F. MARSELLIS.

RAILROAD TRACK RAIL DRILLING MACHINE.

APPLICATION FILED MAR. 7, 1907.

900,109. Patented Oct. 6, 1908.

4 SHEETS—SHEET 1.

Fig. 1.

Fig. 1a.

Witnesses.

F. Monteverde.

R. A. Becker

Inventor

Ford Marsellis

by Wm. F. Booth

his Attorney.

F. MARSELLIS.

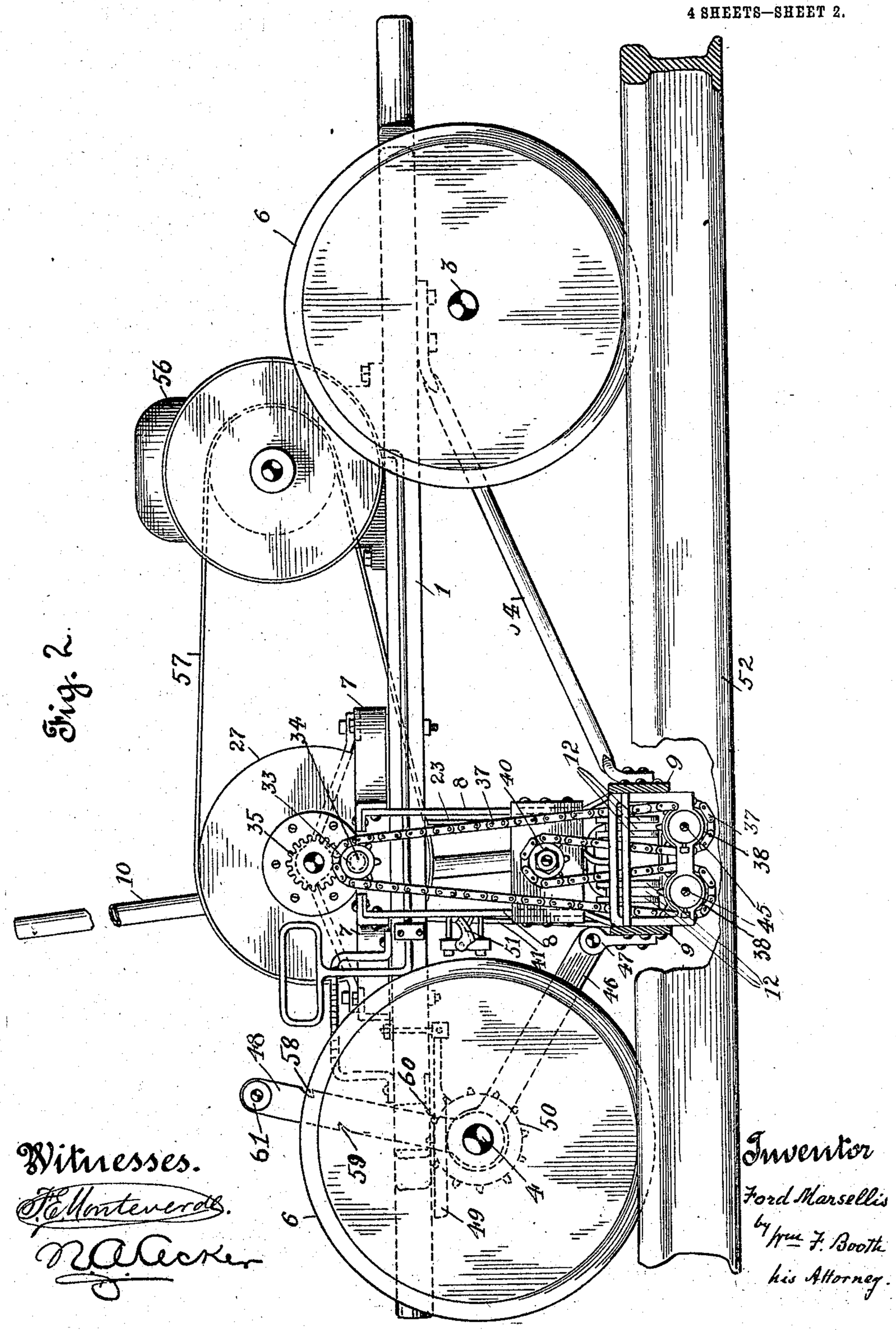
RAILROAD TRACK RAIL DRILLING MACHINE.

