L. W. MORTON.

DRILL.

APPLICATION FILED JULY 12, 1910.

994,186.

Patented June 6, 1911.

3 SHEETS—SHEET 1.

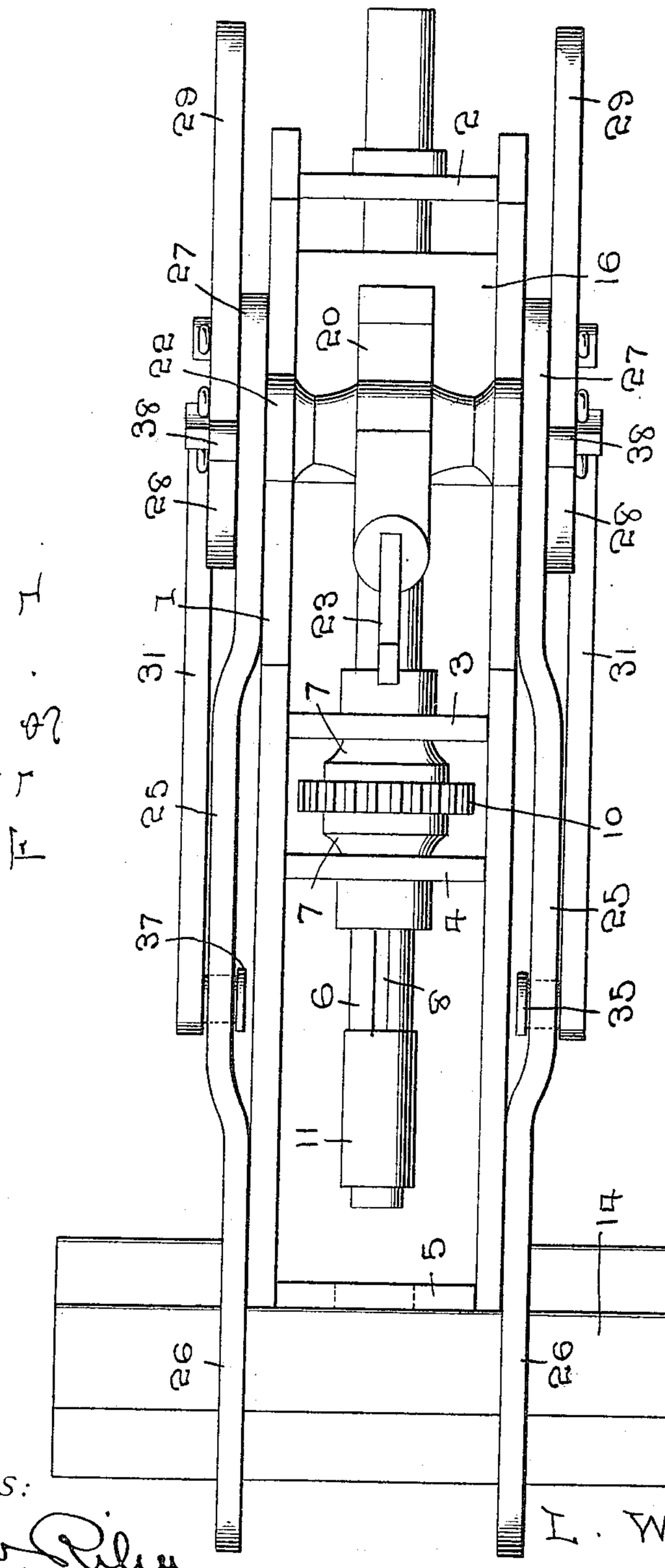

Fig. 1.

WITNESSES:

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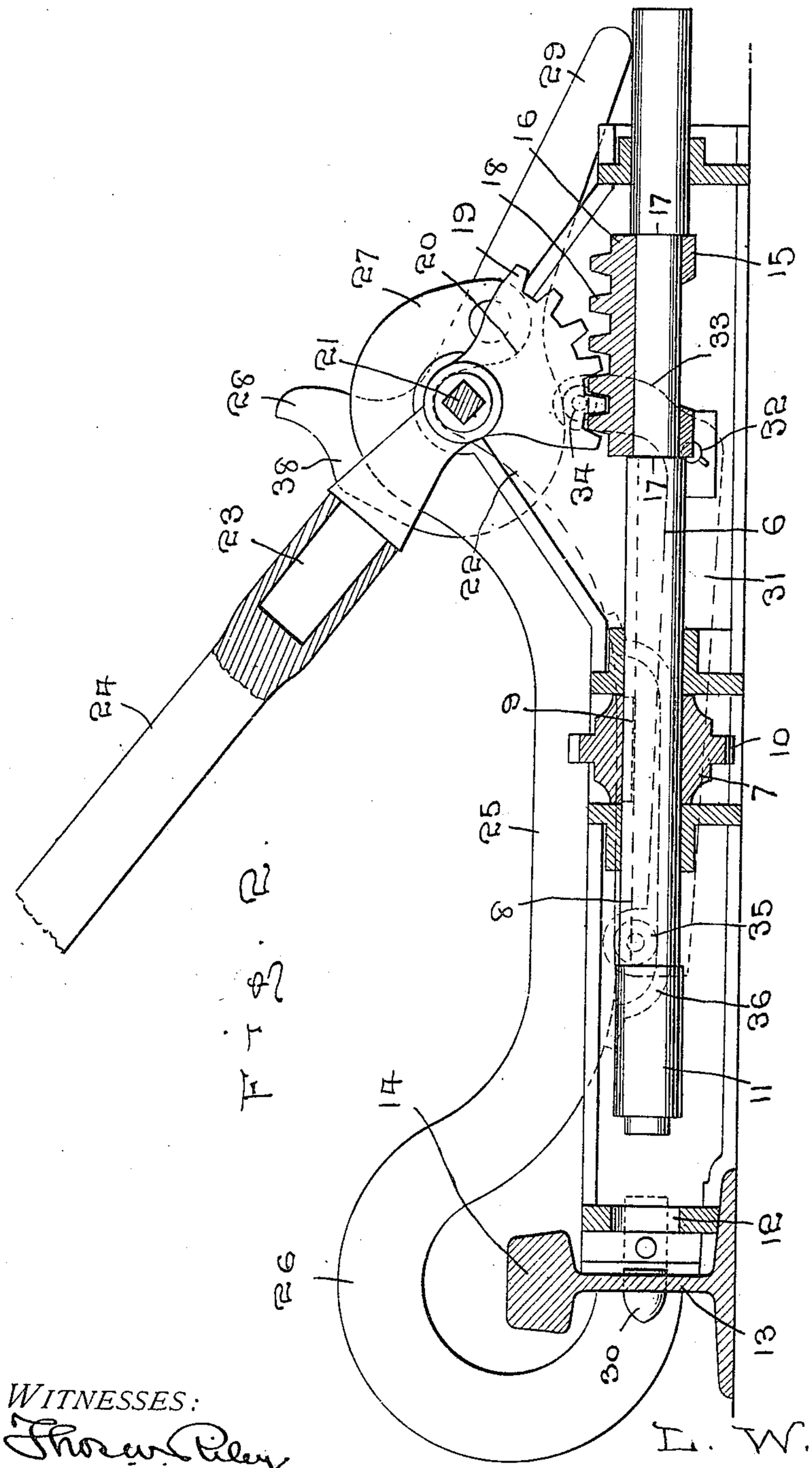

