No. 885,944. PATENTED APR. 28, 1908.

D. A. MOORE.

TRACK DRILL.

APPLICATION FILED AUG. 11, 1906.

3 SHEETS—SHEET 1.

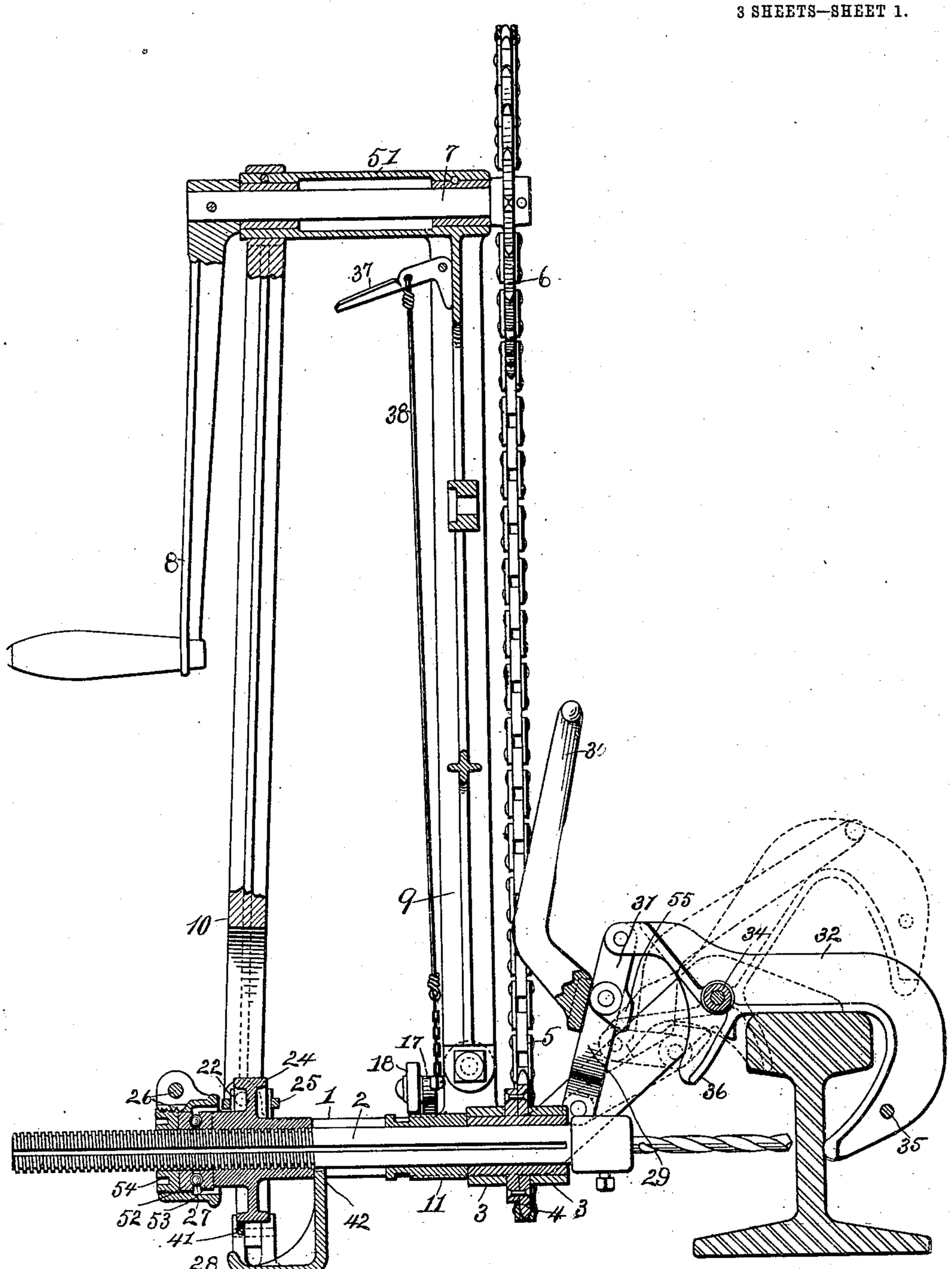

Fig. 1

Witnesses:

Lilie J. Greenfield

Leslie E. Arden

Inventor,

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3 SHEETS—SHEET 2.

