

No. 761,975.

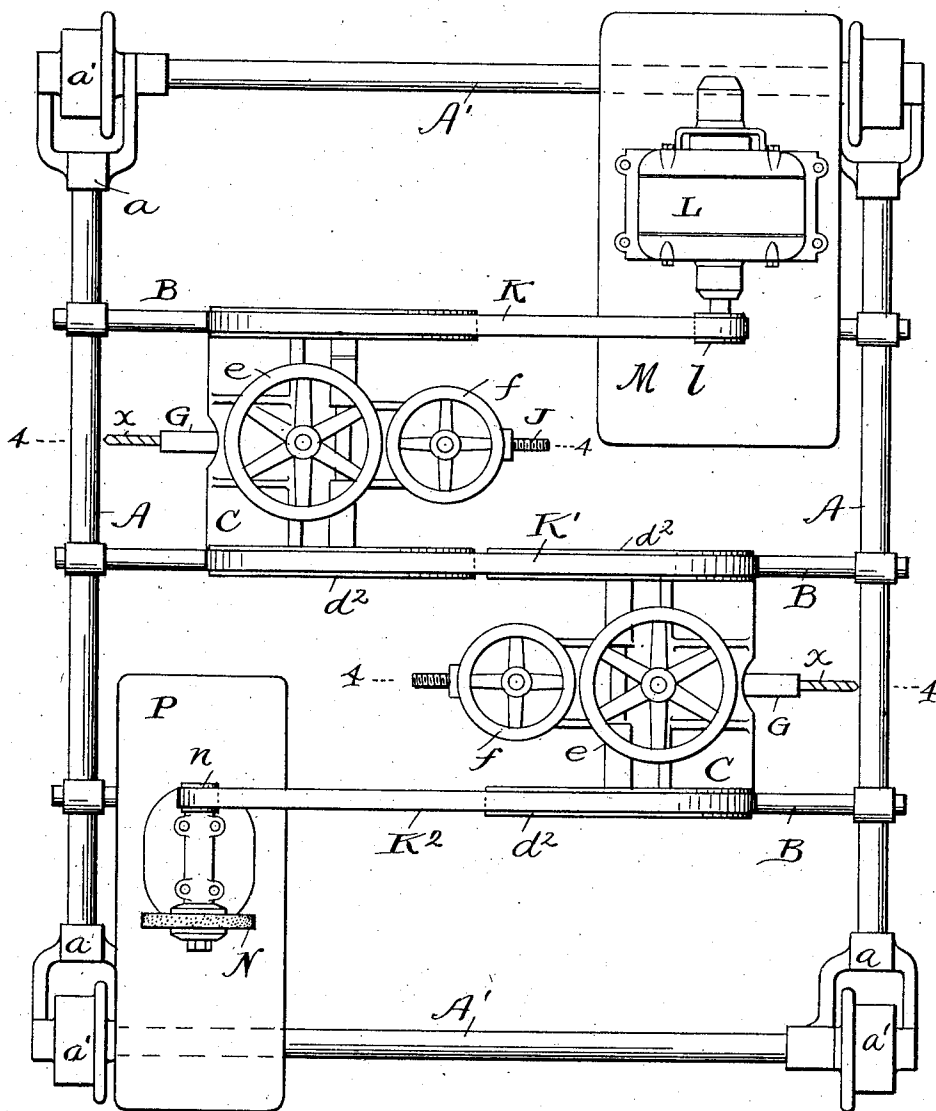
PATENTED JUNE 7, 1904.

W. E. LUDLOW.
TRACK DRILLING MACHINE.
APPLICATION FILED JULY 30, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.
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3 SHEETS—SHEET 2.

Fig. 2.

