

May 19, 1942.

H. P. CHANDLER
PORTABLE POWER DRILL
Filed Dec. 3, 1940

2,283,722

2 Sheets-Sheet 1

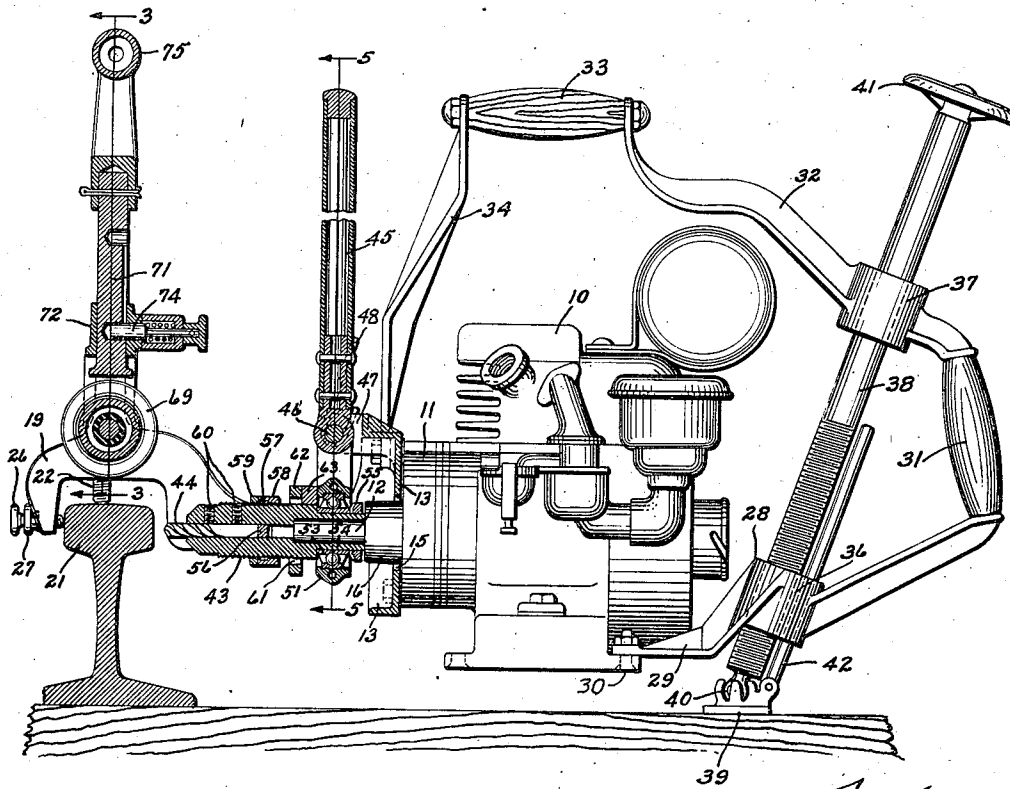


FIG. 1.

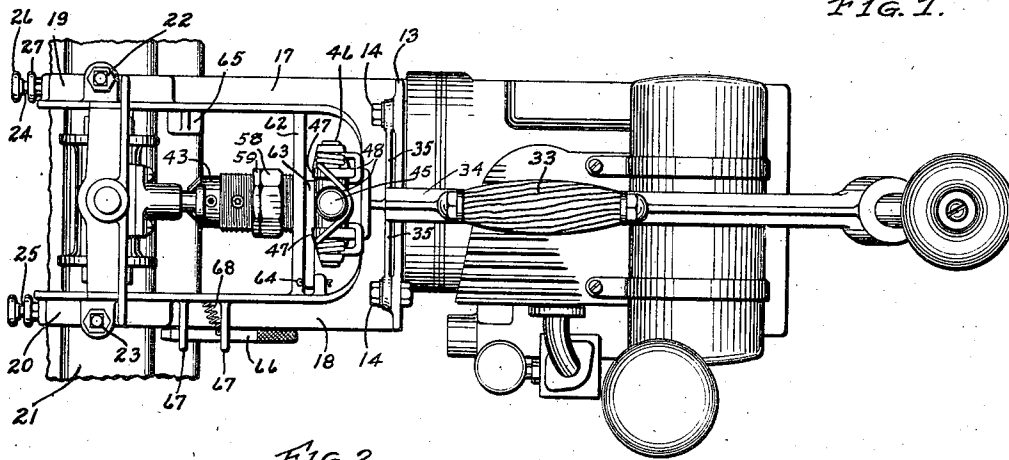


FIG. 2.