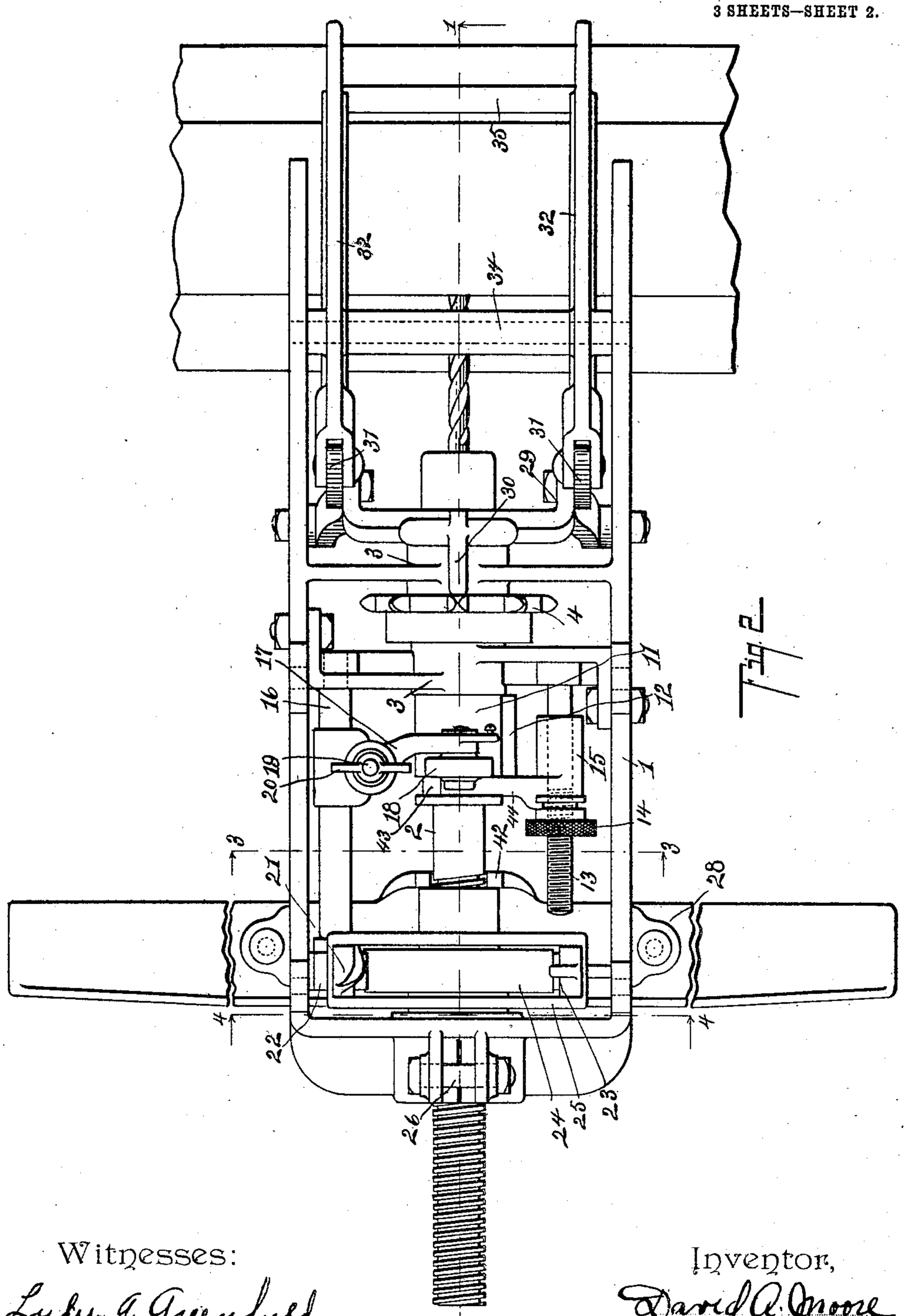

Fig. 2.

Witnesses:

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3 SHEETS—SHEET 3.

