E. PIERCE.

TRACK DRILL.

APPLICATION FILED SEPT. 29, 1908.

952,466.

Patented Mar. 22, 1910

2 SHEETS—SHEET 1.

Fig. 1.

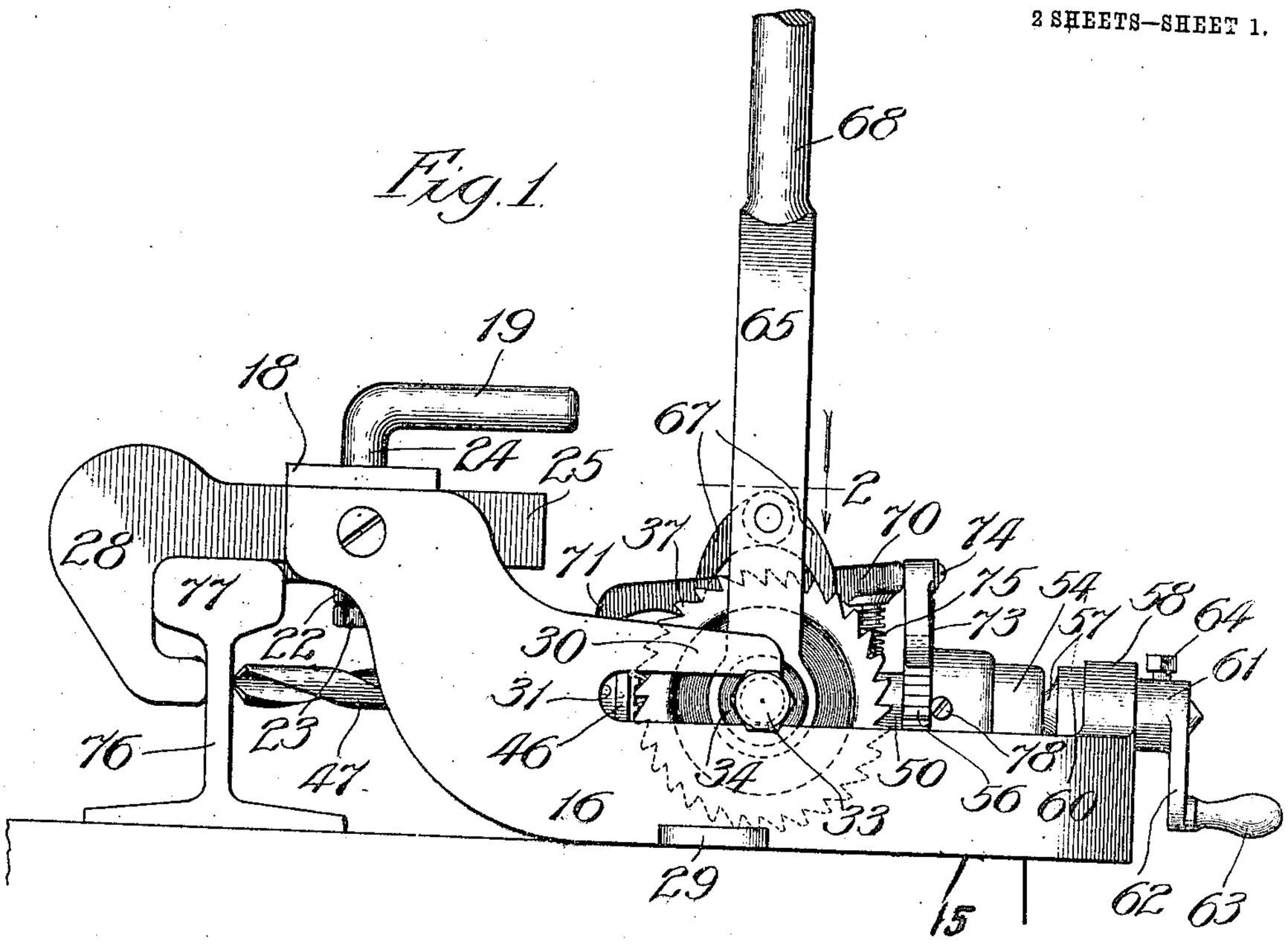
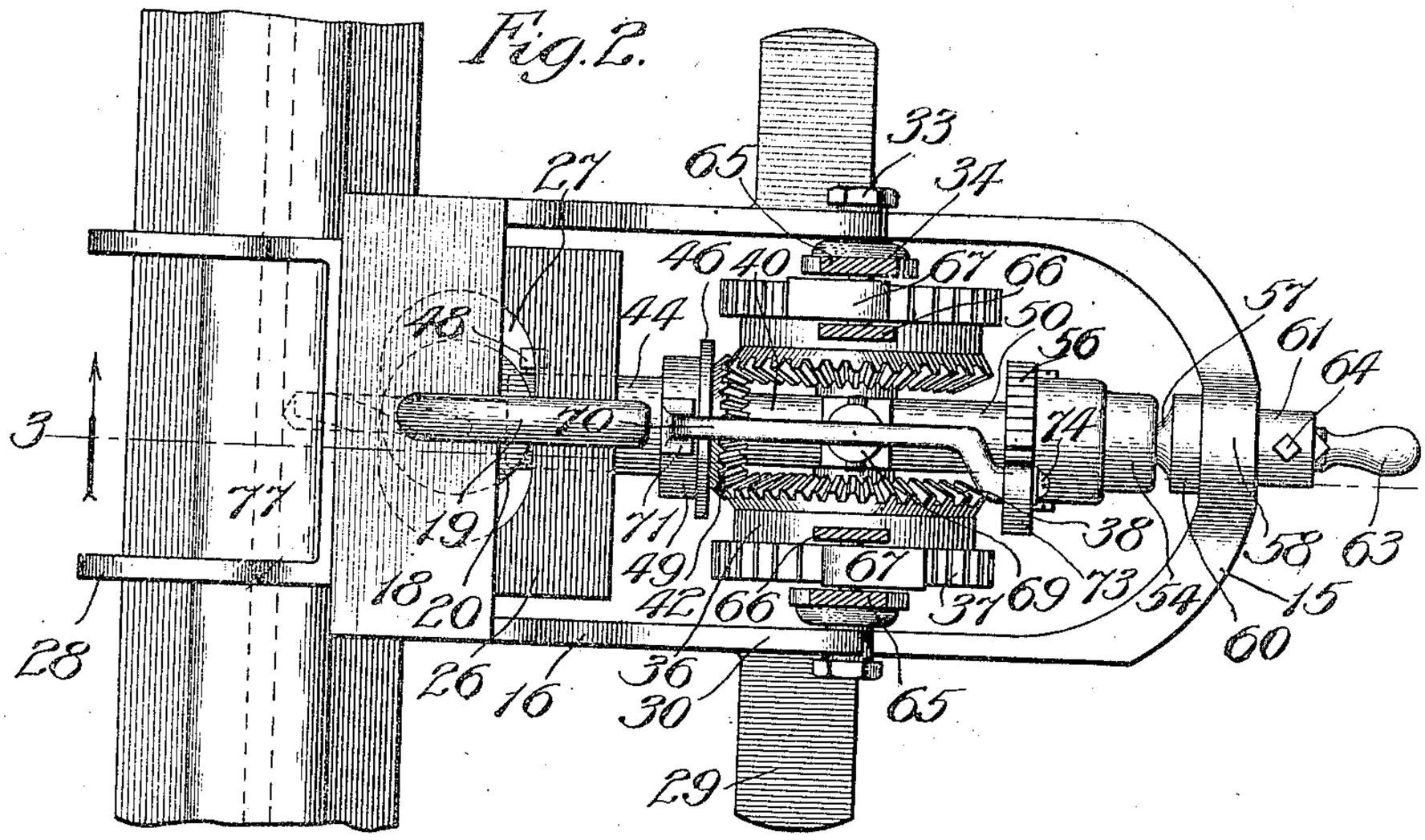


