No. 614,253. Patented Nov. 15, 1898.

M. M. MOORE.

TRACK DRILL.

(Application filed Feb. 1, 1898.)

(No Model.) 4 Sheets—Sheet 1.

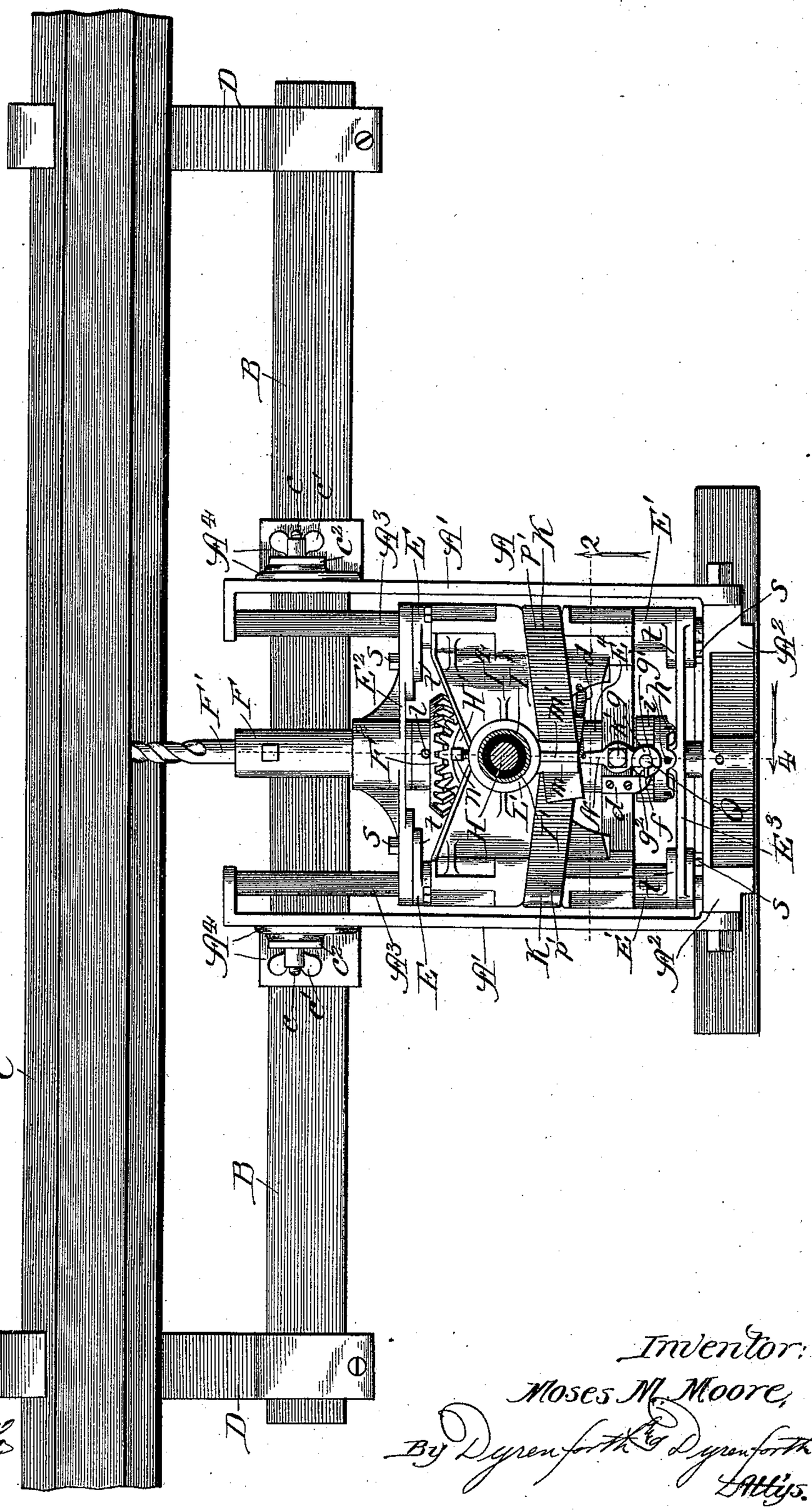

Fig. 1.

