Sept. 8, 1931. E. H. LAWRENCE 1,822,409

TIE PULLER

Filed July 30, 1930 2 Sheets-Sheet 1

FIG. 1

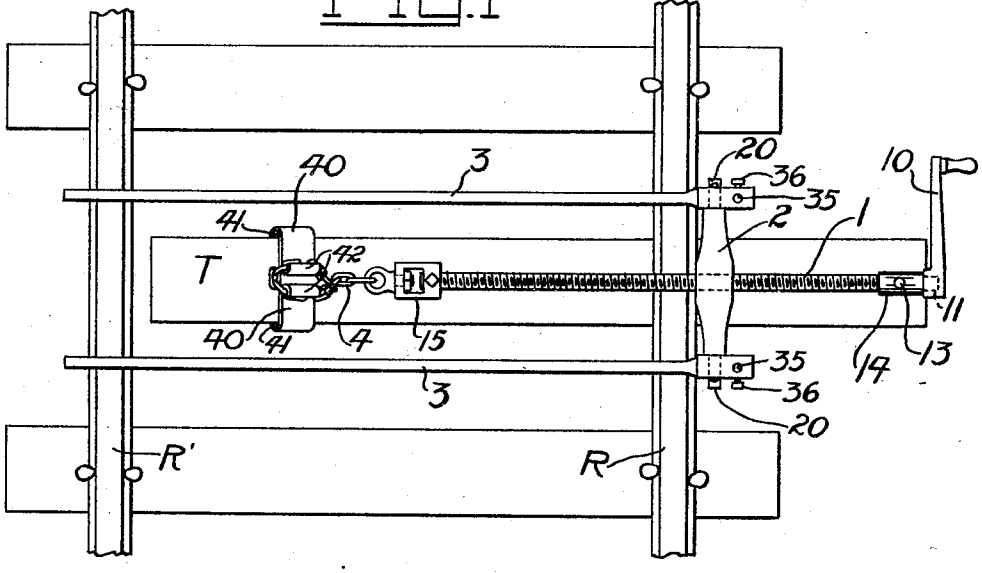


FIG. 2

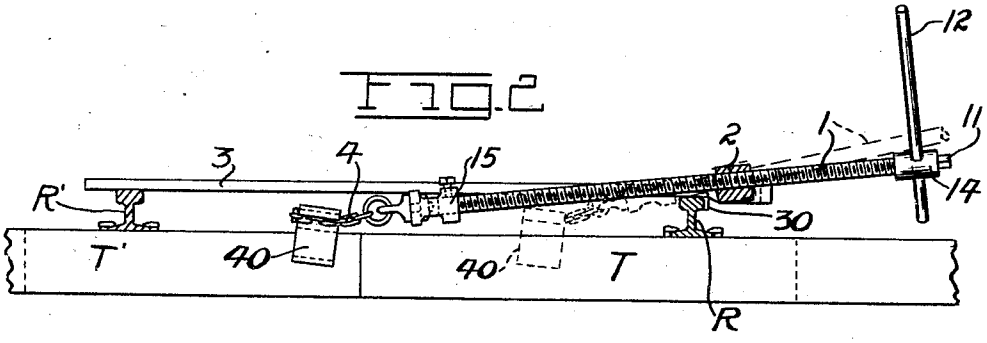


FIG. 3

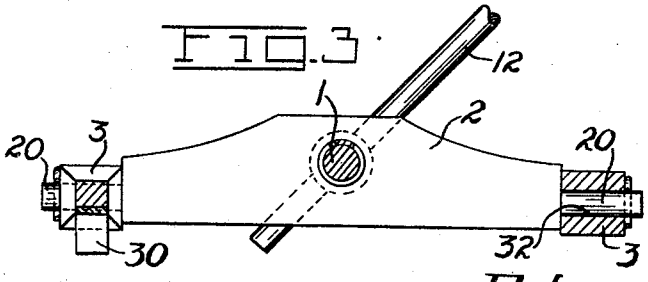
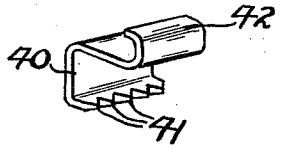