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

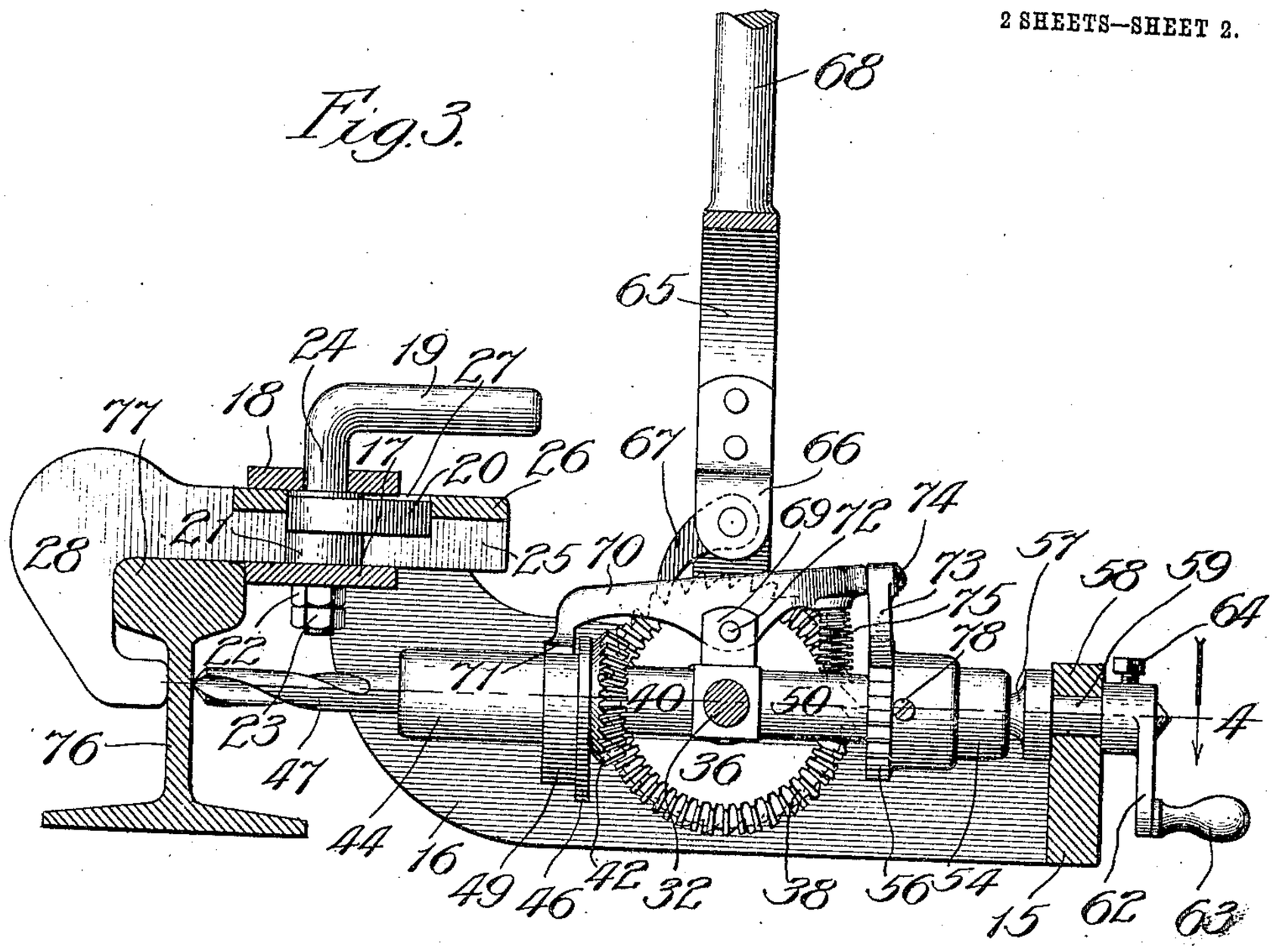
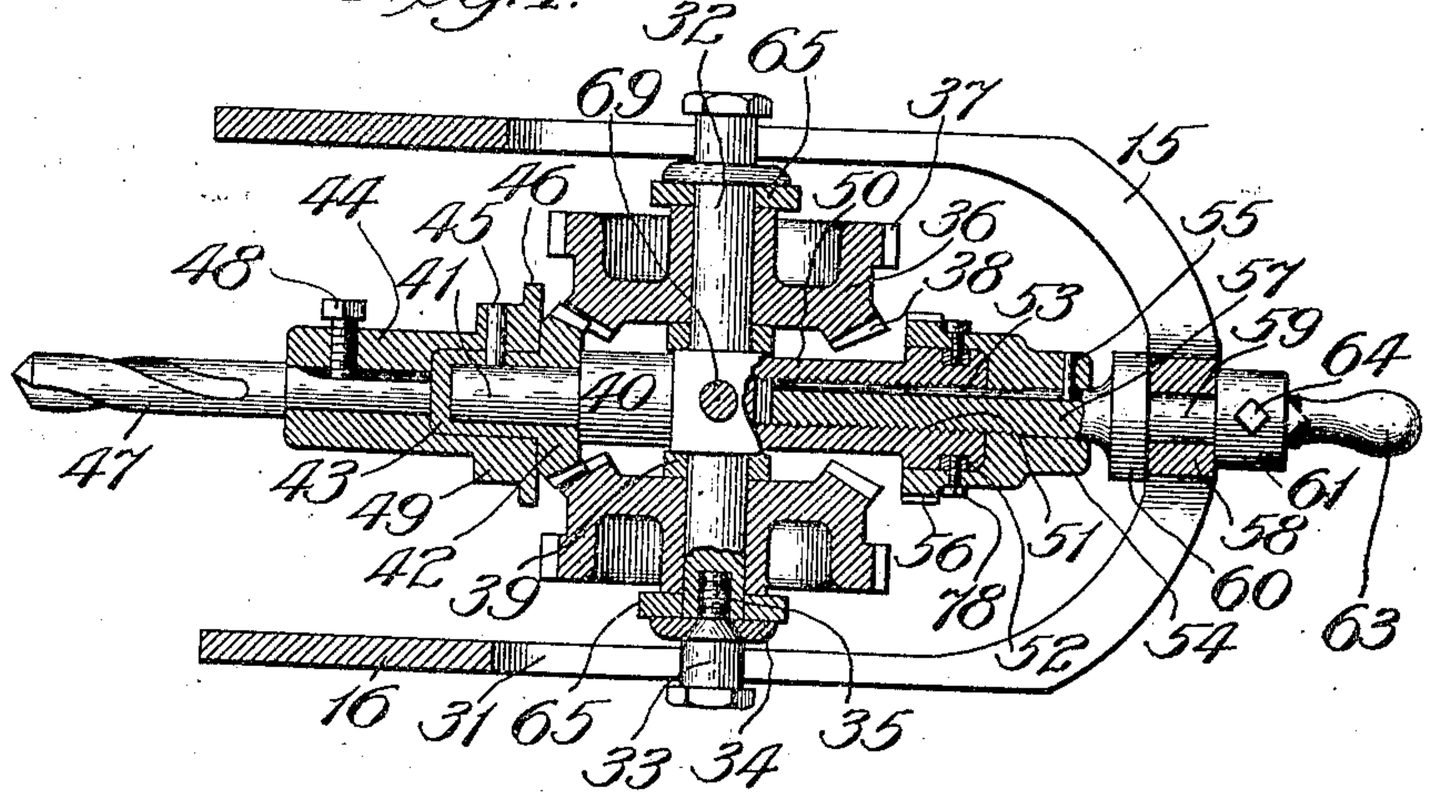


