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J. TRIANA

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PORTABLE TIE BORING MACHINE

Filed May 24, 1928

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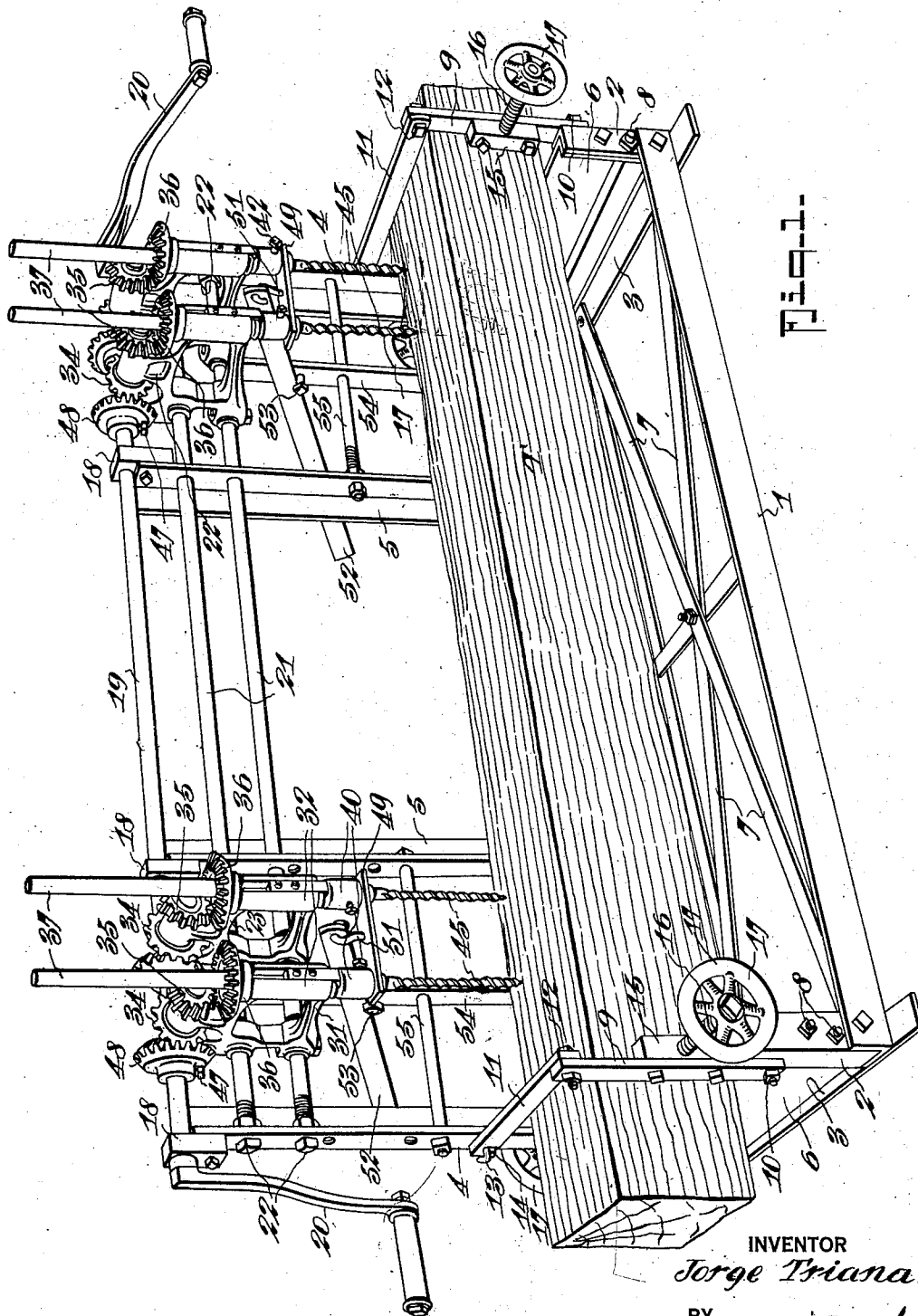