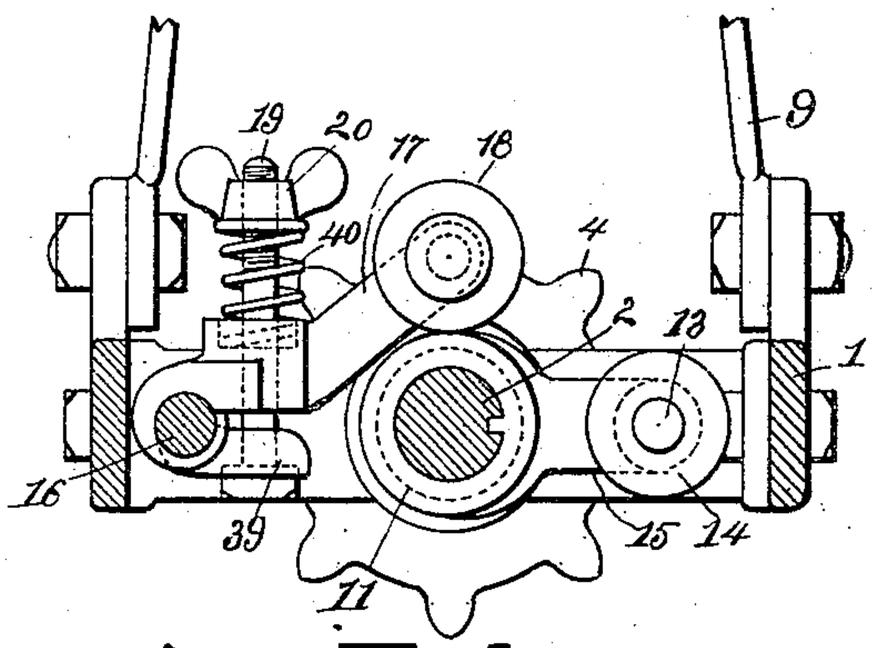

Fig. 3

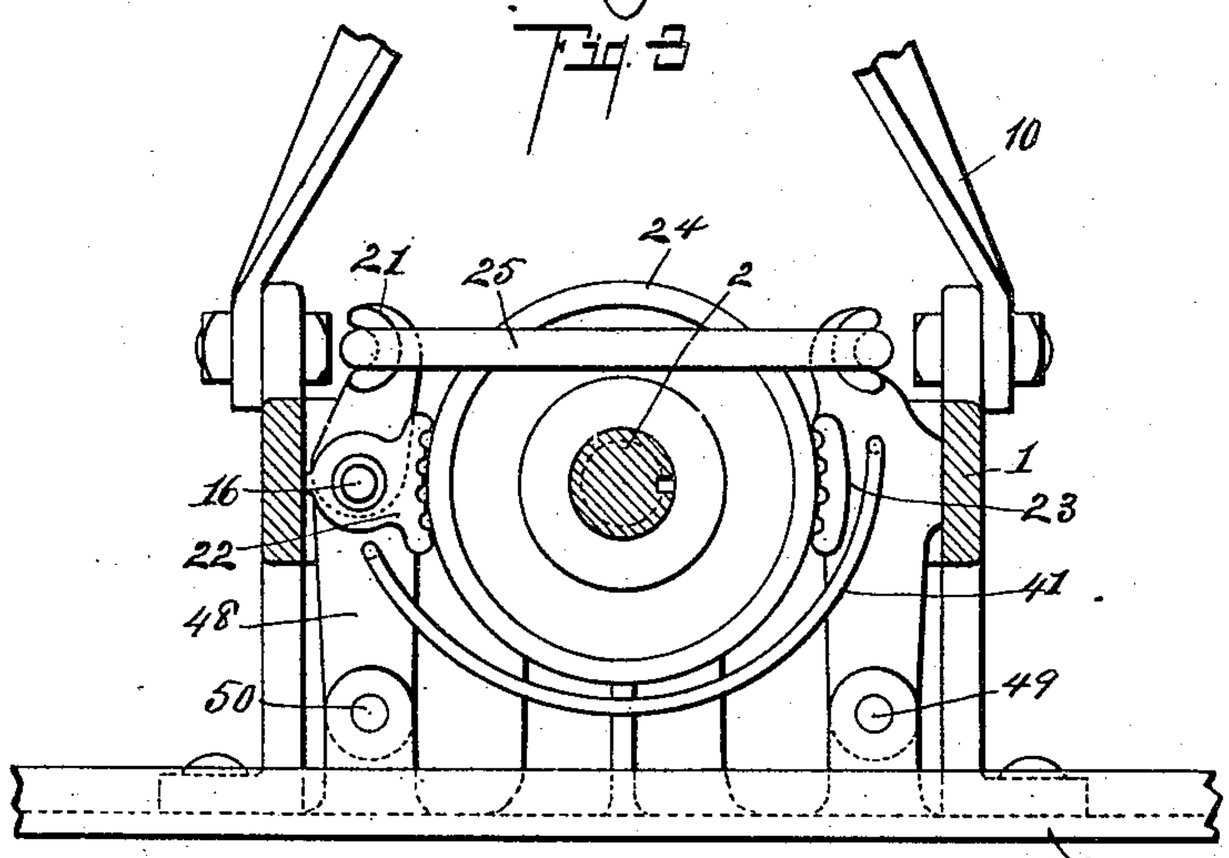

Fig. 4

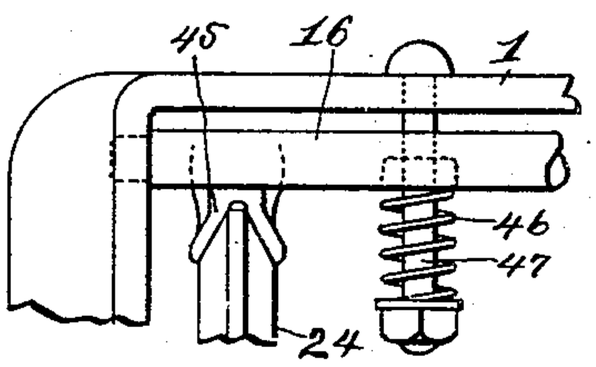

Fig. 6

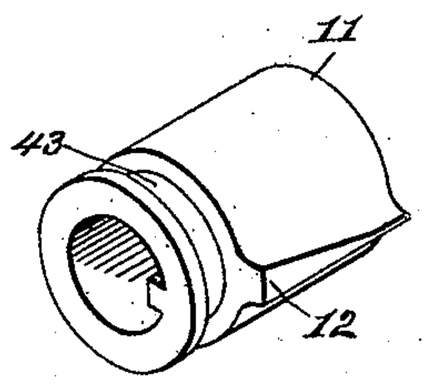

Fig. 5

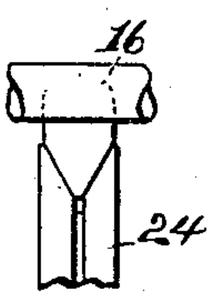

Fig. 7

Witnesses:

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UNITED STATES PATENT OFFICE.

DAVID A. MOORE, OF KALAMAZOO, MICHIGAN.

TRACK-DRILL.

No. 885,944. Specification of Letters Patent. Patented April 28, 1908.

Application filed August 11, 1906. Serial No. 330,141.

To all whom it may concern:

Be it known that I, DAVID A. MOORE, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, and State of Michigan, have invented certain new and useful Improvements in Track-Drills, of which the following is a specification.

This invention relates to improvements in track drills.

The main objects of this invention are: First, to provide in a track drill an improved feed mechanism, whereby the drill holder or stock may be driven at any desired speed. Second, to provide an improved feed mechanism which may be readily thrown out of operation by the operator. Third, to provide in a track drill an improved rail clutch or clamp.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing forming a part of this specification, in which,

Figure 1 is a central vertical longitudinal section of my improved track drill, portions being shown in full lines. Fig. 2 is a plan view with the upright or standard removed. Fig. 3 is an enlarged detail transverse section, taken on a line corresponding to line 3—3 of Fig. 2, showing details of the feed mechanism. Fig. 4 is an enlarged detail taken on a line corresponding to line 4—4 of Fig. 2, showing further details of the feed mechanism. Fig. 5 is a perspective view of the feed cam. Fig. 6 is a detail view of a modified form of the feed wheel 24, the periphery being A-shaped instead of flat, as shown in the main view of the drawing. Fig. 7 is a detail of another modification of the feed wheel 24.

In the drawing, the sectional views are taken looking in the direction of the little arrows at the ends of the section lines, and similar reference characters refer to similar parts throughout the several views.

