(No Model.)

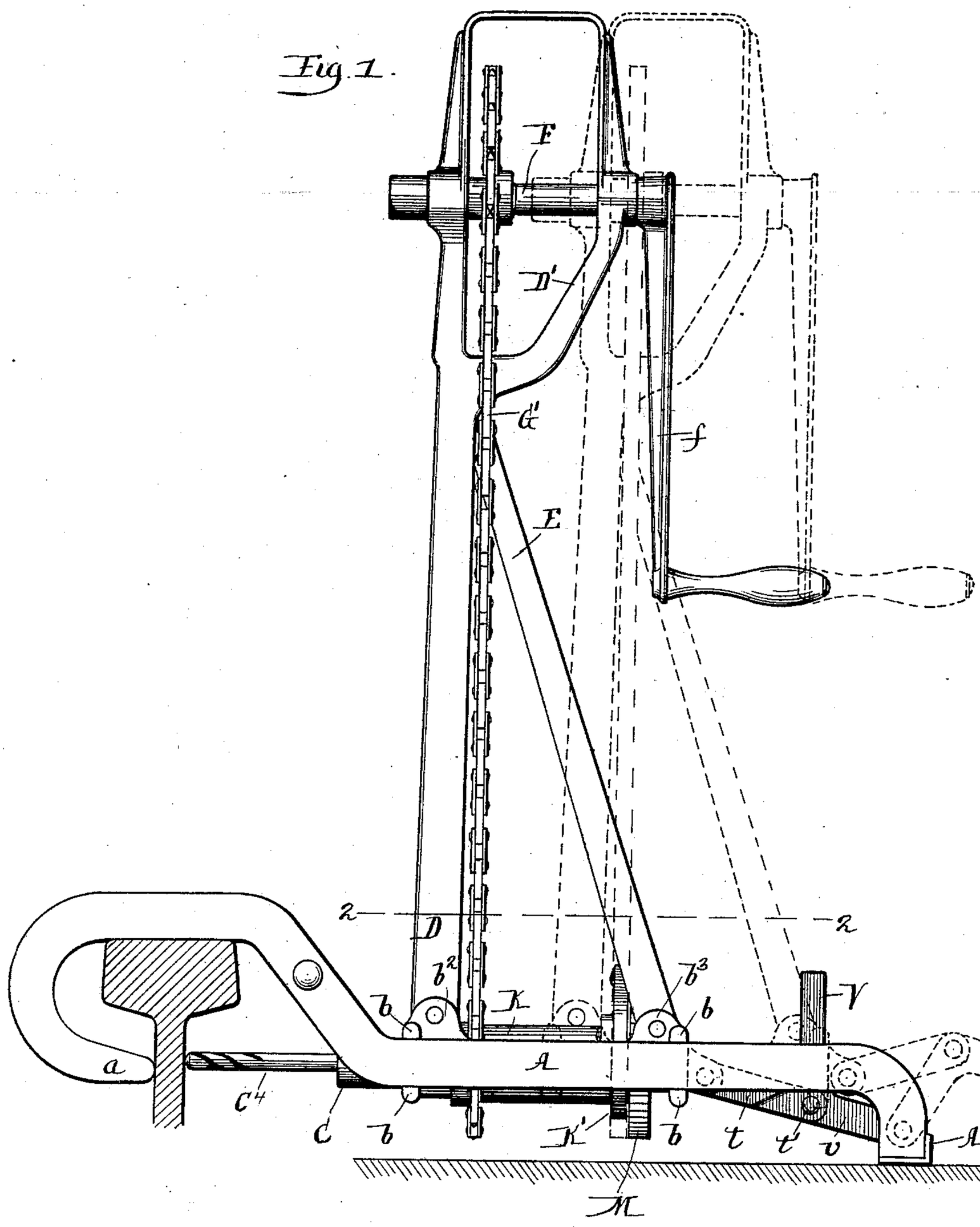
3 Sheets—Sheet 1.

D. A. MOORE.

RAILWAY TRACK DRILL.