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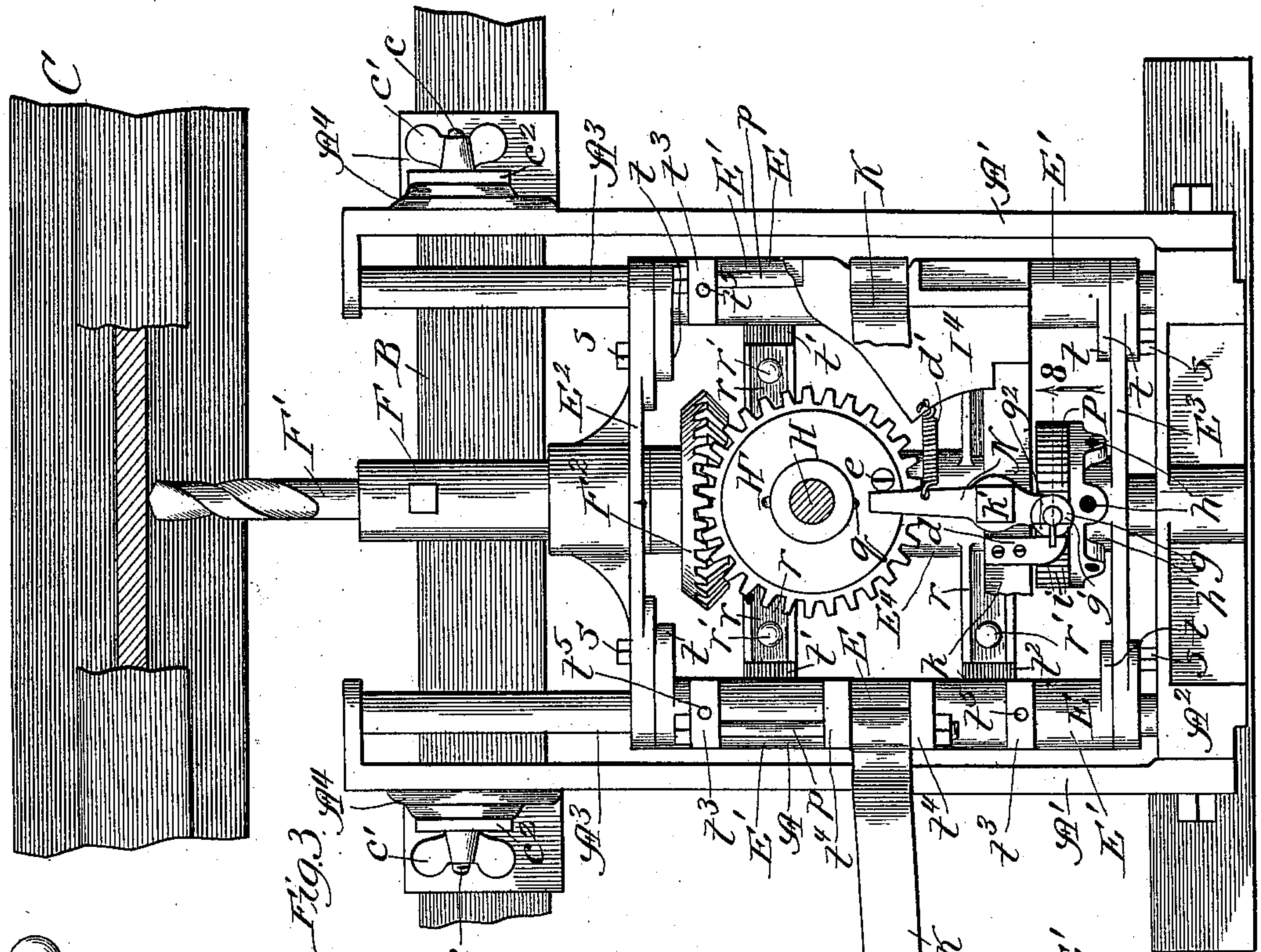

Fig. 3.

