W. F. BOSSERT.

DRILLING APPARATUS.

APPLICATION FILED DEC. 17, 1907.

929,822.

Patented Aug. 3, 1909.

5 SHEETS—SHEET 1.

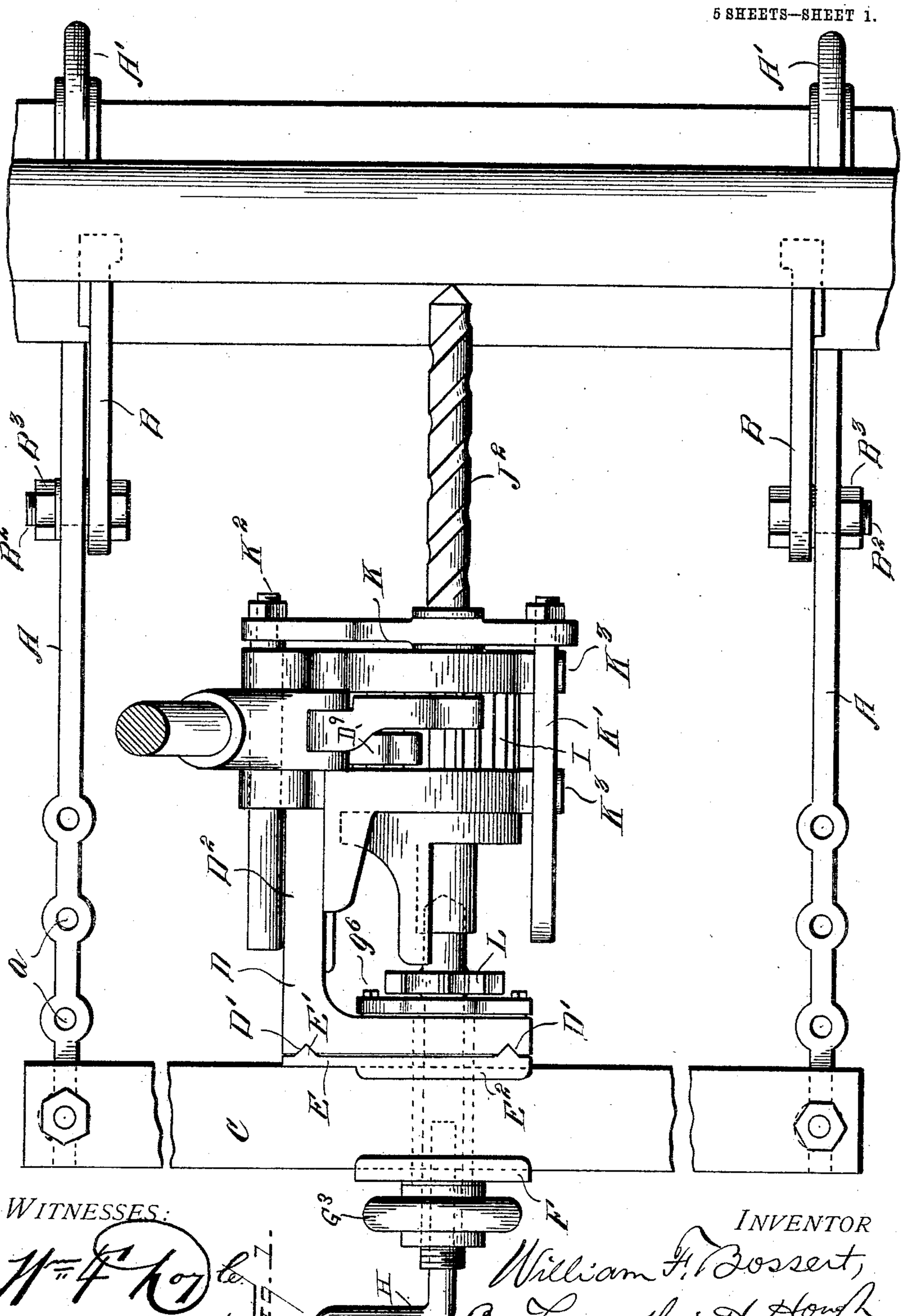

FIG. 1.