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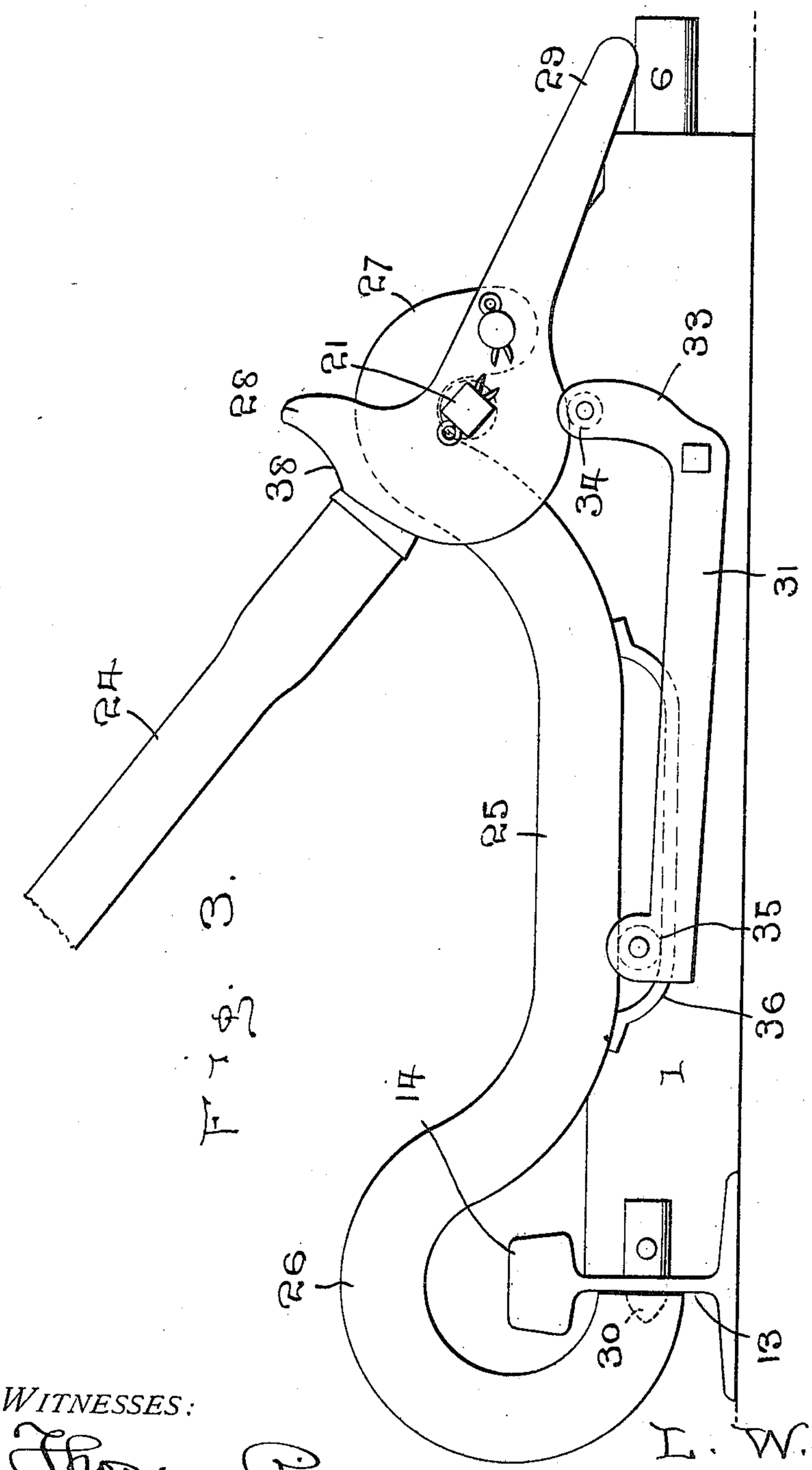

Fig. 3.

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UNITED STATES PATENT OFFICE.

LESLIE W. MORTON, OF CANTON, ILLINOIS.

DRILL.

994,186. Specification of Letters Patent. Patented June 6, 1911.

Application filed July 12, 1910. Serial No. 571,628.

To all whom it may concern:

Be it known that I, LESLIE W. MORTON, a citizen of the United States, residing at Canton, in the county of Fulton and State of Illinois, have invented certain new and useful Improvements in Drills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to new and useful improvements in drills and more particularly to that class adapted to be used for drilling holes in railway rails and my object is to provide means for clamping the drilling mechanism in engagement with the rail.

A further object is to provide a suitable drill shaft and means to apply power thereto, and, a further object is to provide means for manually feeding the drill toward the rail.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the specification hereunto annexed.

In the accompanying drawings which are made a part of this application, Figure 1 is a top plan view of my improved drilling device, Fig. 2 is a longitudinal central sectional view thereof, and Fig. 3 is a side elevation thereof.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates a frame, the side walls of which are connected by cross pieces 2, 3, 4 and 5, the cross pieces 2 and 5 being adjacent the ends of the frame, while the cross pieces 3 and 4 are adjacent the longitudinal center thereof.

Extending longitudinally of the frame 1 and through the cross pieces 2, 3 and 4 is a drill shaft 6, which projects through a sleeve 7, said sleeve being mounted between the cross pieces 3 and 4. The shaft 6 is provided with a longitudinally extending seat 8, into which projects a key 9 carried by the sleeve 7, thus causing the sleeve to rotate with the shaft and permitting lengthwise movement of the shaft through the sleeve. In the present instance, I have shown the sleeve as surrounded by a gear 10 and by means of which power is applied to rotate the shaft 6, but it will be clearly understood that power may be applied to the shaft in any suitable manner. One end of the shaft 6 is provided with a socket 11, into which any suitable form of drill (not shown) is entered, the cross piece 5 having an opening 12 therethrough, so that the drill may readily pass into engagement with the web 13 of the rail 14. The shaft 6 is fed toward the rail by extending said shaft through a socket 15 on a plate 16, the edges of said plate being slidably mounted between the side walls of the frame. That portion of the shaft extending through the socket is reduced in size to form shoulders 17, against which the edges of the plate 16 rest, so that the plate will travel with the shaft.