Fig. 1--

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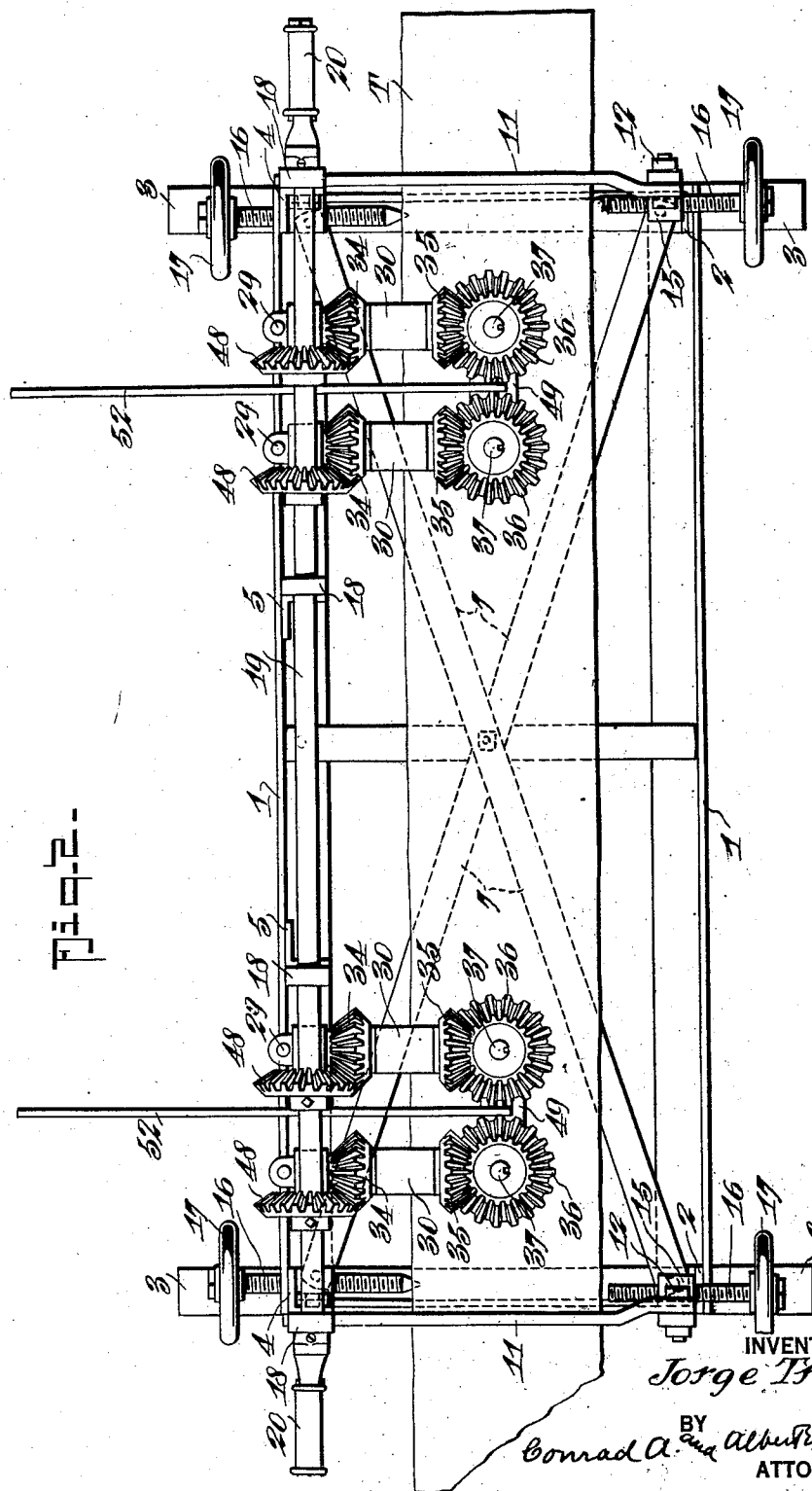
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