FIG. 7



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TIE PULLER

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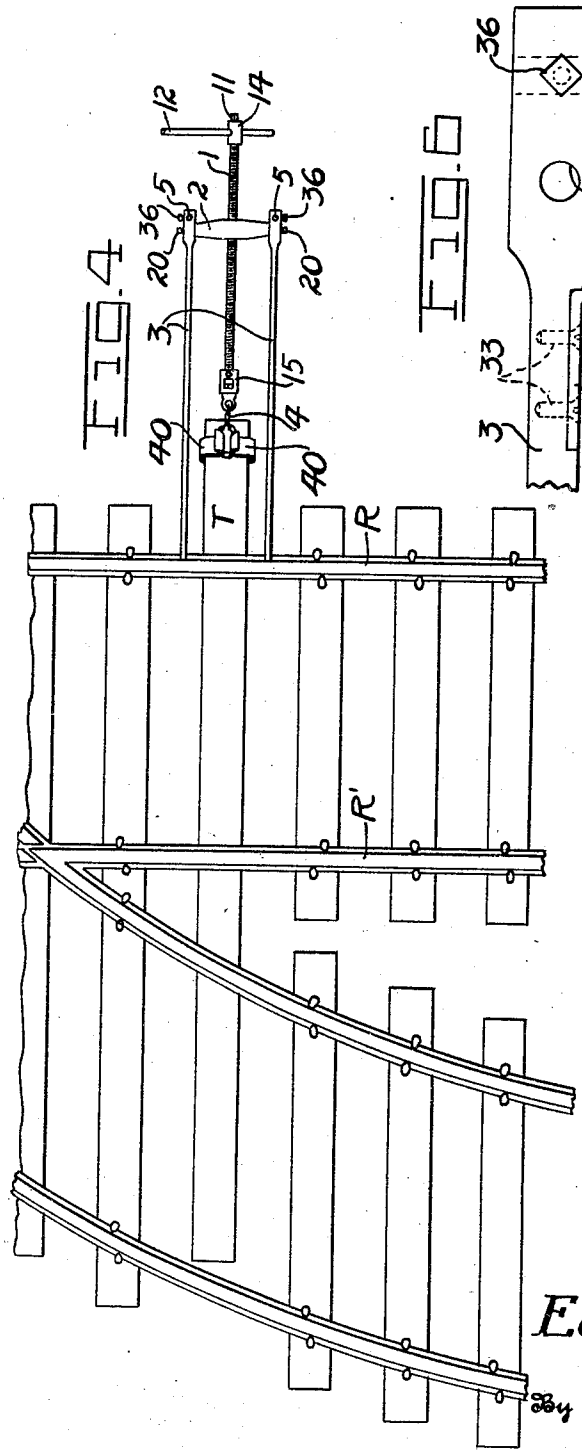


FIG. 4

FIG. 6

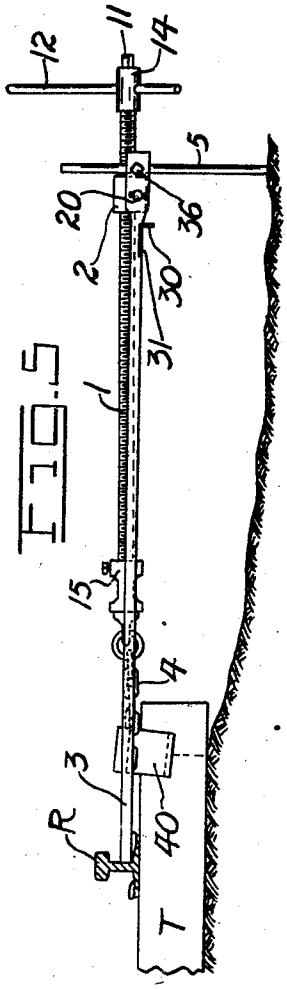


FIG. 5

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Patented Sept. 8, 1931

1,822,409

UNITED STATES PATENT OFFICE

EDWARD H. LAWRENCE, OF SNOHOMISH COUNTY, WASHINGTON

TIE PULLER

Application filed July 30, 1930. Serial No. 471,618.

My invention relates to devices intended for pulling out ties from beneath rails in place.

In addition to the general object of providing a device which can operate to pull out a tie, whether of the ordinary length to support a single rail or of excess length, as at a junction between two tracks, it is my object to provide a device which will operate to insert a new tie in place of an old one, at the same time pushing out the old one.

My invention has for its object a provision of such a device, which will operate without re-setting, and without clamping.

It is also an object of my invention to provide a device of this character, in which the stresses will be as nearly as possible in straight lines, as for instance, direct from the point of engagement of the tie puller with the tie to the reaction point, avoiding angular constructions.

It is a further object to provide a device of this general character which shall be simple in construction, not easily broken or having parts which may be lost, and thoroughly rugged and reliable in operation.

My invention comprises the novel parts and the novel combination and arrangement thereof, as shown in the accompanying drawings, described in this specification, and as will be more particularly defined by the claims which terminate the same.

In the accompanying drawings, I have shown my invention in a form which is now preferred by me, applied to various operations necessary in pulling and inserting ties.

Figure 1 is a plan view, and Figure 2 a central section along the axis of the jack screw, showing my device in the usual operation of pulling out a tie.

Figure 3 is a cross section through my device.

Figure 4 is a plan view of my device in use, showing it operating upon a tie of excess length.

Figure 5 is a side elevation of my device in such an operation.

Figure 6 is a side elevation of an end of one of the brace bars, forming part of my invention.

Figure 7 is a perspective view of one of the tie engaging hooks which may be used in connection with my invention.