Referring to the drawing, the main frame 1 of my improved track drill preferably consists of suitable side rails or pieces connected by suitable cross pieces. The drill stock or holder 2 is mounted in suitable bearings carried by this frame.

A sprocket wheel 4 is splined upon the drill stock or holder, the sprocket wheel being provided with suitable hubs arranged in the bearings 3; see Fig. 1. The crank shaft 7 is mounted on suitable bearings at the upper end of the upright, which preferably consists of the members 9 and 10, which members are rigidly bolted to the horizontal frame 1. The crank shaft 7 is provided with a suitable sprocket wheel which is connected to the sprocket wheel 4 of the tool holder by a chain 6. A crank 8 is provided for the shaft 7.

On the tool holder is a sleeve 11 having a cam projection 12 thereon. This sleeve 11 is splined to the tool holder so that it may be adjusted longitudinally thereon. The cam projection of the sleeve 11 is inclined, *i. e.*, it projects farther at one end than at the other, the purpose of which will appear later.

The cam sleeve 11 is provided with an annular groove 43, which is engaged by the arm 44 projecting from the sleeve 15, which is arranged upon the rod 13 arranged parallel with the drill holder. By means of the knurled finger nut 14, which is suitably connected to the sleeve 15, the arm is adjusted back and forth upon the rod carrying the cam with it, changing its position relative to the feed lever 17, the roller 18 of which is engaged by the cam as the tool holder is revolved. The feed lever or arm is carried by the rock shaft 16. As the tool holder revolves, the cam engages the roller 18 of the feed lever, thereby actuating the same. The rock shaft 16 is arranged parallel with the tool holder. A feed screw is provided for the tool holder preferably by threading the rear portion thereof. The feed wheel 14 is provided with internal threads and turns freely upon the feed screw.

On the shaft 16 is a clamping shoe or jaw 22 arranged to engage the periphery of the feed wheel 24 so that, when the rock shaft is actuated, the feed wheel is locked against rotation thereby. This, of course, causes the revolving tool holder to be fed forward so long as the feed wheel is locked against rotation.

A pivoted jaw or shoe 23 is arranged to co-

act with the shoe 22, the same being arranged on the opposite side of the feed wheel and connected to the rock shaft by means of an upwardly projecting arm 21 thereon and the link 25. The shoe 23 is pivoted at 49. The shaft 16 is supported at its rear end by the support 48 which is pivoted at 50; see Fig. 4. This allows a slight swinging movement of the shoe to and from the feed wheel. A spring 41 is arranged to hold the clamping jaws or shoes for the feed wheel out of engagement; see Fig. 4. By this arrangement, the feed can be adjusted to suit the particular requirements by shifting the cam sleeve 11. I also provide further means of adjustment, the feed lever 17 being adjustably secured to the rock shaft. The rock shaft is provided with a fixed projection 39 to which the lever 17 is adjustably connected by means of the bolt 19 arranged therethrough. A winged nut 20 is provided for the bolt 19 and the spring 40 is arranged between it and the top of the lever. By adjusting the nut, the tension of the spring may be adjusted so that the lever has more or less movement before it acts upon the rock shaft, thereby determining the length of time on each revolution of the tool holder during which the feed wheel is locked.

In the modified construction shown in Fig. 6, the feed wheel 24 is provided with an A-shaped periphery and the shoe 45 is shaped to conform thereto. This secures a somewhat greater gripping surface. In this construction it is intended to use only one shoe. The structure shown in Fig. 4 having two shoes, however, is of advantage as it takes off the side thrust on the tool holder.

In the modified construction of this (Fig. 6) the shoe 45 is held out of its engaging position by means of the coiled spring 46, supported by a suitable bolt 47. The modified construction of Fig. 7 is substantially the same with the exception of the shape of the periphery of the feed wheel and the jaw.

In order to permit of the drill being rapidly advanced to the work and withdrawn, I provide means by which the operator can lock the feed wheel against rotation as long as may be desired. This consists of a hand lever 37 which is arranged at the top of the upright of the drill so as to be engaged by the operator while grasping the handle 51 at the top of the upright; see Fig. 1.

The lever 37 is connected to the feed lever 17 of the rock shaft. By lifting up on this finger lever, the rock shaft is actuated, thereby actuating the feed wheel engaging shoes, locking the feed wheel against rotation as long as may be desired. This affords means for very rapidly advancing the drill to or withdrawing the same from the work.