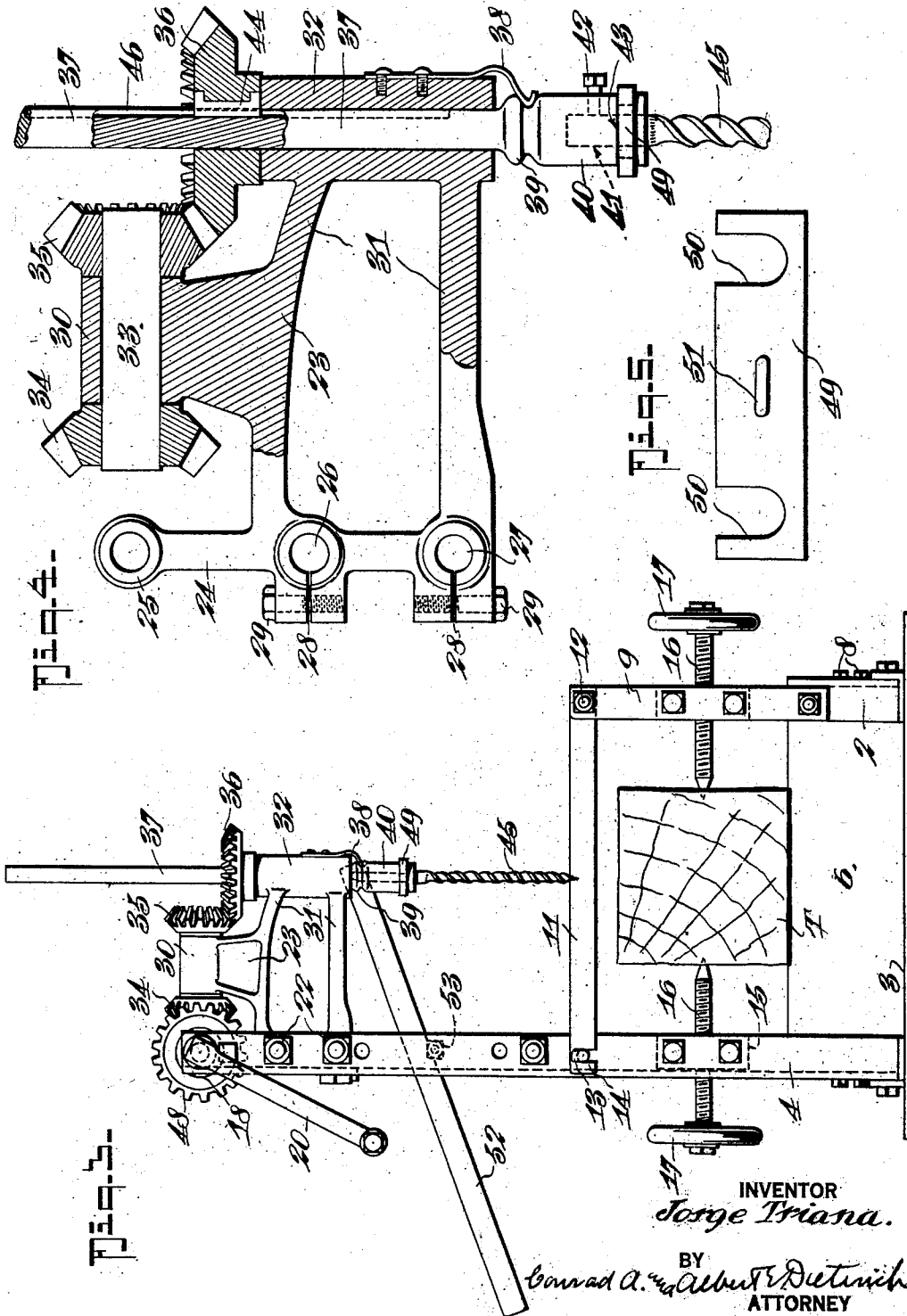
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## UNITED STATES PATENT OFFICE

