Aug. 10, 1965 H. H. HOOKER 3,199,462

RAIL THREADER

Filed Jan. 29, 1964 2 Sheets-Sheet 1

FIG. 1

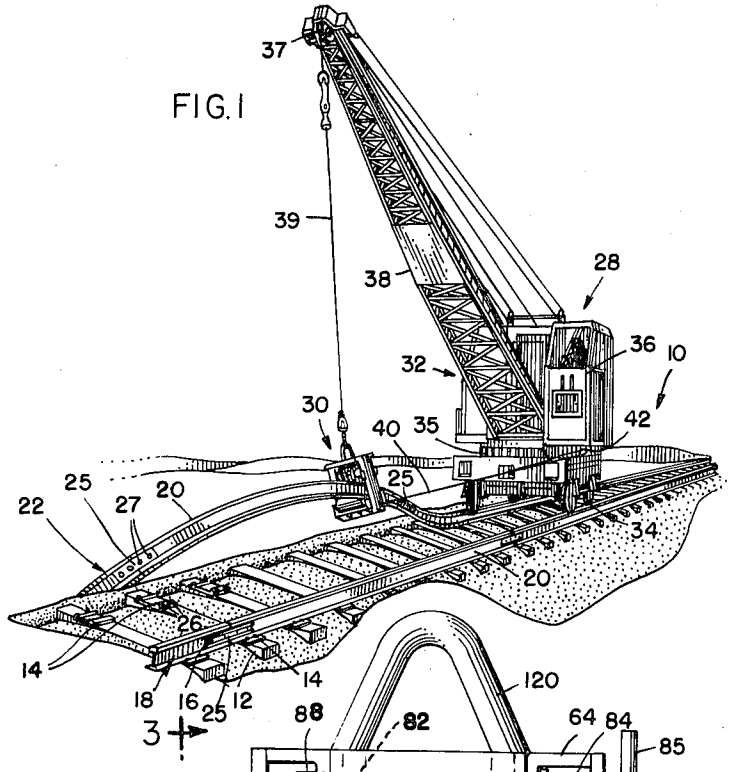
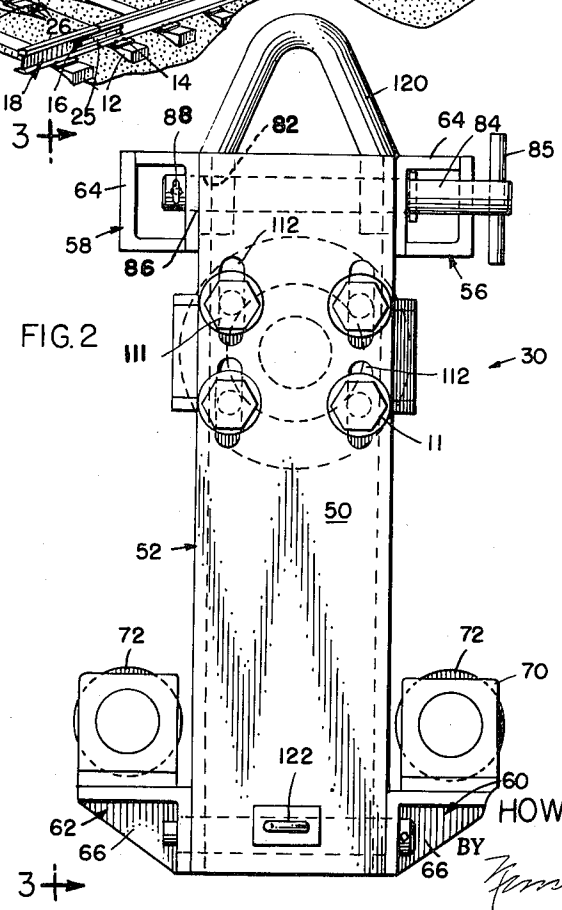


FIG. 2



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Aug. 10, 1965 H. H. HOOKER 3,199,462