A thrust is provided for the feed wheel preferably consisting of bearing rings 52 and 53, having ball races in their meeting faces.

The hub of the feed wheel 24 rests against the bearing ring 53. The bearing ring 52 is retained in a suitable boxing by means of the ring 54, which is threaded into the same behind the ring. The boxing 27 is split on one side and is drawn together to lock the retaining ring in position by a bolt 26, arranged through suitable ears thereon. By this means the ring 54 may be adjusted to bring the bearing into proper position. The forward movement of the wheel is prevented by means of the arm 42 which projects upwardly from the main base plate or shoe 28.

The drill is locked to the rail by means of the rail engaging hooks or clamps 32, which are pivotally mounted on the cross rod 34 at the forward ends of the said rails of the frame. The hooks are adapted to engage over the rails, as clearly appears in Figs. 1 and 2. These hooks are connected to the main horizontal frame 1 by means of the links 29 and 31, which are pivoted to each other and to the drill frame 1 and to the end of the hook 32 respectively.

The link 29 is preferably in the form of a yoke and is extended into a lever 30 by means of which it may be raised or lowered. The links 31 are provided with stops 55 adapted to engage under the link 29. The links form a toggle for drawing the hooks against the rail. The hooks 32 are connected together by cross rods 34 and 35, making in effect a single hook having two spaced engaging members. This might, of course, be modified as desired.

When the lever 30 is thrown upwardly to the position indicated in Fig. 1, the toggle formed by the links 29 and 31 is straightened, thereby throwing the hooks downwardly over the rail and drawing them firmly against the same. When the lever 30 is thrown downwardly, the toggle is broken and the hooks thrown upwardly to release them from the rail.

The downward projection 36 on the hooks engages the head of the rail and continued pressure on the foot lever forces the machine back therefrom. The base 28 is shoe-like in cross sections so that it freely slides thereon. By this means, I am enabled by a single movement of the lever 30 to entirely disengage the device from the track so that it may be taken out of the way of passing trains, if desired, and it further affords a quick means for releasing the drill, as regularly used. The forward ends of the side rails of the frame are adapted to rest on the top of the rail when in operative position, thereby supporting the front end of the frame and preventing injury to the drill when the rail engaging hooks are manipulated.

By the means I have illustrated and de-

scribed, I secure a feed mechanism which may be adjusted to secure any desired speed for the particular work in hand, the scope of the feed being very great and the adjustment being complete. This adjusting may be done while the drill is in operation. I am also enabled to advance the drill to the work or withdraw the same from the work very rapidly, and this connection with the rapidity with which the device may be clamped to or released from the rail makes very rapid work possible.

I have illustrated and described my improved track drill in detail in the form preferred by me on account of the structural simplicity and convenience in manipulation. I am aware, however, that it is capable of very great variation in structural details without departing from my invention.

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

1. The combination with the frame of a rail-engaging hook pivoted on said frame; a link pivoted to said frame; an operating-lever carried thereby; a link pivoted to the rear end of said hook and to the first-named link; a stop for limiting the rearward movement of said links relative to each other; and a depending projection on said hooks adapted to engage a rail when said lever is thrown forwardly to break the toggle, for the purpose specified.

2. The combination with the frame, of a rail-engaging hook pivoted on said frame; a link pivoted to said frame; an operating lever carried thereby; a link pivoted to the rear end of said hook and to the first-named link; and a stop for limiting the rearward movement of said links relative to each other, for the purpose specified.

3. The combination with a frame, of a rail-engaging hook pivoted on said frame; a toggle connection for said hook to said frame; a projection on said hook adapted to engage a rail when said toggle is broken, whereby said hook is swung upwardly and said frame is pushed away from the rail; and a shoe-like base for said frame, for the purpose specified.

4. The combination with a frame, of a rail-engaging hook pivoted on said frame; a toggle connection for said hook to said frame; a projection on said hook adapted to engage a rail when said toggle is broken, whereby said hook is swung upwardly to free it from the rail, for the purpose specified.