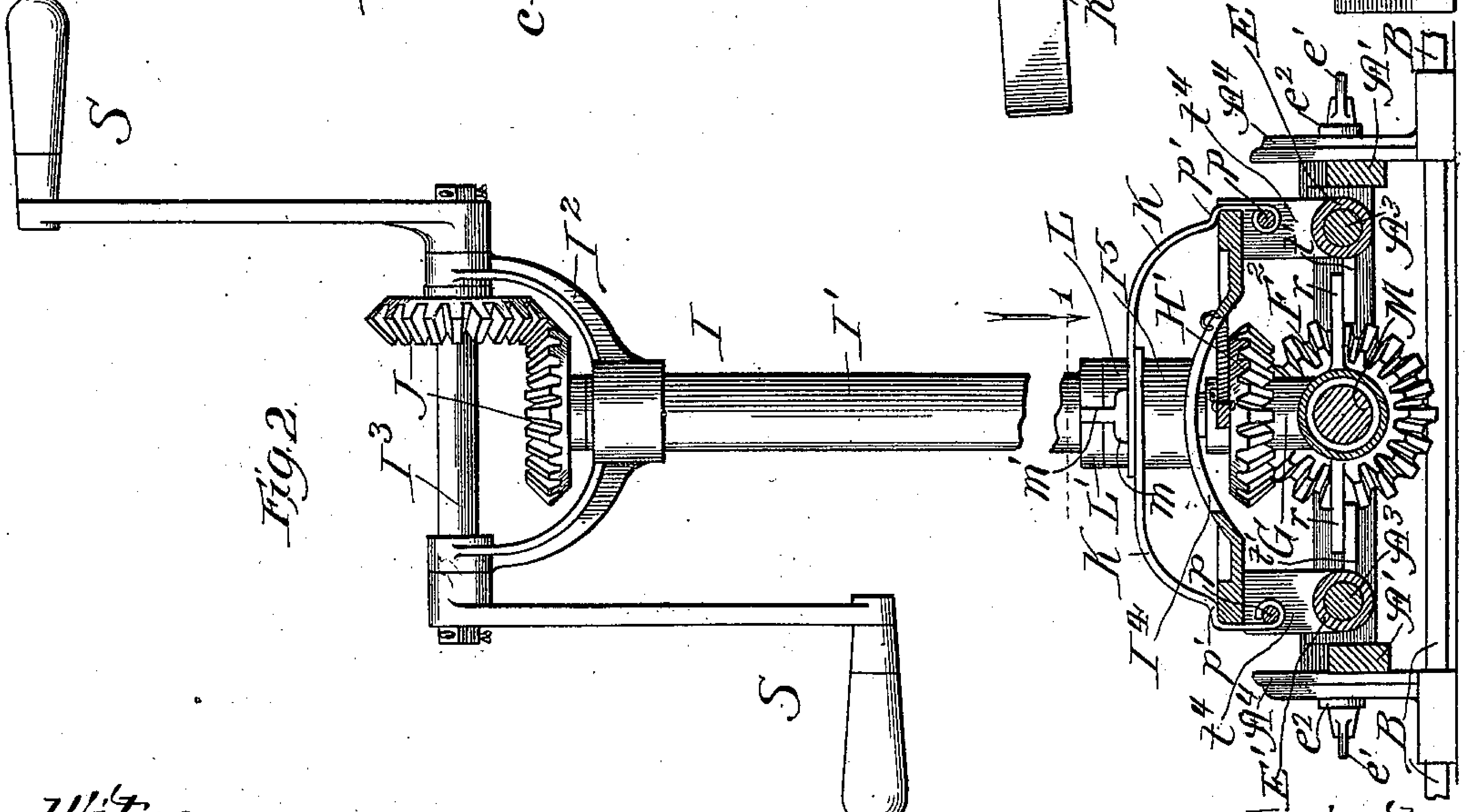

Fig. 2.

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No. 614,253.

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4 Sheets—Sheet 3.