APPLICATION FILED MAR. 7, 1907.

900,109. Patented Oct. 6, 1908.

4 SHEETS—SHEET 2.

Fig. 2.



Witnesses.

F. Montenerdo.

R. A. Becker

Inventor

Ford Marsellis

by Wm. F. Booth

his Attorney.

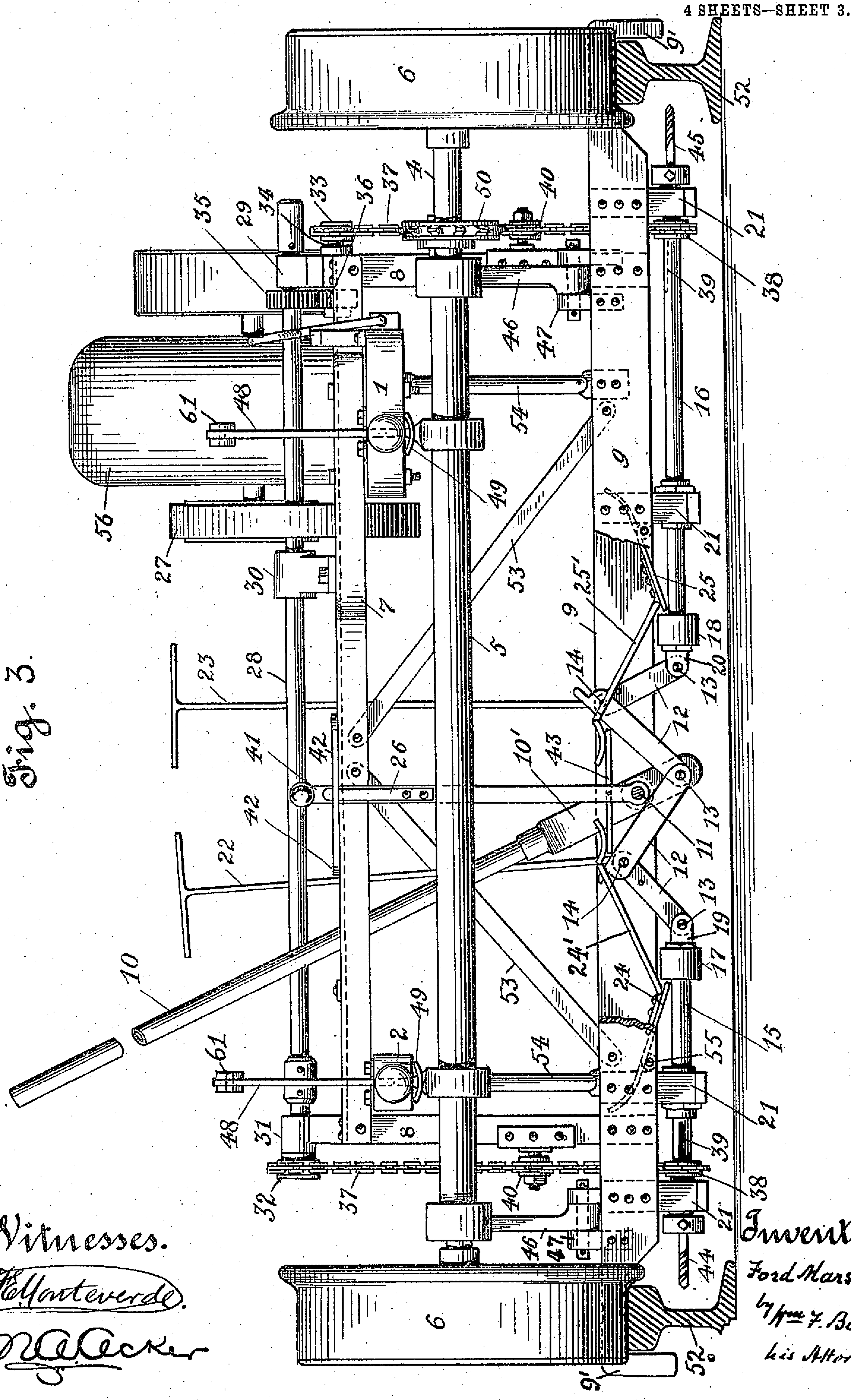
F. MARSELLIS.