Formed on the plate 16 and immediately above the shaft 6 are a plurality of teeth 18, with which coöperate teeth 19 of a segmental gear 20, said gear being mounted upon a shaft 21 extending transversely of the frame, the ends of the shaft finding bearings in the upwardly projecting ears 22 on the side bars of the frame. The gear 20 is operated to move the shaft 6 longitudinally in either direction by providing a shank 23, to which is attached a handle 24 and by swinging said handle back and forth, the shaft 6 will be correspondingly moved.

The frame is held in fixed relation with the rail while the opening is being bored therethrough by means of clamping arms 25, the ends of the arms adjacent the rail being provided with hooks 26, which are curved upwardly and over the rail, the free ends of the hooks being positioned to engage the web of the rail between the head and base thereof, thus clamping the web of the rail between the end of the frame and the ends of the hooks. The opposite ends of the clamping arms are provided with curved terminals 27, which terminals are in turn pivotally secured to cams 28, said cams being rotatably mounted upon the projecting ends of the shaft 21. The terminals 27 are so arranged and pivoted to the cams that when the levers 29 employed for operating the cams 28 are turned to the position shown in Fig. 2, the pivotal point between the terminal and cam will be in a plane below the axis of the shaft 21, thereby locking the cam against casual rotation on the shaft. The frame 1 is additionally held in engagement with the web of the rail by providing one or more removable prongs 30,

which are adapted to project through the usual form of opening made in the rails, when manufactured, for receiving bolts, the free ends of the prongs being preferably pointed, so that if there are no holes in the rail, they will be forced slightly into the web, when the frame is clamped thereagainst, thus securely holding the end of the frame against lateral movement. When the levers 29 are swung upwardly and forwardly from the position shown in Fig. 2, the ends of the arms attached to the levers will be raised, as well as moved forwardly, thus moving the free end of the hook out of engagement with the web of the rail.

In order to raise the hooks 26, as the arms 25 are moving lengthwise to disengage the hooks from the rails, I provide rocking bars 31, which are pivotally mounted upon stub shafts 32 carried by the frame 1, the inner ends of the rocking bars having upstanding portions 33, which carry at their free ends rollers 34, said rollers being so positioned as to engage the cams 28, so that when the cams are rotated from the position shown in Fig. 2, the bars will be rocked on their respective shafts. The forward ends of the rocking bars 31 are extended a distance from their pivots and are also provided with rollers 35, which engage the lower edges of the clamping arms 25 and as pressure is applied to the rollers 34, the forward ends of the rocking bars will be raised, thus elevating the forward ends of the clamping arms and moving the free ends of the hooks 26 to a plane above the top of the rail, so that the drilling device may be readily removed from engagement with the rail. The rollers 35 are held in proper alinement with the arms 25 by attaching elongated loops 36 to the lower edges of the clamping arms 25, the rollers 35 traveling in said loops, the inner ends of the rollers having flanges 37 thereon, which together with the rocking bars 31, prevent disengagement of the rollers from the loops.

In applying the drill to use, the levers 29 being thrown over from the position shown in Fig. 2, the end of the drill frame is moved into engagement with the web of the rail or against the prongs, if used, when there are no openings through the rail. The levers 29 are then swung in the opposite direction, which will result in bringing the clamping arms 25 downwardly and the free ends of the hooks thereof in engagement with the face of the web of the rail opposite that engaged by the frame and by lowering the levers to the position shown in Fig. 2, the ends of the hooks will be securely locked against the rail. Power is then applied to the gear 10 and the drill shaft rotated. As soon as the shaft starts to rotate, the handle 24 is swung rearwardly, which will move the shaft 6 longitudinally and the drill carried thereby into engagement with the web of the rail and by continued pressure on the handle, the drill will be gradually fed toward the rail. As soon as the drill has passed through the rail, the handle 24 is swung in the opposite direction, which will return the shaft 6 to its initial position. The levers 29 are then thrown forwardly, which will release the hooks from the rail, when the drill may be moved to a new position. The levers 29 and cams to which they are attached are held against rotation on the shaft, when the levers are swung forwardly, by placing concavities 38 in the faces of the cams to receive the rollers 34, so that when the rollers are in said concavities, the cams will be held against casual rotation.

