mounting and coaction with structure on the clamp base 30 applies also for the spacer block 71.

The four adjustments disclosed herein will accommodate the five sizes of rail previously referred to.

With the structure as described herein, the unit, before clamping to a rail, can be adjusted for a desired height by loosening the bolts 65 which hold the clamping members 35 and 36 in position and loosening the bolts 72 which hold the rotatable spacer blocks 70 and 71 in a desired position. The spacer blocks 70 and 71 are then rotated to provide the desired positioning of the clamping members 35 and 36 relative to the base 30 and the bolts 72 are then tightened, followed by tightening of the bolts 65 to hold the clamping members 35 and 36 in position on the base. The unit is then positioned on the rail. The rollers 43 and 44 permit movement of the rail drill along the rail. When the rail drill is in the desired position, the ball handle 58 is tightened. This draws the clamp bar 50 into tight engagement with the rail and with the forces reacting through the wear plates 40 on the clamping members 35 and 36 to lock the rail drill in position whereby a drill shown at 90 in FIG. 3 is properly positioned to drill through the web of the rail. The drill 90 as well as the clamp bar 50 being carried by the same common mounting always maintain the same relative height position, as shown in FIG. 3, so that there can be no interference with the drill by the clamp bar 50. Although not shown, the clamp bar 50 can have its lower end 51 bifurcated to form a pair of rail web engaging fingers to provide further clearance for the rail drill 90 as it comes through the web of the rail.

Index means facilitates rapid, accurate use of the rail drill in drilling a plurality of holes in adjacent rail sections. This means includes, as shown in FIGS. 1 and 4, a template 100 in the form of a bar extending alongside the ball 33 of the rail. A pair of clamp devices 101 and 102 at opposite ends of the template each have a part thereof fastened to the template 100 and include structure engaging both sides of the rail ball for clamping the template in position. The template 100 is shown in detail in FIG. 4 and has a pair of aligning grooves 105 and 106 for sighting the template in position with one or the other of said aligning grooves being aligned with the end of a rail. Additionally, the template has a plurality of detent notches 107, 108, and 109 which coact with a detent device 110 carried by the clamp member 35 by means of a bracket 111 (FIG. 3) which has a spring-urged detent 112 engageable in one of said detent notches 107-109.

The template 100, as shown particularly in FIG. 4, provides for drilling of two holes in the rail web at either side of the rail joint. This is accomplished by having the detent device 110 offset a predetermined distance from the centerline of the drill 90 and with related distances set up for the aligning grooves 105 and 106 and the detent notches 107-109 in the template 100. With the detent device positioned in notch 107 and with the aligning groove 105 in use, the first hole is drilled adjacent the rail joint and at one side of the joint. Detent notch 108 is then used which positions the
drill 90 for drilling a second hole at a further distance from the rail joint. The template is then shifted to use aligning groove 106 and then successive use of detent notches 108 and 109 will place openings in the rail web at the opposite side of the rail joint with the same spacing as the openings made in the other rail section.

I claim:

1. A portable rail drill for attachment to a railroad rail having a rail clamping device and a drill unit carried by the base of said device, and means for adjusting the height of the drill unit relative to the top of a rail including a clamping member engageable with the rail and movable relative to the base of the clamping device, variable height spacer means settable between said base and clamping member to control the spacing therebetween comprising a multi-sided block having unequal width and height dimensions, and means rotatably mounting said block to bring either said height or width dimension into operative position.

2. A portable rail drill having a clamping device supporting a drill unit relative to a rail, said device having a base extendable upwardly along one side of a rail and which mounts the drill unit, a pair of clamping members movably mounted on said base for height adjustment relative thereto and each being of an L-shape with one leg extended to overlie the top of the rail and the other leg engageable under the ball of the rail, and a pair of rotatably adjustable spacer blocks associated one with each of said clamping members and positionable between the associated clamping member and parts of said base to vary the spacing therebetween and cor-

respondingly vary the height of the drill unit relative to the rail.

3. A portable rail drill as defined in claim 2 wherein said spacer blocks have four sides and have different height and width dimensions whereby rotational positioning thereof causes variable spacing.

4. A portable rail drill as defined in claim 2 wherein said extended legs of said clamping members each mount a rail-engaging roller to facilitate movement of the rail drill along a rail.

5. A portable rail drill as defined in claim 2 with a clamp bar adjustably fastened to the base and engageable with the rail web opposite from said leg engaging under the ball of the rail to lock the rail drill to the rail.

6. A portable rail drill having a clamping device supporting a drill unit relative to a rail, said device including means for adjusting the height of the drill unit relative to a rail and means for positioning the rail drill lengthwise of the rail including a template positionable along a rail, clamp means for securing the template to the rail, a series of detent notches in said template and a detent carried on the clamping device to engage in one of said notches and locate the rail drill.

7. A portable rail drill as defined in claim 6 wherein said template has a pair of aligning grooves to provide for positioning said template in two positions with one or the other of said grooves in alignment with a rail joint, and said notches related to said grooves to provide plural positions of the rail drill at both sides of the rail joint in two positions of said index bar.