RAILROAD TRACK RAIL DRILLING MACHINE.

APPLICATION FILED MAR. 7, 1907.

900,109. Patented Oct. 6, 1908.

4 SHEETS—SHEET 3.



Witnesses.
H. Monteverde
N. A. Acker

Inventor
Ford Marsellis
by Wm. F. Booth
his Attorney

F. MARSELLIS.

RAILROAD TRACK RAIL DRILLING MACHINE.

APPLICATION FILED MAR. 7, 1907.

900,109.

Patented Oct. 6, 1908

4 SHEETS—SHEET 4.

Fig. 5.

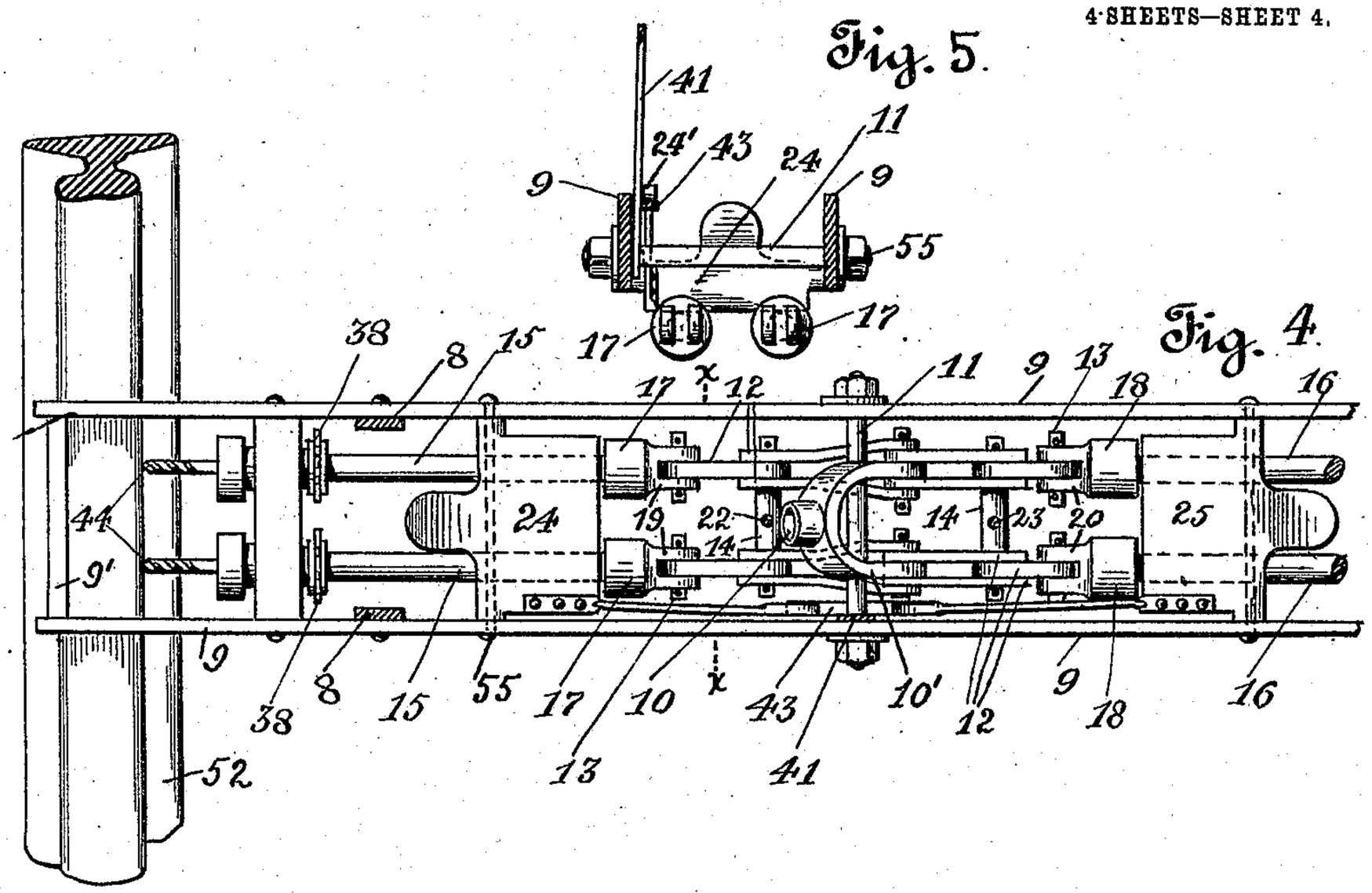
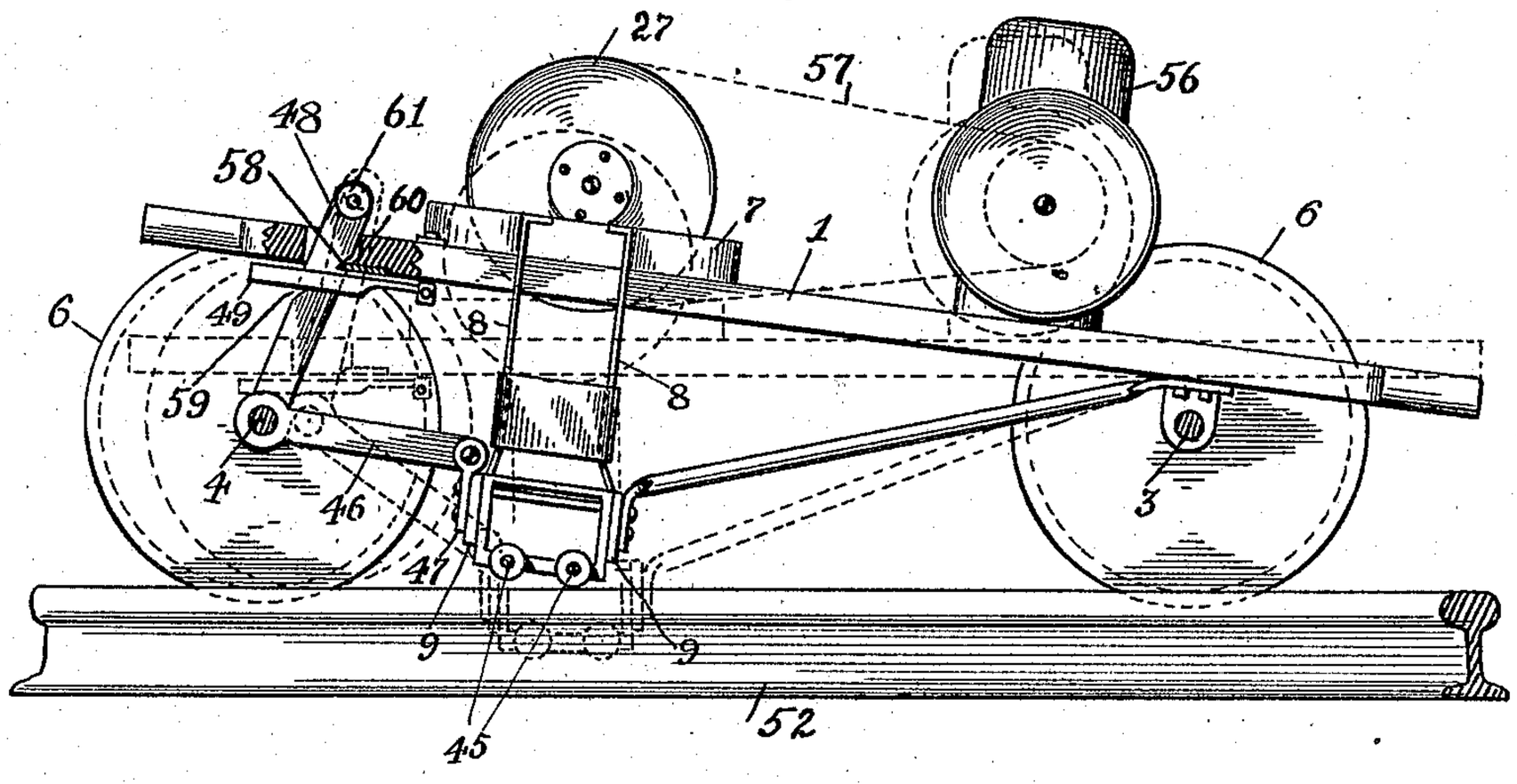