No. 604,410. Patented May 24, 1898.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

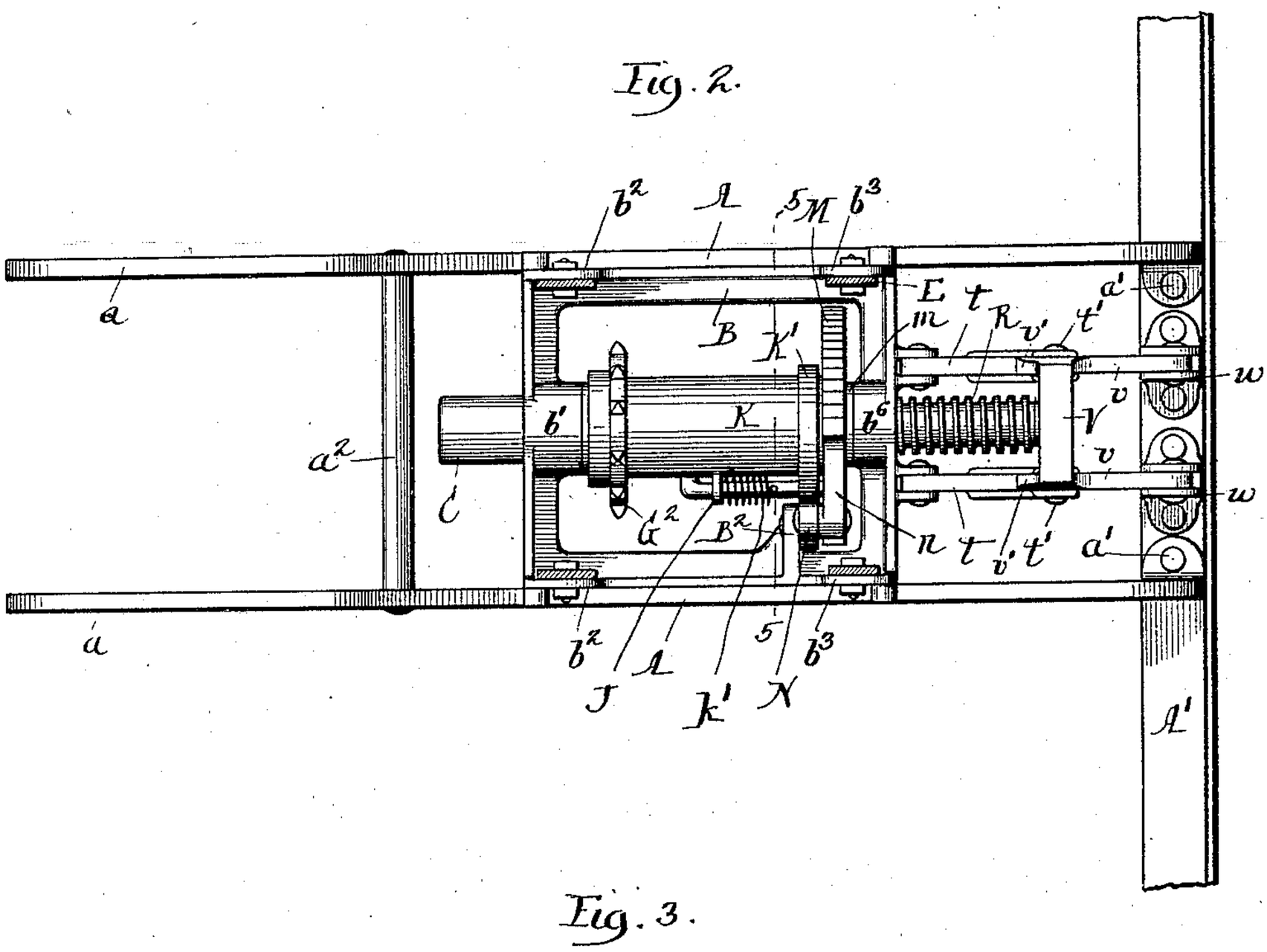


Fig. 3.