RAIL THREADER

Filed Jan. 29, 1964 2 Sheets-Sheet 2

FIG. 4

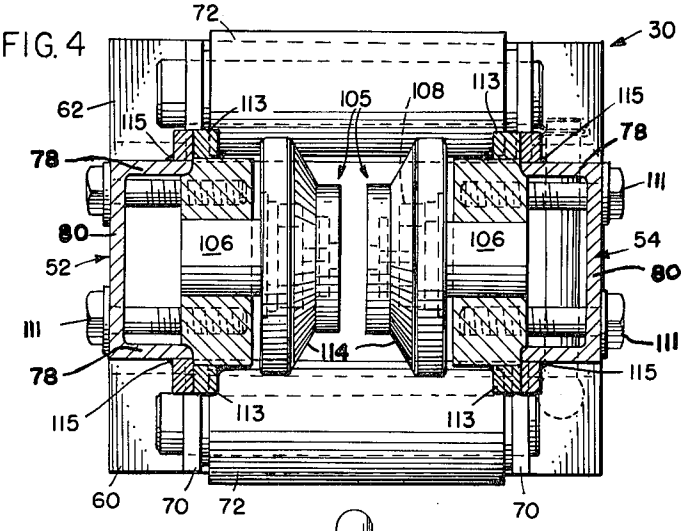
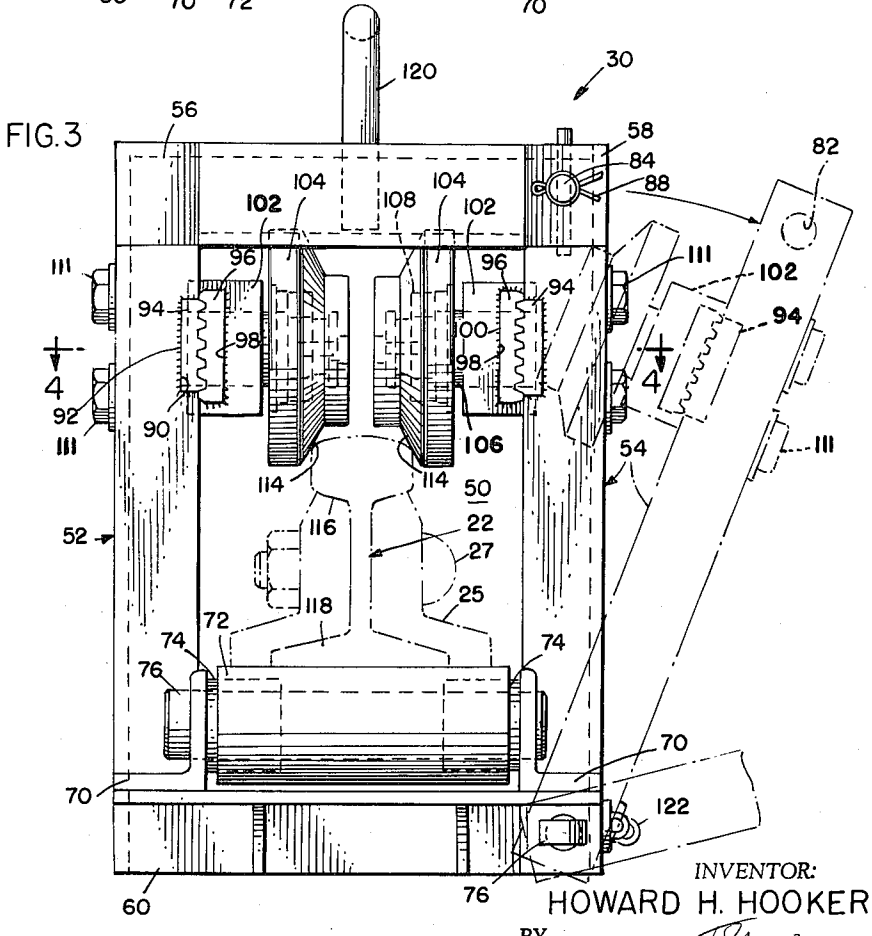


FIG. 3



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3,199,462

RAIL THREADER

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2 Claims. (Cl. 104—2)

The present invention relates to railroad track laying and removal equipment and has particular reference to a rail threader for handling either long lengths of welded ribbon-type rails or appreciable lengths of bolted rail sections. In the laying of welded ribbon-type rails upon a roadbed, the current practice involves fabrication of the rails from standard rail sections in end-to-end fashion and in approximately quarter mile lengths by an oxy-acetylene pressure welding process or a flash butt welding process and the transportation of the rails on a special train, the flat cars of which are equipped with rollers which are arranged in tiers in order to permit the transportation of a large number of rails on a train. The rails are pulled onto the rollers where they are retained until they are unloaded, two at a time, on opposite sides of an existing track on the ballast shoulders where they remain until required in the rail placement operation.