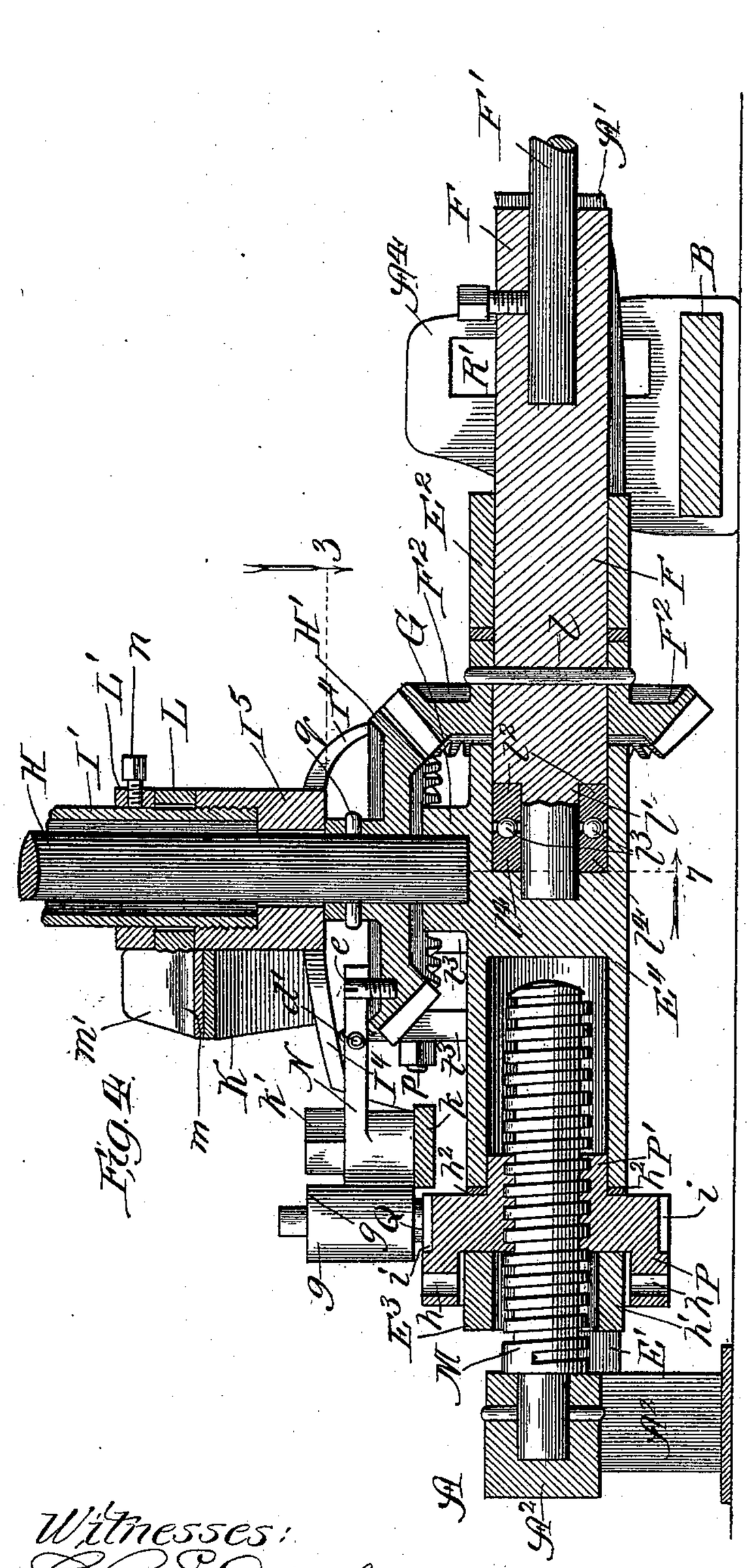

FIG. 4.

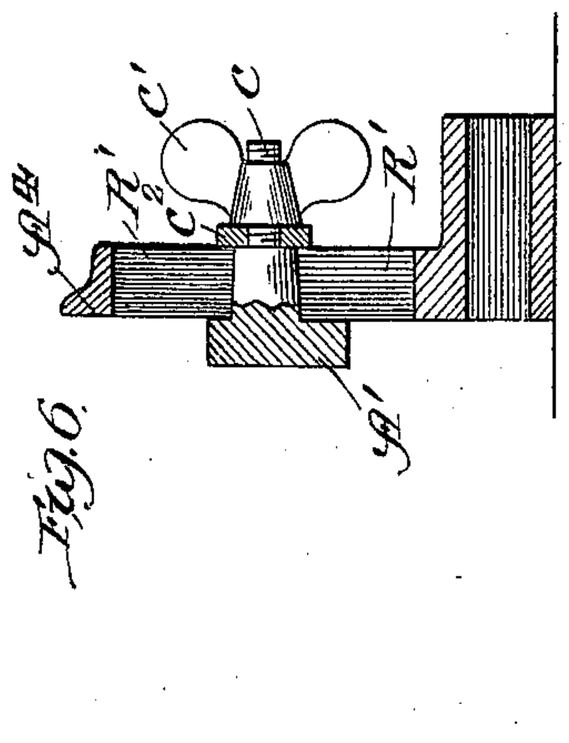

FIG. 6.