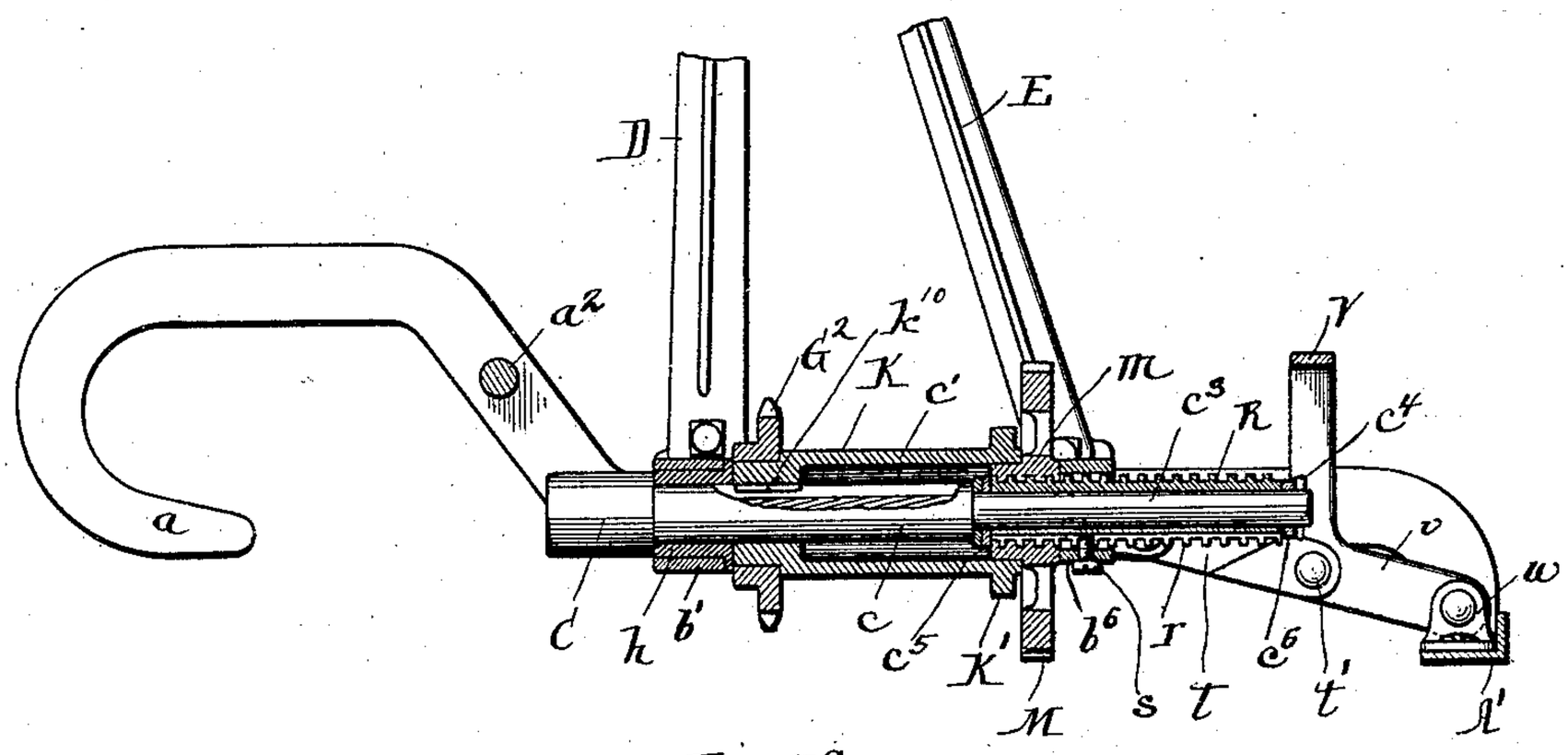
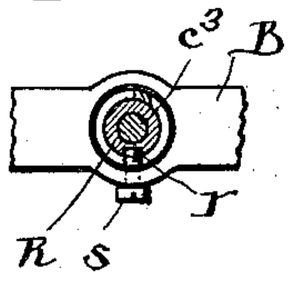


Fig. 7ª



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3 Sheets—Sheet 3.