In order to guide the welded ribbon-type rails properly so they will fall progressively alongside the existing track as required, devices known as threaders are bolted to the leading flatcar of the string of flatcars which comprises the special train and the rails are guided through the threaders and thus deposited on the shoulders. Threaders are also used in connection with overhead cranes during a subsequent operation when the rails are lifted from the ballast shoulders and set between the tie plates to their final positions after the old bolted joint rails have been removed.

Heretofore, it has been the practice to unbolt the old rails at all of the joints, roll them to one side with crowbars, and later pick them up individually with a crane and load them onto gondola cars.

The improved rail threader comprising the present invention is capable of use in the manner of conventional threaders for handling continuous welded ribbon-type rails as outlined above and, since it is also capable of handling lengths of bolted rail sections, it makes possible the unbolting of old rails at approximately every quarter mile and the handling of the intervening long bolted rail sections in various ways. If desired, these bolted rail sections may be pulled from the tie plates and deposited on the ballast shoulder, or they may be pulled onto the same flatcars which were employed for depositing the new welded ribbon-type rails on the ballast shoulders. Conventional threaders currently in use are suitable for handling of lengths of welded ribbon-type rails but they are incapable of handling bolted rail sections due to interference with the projecting joint bars and bolts that are associated with the joints between abutting rail sections.

Accordingly, it is the principal object of the present invention to provide a novel form of rail threader which employs a series of antifriction roller devices which are so disposed on the framework of the threader that they will offer no opposition or interference to passage of the bolts, joint bars or other extraneous devices which are associated with the joints of bolted rail sections and, moreover, will accommodate lengths of rails of varying sizes and shapes.

Other objects and advantages of the invention, not at this time enumerated, will readily suggest themselves as the following description ensues.

In the accompanying two sheets of drawings forming

a part of this specification, one illustrative embodiment of the invention has been shown.

In these drawings:

FIG. 1 is a perspective view of a track installation in the vicinity of the site of track laying operations, showing a crane-supported rail threader embodying the invention and in the process of removing a large length of bolted rail sections from a roadbed;

FIG. 2 is a side elevational view of the improved rail threader device;

FIG. 3 is a front elevational view of the threader; and

FIG. 4 is a horizontal sectional view taken on the line 4—4 of FIG. 3.

Referring now to the drawings in detail and in particular to FIG. 1, a portion of a railroad track bed in which track rail removal is to be made is designated in its entirety by the reference numeral 10 and is provided with the usual transverse wooden ties 12 which are arranged in equidistantly spaced apart relationship along the roadbed. Conventional tie plates 14 are mounted on the ties 12 and are secured in position by suitable anchoring devices 16. In FIG. 1, one of the original track rails 18 consisting of standard short rail sections 20 in bolted together and end-to-end relationship is shown as remaining intact within its tie plates 14 while the other track rail 22 is undergoing the process of being removed from between its tie plates. Adjacent rail sections 20 consisting of standard thirty-nine foot lengths are connected together by the usual joint bars 25 and nut and bolt assemblies 27.

Removal of the rail 22 is accomplished by unbolting the short rail sections at approximately every quarter mile and then utilizing a traveling crane 28 and a threader 30 embodying the present invention to lift the long bolted rail lengths from the associated tie plates 14. The crane 28 is of conventional design and includes a crane body 32 which is supported on flanged track-engaging wheels 34 and has the usual rotating deck 35. The crane cab 36 surmounts the deck and encloses the usual power plant (not shown). The crane boom 38 is pivoted by boom heels to the deck 35, and a sheave 37 at the outer or distal end of the boom supports the unial hoist line 39. A hold line 40 passes over a sheave 42 on the deck 35. The hoist and hold lines are wound upon respective drums which are independently operated by the usual clutch and brake mechanisms (also not shown).