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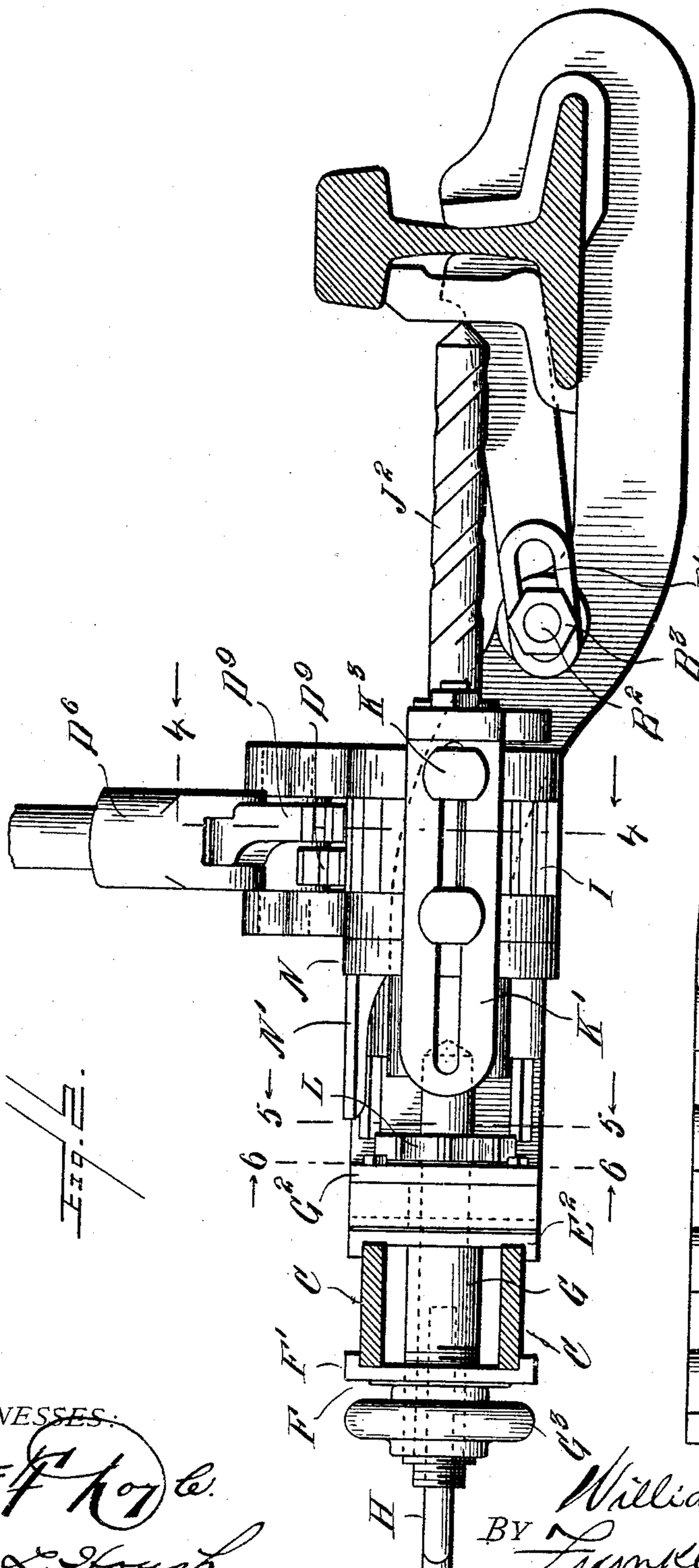

Fig. 2.

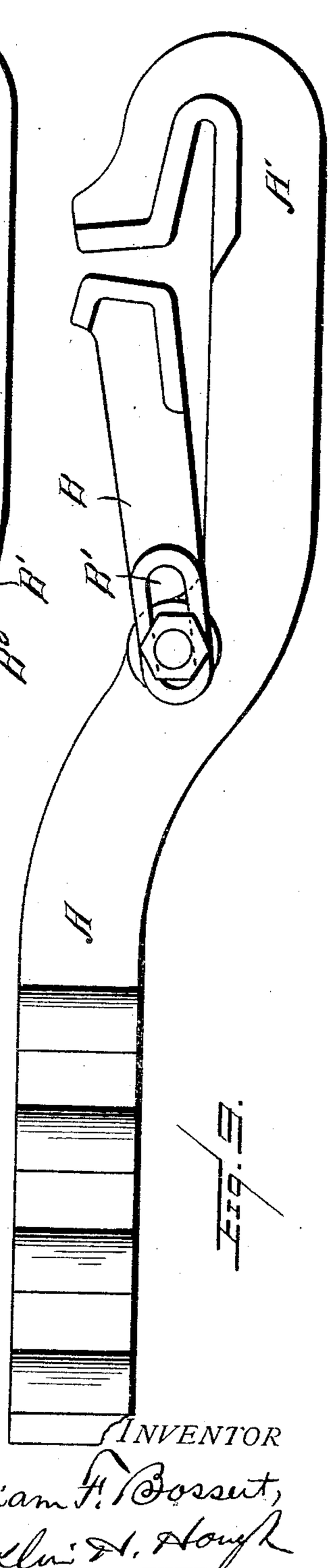

Fig. 3.

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5 SHEETS—SHEET 3.

Fig. 3.