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RAILWAY TRACK DRILL.

No. 604,410. Patented May 24, 1898.

Fig. 4.

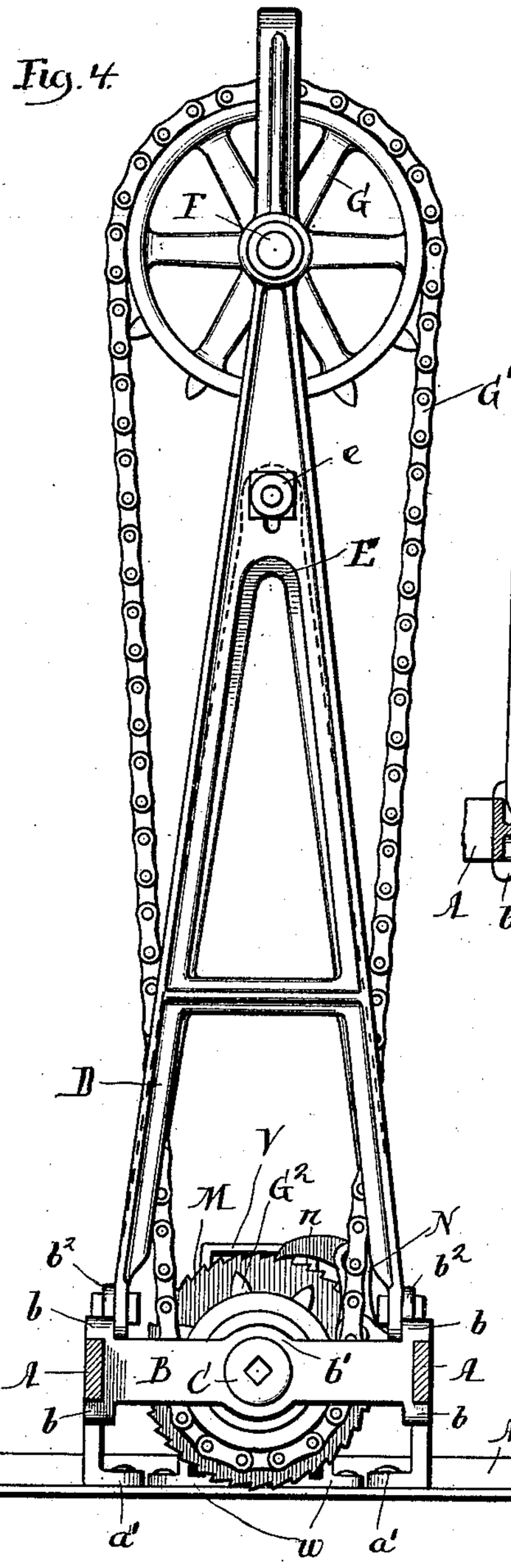


Fig. 5.

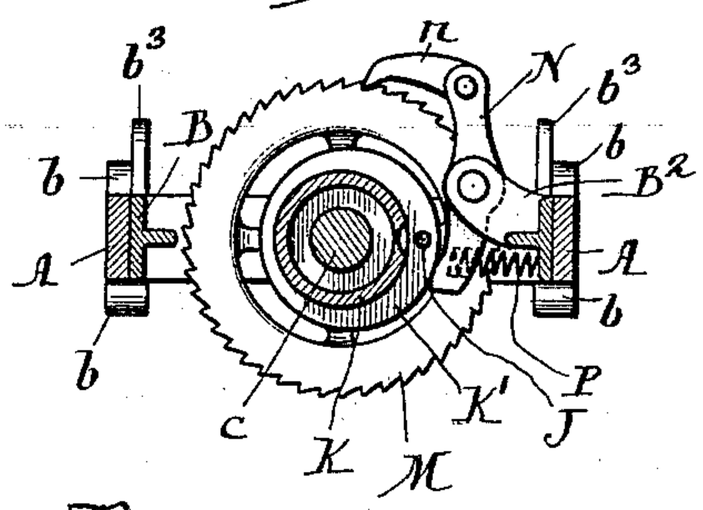


Fig. 6.