During track removal operations, successive portions of each bolted rail length undergoing removal are supported or suspended from the tip of the crane boom 38 by means of the improved threader 30. The latter is illustrated in detail in FIGS. 2, 3 and 4 of the drawings. This threader may be employed for effecting lateral shifting movements of the interconnected rail sections 20 in a progressive manner so as to lift the same from between the tie plates 14 and place the same on the ballast shoulder.

Referring now to FIGS. 2, 3 and 4, the threader 30 involves in its general organization a six-piece frame 50 which is of generally rectangular open cage-like design and comprises two vertical side members 52 and 54, two upper horizontal transverse members 56 and 58, and two lower horizontal transverse members 60 and 62. Each of the upper transverse members is in the form of two angle pieces 64 which are so cooperatively arranged (see FIG. 2) and welded together as to form a tubular open-ended structure, while the lower transverse members are in the form of single angle pieces having reinforcing gusset webs 66 therefor.

Short angle brackets 70 are supported on and fixedly connected to the ends of the lower transverse members 60 and 62 and the two opposed brackets on each lower member serve to support therebetween a horizontal lower

antifriction roller 72 including roller bearings 74 at its ends. The vertical side member 52 is a fixed member, while the vertical side member 54 is in the form of a tiltable gate member. The lower end of the vertical side member 54 is pivoted on a horizontal pin 76 for outward swinging movements (see dotted lines in FIG. 3) and, consequently, may be swung outwards in order to open one side of the cage-like frame 50 for rail-admission purposes, as will be described presently. The two vertical side members 52 and 54 are in the form of channels, each of which has inwardly extending side flanges 78 and a connecting web 80. Holes 82 in the upper end regions of the side flanges 78 of the pivotally mounted side member 54 are adapted to receive therethrough a removable locking shaft 84 including a handle 85 at one end thereof. The shaft when in its operative or locked position passes through aligned holes 86 in the adjacent ends of the upper members 56 and 58 and is releasably secured in position by a cotter pin 88, the shaft 84 serving to maintain the side or gate member 54 in its closed or operative position in the frame 50.

Seated within recesses 90 in the upper end regions of the outer margins of the side flanges 78 of the side members 52 and 54 is a pair of opposed fixed toothed racks 94. The latter are preferably welded in place as at 92. Cooperating with the fixed racks 94 is a mating pair of vertically adjustable toothed racks 96. The latter are seated within recesses 98 in a pair of opposed supports 102 within the upper confines of the frame 50. The supports are disposed inwards of the fixed racks 94 and have the recesses 98 formed in their outer portions. Preferably, the racks 96 are welded in the recesses 98 as at 100. The supports are spaced apart and carry a pair of opposed upper antifriction roller sections 104. The two roller sections 104 are substantially identical and when in an operative position of axial alignment and proximity constitute, in effect, a separable composite roller 105. Each roller section is rotatable on the inner end of a normally horizontal stub shaft 106 by means of a bearing assembly 108 and is held in position by means of one of more screws 110. The outer ends of the stub shafts 106 fit fixedly in sockets in the inner portions of the supports 102.

The supports 102 are adapted to be maintained in any selected position of vertical adjustment by means of respective horizontally disposed clamping screws 111 which pass through vertical slots 112 in the webs 80 of the vertical side members 52 and 54 and serve, when fully tightened, to draw the supports 102 and their respective racks 96 hard against the fixed racks 94. The supports 102 are held against lateral shifting by guide bars 113 which straddle the rack 96 and are welded as at 115 to the side flanges 78 of the side members 52 and 54.

From the above description, it will be seen that the effective elevation of the upper roller sections 104 may be varied by loosening the clamping screws 110, making a desired mating tooth selection as between the racks 94 and 96 and, thereafter, tightening the clamping screws 110.

The individual roller sections 104 are provided with opposed inclined or frusto-conical rail-contacting surfaces 114 which are adapted to engage the side edges of the rail heads 116 of the ribbon-type rails 22 as the latter pass successively through the "eye" of the threader 30, while the two lower rollers 72 are adapted tractionally to support the bases 118 of the rails 22.