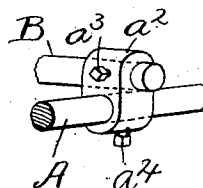
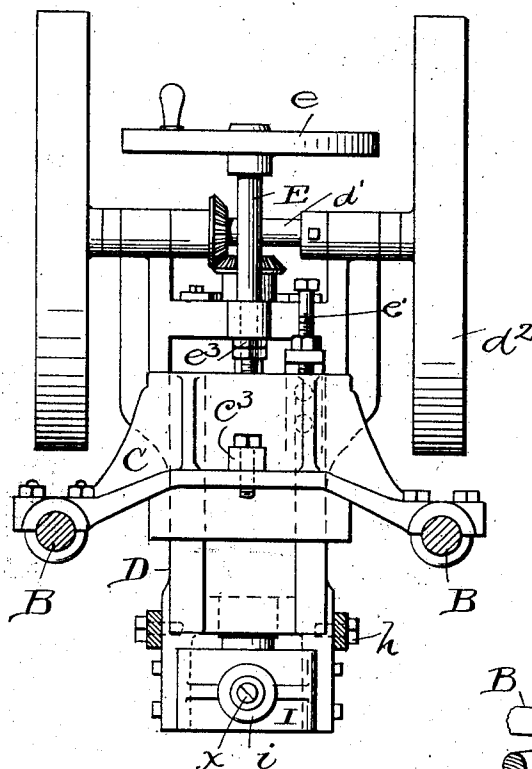
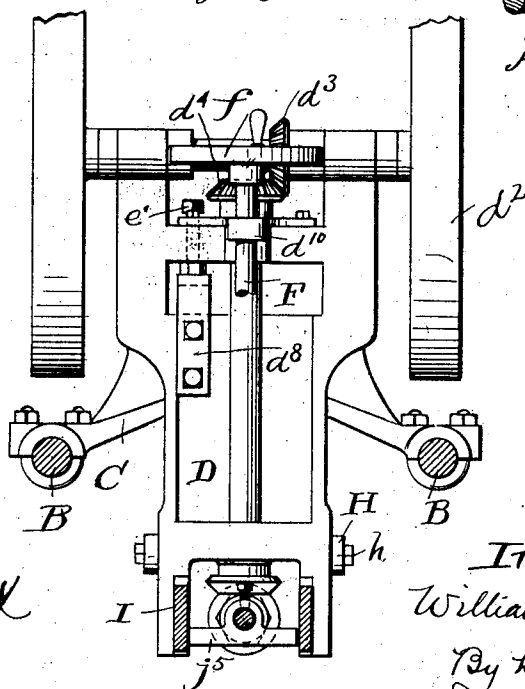


Fig. 6.

Fig. 3.