Inventor
HOMER P. CHANDLER
311
Alphens J. Crand
Attorney

May 19, 1942.

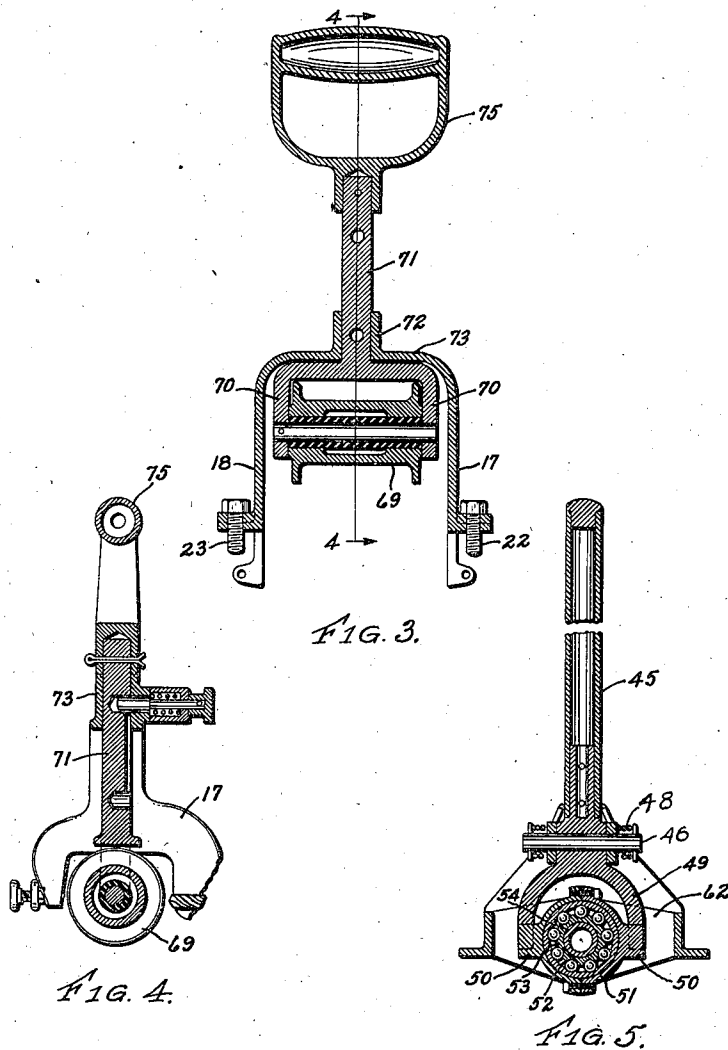
H. P. CHANDLER

2,283,722

PORTABLE POWER DRILL

Filed Dec. 3, 1940

2 Sheets-Sheet 2



Inventor

HOMER P. CHANDLER

By

Alpheus J. Crane

Attorney

UNITED STATES PATENT OFFICE

2,283,722

PORTABLE POWER DRILL

Homer P. Chandler, Mansfield, Ohio, assignor to
The Ohio Brass Company, Mansfield, Ohio, a
corporation of New Jersey

Application December 3, 1940, Serial No. 368,355

11 Claims. (Cl. 77—8)

This invention relates to portable power drills and particularly to drills for boring recesses in the heads of railway rails for receiving terminal studs of rail bonds.

One object of the present invention is to provide a power drill for maintenance work which shall be lightweight, easy to handle, and capable of being easily and quickly adjusted in position for operation and yet one which shall have sufficient power to operate the drill under heavy feeding pressure.

A further object is to provide a portable power drill with quickly and easily operable gaging means for determining the depth and spacing of the drilled holes.

The further object of the invention is to provide a power drill which may be operated by a gasoline motor of standard construction.

A further object of the invention is to provide a device in the class named which shall be of improved construction and operation.

Other objects and advantages will appear from the following description.

The invention is exemplified by the combination and arrangement of parts shown in the accompanying drawings and described in the following specification and it is more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a side elevation with parts in section showing the drill in operative relation with a railway rail.

Fig. 2 is a top plan view of the mechanism shown in Fig. 1.