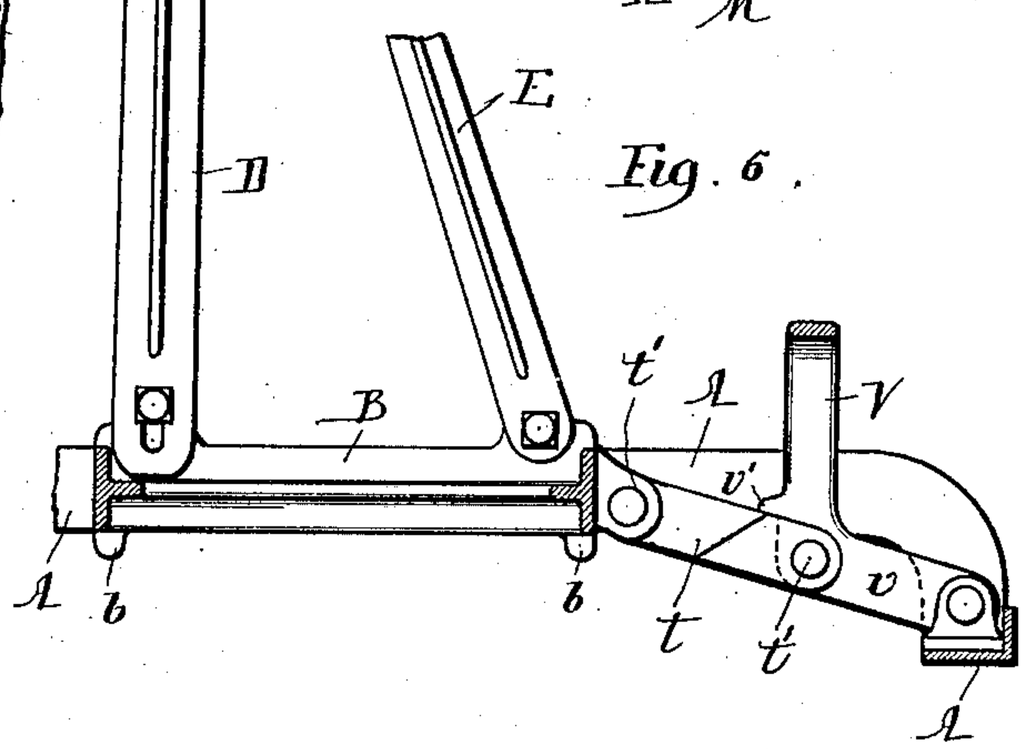
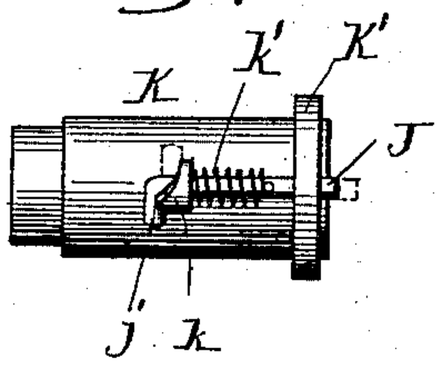


Fig. 7.



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UNITED STATES PATENT OFFICE.

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RAILWAY-TRACK DRILL.

SPECIFICATION forming part of Letters Patent No. 604,410, dated May 24, 1898.

Application filed March 22, 1897. Serial No. 628,692. (No model.)

To all whom it may concern:

Be it known that I, DAVID A. MOORE, a resident of Harvey, in the county of Cook, in the State of Illinois, have invented certain new and useful Improvements in Railway-Track Drills, of which I do declare the following to be a full, clear, and exact description sufficient to enable others skilled in the art to make and use the same.