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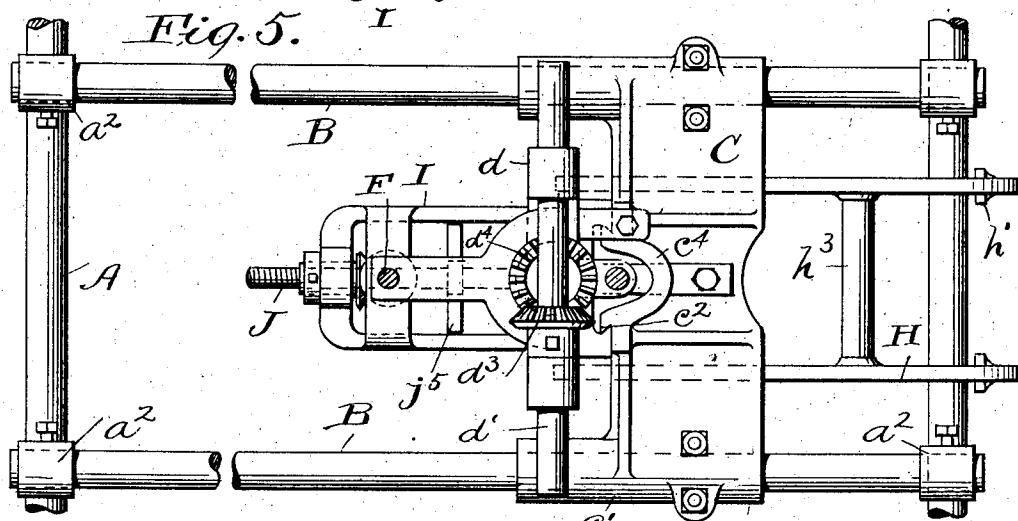
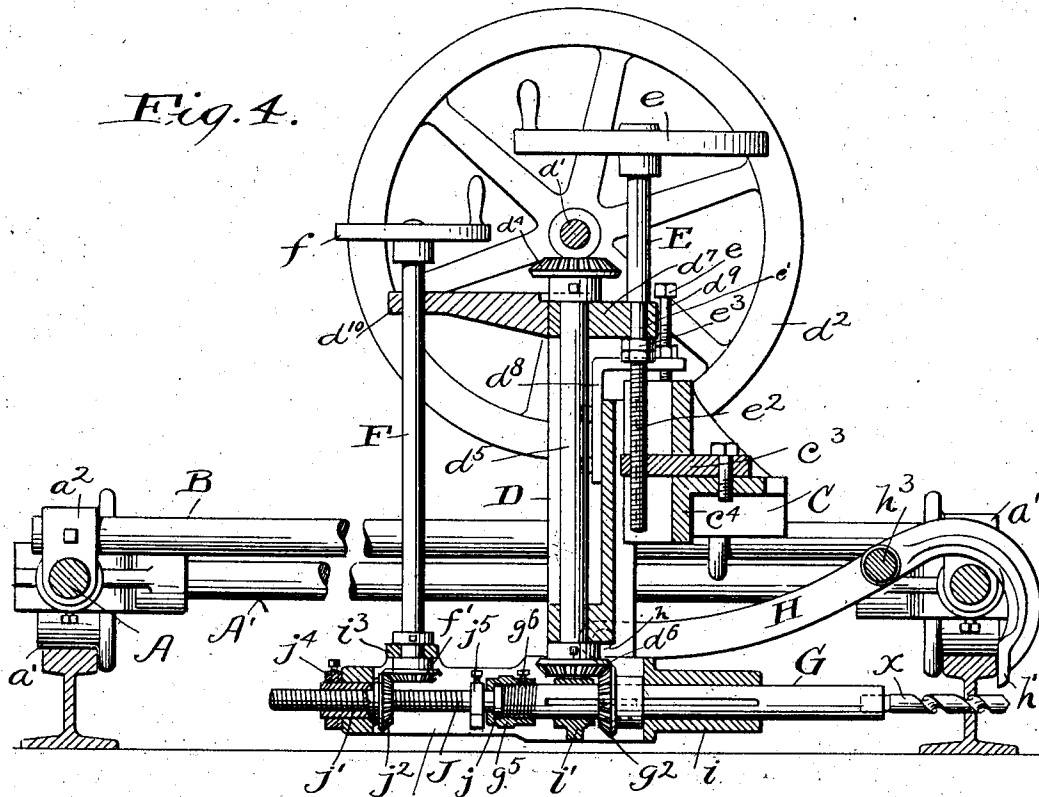
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3 SHEETS—SHEET 3.



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Witnesses Inventor.

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UNITED STATES PATENT OFFICE.

WILLIAM E. LUDLOW, OF CLEVELAND, OHIO.

TRACK-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 761,975, dated June 7, 1904.

Application filed July 30, 1903. Serial No. 167,526. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. LUDLOW, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Track-Drilling Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The invention relates to improvements in railway-construction drills, and has for its object the employment, in a simple and efficient manner, of certain drilling mechanism arranged upon a truck or frame having suitable wheels which permit the device as a whole to be shifted along the track to any desired point.

It further comprehends the use of drilling devices in duplicate, one for either side of the frame, and the mounting of the mechanism upon the frame in a manner such that it may be operated either by hand or suitable motive power, the motive power being available for drilling on either side of the track as desired or for operating a grinding device.

The invention may be further said to consist in the construction and combination of parts hereinafter described, reference being had to the accompanying drawings, description, and claims.

Referring to the drawings, Figure 1 is a top plan view of my device, showing the two separate drills and the motor for operating the same. Fig. 2 is a front elevation of one of the drilling devices. Fig. 3 is a rear elevation with portions of the device broken away to more clearly show parts otherwise hidden. Fig. 4 is a transverse sectional view on the line 4 4 of Fig. 1 through the center of one of the drilling devices. Fig. 5 is a plan view, partly in section, showing the construction about the vertically-movable slide. Fig. 6 is a perspective view of the clip used in securing together the members of the frame.

In the frame of my device two side rails A are employed, having upon their ends, respectively, castings *a* in the form of yokes which are adapted to span suitable flanged supporting-wheels *a'*, these wheels being

mounted upon axles extending from the end cross-bars A', which pass from one casting *a* to the one on the opposite side. Surrounding the side rails A are suitable clips *a²*, clamped in place by set-screws *a⁴* and having openings for receiving cross-bars B, which are held in these clips by means of set-screws *a³* and are adapted to support the framework C of the drills. This construction makes a frame which is simple to construct, while possessing both lightness and strength. The frame or truck proper is not claimed herein, however, but in my application Serial No. 193,564, filed February 15, 1904. I prefer to provide two of the drills mounted upon three of the cross-bars B of the frame, as clearly shown in Fig. 1.