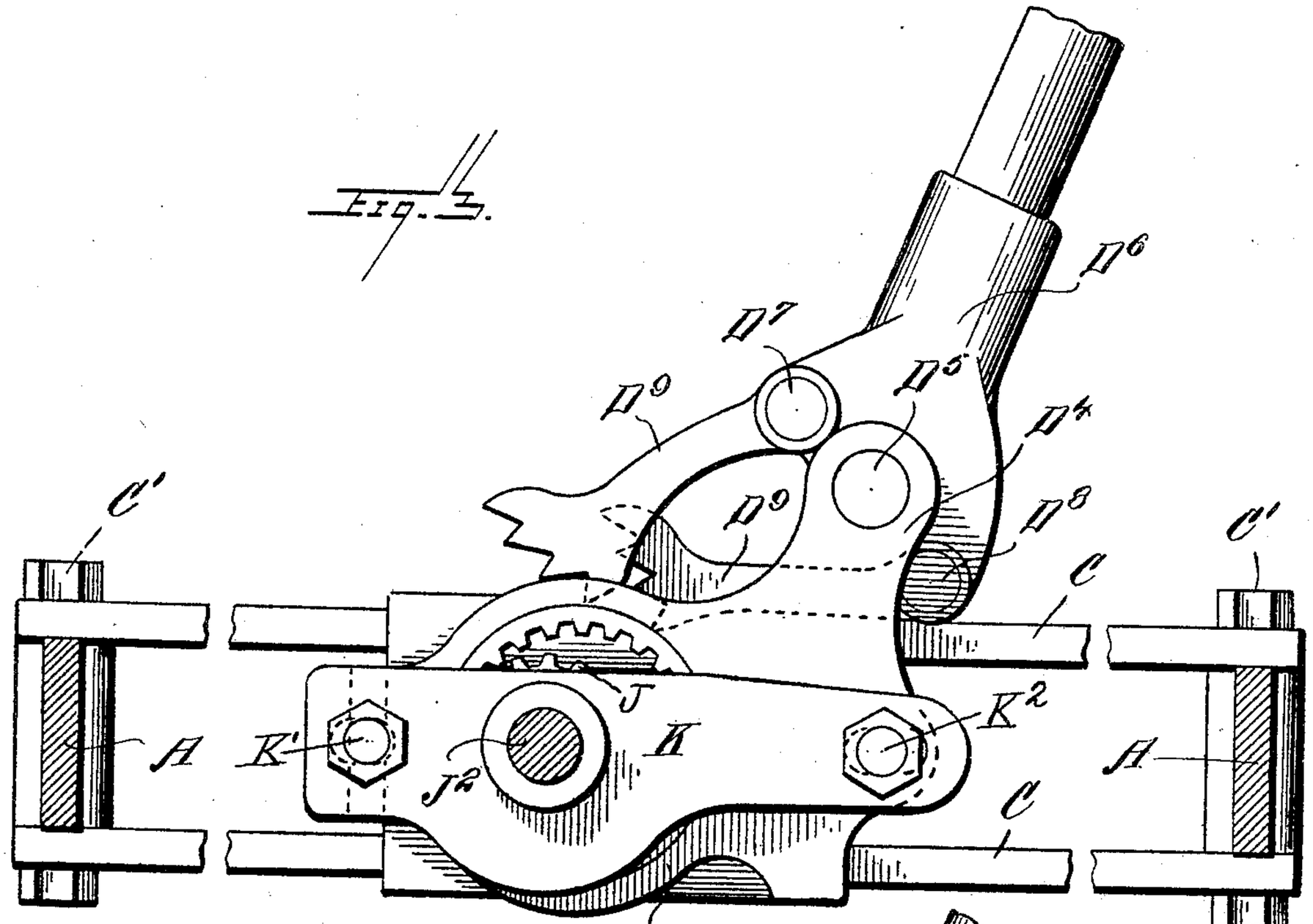