The present invention has relation more particularly to that class of drills adapted to bore railway-rails; and the invention consists in the various novel features of construction hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a view in side elevation of a track-drill embodying my invention. Fig. 2 is a view in horizontal section on line 2 2 of Fig. 1. Fig. 3 is a view in central vertical longitudinal section. Fig. 4 is a view in elevation looking toward the front, the hooked arms being shown in section. Fig. 5 is a view in vertical cross-section on line 5 5 of Fig. 2. Fig. 6 is a detail view in longitudinal vertical section at one side of the screw and its operating mechanism. Fig. 7 is a detail plan view of the drill-stock sleeve with the engagement pin and spring thereon. Fig. 7^a is a detail view of the front cross-bar of the carriage, the drill-stock and screw-sleeve being shown in section.

A designates the side bars of the supporting-frame, the track ends of these side bars being formed with hooks a, adapted to pass over the head of the rail and bear against the web approximately at each side of the working point of the drill. The opposite ends of the side bars A are shown as bent downward and connected, as at a', to a base-bar A', preferably of angle-iron and of any suitable length and width. Between the side bars A extends a tie-bar a^2, whereby greater rigidity is given to the frame.

Upon the side bars A rests a sliding carriage B, whereby the drill-stock and its operating mechanism will be sustained. Preferably this sliding carriage B is formed as a rectangular cast-metal frame, having laterally-projecting lugs or arms b to engage the edges of the side bars A and whereby the carriage B is retained in place upon the frame while being permitted to move back and forth thereon. The carriage B has its front and rear cross-bars formed with bearings b' and b^6, through which the drill-stock C passes. At each side the carriage B is provided with vertical flanges or ribs b^2 and b^3, and to the flanges b^2 are bolted the lower ends of the vertical support D, that is preferably formed in the shape of an A-frame, (see Fig. 4,) the upper end of this A-frame being formed or provided with the yoke-arm D', the upper end of which is shown as united with the top of the A-frame D. (See Fig. 1.) To the flanges b^3 of the carriage B are bolted the lower ends of a brace-frame E, that is also by preference shaped as an A-frame, the upper end or apex of this frame E being bolted, as at e, (see Fig. 4,) to the upper part of the frame D. The purpose of the frame D is to support the shaft F, that carries a driving sprocket-wheel G, from which power will be transmitted by a sprocket-chain G' to the drill-stock in manner to be presently defined. The shaft F is journaled in heads or bosses formed at the top of the frame D and its arm or extension D', and the front end of the shaft F is provided with a crank f, whereby the drill will be operated. (See Fig. 1.)

In the preferred embodiment of my invention the drill-stock C is formed with a central portion c, that passes through a bushing h in the bearing b' of the carriage B, and upon this central portion c of the drill-stock is mounted a driving-sleeve K, that carries a sprocket-wheel G^2, to which rotation will be imparted by the sprocket-chain G'. The sleeve K is connected to the drill-stock C in order to rotate the drill, the connection being preferably effected by means of a lug k^{10}, projecting from the sleeve K into a longitudinal groove c', formed in the central portion c of the drill-stock. The front end of the sleeve K—that is to say, the end next to the operator—sets over the hub m of the ratchet-wheel M, being free to revolve with respect thereto. The outer face of the sleeve K is provided with a cam K', (see Fig. 5,) against which bears the lower end of the pivoted arm N, the upper end of this arm carrying a pawl n, that en-

gages the teeth of the ratchet-wheel M. The arm N is preferably pivoted, as clearly shown in Fig. 5, to an arm or bracket B^2, that projects inwardly from the side bar of the sliding carriage B. By preference a spring P is interposed between the lower end of the arm N and the carriage B in order to hold the lower end of the arm N in normal engagement with the face of the cam K′.