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD PIERCE, OF WEST BURLINGTON, IOWA.

TRACK-DRILL.

952,466. Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed September 29, 1908. Serial No. 455,264.

To all whom it may concern:

Be it known that I, EDWARD PIERCE, a citizen of the United States, residing at West Burlington, in the county of Des Moines and State of Iowa, have invented certain new and useful Improvements in Track-Drills, of which the following is a specification.

The principal object of my invention is to provide an improved apparatus for driving a rotary drill by hand.

Another object of my invention is to provide an improved clamp by which such a drill may be readily applied to a track T-rail, or removed therefrom.

Still another object is to provide an automatic feeding arrangement for such a drill.

All these objects and others will be made apparent in the following specification and claims taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of my improved device. Fig. 2 a top plan view taken partly in section along the line 2 in Fig. 1. Fig. 3 is a longitudinal vertical section taken on the line 3 in Fig. 2. Fig. 4 is a horizontal section taken on the line 4 in Fig. 3.

The main frame of the machine consists of two side plates 16 joined together at one end by a yoke 15. At the opposite end the plates 16 are united by two cross plates 17 and 18. A vertical shaft 24 is mounted to rotate in these cross plates 17 and 18. At its upper end it carries a short handle 19, and between the plates 17 and 18 it carries a cam 20.

21 is a shoulder attached to the cam 20 so as to hold it up and prevent longitudinal displacement of the shaft 24. A nut 22 and a lock nut 23 are provided on the lower end of the shaft 24.

Between the side plates 16 and the cross plates 17 and 18 are two plates 25 joined together by a cross plate 26. An elliptical hole 27 is cut in the cross plate 26 and the cam 20 engages this hole. Each plate 25 ends in the jaw 28 adapted to engage the head 77 of the T-rail 76. The side plates 16 have toes 29 turned out from their under edges. These afford supports for the drill frame as it rests on the ground adjacent to a rail, and the operator can also put his feet on them so as to hold the machine in place. Each side plate has a slot 31 which is overhung by the projecting arm 30.