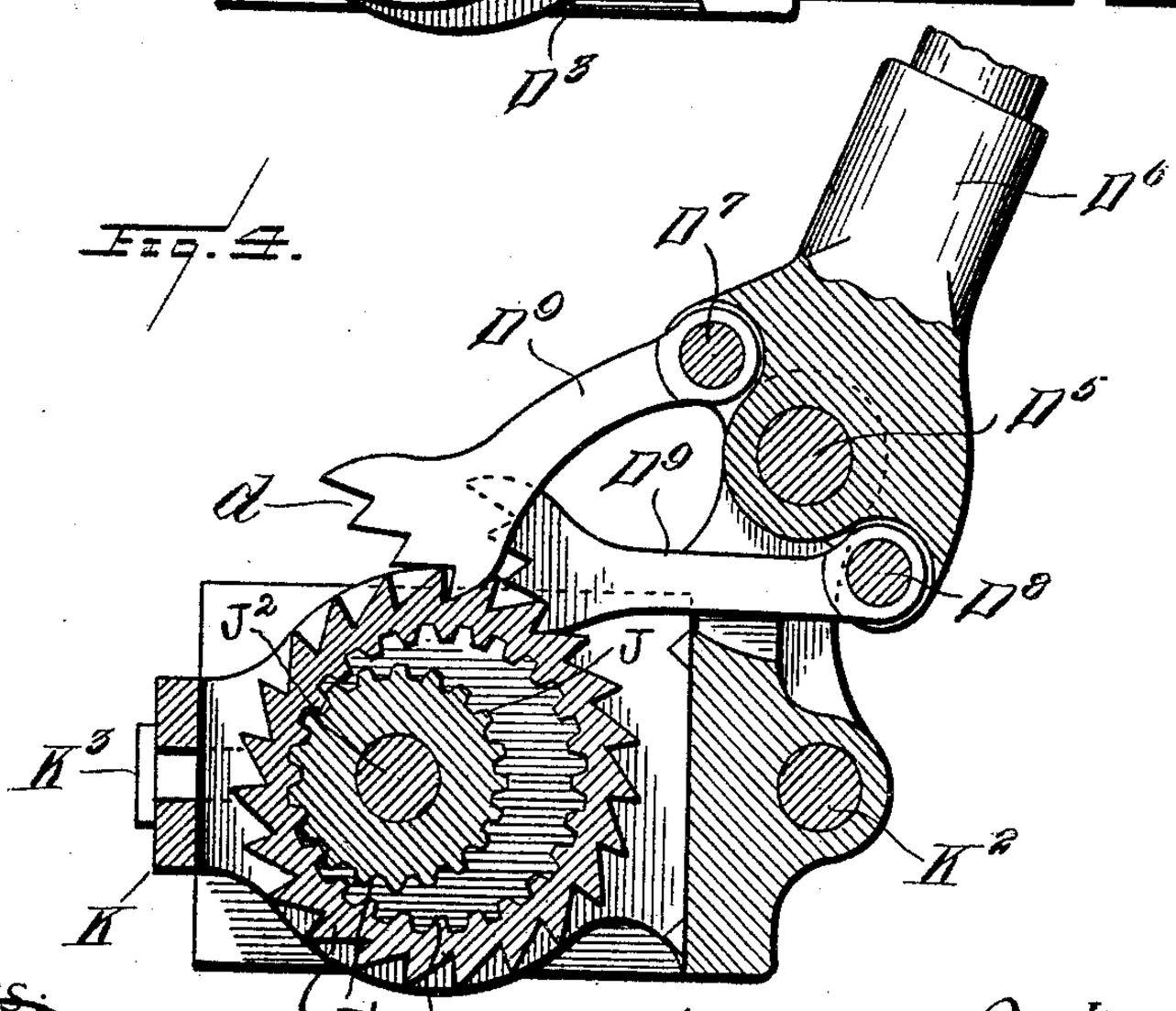