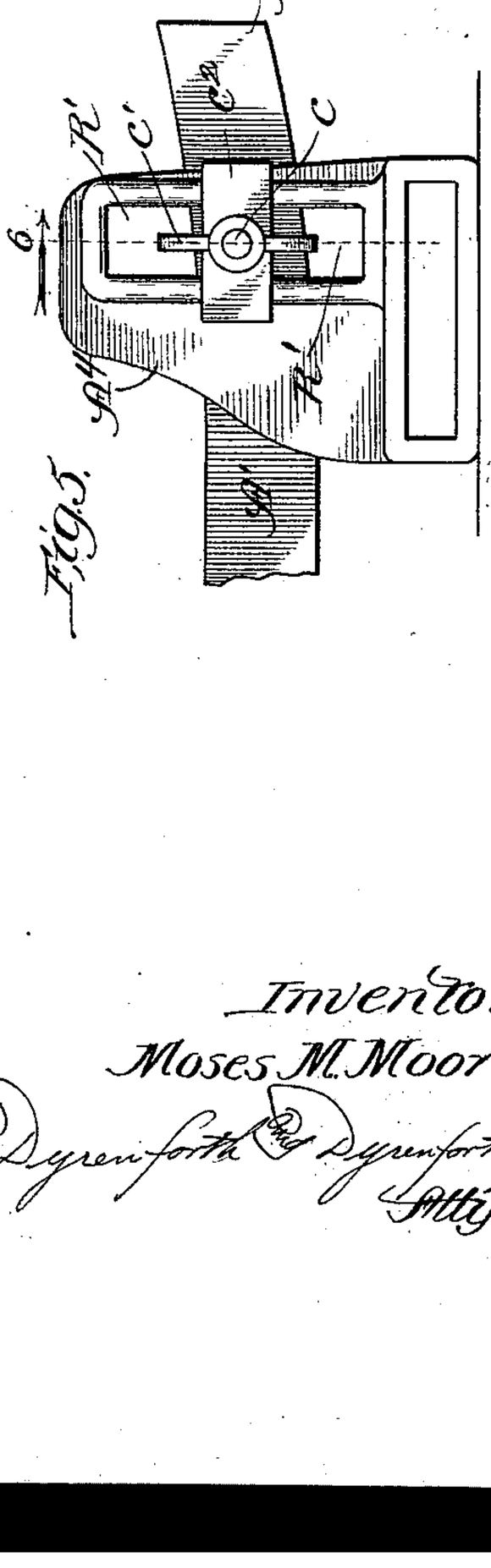

FIG. 5.

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(Application filed Feb. 1, 1898.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 7.

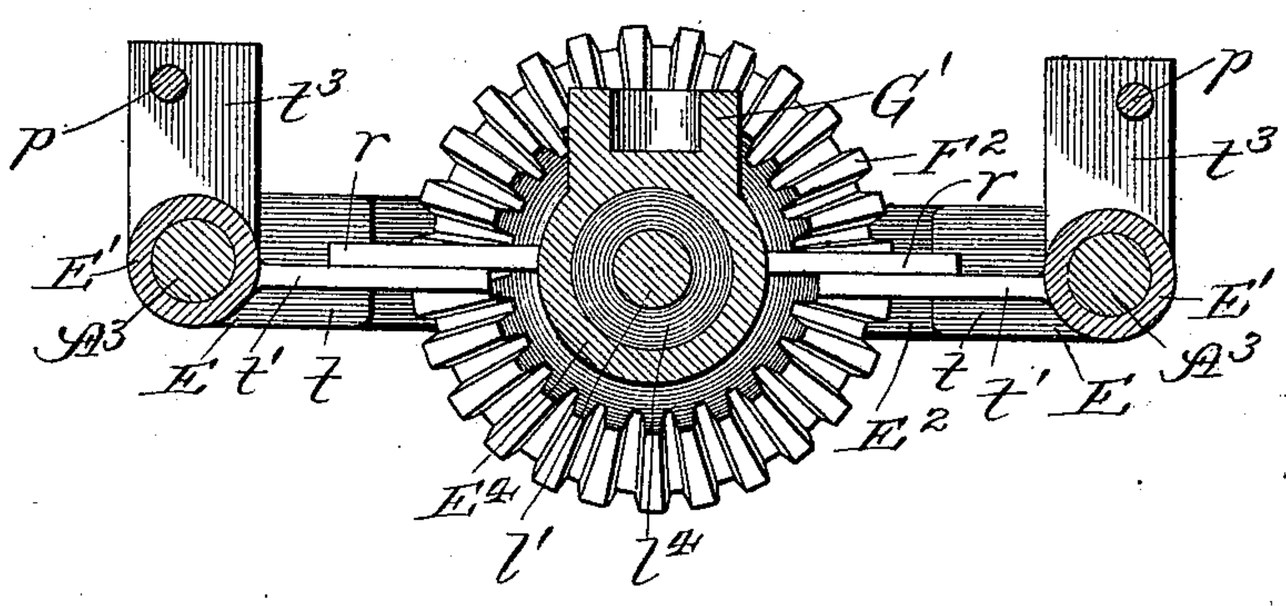
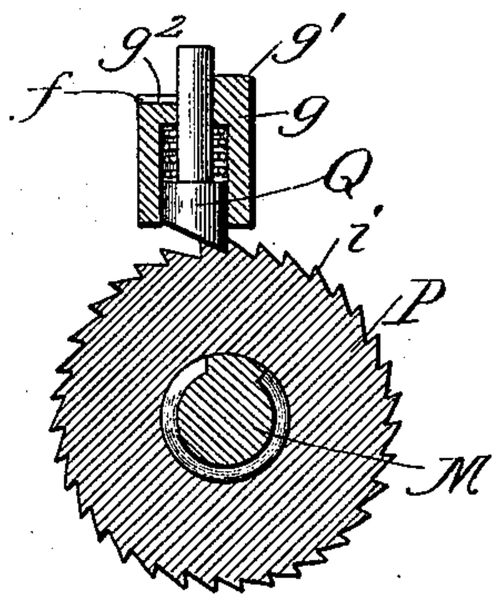


Fig. 8.