The reduced end c^3 of the drill-stock C passes loosely through a screw-threaded sleeve R, the sleeve R being retained upon the drill-stock—as, for example, by a pin c^4—suitable washers c^5 and c^6 being fitted upon the reduced portion c^3 of the drill-stock at the ends of the screw-sleeve R. As will be seen by reference more particularly to Fig. 3 of the drawings, the screw-sleeve R passes through the threaded hub of the ratchet-wheel M and is provided with a longitudinal groove *r*, extending from end to end thereof, and into this groove enters a screw *s*, that passes through a hole formed in the under side of the perforated boss or bearing b^6 on the front cross-bar of the carriage B, the purpose of the slot *r* and screw *s* being to insure the straight-line movement of the sleeve R, as will presently more fully appear.

In order to enable the drill-stock to be rapidly withdrawn from its work, I provide suitable means whereby the screw-sleeve R may be fed rapidly in backward direction, and in the preferred embodiment of this part of my invention the driving-sleeve K will be interlocked with the ratchet-wheel M in order to secure the backward movement of the screw-sleeve R. From the surface of the sleeve K projects a cam-shaped lug *k*, through which passes an engagement-pin J, the free end of this pin passing through a hole formed in the cam K′. (See Fig. 5.) The pin J is encircled by a coil-spring *k′*, which serves to force the pin J normally to the position shown by dotted lines in Fig. 7. The bent end *j* of the pin J is adapted to ride against the curved face of the cam-lug *k* in order to retract the pin J against the force of the spring *k′*, and when the pin J is in the position seen by full lines in Fig. 7 the lug *k* will retain it in such position; but when the bent end *j* of the pin J is reversed the spring *k′* will force the pin J to the position seen in Fig. 7 in dotted lines. The end of the pin J will then pass between the spokes of the ratchet-wheel M, and thus interlock the ratchet-wheel and the sleeve K. Consequently the ratchet-wheel M will partake of the speed of the driving-sleeve K, and a much more effective withdrawal of the drill will be secured than would be possible if the action of the cam K and a pawl and ratchet were depended upon for effecting the withdrawal of the drill.

In order to shift the carriage B, I prefer to provide the means next to be described. The rear bar of the carriage B has pivotally connected thereto (see Fig. 2) the links *t*, the front ends of these links being pivoted, as at *t′*, to the side arms *v* of the shifting-bar V. The forward ends of the links *t* may be bifurcated, as shown in Figs. 2 and 3, to receive the side arms *v* of the shifting-bar V, and the side arms *v* of the shifting-bar are provided with forward extensions *v′*, that will bear upon the top edges of the links *t* in order to limit the downward movement of the links and of the shifting-bar. The front ends of the side arms *v* of the shifting-bar are pivotally connected to brackets *w*, (see Fig. 2,) that are attached to the cross-bar A′.

From the foregoing description the operation of my improved drill will be seen to be as follows: When the hooked ends of the side bars A have been set over the rail, as shown in Fig. 1 of the drawings, the operator will either by his hand or foot throw the shifting-bar V from the position shown by dotted lines in Fig. 1 to the position shown by full lines, and this movement of the shifting-bar V will cause the sliding carriage B to move forward until the drill C^4 is brought against or approximately against the web of the rail to be drilled. When the shifting-bar V and link *t* are in the position shown by full lines in Figs. 1, 2, and 3, the frame D will securely hold the drill in working position. The operator will now turn the crank *f*, and thereby through the medium of the shaft F, sprocket-wheel *g′*, and sprocket-wheel G^2 impart revolution to the driving-sleeve K, and inasmuch as this sleeve K is keyed to the drill-stock C corresponding revolution will be imparted to the drill. By reference more particularly to Fig. 5 of the drawings it will be seen that as the driving-sleeve K revolves the cam K′ will rock the pawl-carrying arm or lever N, thereby causing the pawl *n* to effect a step-by-step revolution of the ratchet-wheel M. As the ratchet-wheel M is thus revolved it will cause the screw-sleeve R, with which it engages, to carry the drill-stock C in forward direction, and thus gradually feed forward the drill to the required extent at the same time that the revolution of the drill is effected. In order to enable the drill to be rapidly withdrawn from the hole that it has bored, it is only necessary for the operator to swing the engagement latch or pin J from the position shown in full lines to the position shown by dotted lines in Fig. 7 of the drawings, thereby causing the end of this latch or pin to pass between the spokes of the ratchet-wheel M and thus lock the ratchet-wheel to the driving-sleeve. If then the pawl *n* be thrown backward out of engagement with the ratchet-wheel, the operator can by turning backward the crank *f* impart a rapid rotation to the driving-sleeve K in reverse direction, and inasmuch as the ratchet-wheel M is locked to the driving-sleeve it follows that a quick backward movement of the screw-sleeve R and of the drill-stock will be secured.