Fig. 4.



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5 SHEETS—SHEET 4.

Fig. 5.

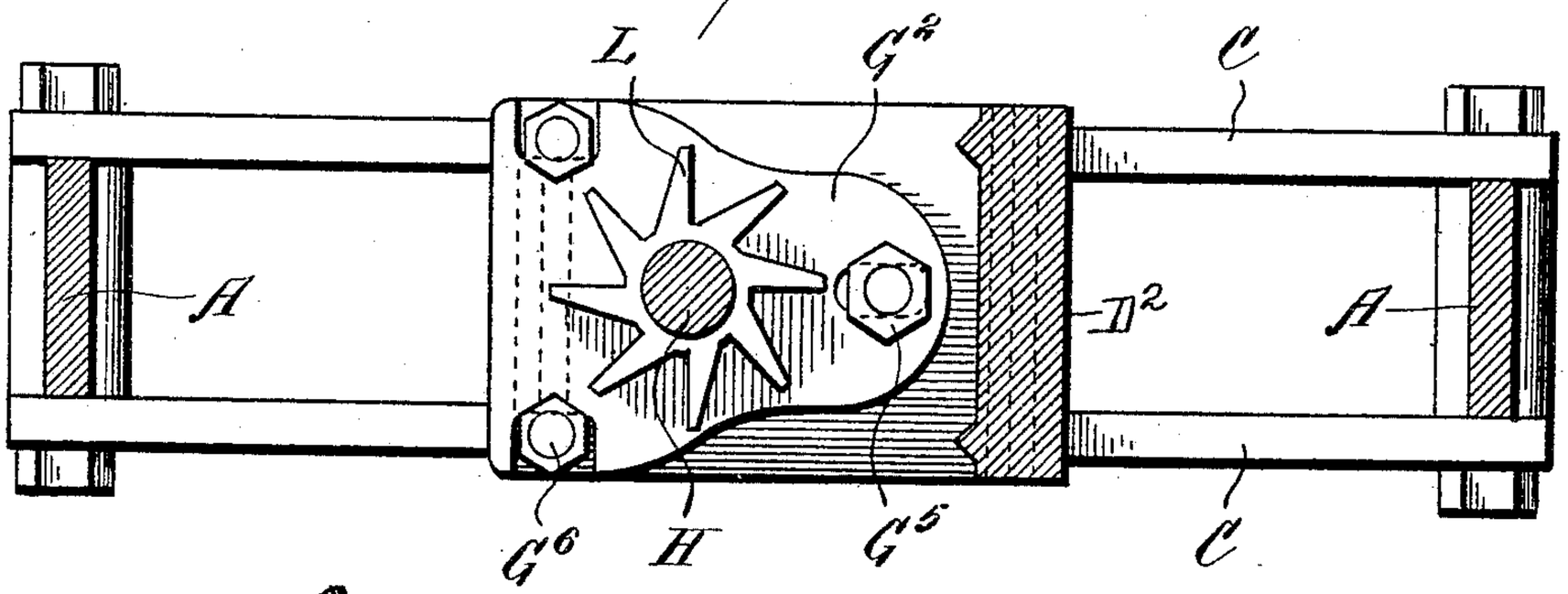
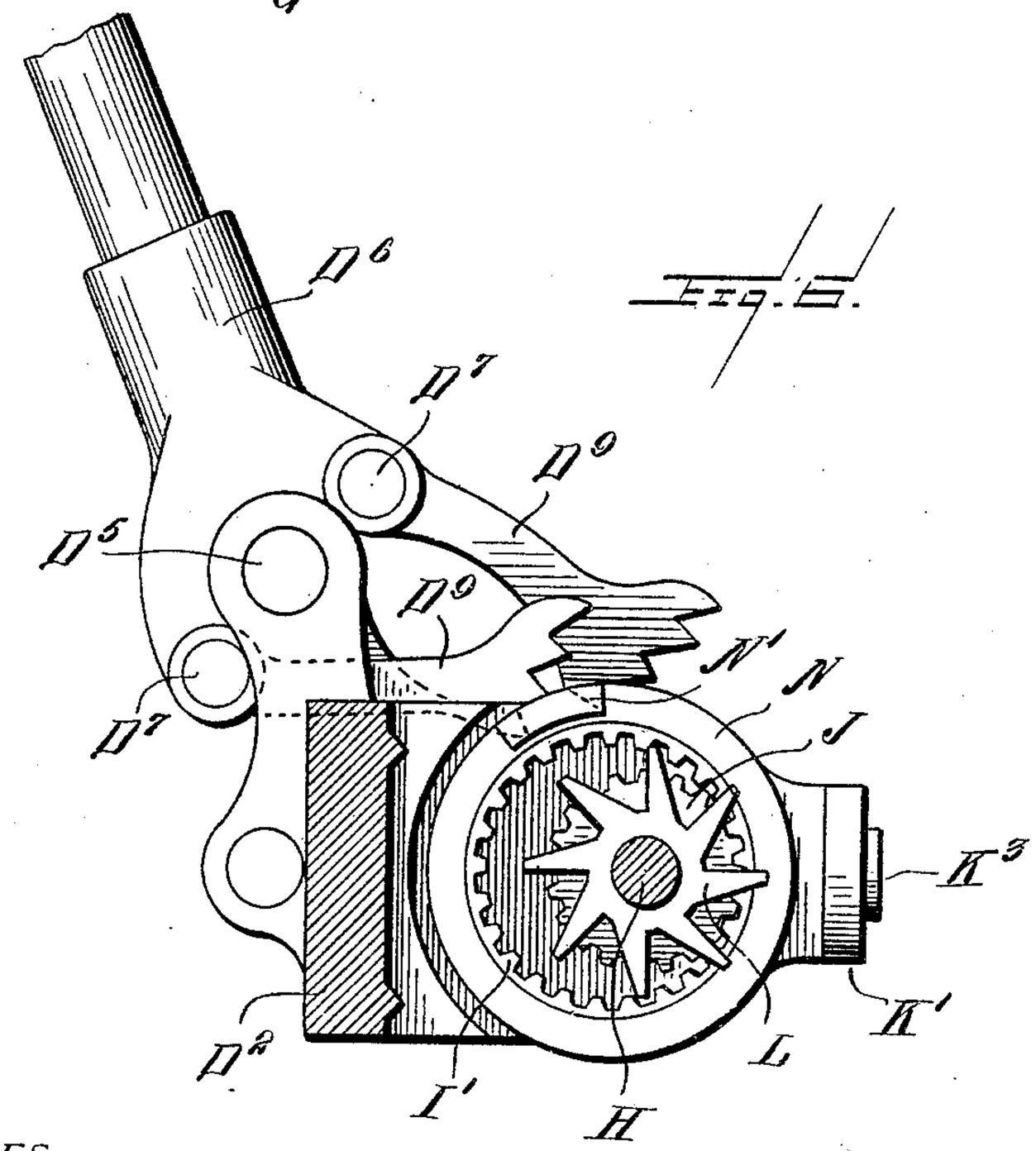


Fig. 6.



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5 SHEETS—SHEET 5.