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## PORTABLE TIE-BORING MACHINE

Application filed May 24, 1928. Serial No. 280,291.

My invention relates to machines for boring holes in railroad ties to receive the spikes or other fastening means whereby a rail is secured in position upon a tie, and said invention has for its object to provide a simple, convenient, and inexpensive machine for simultaneously boring a plurality of properly positioned holes in a tie.

Further, said invention has for its object to provide a machine which may be readily adapted to bore a plurality of duly positioned holes for fastening either narrow or broad gauge track, and which may be readily adjusted to provide holes for the securement of rails whose bases may be of different widths.

Further, said invention has for its object to provide a relatively light, readily portable machine having a suitable support or base for receiving the tie to be bored, and means for conveniently securing a tie of any desired shape firmly and positively in position therein while the same is being acted upon by the drills.

Further, said invention has for its object to provide a machine having an upright frame portion composed of angle iron members having bearings in which the operating shaft is mounted.

Further, said invention has for its object to provide a machine having a rigid upright frame portion provided with bearings in which an operating shaft is mounted, and which frame portion is composed of a plurality of angle iron members having apertures therein through which a pair of drill-head supporting rods extend and which by their securement to said angle iron members serve to aid in bracing said upright frame.

Further, said invention has for its object to provide a machine of the type specified whose frame, in end elevation, is approximately L-shaped to provide a relatively low support to permit of the easy placing and removal of the tie thereon without danger of striking or injuring the bits or drills.

Further, said invention has for its object to provide a relatively light, portable machine which may be readily moved from

place to place as the work of track laying progresses.

Further, said invention has for its object to provide a machine in which the drill heads are adjustable to suit different gauges of tracks, and to suit different sized rail bases, and in which the drills and their heads may be readily retracted or withdrawn after completion of the drilling operation.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends, my invention consists in the novel features of construction, and in the combination, connection, and arrangement of parts hereinafter more fully described and then pointed out in the claims.

In the accompanying drawings, in which is shown one form of machine embodying my said invention—

Figure 1 is a perspective view of the machine with a tie in position thereon ready to be drilled;

Fig. 2 is a plan view of the same;

Fig. 3 is an end elevation thereof;

Fig. 4 is an enlarged vertical longitudinal sectional view partly in elevation showing one of the drill heads, and

Fig. 5 is a detail plan view of one of the drill-lifter yoke plates.

In said drawings, the base frame member comprises front and rear longitudinal angle iron members 1 which are bolted or otherwise secured at 8 to the front and rear angle iron corner posts 2 and 4. The front and back angle iron members 1 are secured together by transverse bars 3. 5 denotes intermediate angle iron posts which are secured to the back angle iron member 1 intermediate the corner posts 4, and constitute part of the upright frame.

The base frame is reinforced at its opposite ends by cross plates 6 which jointly constitute a support for the tie T to be drilled. 7, 7 denote diagonal braces connecting the frame members 1, 2, and 6, and serving to render the structure rigid, and to hold the same to rectangular form.

In order to hold a tie duly in position upon the base frame, clamping bars 9 are secured

at 10 to the corner posts 2. The said bars 9 are provided with bearing blocks 15 in which work clamping screws 16 having pointed ends adapted to be forced a short distance into the front face of a tie when said screws 15 are actuated by the hand wheels 17. The bars 9 are pivotally linked to the upright corner posts 4 by horizontal clamping bars 11, having recesses 14 in the rear ends adapted to engage with lugs or studs 13 on the rear corner posts 4, as shown at Figs. 1 and 3.

The rear corner posts 4 are also provided with suitable bearing blocks 15, within which work similar clamping screws 16 which are adapted to engage the rear face of a tie, in line with the clamping screws 16 at the front of the machine.

19 denotes an operating shaft mounted in bearing blocks 18 secured to the rear upright posts 4, 5, and provided at its opposite ends with operating cranks 20.

The upright posts 4, 5 are rigidly braced by transverse drill-head supporting rods 21 which are arranged parallel to the operating shaft 19 and extend through suitable apertures in said posts and have their ends screw-threaded to receive nuts 22, see Figs. 1 and 4.

23 denote four drill heads which are mounted in two pairs or sets upon the rods 21 between each pair of posts 4, 5. Each drill head comprises an upwardly extending portion 24 having a transverse bearing aperture 25 to receive the operating shaft 19, and transverse bearing apertures 26, 27 arranged below said shaft aperture 25, to receive the rods 21. The bearing apertures 26, 27 are preferably made in the form of split clamps 28, to permit of the same being firmly secured in adjusted position upon the rods 21, by means of screws 29.