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UNITED STATES PATENT OFFICE.

MOSES M. MOORE, OF CHICAGO, ILLINOIS.

TRACK-DRILL.

SPECIFICATION forming part of Letters Patent No. 614,253, dated November 15, 1898.

Application filed February 1, 1898. Serial No. 668,698. (No model.)

To all whom it may concern:

Be it known that I, MOSES M. MOORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Track-Drills, of which the following is a specification.

My invention relates to an improvement in track-drills, and has for its object more especially the production of a horizontal drill provided with vertically-disposed operating mechanism which may be quickly and certainly detached from the horizontal portion of the device in case of emergency, as at the approach of a train, while the drill is being used upon the track between the rails.

To the above end my invention consists, generally stated, in a horizontally-disposed frame carrying a movable drill-stock provided with a gear for rotating it and a detachable vertically-disposed standard in which is journaled a shaft carrying at its lower end a gear which meshes with the gear connected with the drill-stock and provided at its top with means for causing its rotation.

In the accompanying drawings, Figure 1 is a plan section of my improved track-drill in position for boring a rail, said section being taken on line 1 of Fig. 2 and viewed as indicated by the arrow; Fig. 2, a broken view in sectional elevation, the section being taken on line 2 of Fig. 1; Fig. 3, an enlarged broken sectional view similar to Fig. 1; Fig. 4, a broken longitudinal section taken on line 4 of Fig. 1; Fig. 5, a detail of the means for raising and lowering the drill-point; Fig. 6, a section taken on line 6 of Fig. 5; Fig. 7, a section on line 7 of Fig. 4; and Fig. 8, a section on line 8 of Fig. 3 and viewed in the direction of the arrow, showing a detail of the feed mechanism.

The operative mechanism is mounted upon a horizontally-disposed frame A, comprising side pieces A′, a rear end standard A^2, circular guides A^3, front end standards A^4, adjustably secured to the side pieces A′, and a guide B, with which the standards A^4 are slidably connected. The guide-strip B is held at a fixed distance from the rail C by means of hooks D, which pass under the rail and engage the lower flange at the opposite side.

Upon the guides A^3, Fig. 3, is mounted a sliding frame E, comprising sleeves E′, moving on the circular guides A^3 and provided with end lugs t and intermediately with inwardly-extending lugs t' t^2 and upwardly-extending lugs t^3 t^4, front and rear cross-bars E^2 E^3, respectively, secured to the sleeves by bolts s, and a central horizontally-disposed sleeve E^4, supported by laterally-extending lugs r, secured to the lugs t' t^2 by rivets r'. In the front cross-bar E^2 of the sliding frame E is journaled a drill-stock F, in which is secured the drill-bit F′. The drill-stock F extends through the bar E^2 and is provided within the frame with a bevel-gear F^2. The central sleeve E^4 of the sliding frame is provided with a lug G, Fig. 4, in which is journaled the lower end of a shaft H, provided toward its lower end with a gear H′, meshing with the gear F^2. The shaft H is journaled in a vertically-disposed frame I, Fig. 2, which when the drill is in operation is rigidly secured to the horizontally-disposed sliding frame E, but which is readily detachable therefrom in case of emergency. The vertical frame I comprises a sleeve I′, which may be of ordinary gas-pipe, carrying at its top a yoke I^2, in which is journaled a horizontally-disposed shaft I^3, from which motion is communicated to the shaft H by means of bevel-gears J, and a vaulted or arched base-plate I^4, provided with a central socket I^5, into which the gas-pipe I′ is screwed. The pipe or sleeve I′ is of sufficient diameter to accommodate the shaft H loosely within it, the hub or socket I^5 of the base-plate being accurately bored to afford a bearing for the shaft. The gear H′ is rigidly secured to the shaft H by means of a pin q. As a means for securing the vertical frame to the sliding frame E in a manner to be readily detachable, I provide spring-steel straps K, pivotally secured to bolts p, joining the lugs t^4, said straps being of a length to overlap when raised to the position shown in Fig. 2 and being provided near their lower ends with offsets p', which engage the sides of the base-plate I^4. The base-plate is provided at its four corners on its under side with dowel-pins (not shown) which fit into holes t^5, with which the lugs t^3 are provided. To lock the straps K in a posision shown in Fig. 2, I provide the gas-pipe I′ with a rotatable ring L, secured against