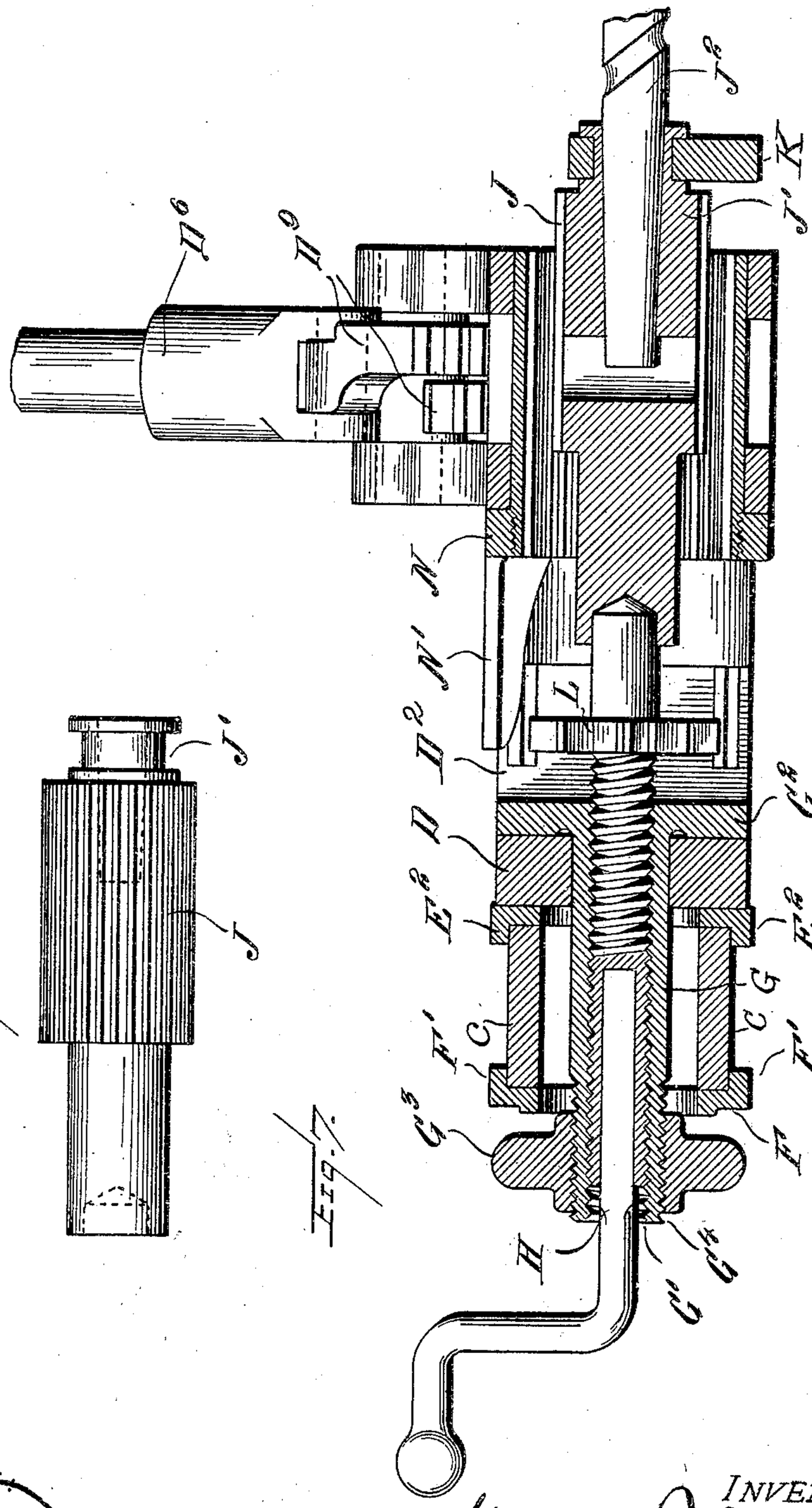

Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM F. BOSSERT, OF UTICA, NEW YORK.

DRILLING APPARATUS.

No. 929,822. Specification of Letters Patent. Patented Aug. 3, 1909.

Application filed December 17, 1907. Serial No. 406,926.

To all whom it may concern:

Be it known that I, WILLIAM F. BOSSERT, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Drilling Apparatus; 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in drilling apparatus and designed especially for use in drilling holes in railway rails and the object of the invention is to produce means of this nature so arranged that the drill may be raised or lowered without altering the position of the frame, whereby holes in exact positions may be bored in rails of different sizes.

The invention consists further in the provision of means for eliminating the ineffective return movement experienced with the use of common ratchets and to make every movement of the operator effective and valuable and increase the speed of the drilling and enable the drilling of a plurality of holes without moving the frame.

In connection with the foregoing is a further advantage, that the apparatus which is attached to the rail will offer no obstruction to passing trains, thereby making it unnecessary to remove the drill until the holes are finished.

Other advantages will hereinafter appear obtained by various combinations of parts, which will be clearly illustrated and set forth in the appended claims.

My invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a top plan view of my improved drilling apparatus. Fig. 2 is a sectional view through a rail and a portion of the frame of the apparatus, the operative parts of the drill being shown in elevation. Fig. 3 is a sectional view through the shank of the drill frame, showing in elevation the ratchet feed mechanism. Fig. 4 is a sectional view on line 4—4 of Fig. 2 looking in the direction of the arrows. Fig. 5 is a sectional view on line 5—5 of Fig. 2. Fig. 6 is a sectional view on line 6—6 of Fig. 2 looking in the opposite direction from that of Fig. 5. Fig. 7 is a vertical sectional view through the check and feeding shaft for the drill. Fig. 8 is a detail in elevation of the drill chuck, and Fig. 9 is a detail in side elevation of the means for securing the frame to a railway rail.