Fig. 3 is a vertical section on the line 3—3 of Fig. 1.

Fig. 4 is a transverse section on the line 4—4 of Fig. 3, but with the parts in a different relative position from that shown in Fig. 3.

Fig. 5 is a section on the line 5—5 of Fig. 1.

In the drawings, the numeral 10 designates a small gasoline engine of standard construction preferably having reduction gearing disposed in a gear housing 11 and having a drive shaft 12 projecting at one side of the engine. A bracket comprising a plate 13 is secured to the side of the engine adjacent the projecting end of the shaft 12 by means of bolts 14 attached to the gear housing 11. The plate 13 is provided with an opening 15 through which the bearing boss 16 for the shaft 12 extends. A pair of spaced arms 17 and 18 project from the plate 13 at opposite sides of the shaft 12 and the outer ends of these arms carry hooks 19 and 20 for engaging the

head 21 of a railway rail to be recessed. Adjustment screws 22 and 23 are threaded in the arms 17 and 18 respectively and bear on the upper face of the rail head to locate the arms vertically relative to the head. Adjustment screws 24 and 25 are carried by the outer ends of the hooks 19 and 20 respectively for engaging the outer face of the rail head to locate the hooks horizontally relative to the rail for a purpose to be more fully explained later. The screws 24 and 25 are provided with hand wheels 26 rigid with the screws and locking wheels 27 threaded on the screws. A bracket 28 is provided with spaced arms, one of which is shown at 29 in Fig. 1 of the drawings, the arms being attached to the base of the engine 10 by screws 30. The bracket is provided with a handle portion 31 and an upwardly extending arm 32 connected to a second handle 33. The forward end of the handle 33 is connected by a strap 34 and branches 35 to bolts 14 which attach the bracket and plate 13 to the front of the engine frame. The bracket 28 has aligning sleeve portions 36 and 37 which receive a shaft or bar 38 having a foot rest 39 connected to its lower end by a ball and socket 40. The shaft 38 may be threaded into the sleeve 36 and provided with a hand wheel 41 for adjusting the shaft longitudinally. Other means for securing the shaft in longitudinally adjusting positions may be employed instead of the threaded connection if desired. A guide bar 42 is secured to the foot rest 39 and has sliding engagement with an opening in the sleeve 36 to prevent rotation of the foot rest.

A drill chuck 43 is splined on the forward end of the drive shaft 12 and carries a drill 44 for penetrating the rail 21. The drill chuck and drill are moved forwardly into engagement with the rail by an operating lever 45 pivotally mounted on a shaft 46 carried by ears 47 projecting from the plate 13. A spring 48 tends to move the lever 45 forwardly so as to retract the chuck 43. The lower end of the handle 45, as shown in Fig. 5, is provided with bifurcations 49 which engage trunnions 50 on a split collar 51 which carries a thrust ball bearing 52 having an inner sleeve 53 secured to reduced portion 54 of the chuck 43 by means of a ring nut 55. An abutment bar 56 extends through a transverse slot in the chuck 43, the ends of the bar projecting into a recess 57 in a ring nut 58 threaded on the outer periphery of the chuck. The abutment bar 56 may be accurately located by the ring nut 58 and locked in position by the locking ring 59,

also, threaded on the chuck. The drill may be secured in the chuck by a set screw threaded into either one of the openings 60. The chuck 43 extends through an opening 61 in a transverse bar 62 secured to the bracket arms 17 and 18. A depth gauge 63 is pivotally mounted on a cotter 64 carried by a lug projecting inwardly from the bracket arm 18.

In operation the drill is disposed at the outside of the rail as shown in the drawings and adjusted to bring the point of the drill at the proper height relative to the rail head by the screws 22 and 23. The hand wheel 41 is then rotated until the axis of the shaft 12 and drill 44 is brought into a horizontal position. Any suitable level gauge may be employed for accurately determining the horizontal adjustment. With the drill projected forwardly as far as it will go, while the gauge 63 is interposed between the collar 51 and bar 62, the entire drill mechanism is moved forwardly or to the left, as viewed in Fig. 1, until the point of the drill 44 engages the face of the rail. The adjustment screws 24 and 25 are then threaded inwardly until they engage the opposite face of the rail from that engaged by the drill. The depth gauge 63 is then lifted out of engagement with the cross bar 62 and the handle 45 is pulled rearwardly by the operator while the engine is running to press the drill into contact with the face of the rail and cause it to penetrate the rail. The lever is operated until the split collar 51 contacts the cross bar 62. The drill will then have penetrated the rail to a depth equal to the thickness of the depth gauge 63. The depth of penetration is accurately determined by the thickness of the depth gauge.