Various forcing means may be employed, but for reliability I prefer to employ a jack screw 1, threaded in a nut 2. The jack screw may be turned by such means as a crank handle 10 fitting upon its square end 11, or by a handle bar 12, received within a transverse hold 13 in its head 14. The screw would ordinarily be of about the same length as the distance between the rails R and R'.

As a support for the nut 2, and as an anchor therefor, against which the threads 1 can work, I provide brace bars 3, one at each side of the nut 2, and extending across from one rail, R, to the other, R'. The brace bars overlie the rails, and at one end at least, preferably extend outside of the rail, as R, and in these projecting ends the nut 2 is pivotally supported upon a substantially horizontal axis, that is an axis parallel to the adjacent rail R. For this purpose, the nut may be provided with trunnions 20 received in apertures 32 in the end of the brace bar, provided for this purpose. For a reason which will appear hereafter, it is desirable that the axis of the screw 1 lie above the axis of the pivot trunnions 20.

The brace bars are provided with suitable means for engaging one or both of the rails, and are shown as provided with spurs 30, which project downwardly at the end which carries the nut 2. I prefer that these spurs be separable, so that they can be made of stronger material than the whole bar, and hence form them as angular members, the horizontal portion 31 of which is received in a recess in the underside of the brace bar 3, as seen in Figure 6, these being secured in place by screws or bolts, as indicated at 33. By making the horizontal portions 31 flush with the under surface of the brace bar 3, they allow the brace bar to rest evenly upon the top surface and to slide thereover without hindrance.

At one end the jack screw is provided with a head 15, within which is swiveled one end of a tension member such as a chain 4. To the other end of this chain 4 are secured means for engaging a tie, as T, which it is

desired to pull out or to pull through. Such means may conveniently take the form of complemental hooks 40, having teeth 41 (see Figure 7) which grasp the sides of the tie, and having hooked ends 42, about which the chain 4 passes to form in effect a choker which draws the hooks 40 more tightly together as the tension increases on the chain 4.

It will be observed that the engagement of the hooks 40 with the upper end of a tie, either T which is being withdrawn, or T' which is being inserted, is through a flexible member, as the chain 4, connected in line with the screw 1. This causes the screw to align itself with the chain in the direction of the stress, and this is permitted by reason of the pivotal action of the nut in the brace bars 3. This position is maintained, the screw tilting at a progressively increasing angle as the hooks 40 approach closer to the nut 2, as may be seen in Figure 2. By reason of the elevation of the axis of the screw above the pivot axis of the nut, the screw is at such an elevation above the adjacent rail R that the screw may be entirely fed through the nut without the necessity of releasing the hooks and re-engaging the tie. The ultimate position may be seen in dotted lines in Figure 2.

The device may also be used by engaging the ends of the brace bar 3 against the outside of a rail, as seen in Figure 4, the hooks 40 engaging the outer end of a tie and withdrawing the tie thus. In such a case, in view of the fact that railroad beds are usually built up somewhat above the surrounding surface, it may be desirable to employ a support or leg 5, which may take the form of a rod extending through an aperture 35 provided therefor in the projecting end of the brace bar 3, and the brace bar may thus be held in substantially horizontal position, the leg being retained by a set screw 36.

What I claim as my invention is:

1. In a tie puller, in combination, brace means overlying and adapted to engage a rail, a member pivotally supported thereon upon a substantially horizontal axis, a tension member adapted to engage a tie by one end, its other end being engaged by said pivoted member, and means for producing movement of the tenison member relative to the first member transversely of the pivot axis referred to.

2. In combination, in a tie puller, a nut, a jack screw threaded therein, means associated with one end of said screw for engaging a tie, and brace means supported from a rail and pivotally supporting said nut upon an axis substantially parallel to the rail.

3. In a tie puller, in combination, a nut, a jack screw threaded therein, means associated with one end of said screw for engaging a tie, two brace bars, one at each side of said nut, pivot means supporting said nut from said brace bars upon a substantially horizontal axis, and means upon said brace bars to engage a rail.

4. In a tie puller, in combination, a pair of brace bars overlying and extending outside of a pair of rails, means associated with said brace bars for engaging said rails to resist movement transversely thereof, a nut pivotally supported between said brace bars outside of one of the rails, upon a substantially horizontal axis, a jack screw threaded in said nut and extending downwardly over the adjacent rail, and means associated with the lower end of said screw for engaging a tie.

5. The combination of claim 4, the tie-engaging means comprising a chain or like tension member, a swivel connection between one end thereof and the screw, and hooks engaged by the other end of the tension member and gripping the tie.

6. The combination of claim 3, the rail-engaging means comprising a separable angular member, each brace bar being recessed upon its under side to receive the horizontal portion of the angular member flush with its under surface, and the remainder of the angular member projecting downwardly to engage the rail.

7. The combination of claim 4, the axis of the screw lying above the pivot axis of the nut.

Signed at Seattle, Washington, this 25th day of July, 1930.

EDWARD H. LAWRENCE.