Reference now being had to the details of the drawings by letter, A—A designate two bars having hooked ends A′, the latter being adapted to engage over the flange of a railway rail in the manner shown in Fig. 2 of the drawings, and B designates a bar having an elongated slot B′ therein and adapted to receive a bolt B^2 which passes through registering holes in the two bars A and B in the manner shown clearly in Fig. 1 of the drawings.

B^3 is a nut fitted upon the threaded end of the bolt B^2 and coöperates with the head of the bolt to hold the two bars securely together with the ends of the bars engaging the shank and web of the rail in the manner shown.

The shank portions of the two bars A—A are provided with a series of apertures *a*, shown clearly in Fig. 1 of the drawings, said apertures being at right angles to the length of the bars and edgewise thereto.

C—C designate two bars, top views of one of which is shown in Fig. 1 and sectional views in Fig. 2, said bars being adapted to be clamped to the upper and lower edges of the bars A by means of bolts C′, shown in Fig. 3 of the drawings.

The drill holding apparatus comprises a frame, designated by letter D, which is capable of a vertical adjustment in order to bring the drill to a proper position in alinement with which it may be desired to drill a hole in the web of a rail. Said frame has vertical V-shaped grooves D′ formed in one end thereof adapted to receive the angular outlined ribs E′ which project from the face of the clamping plate E, a top plan view of which is shown in Fig. 1 of the drawings. Said plate E has flanges E^2 upon its upper and lower edges, as shown clearly in Fig. 7 of the drawings, said flanges adapted to project over the outer faces of the bars C. F designates a similar plate having flanged edges F′ which project over the opposite

edges of the bars C and each of the plates E and F is centrally apertured to receive the shank portion of a shell G, shown clearly in Fig. 7 of the drawings, which shell has interior threads G′ engaged by the threads of a screw H, which latter has an angular outlined recess in its outer end for the reception of the crank H′, the shank portion of the latter being angular in outline and conforming to the angular outline of the recess in said screw. Said shell has a flanged end G^2 adapted to coöperate with the outer face of the plate E to hold the frame D in an adjusted position, and G^3 designates a hand wheel having threads in a central opening therein, said wheel fitting upon the threads G^4 formed upon the outer circumference of the shank portion of the shell G. Said wheel G^3 serves as means for holding the flange at the end of the shell in a clamping relation by said wheel being turned upon the threads of the shank of the shell to frictionally bear against the plate F. Said frame D has a laterally projecting arm D^2 integral with a shell D^3 having wings D^4, shown clearly in Figs. 3 and 4 of the drawings, and which support a pin D^5 upon which the lever D^6 is pivotally mounted and is adapted to rock. Said lever carries two pivotal pins D^7 and D^8, shown in Figs. 3 and 4 of the drawings, and upon each of which is pivotally mounted a dog D^9. Each of the dogs D^9 has a plurality of teeth *d* at its free end adapted to engage the ratchet teeth upon the circumference of the hollow ratchet cylinder I, which is journaled within said shell. Said ratchet cylinder has gear teeth I′ upon its inner circumference, as shown clearly in Figs. 4 and 6 of the drawings, adapted to mesh with the teeth J upon the circumference of the chuck J′, as shown in Figs. 7 and 8 of the drawings. Said chuck is rotatably mounted at one end in an aperture in the bar K and carries the drill J^2. Said bar K is mounted at one end upon a guide pin K^2 and its other end upon a slotted plate K′, the latter being mounted upon the headed screws K^3 which pass through the slot therein.

N designates a ring having threads upon its inner circumference adapted to fit over threads upon the circumference of said ratchet cylinder and serves as means to hold the latter within the shell in which the cylinder has a bearing and projecting from the ring N is a finger N′. Mounted upon the screw H, the inner end of which engages a recess in the end of the drill chuck, is a star wheel L, details of which are shown clearly in Figs. 5 and 6 of the drawings. Said star wheel is so positioned that at each revolution of the ring N with the ratchet cylinder the integral finger N′ will contact with one of the teeth of the star wheel and cause an intermittent movement to be imparted thereto for the purpose of feeding the screw H forward. In order to allow for the employment of different size drills and chucks of varying diameters, the shell G is adapted to be moved horizontally, adjustment being allowed by means of the flanged end G^2, shown clearly in Fig. 5 of the drawings, having a slight movement allowed by the slots G^5 through which the bolts G^6 pass and, to compensate for this horizontal movement of said shell, the bar K has also a slight horizontal adjustment in order to bring the drill and the feeding screw connected to the chuck into proper positions horizontally.