The proper position of the recess relative to the end of the rail is determined by means of a sight gauge 65 mounted on the arm 17. When the inner end of the gauge 65 is in alignment with the end of the rail to be bored the hole will be properly spaced from the end of the rail. After the hole in the rail has been bored, the handle 45 is released and the spring 48 withdraws the drill from the recess.

A pin 66 is slidably mounted in perforations in a pair of ears 67 on the arm 18 and is held in either of two extreme positions by a compression spring 68. The pin is shown in its retracted position in Fig. 2 of the drawings. After the first hole has been drilled, the pin is moved forwardly until the spring 68 passes its center position. The spring will then cause the pin to bear against the face of the rail. The entire device is now moved along the rail until the pin 66 registers with the opening just drilled. When this occurs, the spring 68 will snap the pin 66 into the opening and arrest the movement of the drill mechanism. The pin will now accurately locate the drill 44 in the proper position for drilling the recess in the adjacent rail. After the pin 66 has thus snapped into place the drilling operation is repeated and the ends of both rails will then be properly drilled for receiving the ends of a rail bond.

The drill may be carried from place to place by the handle 33 or it may be trundled along the rail by the handle 31. For this purpose a roller 69 is provided, which is journaled between arms 70, at the lower end of a bar 71, as shown more clearly in Fig. 3. The bar 71 extends through a sleeve 72 carried by a cross bar 73 mounted on the arms 17 and 18. The roller 69 is held in a retracted position by a spring pressed pin 74, as shown in Fig. 1, and in a projecting position

as shown in Fig. 4. The roller may be moved from one position to the other by a handle 75 on the upper end of the bar 71. When it is desired to move the drilling mechanism, the pin 74 is retracted and the drill lifted until the bar 71 slides downwardly into a position where the pin 74 snaps into the upper opening in the bar 71 thus locking the roller in its projected position. The entire device may then be lifted from the rail and turned through an angle of 90 degrees from the position shown in Figs. 1 and 2. The roller 69 may then be rested on the rail and by grasping the handle 31, the operator may readily trundle the device to a new point of operation.

The entire device with a three quarter horsepower engine weighs only about eighty-five pounds and an engine of this size has sufficient power that the strongest operator cannot overload it. It can drill a rail in seven seconds or less and the handy flexible adjustments make it quickly adapted to any size or condition of rail. The holes are accurately spaced and automatically regulated as to depth, regardless of variations in the rail and changes in operating conditions. The device can be easily operated by one man either for new construction or for maintenance work, but it is designed particularly for maintenance operation.

I claim:

1. In a portable track drill a power motor having a drive shaft, spaced bracket arms rigidly secured in fixed position to said motor, one at each side of said drive shaft for engaging a railway rail, means for connecting a drill to said drive shaft in axial alignment with said drive shaft and for projecting said drill against a rail engaged by said bracket arms, and an adjustable support secured to said motor at the side thereof opposite said bracket arms to aid said bracket arms in supporting said motor with the axis of said drive shaft in a horizontal position while said drill is projected to penetrate said rail.

2. In a portable track drill, a power motor having brackets rigidly fixed directly to opposite sides thereof for suspending said motor therebetween, a drive shaft projecting from said motor at the side adjacent one of said brackets, means on said drive shaft for holding a drill in position to penetrate a rail engaged by the adjacent bracket, means adjustably carried by the other bracket for resting on the rail support at one side of the rail and a carrying handle disposed above said motor and connected with said brackets.

3. In combination a motor having a projecting drive shaft, a drill chuck splined on said drive shaft, a lever arm for moving said chuck along said shaft to project a drill in said chuck in the direction of the axis of said shaft, bracket arms rigidly fixed to said motor, one at each side of said drive shaft and shaped to engage a railway rail and an adjustable support for said motor at the side thereof opposite said drive shaft.