Fig. 4.

Fig. 6.



Witnesses.

H. Monteverde.

M. A. Decker

Inventor

Ford Marsellis

by Wm F. Booth

his Attorney

UNITED STATES PATENT OFFICE.

FORD MARSELLIS, OF BERKELEY, CALIFORNIA, ASSIGNOR OF ONE-FOURTH TO E. M. CUTTING, OF FRUITVALE, CALIFORNIA, AND ONE-FOURTH TO W. W. SLATER AND ONE-FOURTH TO H. C. BARNES, OF OAKLAND, CALIFORNIA.

RAILROAD-TRACK-RAIL-DRILLING MACHINE.

No. 900,109. Specification of Letters Patent. Patented Oct. 6, 1908.

Application filed March 7, 1907. Serial No. 361,024.

To all whom it may concern:

Be it known that I, FORD MARSELLIS, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Railroad-Track-Rail-Drilling Machines, of which the following is a specification.

My invention relates to railroad track-rail drilling-machines.

The object of my invention is to provide a simple, compact, serviceable and practical portable drilling-machine which will drill one or more holes at a time in railroad rails *in situ*, for the purpose of connecting electrical bond-wires, or for any purpose; and which can be readily moved from one point to another, either by hand, or by motive power carried by itself.

My invention consists in the novel constructions, arrangements and combinations, which I shall, hereinafter, fully describe, by reference to the accompanying drawings in which

Figure 1 is a plan view of the machine, the forward part being broken away. Fig. 1ª is a plan of said forward part, on a reduced scale. Fig. 2 is a right side elevation of the machine. Fig. 3 is a rear end elevation. Fig. 4 is a plan view of the bottom chords of the drill-frame, broken at one end. Fig. 5 is a sectional detail on line *x*—*x* of Fig. 4, showing also the parts immediately above. Fig. 6 is a diagrammatic side elevation, showing in full lines the rear of the machine elevated, to adapt it for traveling, and showing the normal working position in dotted lines.

The main frame of the machine includes a right sill 1 with handles at its ends and a left sill 2, with end handles, said sills being adjustably supported by truck members comprising a front axle 3, a rear axle 4 having a sleeve 5, and wheels 6, the whole being suitably assembled to form a portable frame to travel on track rails 52.

The terms right, left, front and rear are herein applied from the standpoint of a person viewing the rear end elevation, Fig. 3.

The drill-frame is composed of the pair of tie-bars 7; the depending uprights 8, bolted to the tie-bars at each end; and the pair of bottom chords 9, secured to the lower ends of the uprights 8; said drill-frame being properly stiffened, as, for example, by the diagonal braces 53, shown in Fig. 3, connecting the tie-bars and bottom chords; and by the braces 54, Figs. 2 and 3, connecting the bottom chords to the main-frame sills.

The drill-frame is carried by the main-frame by its tie-bars 7 being bolted to the sills of said main-frame, and by the braces 54 bolted to said sills; and said drill-frame, when down in operative position, is supported on the track-rails 52, by having its bottom chords 9 rest directly upon said rails, with their extremities 9′ bent over the rail tops, to embrace them, as shown in Fig. 3.