5. The combination with a horizontally arranged frame, having a base portion at its rear end and a pair of forwardly projecting arm-like members at its forward end adapted to rest upon the rail; a rail-engaging hook pivoted upon said forwardly projecting members, said hook having an arm projecting rearwardly of the pivot thereof and a toggle connection from said frame to said rearwardly projecting arm of said hook, whereby when said toggle is straightened, the hook is thrown downwardly and locked in engagement with the rail and when said toggle is broken, said hook is disengaged from the rail and thrown upwardly above said arm-like members of said frame.

6. The combination with a horizontally arranged frame having a base at its rear end and forwardly projecting arm-like members at its forward end to rest upon the rail; a rail-engaging hook pivoted on said arm-like members and connections from said hook to said frame arranged to rock said hook on its pivot, whereby when said connections are manipulated to engage the hook, it is thrown downwardly into engagement with the rail and when manipulated to disengage the hook, it is thrown upwardly above said rail-engaging members.

7. The combination with a frame, the forward ends of which are adapted to rest upon the top of a rail; a rail-engaging hook pivoted on said frame; means for swinging said hook on its pivot to engage or disengage the same from a rail, and a projection on said hook adapted to engage a rail when said hook operating means is actuated to disengage the hook whereby said frame is pushed away from the rail.

8. The combination with a frame of a rail-engaging hook pivoted on said frame; means for swinging said hook on its pivot to engage or disengage the same from a rail; and a projection on said hook, adapted to engage a rail when said hook-operating means is actuated to disengage the hook, whereby said frame is pushed away from the rail.

9. The combination with a frame, of a tool-holder; driving means for said tool-holder; a feed-screw therefor; a feed-wheel threaded upon said feed-screw; a cam splined upon said tool-holder; a feed-lever actuated by said cam; means for locking said feed-wheel actuated by said feed-lever; and a hand-lever for actuating said feed-lever, for the purpose specified.

10. The combination with a frame, of a tool-holder; driving means therefor; a feed-screw for said tool-holder; a feed-wheel threaded upon said screw; means for automatically locking said feed-wheel against rotation as said tool-holder is revolved; and a hand-lever for actuating said locking means.

11. The combination with the frame of a tool-holder; driving means therefor; a feed-screw for said tool-holder; a feed-wheel threaded thereon; means for locking said feed-wheel against rotation; and a hand-lever for actuating said locking means.

12. The combination with a frame, of a tool-holder; driving means for said tool-holder; a feed-screw therefor; a feed-wheel

threaded upon said tool-holder; a cam splined upon said tool-holder; a feed-lever actuated by said cam; means for adjusting said feed-lever whereby variations in the stroke of said lever are secured; and means for locking said feed-wheel, actuated by said feed-lever, for the purpose specified.

13. The combination with a frame, of a tool-holder; driving means for said tool-holder; a feed-screw therefor; a feed-wheel threaded upon said tool-holder; a locking means for said feed-wheel; a feed-lever for actuating said locking means; an inclined cam splined upon said tool-holder; and means for longitudinally adjusting said cam, whereby the stroke of said feed-lever is varied, for the purpose specified.

14. The combination with a frame of a tool-holder; driving means for said tool-holder; a feed-screw therefor; a feed-wheel; a rock shaft; a shoe on said rock shaft, arranged to engage said feed-wheel when said rock-shaft is actuated; a shoe arranged oppositely of said shoe on said rock shaft, adapted to co-act therewith; an arm on said rock-shaft; a link connecting said arm to said second shoe; a means for actuating said rock shaft.

15. The combination with a drill spindle, of driving means therefor; a feed-screw for said spindle, connected to revolve therewith; a feed-nut for said screw; a friction clutch arranged to act upon said feed-nut; and actuating means for said clutch, whereby the said feed-nut is locked against rotation and said feed-screw is advanced.

16. The combination with a frame, of a tool-holder; driving means for said tool-holder; a feed-screw therefor; a feed-wheel threaded upon said feed-screw; a sleeve having an inclined cam thereon, splined upon said tool-holder, said sleeve having an annular groove therein; a rod arranged parallel with said tool-holder; an arm arranged to engage said annular groove in said sleeve, adjustably mounted on said rod; a rock shaft; a feed lever or arm on said rock shaft, arranged to be acted upon by said cam; and locking means for said feed-wheel, actuated by said rock shaft, for the purpose specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

DAVID A. MOORE. [L. S.]

Witnesses:
AMELIA J. ALBER,
OTIS A. EARL.