The reference numerals 32—40—50 designate a frame member having the general shape of a cross (see Fig. 4). Studs 33 have screw-threaded engagement with the ends of the arms 32 as indicated by the reference numerals 35. The studs 33 clamp washers 34. On each arm 32 is loosely mounted a wheel 36, having ratchet teeth 37 on one side and beveled gear teeth 38 on the other side. Washers 39 lie between the respective wheels 36 and the central portion of the frame member 32—40—50. A projection 40 extends forward from the frame member 32—40—50 and carries a spindle 41. On this spindle 41 is a rotatable cap 43 carrying a gear pinion 42 which engages both gear wheels 38. A drill socket 44 is slipped over the cap 43 and has non-rotative engagement therewith by means of the pin 45. The rear end of this drill socket 44 is surmounted by a cam 49, back of which is a flange 46. The drill 47 is secured in its socket 44 by means of the set screw 48.

The frame member 32—40—50 has a rearward projection 50 which is internally screw-threaded, as indicated by the reference numeral 51. This rearward projection 50 has an annular groove 52, in which ring segments are placed as indicated in Fig. 4. A sleeve 54 rests over the said ring segments 52, and screws 78 bind said ring segments to the inner side of said sleeve 54. The screw-threaded shaft 57 engages the internal screw threads 51 and has a longitudinal slot 53 into which the pin 55 projects from the sleeve 54. On its forward end the sleeve 54 has a circumferential series of ratchet teeth 56. A lug 58 on the yoke 15 has a bearing for the portion 59 of the screw-threaded shaft 57. On one side is the collar 60 and on the other side is the collar 61, from which a crank 62 projects, carrying a handle 63. A set screw 64 locks the collar 61 on the shaft 57—59.

The main operating handle 68 is forked at its lower end, the branches being designated by the reference numerals 65. Each branch 65 has its end rotatively engaging the frame members 32. On the inner side of each branch 65 is an offset 66, and in these offsets 66 the opposite pawls 67 are pivoted.

A stud 69 is fixed at the center of the cross frame member 32—40—50, and the lever 70 is pivoted in this stud by means of the pin 72. The spring 75, acting between the member 50 and one end of the lever 70, keeps the opposite end thereof 71 resting on the cam 49. At the same end of the lever 70 with the spring 75 is pivoted the pawl 73 by means of the screw 74. This pawl 73 engages the ratchet wheel 56.

In the drawings the handle 19 and the cam 20 are shown in the position which they would occupy when the machine is engaging a rail 76. When it is desired to move the machine the handle 19 can be thrown around about 180 degrees, thus pushing back the jaws 28 so that the machine can be removed from the rail. The action just described is due to the turning of the cam 20 in the elliptical hole 27 in the plate 26 which unites the jaws 28. Since the pawls 67 are disposed oppositely, it follows that oscillation of the lever 68 will rotate one ratchet wheel 37 on one stroke and will rotate the other ratchet wheel 37 in the opposite direction on the opposite stroke. In both cases the rotation will be communicated through the beveled gears 38 to the beveled gear pinion 42, its rotation being always in one direction. Thus the to and fro movements of the operating handle 68 are alike effective to rotate the drill 47 in one direction. The cap 43 and the spindle 41 constitute a thrust bearing. The drill 47, its socket 44 and the cap 43 are prevented from accidentally dropping off by means of the hook end 71 of the lever 70 in combination with the flange 46 adjacent to the cam 49.

The frame member 32—40—50 rests on the side plates 16, the studs 33 being adapted to slide back and forth in the slots 31. By rotating the handle 63 by hand the shaft 57—59 will be caused to rotate, and thus, by reason of the screw threaded engagement with the projection 50, the frame 32—40—50 and the parts carried thereby will be moved forward or backward as desired. In case it is wished to withdraw the drill, that is to move the frame 32—40—50 backward, it will be necessary to rotate the shaft 57—59 so that the ratchet wheel 56 will turn against the pawl 73. Therefore the pawl 73 must be thrown over to the right. When the shaft 57—59 is rotated by hand, as just described, the sleeve 54 will rotate therewith, the screws 78 revolving the ring segments in the annular groove 52. The spring 75 acts to press the end 71 of the lever 70 on the cam 49. Thus the rotation of the drill 47 oscillates the lever 70 causing the pawl 73 to slowly rotate the ratchet wheel 56 step by step. Inasmuch as the ratchet wheel 56 is a part of the sleeve 54, it follows that the pin 55, by reason of its engagement with the slot 53 in the threaded shaft 57, will cause the shaft 57 to rotate, thus automatically feeding the drill forward.