10 is the drill-spindle feed-lever, the yoked foot 10′ of which has for its fulcrum a pin 11, which is mounted between and in the chords 9. Fig. 1. The extremities of the yoked foot of the feed-lever 10 extend below the fulcrum pin 11, and are secured to the right and left drill-spindle feed-links 12, which with their pins 13 and 14, form, in the present illustration, a system of feed-links for operating on four drill-spindles, through the action of one lever 10.

15 are the two drill-spindles of the left, and 16 are the two drill-spindles of the right side. Fig. 5. The former, at their inner ends, have a thrust-bearing 17, and the latter have a corresponding thrust-bearing 18. The thrust-bearing 17 has a pair of jaws 19, to which the outer ends of the left feed-links 12 are pivoted by pins 13; and the thrust-bearing 18 has a similar pair of jaws 20 to which the outer ends of the right feed-links 12 are pivoted by pins 13.

The drill-spindles 15 and 16 are supported by and revolve in housings 21, which are secured to the drill-frame bottom chords 9. The pins 14 which connect the adjacent ends of the members of the left and right feed-links 12 extend across to the companion feed-link group, as seen in Figs. 1 and 5, and, from their function, may be termed lift pins, a lift-rod 22, Fig. 3, being secured at its lower end to the pin 14 of the left group of feed-links, and a lift-rod 23 being secured to the pin 14 of the right group of feed-links.

24 is a stop-latch, pivoted at 55 between the drill-frame chords 9, Fig. 5, and adapted, by gravity, to normally present its edge in the path of the thrust-bearing 17 of the pair of left drill-spindles 15, as seen clearly in Fig.

3. 25 is a similar gravity stop-latch for the thrust-bearings 18 of the pair of right drill-spindles 16.

The stop-latch 24 has an arm 24′, seen in Fig. 3, secured to it, the upper end of said arm resting upon a cross-foot 43 of a stop-latch lift-lever 41, the lower end of which is pivoted on the fulcrum pin 11, Fig. 5, and the upper end passes through and is limited in a slot 42′ in a plate 42, Fig. 1, secured to one of the tie-bars 7. A spring 26, Fig. 3, on the lever 41 serves to frictionally control its position. A similar arm 25′, Fig. 3, extends from the stop-latch 25, and has its upper end resting on the opposite side of the cross-foot 43 to that upon which the arm 24′ rests.

56 indicates a motive power of any suitable character. It transmits motion through a belt 57 to the pulley 27 of the main-shaft 28, which is mounted on the bars 7 in suitable bearings, here indicated by a right bearing 29, a left bearing 31, and an intervening bearing 30. Figs. 1 and 3. Upon the left hand end of the main-shaft 28 is a sprocket 32, from which a chain 37 passes down to the sprockets 38, mounted on feathers 39, Fig. 3, on the pair of left drill-spindles 15, said chain passing up over an intervening tightener sprocket 40, adjustably secured to the drill-frame uprights 8. Fig. 3. Thus, the left drills 44 may have rotary motion imparted to them.

The right drills 45 are rotated by a chain 37, feathered sprockets 38, Figs. 1 and 3, and tightener sprocket 40, all similar to those at the left; but the chain is driven by a sprocket 33 on an intermediate short shaft 34, which shaft is driven from the main-shaft through the gears 35 and 36.

The operation of drilling is as follows: Assuming that the drill-frame is resting upon the track-rails by its chords 9, as shown in Fig. 3, and that the drills are being revolved at the proper speed, if it be desired to drill the left hand rail, the stop-latch lift-lever 41 is thrown over to the right as far as it will go, its limit being defined by the guide slot 42′ in the plate 42, through which it plays. This movement of the lever 41 causes its cross-foot 43 to lift the arm 24′ of the stop-latch 24, and thus to lift the stop-latch itself, so that the drill-spindle thrust-bearings 17 are released. Now, the lift-rod 22 is forced down in order to press downwardly the left group of feed-links 12 to their limit of motion. The projection of these feed-links will now be against the pins 13; and the intervening pin 14 will be a little below the center line joining the pins 13, thus making inflexible connections between the short arm of the feed-lever 10 and the drill-spindle thrust-bearing jaws 19. The feed-lever 10 is now moved slowly to the right, forcing the left drills 44 through the rail. When the boring is complete, the left drills are retracted by raising the left group of feed-links 12, by means of the lift-rod 22. With the apparatus in this condition, if it be desired to drill the opposite rail, the operation is as follows. The stop-latch lift-lever 41 is thrown over to the left position, thereby lifting drill-spindle stop-latch 25 from its engagement with the thrust-bearings 18 of the drill-spindles. Then the right link-lift-rod 23 is forced down, which movement will depress the right group of feed-links 12 to form inflexible connections between pins 13, and bring the right drills 45 close to the rail. Now the feed-lever 10 is moved slowly to the left, which will force the drills 45 through the right hand rail. When the boring is complete, the drills are retracted by lifting the right lift-rod 23.