So far as I am aware my invention presents the first instance of a drill in which means is provided for locking the feed ratchet-wheel

with a part of the driving mechanism, whereby a more rapid movement may be given to the ratchet-wheel for the purpose of withdrawing the drill from its work, and I do not wish, therefore, that the invention should be understood as restricted to the precise details of construction above set out, since manifestly the locking mechanism, whereby the rapid reverse movement of the ratchet-wheel is secured, may be of any suitable type. When the position of the drill is to be shifted—as, for example, for the boring of new holes or to remove it on the approach of railway-trains—the operator will press backward the shifting-bar V from the position shown by full lines to the position shown by dotted lines in Fig. 1, thereby quickly withdrawing the drill from proximity to the rail and permitting the hooked ends *a* of the side bars A to be lifted from the rails. It will thus be seen that not only can the drill be quickly withdrawn from the bored hole, but by a simple movement of his foot the operator can quickly retract the drill, so that the hooked ends of the supporting-frame can be instantly disengaged from the rail. These features are of importance, particularly in drills designed for the boring of railway-tracks, since they enable the drill to be instantly removed from the track in case of the approach of a train.

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

1. In apparatus of the character described the combination with a supporting-frame provided with hooks adapted to engage a track-rail, of a drill-stock, a horizontally-arranged reciprocating carriage mounted upon said supporting-frame and carrying said drill-stock and vertically-swinging toggle-links connecting the rear of said supporting-frame with said reciprocating carriage whereby said carriage and drill-stock can be quickly moved toward and from the work and held in place.

2. In apparatus of the character described, the combination of a main supporting-frame comprising side bars A, A′ having hooks at one end and having their opposite ends rigidly connected with a suitable cross-bar or base A′, and a reciprocating carriage B mounted upon said side bars A, A′, a drill-stock mounted in said carriage, means for shifting said carriage, a support rising from and sustained by said carriage and means for operating the drill-stock carried by said support.

3. In apparatus of the character described, the combination with a suitable support, of a rectangular carriage movably mounted thereon, a horizontally-arranged drill-stock and means for rotating said drill-stock, a support D rising vertically from said frame and provided with an arm D′, a shaft journaled in said support D and said arm D′ and a brace-frame E connected to said support D, said shaft being suitably engaged by said drill-stock.

4. In apparatus of the character described the combination with a suitable support or frame provided with means whereby it may be connected with a railway-rail, of a drill-stock, a driving-sleeve through which said drill-stock passes and to which it is connected, a screw for advancing said drill-stock, pawl-and-ratchet mechanism for operating said screw and means for detachably locking the ratchet-wheel to the driving-sleeve whereby a rapid backward movement may be given to the ratchet-wheel to withdraw the drill from its work.

5. In apparatus of the character described, the combination with a suitable support provided with hooks for engaging the rail, of a carriage, a drill-stock, means for rotating said stock, a screw for advancing said stock, pawl-and-ratchet mechanism for operating said screw and a shiftable latch for connecting said ratchet with the means for rotating the drill, whereby the drill may be quickly shifted.

6. In apparatus of the character described, the combination with a suitable support, of a drill-stock, means for rotating said stock, a screw for advancing said stock, pawl-and-ratchet mechanism for operating said screw, a driving-sleeve for effecting its rotation, a shiftable latch carried by said driving-sleeve and adapted to lock said sleeve to the ratchet in order to permit the rapid movement of the drill-stock.

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