This device, while simple in construction, may be rendered very strong and durable and may be quickly placed in position and clamped onto the object, through which an opening is to be drilled. It will likewise be seen that power may be readily applied to rotate the drill shaft and said shaft may be manually operated to feed the drill to the object. It will likewise be seen that the drill will be held in fixed relation with the object and prevented from casually leaving the same through the medium of the clamping arms and cams and while I have shown and described the device as used primarily for drilling holes through railway rails, yet it will be understood that the same may be used for various purposes.

What I claim is:—

1. A drilling construction, comprising the combination with a frame having cross pieces connecting the side walls of the frame, each of said cross pieces having openings therethrough and in alinement with each other, of a shaft rotatably mounted in certain of said cross pieces, means whereby said shaft may be rotated, means to move the shaft longitudinally, clamping arms having one of their ends in position to engage an object, against which one end of the frame rests, means to lock the clamping arms in engagement with the object and additional means to raise said arms vertically, when moving lengthwise.

2. In a drill, the combination with a frame, cross pieces connecting the sides of said frame and means to hold one end of the frame against lateral movement, of a shaft rotatably mounted in certain of said cross pieces, means to rotate said shaft, a plate attached to said shaft and having teeth thereon, a pivotally mounted gear having teeth thereon adapted to engage the teeth of the plate, means to swing the gear on its pivot to move the shaft longitudinally, means to clamp the drill in engagement with an object, and means to impart a vertical motion to the clamping member simultaneous with its longitudinal motion.

3. The herein described drill, comprising the combination with a frame, of a shaft rotatably and movably mounted in said frame, means to apply power to the shaft, additional means to move said shaft longitudinally, clamping arms terminating at one end in hooks and the opposite end in curved terminals, cams to which said curved terminals are pivotally secured and means coöperating with said cams to raise the clamping arms vertically coincident to the longitudinal movement thereof.

4. In a drilling device, the combination with a frame and a rotatably mounted shaft carried by the frame and means to move the shaft longitudinally, of a pair of rotatable cams, clamping arms pivoted to said cams and means coöperating with said cams to raise the clamping arms vertically simultaneously with the longitudinal movement of the clamping arms.

5. In a drilling device, the combination with a frame, of a pair of clamping arms having hooks at one end, the free ends of which hooks are adapted to bind an object against one end of the frame, curved terminals at the opposite ends of the clamping arms, rotatably mounted cams to which said terminals are pivotally secured, levers attached to the cams, by means of which the cams are rotated and means operated by the cams to move the clamping arms vertically, while being moved longitudinally.

6. In a drill of the class described, including a frame adapted to engage the work, a cam and a crank rotatably mounted in said frame, means for effecting the simultaneous rotation of said cam and crank, a gripping jaw operated by the crank, and means actuated by the cam for raising said gripping jaw.

7. In a drill of the class described, including a frame, a drill spindle rotatably mounted therein, a rack on the spindle, and a gear coöperating with said rack and pivotally mounted in the frame, a cam and a crank rotatably mounted on the shaft of said gear, a gripping jaw operated by the crank, and means for raising said jaw simultaneously operated by the cam.

8. In a gripping device, a pair of jaws adapted to engage the work, a shaft rotatably mounted in one of said jaws, a crank on said shaft for rotating the same operatively connected with the other of said jaws, and additional means actuated by the rotation of said shaft for giving the last mentioned jaw an additional motion.

9. In a gripping device, a pair of jaws adapted to engage the work, a shaft rotatably mounted in one of said jaws, a crank secured to said shaft, a cam on said crank, means actuated by the crank for operating the other of said jaws, and means operated by the cam for giving an additional motion to said last referred to jaw.

10. In a drill of the class described, a frame, a shaft pivotally secured therein, a cam and a crank secured to the shaft, means for rotating said shaft, an arm having a gripping jaw at one end and mounted on the crank at the other end, and a lever pivoted in the frame and having one end in operative relation with said arm and the other in operative relation with said cam.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LESLIE W. MORTON.

Witnesses:
W. D. PLATTENBURG,
E. A. HEALD.