When it is desired to transport the machine to some other point, say, to a distance, the latch-lift-lever 41 is first brought to its central position, as in Fig. 3, thereby leaving the stop-latches 24 and 25 in engagement with the drill-spindle thrust-bearings 17 and 18, whereby the spindles 15 and 16 are kept from jarring forward in transportation. Then the means which are provided to raise and support the rear end of the drill-frame, so that its drills and lower parts will be clear of the rails, are operated. The front ends of the main-frame sills are rigidly fastened to the front axle, as seen in Fig. 1ˣ, but their rear ends simply rest on the sleeve 5 of the rear axle, as indicated in Fig. 1, and are connected therewith flexibly. The rear-axle-sleeve 5 is attached to the drill-frame by the connecting links 46, which at one end are connected with the sleeve 5 and at the other end are connected with the bottom chords 9, by means of the brackets 47.

48 are supporting bars, mounted at their lower ends on the rear-axle-sleeve 5, and thence they rise freely, at an inclination, through slots in the sills 1 and 2. The supporting bars have a notch 58 in their front edges, and a notch 59 in their rear edges, with which latter notches, latches 49 under the sills are adapted to engage. Now, when the sills 1 and 2 are grasped by their handles and raised, the supporting bars 48, owing to their normally inclined position, fall a little forward against a plate 60 which is secured on the under side of the sills, on that edge of the slots against which the supporting bars lean. When the sills are raised far enough to come up against the buttons 61 on top of the bars 48, they are then lowered a little, until their front notches 58 engage the plate 60, whereupon the whole rear portion of the machine is held elevated, as shown in full lines in Fig. 6; and the bar latches 49 being released, fall by gravity into the notches 59 on the rear sides of the bars 48, thus locking the device in the raised position, with the lower parts clear of the rails. (Fig. 6.) When in this position the right drive chain

37 may be removed and another chain, (not shown) substituted on the sprocket 33 and carried through a chain-guide 51, Figs. 1 and 2, to a drive sprocket 50 on the rear axle; whereupon the motive power can be used to propel the drilling machine.

Any suitable motor can be used to propel the machine. One or more drills may be used, and they can be arranged in any manner desired, that is, if one drill is used, it may be placed on either side; if more than one is used, they may be placed all on one side, or some on one side and the rest on the other side. Similarly, any suitable power mechanism may be used to transmit rotary motion to any of the parts. I do not, therefore, confine myself, in any of these respects, to the precise devices herein illustrated.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is,

1. In a railroad track-rail drilling-machine, the combination of oppositely disposed drills, means for rotating the drills, and feeding and retracting mechanism including a pair of links for each drill, means for alternately alining each pair of links to present a rigid thrust connection with the drills, and flexing them to retract the drills, and a single lever connected at one end with each pair of links to impose a pressure upon them when alined as a thrust connection, to feed the drills.

2. In a railroad track-rail drilling-machine, the combination of a drill; means for rotating it; and feeding and retracting mechanism comprising a pair of links, a rod for alternately alining said links to present a rigid thrust connection with the drill, and flexing them to retract the drill, and a lever connected with the links to impose a pressure upon them when alined as a thrust connection, to feed the drill.