Each of the drills C, above referred to, consists of a bridge-piece *c*, having long tubular portions *c'*, adapted to rest upon the bars B. This bridge-piece *c* may be of any preferred form, such that it will accommodate itself to the arrangement of the drill; but I prefer to provide it with a suitable trackway having two undercut tracks *c²* and with a hollowed-out portion *c⁴*, as shown in Fig. 5, arranged vertically for the purpose of carrying the slide D. The slide D has suitable guideways for engaging the tracks *c²* and is provided at its upper end with bearings *d*, adapted to receive an operating-shaft *d'*, which carries suitable fly-wheels *d²* and a bevel-pinion *d³*, keyed to the shaft and meshing with a bevel-pinion *d⁴*, rigid with a vertical shaft *d⁵*, suitably mounted in the slide. At the lower end of the shaft *d⁵* is a bevel-pinion *d⁶*, adapted to rotate the drill-point. The slide D is further provided with an arm *d⁷*, extending therefrom to a point which is over the hollowed-out portion *c⁴* of the bridge-piece *c*. At this point the arm *d⁷* is provided with a suitable opening through which an adjusting-screw E passes. This screw E is provided upon its shank with a hand-wheel *e* and has a reduced portion *e'* passing through the arm *d⁷* and below this portion *e'* a threaded portion *e²*. A stop-nut *e³* (provided with a suitable lock-nut) upon this threaded portion *e²* prevents the upward movement of this elevating-screw, while the shoulder formed by the reduction of the shank prevents

the same from moving downward. The screw e^2 engages a threaded opening in an arm e^3 , secured to the bridge-piece e . It will be seen from the foregoing that when it is desirable to raise or lower the slide D the screw E need only be rotated by the hand-wheel e . The lowering of the slide D, however, is limited by an angular stop d^8 , secured to said slide and extending to a point where it may engage upon the top of the bridge-piece. A screw d^9 , having a suitable lock-nut, is provided in the end of this stop for the purpose of adjusting the extent of the downward movement of the slide. When the drill-truck is run along the track, it may require the elevating of the slide D to cause the lower mechanism to escape obstructions. The screw d^9 when once adjusted will insure the slide being thereafter returned to the proper position. Projecting from the slide D is another arm, d^{10} , having a suitable opening therethrough for receiving a feed-operating shaft F, which passes loosely through said arm and has at its upper end a hand-wheel f . The purpose of this wheel is to operate the device which feeds forward the drill.

The drill proper and its mechanism will now be described. At the lower end of the slide D is a hook H, which consists of two members rigidly fastened together by a spacing-piece h^3 and extending upon opposite sides of the slide D, where they are pivoted to said slide at h . The outer ends of these members are provided with flat portions h' , which are arranged to engage the outer face of the ball of the rail. This insures a fixed relation between the lower end of the slide and the rail. Rigidly carried by the lower end of said slide D is a housing I, which has a long bearing i for receiving the drill-spindle G. It also has another bearing, i' , which supports the inner end of said spindle. At the opposite end of the housing I is a suitable opening for receiving the feed-screw-adjusting nut j' , hereinafter described. Upon the upper side of the housing is a cross member j^3 , adapted to receive the lower end of the feed-operating shaft F. The lower end of this shaft F carries a bevel-pinion f' . Loosely splined to the spindle G is an operating bevel-pinion g^2 . This pinion meshes with the pinion d^6 , rigid with the operating-shaft d^6 . Thus it will be seen that the rotation of the shaft d^7 will rotate the shaft d^6 through the mechanism heretofore described, and the rotation of this shaft d^6 will in turn rotate the spindle G of the drill. The spindle G is also provided with suitable means at its forward end for carrying a drill-point g and at its opposite end with a cap g^5 , which is arranged to be screwed or otherwise secured upon the same. The cap g^5 has an opening in its end for receiving the stem of the feed-screw J. This connection between the feed-screw and the drill-spindle permits the latter to rotate upon said screw, and their disengagement is prevented by a head j , rigid with