Each drill head 23 includes a horizontal bearing 30 in which works a gear shaft 33 on the opposite ends of which are fixed bevel gears 34, 35. Each drill head 23 further includes a forwardly projecting horizontal arm 31 provided at its forward end with a vertical bearing 32 in which is revolubly supported a drill shaft 37. 36 denotes a bevel gear which meshes with the bevel gear 35 on the horizontal shaft 33 and is supported upon the upper end of the bearing 32 and slidably keyed to the shaft 37. The gear 36 is provided with a key 44 which works in a groove 46 in the shaft 37 in order to cause said gear 36 to be rotatable with said shaft 37 and still permit of extended longitudinal movement of said shaft relative to the bearings 32 and said gear 36 thereon.

38 denotes a spring lock or latch whose lower free end is adapted to engage with an annular groove 39 in the drill chuck 40, when said chuck is raised to inoperative position. The chuck 40 has a socket 41 and set screw 42 whereby to secure the end of the shank of a drill 45 in position within the same. The

chuck 40 is further provided, adjacent to its lower end, with an annular groove 43 to receive a lifter plate 49 which also acts as a spacing member or guide to maintain the drill heads duly spaced apart.

Motion is transmitted from the driving shaft 19 to the bevel gear 34, by the bevel gear 48 which is adjustably secured upon the shaft 19 by a set screw 47, each drill head having a separate actuating gear 48.

52 designates lifting levers each of which is fulcrumed at 53 upon a rear intermediate upright 54, disposed between each pair of uprights 4, 5 and secured by the rods 55. Each lever is provided at its forward end with an aperture to receive the hook 51 of the lifter plate 49, whereby, when said lever is actuated, the chucks 40 and drills 45 may be raised to inoperative position after completion of the drilling operation.

The operation of the machine will be largely obvious from the foregoing description. It need merely be noted that when a tie is to be drilled the clamping bars 11 are first unlocked from their lugs or bolts 13 and swung forwardly, and the tie T is then placed in position upon the cross plates 6 of the base. Hereupon the bars 11 are restored, and the clamping screws 16 then actuated by their hand-wheels 17, and the inner pointed ends thereof forced into engagement with the opposite vertical faces of the tie to hold the tie rigidly upon the base in the desired position. It will be understood, of course, that at this time the drill heads are held in raised or inoperative position. In order now to effect the drilling operation it merely becomes necessary to adjust the drill head units 23 to the proper position upon the parallel rods 21 and then release the chucks 40 from the spring latches 38 so that the ends of the drills or bits 45 may be lowered into engagement with the upper horizontal face of the tie. Hereupon the driving shaft 19 is rotated by the cranks 20, and rotation communicated to the drills 45. The weight of the drills 45, shafts 37, chucks 40, and associated parts, supplemented by the force which may be exerted upon the plates 49 by the levers 52 will be sufficient to maintain the drill points up to the work until the desired depth of hole has been obtained. Thereafter to remove the drilled tie the operator first withdraws the drills or bits 45 by bearing upon the rear end of the levers 52 until the chucks 40 are engaged and held to raised or inoperative position by the spring latches 38. Hereupon the clamping screws 16 are released of their engagement with the tie, and the retaining bars 11 released and swung forwardly out of the way, whereupon the tie may be raised and removed from the support.

Having thus described my said invention, 130

what I claim and desire to secure by Letters Patent is:

In a portable boring machine, a frame composed of a base part and an upright part, means for retaining a tie on said base part, an operating shaft journalled in bearings on said upright part, a pair of drill-head-supporting rods paralleling said shaft and carried by said upright part, drill heads, said drill heads each comprising an open frame having top and bottom bars joined at their back ends by an upright bar and at their front ends by a spindle bearing, said upright bar having a pair of split bearings to receive said supporting rods and including clamp ears, clamp screws in said ears to secure said split bearings to said supporting rods, said upright bar having a bearing at its top for said operating shaft, said head having an upwardly projecting portion from its top bar which is provided with a bearing, a short shaft journalled in said last named bearing, bevelled gears on the ends of said short shaft, a bevel gear on said operating shaft to mesh with one of said short shaft's bevel gears, a spindle mounted in said spindle bearing, a bevel gear on said spindle meshing with the other of said short shaft's gears, and a chuck carried by said spindle to receive and hold a bit substantially as shown and described.

Signed at Bogota, Colombia, S. A., this 12th day of April, one thousand nine hundred and twenty-eight.

JORGE TRIANA.