3. In a railroad track rail drilling machine, the combination of oppositely disposed drills, means for rotating the drills, and feeding and retracting mechanism, including a pair of links for each drill, means for alining each pair of links to present a rigid thrust connection with the drills, and flexing them to retract the drills, and means common to each pair of links to impose a pressure upon them when alined as a thrust connection to feed the drills.

4. In a railroad track rail drilling machine, the combination of oppositely disposed drills, means for rotating the drills, a means connected with the drills to feed the same forward and retract the same, separate latches to lock the drills in a retracted position and a single means to release the drills and permitting the release of only one drill at the same time, said means comprising a lever having lateral projections to engage and lift said latches.

5. In a railroad track rail drilling machine, the combination of a drill, means for rotating it, mechanism for feeding and retracting the drill, means for locking said drill in a retracted position and releasing the same, said means comprising a swinging stop latch engaging the drill connections and a lever provided with a lateral projection to lift said latch.

6. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame intermediate the truck members rigidly connected with one of the axles and adjustably connected with the other axle to permit the frame to be raised and lowered.

7. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame rigidly connected with one of the axles and engaged with the other axle to permit vertical adjustment relative thereto and means mounted on one of the axles to support the frame when raised from said axle.

8. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame fast to one axle and engaged with the other axle for adjustment relative thereto, a member pivotally mounted on one of the axles to engage and support the frame when adjusted relative thereto.

9. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame fast to one axle and having a flexible connection with the other axle permitting vertical adjustment of the frame relative thereto, and a member pivotally mounted on said axle to engage and support the frame when adjusted relative thereto.

10. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame having a connection with one of said axles, said connection being fixed with respect to movement of the axle longitudinally of the frame, and adjustably connected with the other axle to permit the frame to be raised and lowered.

11. In a railroad track-rail drilling-machine, a main frame supported for adjustment and a drill frame carried by the main-frame having a rigid bottom chord to engage the track rail, said main-frame being adapted to be adjusted to support the drill frame clear of the track rail, and to permit the rigid bottom chord of the drill frame to rest upon the track rail.

12. In a railroad track-rail drilling-machine, a wheeled truck, a main frame adjustably supported by the truck and a drill frame carried by the main frame and adapted to rest upon and be supported by the track rail, said main frame being adapted to be adjusted to support the drill frame clear

of the track rail, and to permit the drill frame to rest upon and be supported by the track rail.

13. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame having a slot at one end thereof made fast to one axle and engaged with the other axle to permit of adjustment relative thereto, an arm pivoted to said axle and working in the slot of the frame to support the same when adjusted relative to said axle, said arm being provided with a seat to be engaged by the frame and with a stop to limit the adjustment of said frame.

14. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame fast to one axle and engaged with the other axle to permit adjustment of the same relative thereto, an arm pivoted to said axle to support the frame when adjusted relative to said axle, said arm being provided with a seat and the frame having a catch to engage the seat of the arm.

15. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a main frame, a drill frame carried by the main frame and extending downwardly therebeneath between the truck members, said main frame being made fast to one of the axles and engaged with the other axle to permit vertical adjustment of the frame relative thereto, a latch lever mounted on said axle to support the main frame when raised from said axle and a pivotal link connection between said axle and the lower end of the drill frame.

16. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame fast to one axle and engaged with the other axle for adjustment relative thereto, a member pivotally mounted on one of the axles to engage and support the frame when adjusted relative to said axle and a pivotal link connection between said frame and the [illegible] ferred to axle.

17. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame fast to one of the axles and having a loose pivotal connection with the other axle permitting vertical adjustment of the frame relative to said axle.

18. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame fast to one of the axles and having a loose pivotal connection with the other axle permitting vertical adjustment of the frame relative to said axle and means to maintain the frame in its adjusted position.

19. In a railroad track rail drilling machine, truck members comprising a pair of wheeled axles, a drill supporting frame fast to one of the axles and having a loose pivotal connection with the other axle permitting vertical adjustment of the frame relative to said axle and a pivotal link connection between said axle and frame.

In testimony whereof I have signed my name to this specification in the [illegible] two subscribing witnesses.

[illegible]

Witnesses:
N. A. Agnew,
L. E. Wilson.