In operation, in adjusting the apparatus to the railway rail, the bars are clamped in the position shown in Fig. 2 of the drawings with the drill and apparatus for operating the same spaced apart a distance from the rail so that the apparatus will not in any way interfere with a passing train. The drill being adjusted in its proper position, a continuous rotary movement may be imparted thereto by swinging the lever D^6 backward and forward, which movement will cause the two dogs to successively engage the teeth upon the ratchet cylinder. As the ratchet cylinder rotates, a rotary movement will be imparted to the drill by the teeth upon the drill chuck engaging the gear teeth upon the inner circumference of said cylinder. At each rotary movement of the ratchet cylinder, the finger projecting from the ring upon the end thereof will contact with a tooth of the star wheel and impart an intermittent movement thereto, which will feed the drill forward. It will be noted that each dog D^9 will move idly back over the ratchet teeth of the cylinder, thus making it impossible to impart a reverse movement to the ratchet cylinder as the lever is rocked upon its pivot. In the event of its being desired to accelerate the movement of the drill, it may be done by turning the crank shaft which engages the recess in the screw H which latter bears against the drill chuck. Should it be desired to increase the rotary movement of the drill, it may be done by substituting a drill chuck of smaller diameter, in which event it would be necessary to adjust the bearings for the drill chuck by moving the bars K slightly horizontally and also the shell G, the latter having a slight movement within an aperture in the frame D and a vertical adjustment is allowed to the apparatus by raising or lowering the frame D, the latter being guided by the rib D′.

By the provision of a drill as shown and described, it will be observed that a simple and efficient apparatus is afforded whereby a continuous rotary movement may be imparted to the drill in one direction and so constructed that the drill may be raised or lowered without altering the position of the frame, making it possible to drill holes in

exact positions in rails of different sizes and enabling a plurality of holes to be formed without moving the frame.

What I claim to be new is:—

1. A drilling apparatus comprising bars for engagement with a railway rail, cross pieces secured to said bars, apertured clamping plates, means for holding the same in engagement with the opposite edges of said cross pieces, a shell having a shank portion passing through the apertures of said clamping plates and adapted to have a lateral and vertical movement therein and provided with a flange, a drill carrying frame adapted to be held in an adjusted position between said flange and one of said clamping plates, a drill upon said frame, and means for operating the drill, as set forth.

2. A drilling apparatus comprising bars for engagement with a railway rail, cross pieces secured to said bars, apertured clamping plates, means for holding the same in engagement with the opposite edges of said cross pieces, a shell having a shank portion passing through the apertures of said clamping plates and adapted to have a lateral and vertical movement therein and provided with a flange, a drill carrying frame adapted to be held in an adjusted position between said flange and one of said clamping plates, means for guiding said frame as it is moved vertically and laterally, a drill carried by said frame, and means for operating the drill, as set forth.

3. A drilling apparatus comprising bars for engagement with a railway rail, cross pieces secured to said bars, apertured clamping plates, means for holding the same in engagement with the opposite edges of said cross pieces, a shell having a hollow threaded shank portion passing through the apertures of said clamping plates and adapted to have a lateral and vertical movement therein and provided with a flange, a drill carrying frame adapted to be held in an adjusted position between said flange and one of said clamping plates, means for guiding said frame as it is moved vertically and laterally, a feeding screw mounted in the hollow threaded shank portion of said shell, a drill carried by said frame, and means for rotating the drill, as set forth.

4. A drilling apparatus comprising bars for engagement with a railway rail, cross pieces secured to said bars, apertured clamping plates having flanged ends engaging over the opposite edges of said bars, a member passing through and horizontally and vertically adjustable in the apertures of said clamping plates and provided with a flanged end, an adjustable drill carrying frame held by said flange against one of the faces of the clamping plates, a drill carried by the frame, and means for operating the drill, as set forth.

5. A drilling apparatus comprising bars for engagement with a railway rail, cross-pieces secured to said bars, apertured clamping plates engaging said cross-pieces, one of said plates having ribs projecting from a face thereof, a drill carrying frame having grooves therein to receive said ribs, means passing through and adjustable in the apertures of said plates for holding the frame in an adjusted position against said ribbed plate, a drill, and means for operating the latter, as set forth.

6. A drilling apparatus comprising bars for engagement with a railway rail, cross-pieces secured to said bars, apertured clamping plates engaging said cross-pieces, one of said plates having ribs projecting from a face thereof, a drill carrying frame having grooves therein to receive said ribs, a member passing through said frame and plates, transversely adjustable therein, and having a flanged end engaging the face of the frame, a nut upon the threaded portion of said member, a drill carried by the frame, and means for operating the drill, as set forth.

7. A drilling apparatus comprising bars adapted to engage a railway rail, cross-pieces secured to said bars, flanged clamping plates engaging said cross-pieces, one of said clamping plates having transverse ribs thereon, a drill carrying frame having a laterally projecting angled portion with grooves therein adapted to receive said ribs, means for holding said frame in adjusted position against said ribbed plate, a drill carried by said frame, and means for operating said drill, as set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

WILLIAM F. BOSSERT.

Witnesses:

CLARENCE C. BOFF,

W. W. LONG.