This drill is more particularly intended to be used for the purpose of drilling holes in rails while the latter are in place on the ground. By means of the handle 19 and cam 20 the device can be instantly applied to a rail or removed therefrom. The machine permits the operator to assume a convenient posture and to apply his strength most directly and effectively to work the machine. The drill operates on both back and forth strokes by the handle 68, thus being more effective and economical of effort than drills which work only one way. The drill can be quickly fed forward or withdrawn from the work by means of the handle 63 operated manually. But a simple and effective automatic feed is provided in the cam 49, lever 70 and associated parts.

I claim:

1. In combination, a main frame, a frame member having the form of a cross, the extremities of two arms of the cross engaging said main frame, a drill socket, and a thrust bearing between said drill socket and another arm of the cross.

2. In combination, a main frame, a frame member having the shape of a cross, a drill socket, a thrust bearing between said drill socket and one arm of the cross, driving mechanism mounted on two opposite arms of the cross, these two arms having sliding engagement with the main frame, and feeding mechanism connected to the remaining arm of the cross.

3. In combination, a rigid frame member having the shape of a cross, beveled gear wheels mounted on opposite arms thereof, a beveled gear pinion mounted on a third arm, said pinion engaging both said gear wheels, a drill socket connected to said pinion, a lever having one end engaging the extremities of the same arms as the beveled gear wheels, and two opposite one way mechanisms for communicating movement from the lever to the respective beveled gears.

4. In combination, a main frame, a cross frame, the ends of two opposite arms thereof having sliding engagements with the main frame, a drill socket having a thrust bearing on a third arm of the cross, and feeding mechanism acting between the fourth arm of the cross and the main frame.

5. In combination, a yoke-shaped frame having opposite parallel slots, a cross-shaped frame member with the ends of two opposite arms in said slots, a drill socket, a thrust bearing between the same and the third arm of the cross, and feeding mechanism acting between the main frame and the fourth arm of the cross.

6. In a track drill, a main frame, a hooked jaw having sliding engagement with the end of the frame, means to reciprocate said jaw

relatively to the frame, a drill socket mounted in the frame, and means to feed said drill socket relatively to the frame.

7. In a track drill, a main frame, a jaw adapted to engage a head of a T-rail, said jaw having sliding engagement with said frame at the end thereof, a cam pivoted on the frame and adapted to reciprocate said jaw, a drill socket, and means to feed said drill socket relatively to the frame.

8. In a track drill, a main frame, a hooked jaw adapted to engage the head of a T-rail, an extension from said jaw at one side of the T-rail, said extension having a sliding engagement with the said main frame, and a cam carried by one of said members, the other member having a transversely elongated slot in engagement with said cam.

9. In a track drill, a main frame, a jaw having a plate thereon and slidably mounted in said main frame, said plate having a transversely elongated opening, a cam pivoted in said main frame and within said elongated opening, and a handle to rotate said cam.

10. In combination, a yoke-shaped frame adapted to lie beside a T-head rail with its arms extending toward the same and having guide slots therein, a rigid cross shaped sliding frame with the ends of two opposite arms thereof adapted to slide along the slots in the arms of the yoke-shaped frame, a drill shaft mounted to rotate upon a third arm of the cross shaped frame, and feeding mechanism adapted to act between the remaining arm of the cross shaped frame and the vertex of the yoke shaped frame.

11. In combination, a yoke-shaped frame adapted to lie beside a T-head rail with its arms extending toward the same, a member having sliding engagement with the said yoke-shaped frame, a hook adapted to extend from said last named member to engage the T-head rail, and a cam adapted to act between said yoke-shaped frame and said hook to clamp said frame in operative position beside the rail.

12. In combination, a yoke-shaped frame adapted to lie beside a T-head rail with its arms extending toward the same, a bearing member joining the ends of the yoke-frame, a member adapted to slide between the arms of the yoke-frame, a hook on said member adapted to engage the head of the rail, and a cam rotatably mounted in said bearing member, said sliding member having a transverse slot adapted to be engaged by said cam.

In testimony whereof, I, have subscribed my name.

EDWARD PIERCE.

Witnesses:
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