4. In combination a power motor having a main power driven rotor, a drive shaft projecting from said motor in the direction of the axis of said rotor, a bracket secured to the side of said motor adjacent said drive shaft and having rail engaging means thereon for holding said motor to a rail with the axis of said rotor transverse to said rail, means for connecting a drill to said drive shaft, means for projecting said drill against a rail engaged by said rail engaging means to drill a recess therein, an adjustable support

for said motor at the side thereof opposite said bracket and a handle connected with said motor for transporting the same, said support operably associated with said handle.

5. In combination, a motor having a projecting drive shaft, a drill chuck on said drive shaft, track rail engaging means secured to one end of said motor for holding said motor in position for a drill in said chuck to penetrate a rail engaged by said means, a lever arm pivotally secured to said means for projecting said chuck to force a drill therein against a rail engaged by said means and a stop pivotally secured to said means for limiting the axial movement of said chuck to determine the depth of hole made by said drill.

6. In combination a motor having a projecting drive shaft, a drill chuck longitudinally slidable on said shaft, a movable stop for limiting the forward movement of a drill in said chuck, adjustable track rail engaging means secured to said motor for adjusting the position of said motor so that a drill in said chuck just touches the surface of a rail engaged by said track rail engaging means when said drill is in the position determined by said movable stop, and a second stop for limiting forward movement of said drill at a predetermined distance beyond the position determined by said first mentioned stop to limit the depth of the hole drilled in said rail by said drill.

7. In combination a motor having a projecting drive shaft, a drill chuck splined on said drive shaft, a lever for sliding said chuck along said shaft, a stop for determining the extreme forward position of a drill in said chuck, a movable stop for arresting forward movement of said drill at a point spaced back of its extreme position a distance equal to the predetermined depth of a hole to be drilled, and adjustable track rail engaging means for fixing said motor in a position in which said drill just touches the face of a rail engaged by said track rail engaging means when the forward position of said drill is determined by said movable stop so that projection of said drill from said position to its extreme position will produce a hole in said rail of said predetermined depth.

8. In combination a motor having a projecting drive shaft, a drill chuck splined on said shaft, a bracket secured to said motor and having rail engaging arms at each side of said shaft, cooperating stops on said chuck and bracket for limiting forward movement of a drill in said chuck, a gauge of a thickness equal to the depth of a hole to be drilled in a rail, said gauge being arranged to be interposed between said stops, and adjustable means on said rail engaging arms

for fixing the position of the motor relative to a rail engaged by said arms so that a drill in said chuck will just touch the face of said rail when the forward position of said chuck is determined by said gauge and so that when said gauge is removed and said chuck is moved forwardly until arrested by said cooperating stops a hole will be drilled in said rail of a depth equal to the thickness of said gauge.

9. The combination with a drill and operating mechanism therefor of means for engaging a rail to hold said drill in position while drilling a recess in said rail, a longitudinally movable pin mounted on said rail engaging means in parallel spaced relation with said drill and spring means for projecting said pin into a recess made by said drill when said drill is moved away from said recess a sufficient distance to bring said pin into registration with said recess, to locate said drill for drilling a second recess at a predetermined distance from said first recess.

10. The combination with a drill and operating mechanism therefor of means for holding said drill in operative relation with a railway rail and means for regulating the spacing of different holes made by said drill said regulating means comprising a longitudinally movable pin arranged in parallel spaced relation with said drill and a spring for moving said pin in either direction from a central position and for holding said pin in retracted position when moved in one direction from its central position and in spring pressed relation against said rail when moved in the other direction so that when a hole has been drilled in said rail and said drill moved along said rail to bring said pin in registration with said hole said pin will snap into said hole and fix said drill in definite spaced relation with said hole.

11. The combination with a motor having a projecting drive shaft, of a drill chuck mounted on said drive shaft, bracket arms attached to said motor adjacent said drive shaft and having track rail engaging means thereon, a bracket secured to said motor at the side thereof opposite said drive shaft, a support adjustably mounted on said bracket for cooperating with said bracket arms to support said motor, a trunnion roller carried by said bracket arms and having its axis transverse to said drive shaft, a handle bar disposed above said motor and connected at its opposite ends with said bracket and bracket arms respectively, a handle on said handle bar above said motor for carrying said motor and a second handle on said handle bar adjacent the bracket end thereof for trundling said motor with said roller engaging a track rail.

HOMER P. CHANDLER.