vertical movement by a ring L′, held in place by set-screw *n*, said ring L being provided with a lug *m*, adapted to bear upon the straps when rotated to the proper position. The ring L is further provided with a lug *m′*, by means of which it may be shifted from its locking position when struck a blow, as with a hammer, or when pressed by the foot of the workman. The rotation of the ring L is limited by the lug *m′* engaging the set-screw *n* of the ring L′, and thus the locking-ring is always in position for use.

To the rear end of the main horizontal frame is rigidly secured a screw M, by means of which, proper connection being had with the other operative parts, the sliding frame E is automatically fed forward to cause the drill to enter the rail. The gear F^2 is rigidly secured to the drill-stock F by means of a pin *l*. At its rear end the drill-stock is provided with a reduced portion *l′*, upon which is fitted a race member l^2, which forms a portion of a bearing for the balls l^3.

The front end of the central sleeve E^4 is provided with a suitable socket to receive the companion race member l^4, and it is through this bar that the rearward thrust from the drill is transmitted to the sliding frame. The vaulted arch I^4 does not extend rearwardly the full length of the base-plate, but an open section is left near the rear end of the plate, and at the rear end is provided a depressed cross-bar *k*, upon which is pivoted, by means of a pin *k′*, a lever N, the front end of which extends above the rear portion of the horizontally-disposed gear H′ and the rear end of which extends above a nut P upon the screw M. The nut P is of circular form and is provided throughout the front half of its outer surface with ratchet-teeth *i*. At its rear portion the nut is provided with a series of perforations *h*, adapted to receive an operating-rod, by means of which the sliding frame may be retracted. As shown in Figs. 3 and 4, the nut P fits closely between a lug *h′* upon the rear cross-bar E^3 and the rear end of the central sleeve E^4, into which fits a central hub P′, with which the nut is provided, about which is confined a brass bearing-ring h^2. The rear end of the lever N is provided with a perforated circular boss *g*, having an elevated portion *g′* and a depressed portion g^2. Within this portion of the lever is confined a spring-held pawl Q, provided toward its upper end with a pin *f*, by means of which the pawl may be kept out of engagement with the ratchet-wheel by turning the pin to engage the elevated portion of the lug *g*. The gear H′ is provided upon its upper surface with a pin *e*, which at every revolution engages the front end of the lever N. The rear end of the lever N bears against a stop *d* upon the depressed cross-bar *k* of the base-plate, being held normally against the same by means of a spring *d′*. At every revolution of the gear H′ the lever N is operated, and if the pawl Q is in engagement with the ratchet of the nut P the latter is moved forward the distance of one ratchet-tooth. Of course the gear H′ may be supplied with more than one pin, if desired, or any other suitable means may be employed to increase the rate of feed.

Figs. 1, 5, and 6 show the means whereby the position of the drill is regulated both as to height and position longitudinally of the rail. Upon the guide-bar B are the slidable standards A^4, provided with vertical slots R′. Through these slots extend bolts *c*, rigidly secured to the side pieces A′ of the frame and provided with thumb-nuts *c′* and with rectangular bearing-blocks or washers c^2, the latter being adapted to be rotated to a vertical position and so to pass through the slot R′ when it is desired to remove the standard from the frame.

The shaft I^3 is provided with operating-handles S, by means of which motion is communicated to the drill.

The operation is as follows: The vertical standard is placed upon the horizontal frame, with the gear H′ meshing with the gear F^2 and the shaft H resting in the socket G of the central sleeve E^4 of the sliding frame and the dowel-pins on the under surface of the base-plate of the vertical standard fitting into the holes t^5 of the lugs t^3. The straps K are then brought to the position shown in Fig. 2 and while held down with the foot the locking-ring L is moved to a position to bring the lug *m* above the spring-straps, thus firmly clamping the base-plate of the standard to the sliding frame E. The drill is set in any position along the guide B and is adjusted at its front end by means of the thumb-screw *c′* at the standards A^4. If the drill is thrown out of a horizontal position in the vertical adjustment of the front end, this may be overcome by blocking up the rear end of the drill. Workmen grasping the handles S, which are at a suitable height to be conveniently operated through the medium of the shaft H, bevel-gears H′ and F^2, and drill-stock F, rotate the drill F′. At each revolution of the gear H′ the pin *e* of the gear engages the front of the lever N and moves the lever against the action of its spring to rotate the nut P, and thus force the sliding frame toward the rail which is being bored. After the hole has been drilled the sliding frame is retracted by first raising the pawl Q out of engagement with the ratchet and then by means of a hand-lever turning the nut P in a reverse direction.