said stem and engaging the cap g^5 . A set-screw g^6 is arranged in said cap g^5 to hold the same in any adjusted position. Mounted upon the threaded portion of the feed-screw is a nut j' , having a bevel-gear j^2 , which meshes with the bevel-gear f' , rigid upon the feed-screw-operating shaft. A suitable collar j^4 is rigidly secured to said nut to prevent endwise movement thereof. Rigidly carried by the feed-screw is a winged member j^5 , which loosely engages the sides of the housing I. It will be seen from the parts just described that the rotation of the feed-operating shaft F will rotate the nut j' , which in turn will force the feed-screw J one way or the other in an endwise direction. The rotation of this screw, however, is prevented by the winged member j^5 . Of course the endwise movement of this screw J will convey endwise movement to the drill-spindle, and hence will feed the drill forward, the pressure of the drill upon the rail being received by the hook H, previously described. The drill may be adjusted up and down for any purpose by rotating the elevating-screw E. One of these completed drills is provided for each side of the machine, as shown in Fig. 1, whereby holes may be drilled in either of the rails. The bridge-pieces of these drills are mounted upon the bars B in such a manner that one tubular portion of each bridge-piece is mounted upon the same bar B, and the wheels d^2 are so located upon the operating-shafts that when said drills are mounted in the manner just mentioned one wheel d^2 of one drill will aline with one wheel of the other and may be geared together by means of a belt K'.

At one end of the truck there is a motor L, secured to a plate M, rigidly carried by the adjacent transverse bar B and the cross-bar A' at that end of the machine. The driving-pulley l of this motor alines with the wheel d^2 on that side of the first drill to which it is belted by the belt K. The object of arranging the device in this manner is that the motor will drive through one wheel, thus driving the drill connected with it. Then through the medium of the belt K' the operation of the drill just mentioned will rotate the wheel of the other drill, and thus economy in space and efficiency in operation will be obtained. A belt K² may be placed upon the free wheel d^2 for the purpose of rotating an emery grinder N, which has a pulley n for receiving this belt. This grinder is likewise mounted upon a base-plate P, secured to one of the bars B and to the adjacent end cross-bar.

I claim—

1. In a drill for railway construction, the combination of a frame, a vertically-adjustable slide mounted thereon, a housing at the lower end of said slide comprising a pair of separated side bars, an end piece and a bridge-piece across the side bars, a drill-spindle rotatably mounted in said housing, means for ro-

ratingsaid drill-spindle, a nut rotatably mounted in said end piece of the housing and having rigid with it a bevel-gear, a feed-screw within said nut and swiveled at its forward end to said drill-spindle, a block secured to said screw and engaging one of the side walls of the housing to prevent rotation of the screw, a vertical shaft mounted at its lower end in said bridge-piece of said housing, a bevel-gear on the lower end of said shaft and meshing with the bevel-gear on the nut, and means for rotating said shaft, substantially as described.

2. In a drill for railway construction, the combination with a wheel-truck, a vertically-adjustable slide mounted thereon, a housing at the lower end of said slide, a drill-spindle rotatably mounted within said housing, means for rotating said spindle, a feed-screw loosely mounted in said housing, a flange upon one end of said screw, a sleeve having an internal flange for engaging with said flange, means for securing said sleeve to the spindle, a nut upon said screw provided with a bevel-gear, a vertical shaft rotatably mounted in said housing and in said slide, a bevel-gear on the lower end thereof for engaging with bevel-gear on said nut, means whereby said vertical

shaft may be rotated, substantially as described.

3. In a drill for railway construction, the combination of a frame, a vertically-adjustable slide mounted thereon, a housing at the lower end of said slide comprising a pair of separated side plates, a hollow boss at the forward end thereof and a cross-piece at the rear end thereof, a drill-spindle rotatably mounted within said boss, means for rotating said spindle, a nut rotatably mounted within said end piece, a screw within said nut and having at its forward end a flange, a sleeve having an internal flange engaging said flange and having an internal thread screwing onto said drill-spindle, and a member clamped to said screw back of said sleeve and engaging one of the side pieces of said housing out of alinement with the axis of the screw to prevent rotation thereof, and means for rotating said nut to feed said screw and spindle, substantially as described.

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

WILLIAM E. LUDLOW.

Witnesses:

ALBERT H. BATES,
B. W. BROCKETT.