If during the operation of the machine upon a track a train should approach, the workmen by kicking against the lug *m′* of the locking-ring L throws the latter out of engagement with the spring-straps K, when the vertical standard can be at once removed, the horizontal frame being left in the drilling position during the passage of the train.

By making the vertical frame readily detachable from the horizontal frame I secure the important result of enabling the power to be applied to the drill in an advantageous

manner and yet render it unnecessary to remove the main body of the drill from the boring position during the passage of a train.

While the feature of a bearing in the central sleeve of the sliding frame for the lower end of the vertically-disposed shaft is important, yet obviously it would be possible to dispense with this feature, depending upon the bearing afforded by the vertical frame for holding the bevel-gear H′ in mesh with the gear F^2. In such a construction the dowel-pins mentioned would serve not only to prevent the vertical frame from twisting or rotating with relation to the horizontal frame, but also to hold the vertical frame against being forced backward by the action of the gears.

It is obvious that the construction may be varied in matters of detail without departing from the spirit of my invention, and I therefore do not limit myself to the precise construction shown or described, except as shall appear from the appended claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a track-drill, the combination of a horizontally-disposed frame, a drill-stock journaled therein, a gear connected with said drill-stock, a vertically-disposed frame, a shaft journaled therein provided with a gear engaging the gear on said drill-stock, means for rotating the shaft, and means for detachably securing the vertical frame to the horizontal portion of the drill device to enable its quick removal in case of emergency, substantially as and for the purpose set forth.

2. In a track-drill, the combination of a horizontally-disposed frame provided with guides a sliding frame mounted on said guides, a drill-stock journaled therein, a gear on said drill-stock, feed mechanism for the sliding frame, a vertical frame resting upon the sliding frame, means for detachably securing the vertical frame to the sliding frame, a shaft journaled in the vertical frame provided with a gear engaging the drill-stock gear, and means for applying power to the vertical shaft, substantially as and for the purpose set forth.

3. In a track-drill, the combination of a horizontally-disposed frame provided with guides, a sliding frame mounted thereon provided with a central vertical shaft-bearing, a drill-stock journaled in the sliding frame provided with a bevel-gear, feed mechanism for the sliding frame, a vertical frame resting on the sliding frame, means for detachably securing the vertical frame to the sliding frame, a shaft journaled in the vertical frame with its lower end extending into the bearing on said sliding frame and provided with a gear engaging said drill-stock gear, and means for applying power to the vertical shaft, substantially as and for the purpose set forth.

4. In a track-drill, the combination with a horizontally-disposed frame, drill-stock, gear, and screw-feed, of a detachable vertical frame resting on the horizontal portion of the drill device, comprising a vaulted base-plate I^4, a standard or sleeve I′, a shaft journaled therein provided with a gear H′ meshing with the drill-stock gear, a depressed rear cross-piece *k* on the base-plate provided with a stop, a spring-held lever N pivoted on said cross-piece and bearing normally against said stop, a spring-held pawl at the rear end of said lever engaging the feed-nut of said screw-feed, a projection on the gear H′ engaging the front end of said lever, and means for rotating the shaft carrying the gear H′, substantially as and for the purpose set forth.

5. In a track-drill, the combination of a horizontal frame, a drill-stock journaled therein provided with a gear, a vertical frame resting upon the horizontal frame provided with a base-plate, a shaft journaled therein provided with a gear engaging said drill-stock gear, spring-metal straps pivotally joined to the horizontal frame and passing over the edges of said base-plate and overlapping at their ends, and a locking-ring, or the like, on the vertical frame clamping said straps against the flanges of said base-plate, substantially as and for the purpose set forth.

6. In a track-drill, the combination with a horizontally-disposed frame, a drill and drill-operating mechanism mounted thereon, of a guide B, means for connecting said guide to the rail, slidable standards A^4 mounted on the guide provided with vertical slots, and bolt connection between the standards and front end of the frame for adjusting the vertical height, substantially as and for the purpose set forth.

7. In a track-drill, the combination with a horizontally-disposed frame, a drill and drill-operating mechanism mounted thereon, of standards A^4 provided with slots R′, bolts *c* connected with the frame and extending through the slots, rectangular or elongated washers c^2, and nuts *c*′ for adjustably fastening the frame to the standards, substantially as and for the purpose set forth.

MOSES M. MOORE.

In presence of—
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R. T. SPENCER.