The two upper transverse frame members 56 and 58 serve to support therebetween a lifting bail 120 by means of which the threader 30 as a whole may be supported from the hoist line 39 of the traveling crane 28. A reaction bail 122 is secured to the lower end region of the side member 54 of the frame in order to permit the crane to be connected to the hold line 40 of the crane.

In the operation of the herein described threader 30, one of the rails is admitted sideways into the frame 50 by opening the pivoted vertical side member 54 in the manner previously described. When said member is swung into its open position, the one rail may be positioned on the two lower supporting rollers 72. The upper roller sections 104 are adjusted by means of the clamping screws 110 in the manner also previously described so as to bring the frusto-conical surfaces 114 thereof into straddling engagement with the rail head 116. This adjustment may be previously made in accordance with known rail and threader dimensions, or it may be made empirically after the rail is in position within the threader and the side member 54 of the frame 50 has been closed.

In FIG. 3, the rail 22 is shown as being disposed in the threader 30 so that a pair of joint bars 25 are in register with the frame opening. It is to be noted that neither the joint bars 25 nor the bolt and nut assemblies 27 offer any opposition to free passage of the rail 22 through the threader and this is directly attributable to the particular design and arrangement of the roller sections 104.

Whereas, the herein described rail threader 30 has purely for exemplary purposes been described in connection with its use for removing bolted rail lengths from a roadbed and depositing the removed lengths on the ballast shoulder, it is to be understood that the threader is capable of handling such bolted joint rail lengths in various other ways, for example, in loading the same on a string of flatcars. The threader 30 obviously is useable in the handling of lengths of welded ribbon rail according to current procedure, either to unload the same from the flatcars onto the ballast shoulder or to transfer the ribbon rail from the ballast shoulder to the tie plates in the central region of the roadbed. In the former instance, the threader will usually be bolted to the first flatcar in the string of cars, while in the latter instance an overhead crane will usually be employed.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit or scope of the invention. Therefore, only insofar as the invention has particularly been pointed out in the accompanying claims is the same to be limited.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. A rail threader comprising an articulated, open, generally rectangular, frame-like structure through which rails are adapted successively to pass during movement of the threader along a roadbed, said structure including a fixed, generally C-shaped support including upper and lower fixed horizontal transverse frame sections and an interconnecting fixed vertical frame side section, a movable frame gate section pivotally connected at one end to the distal end of the lower transverse frame section for movement between a vertical closed position wherein its other free end engages the distal end of the upper transverse frame section, and an inclined open position for admission of the rails sideways into the structure, a pair of lower antifriction confining rollers supported on said lower transverse frame section for rotation about respective horizontal axes and adapted to underlie and contact the bases of the rails and thus support the rails, a composite upper roller including two normally coaxial roller sections, one of said roller sections being rotatably mounted on said fixed frame side section near the upper end thereof and the other roller section being rotatably mounted on said gate sections near the free end thereof, said roller sections, when the frame gate section near the free end thereof is in its closed position, being independently rotatable about common axes spaced upwardly from and parallel to the axes of rotation of the lower rollers, said other roller section being movable toward and away from the one roller section during closing and opening movements of said frame gate section respectively, and means for individually effecting vertical adjustment of said roller sections.

2. A rail threader comprising an open generally rec-

tangular frame-like structure through which rails are adapted successively to pass during movement of the threader along a roadbed, said structure including a fixed vertical frame side section and an opposed movable frame gate section pivotally mounted in the structure for movement between a vertical closed position and an inclined open position for admission of the rails sideways into the structure, a lower antifriction confining roller mounted on the structure for rotation about a horizontal axis and adapted to underlie and contact the bases of the rails and thus support the rails, and a composite upper roller including two normally coaxial roller sections having downwardly and inwardly facing opposed frusto-conical rail-engaging surfaces thereon, means for rotatably mounting one of said roller sections on said frame side section, identical means for mounting the other roller section on said movable frame gate section, said means each comprising a fixed vertical toothed rack on the frame

section, a cooperating movable toothed rack engageable with the fixed rack in selected positions of vertical adjustment therealong, and means for releasably clamping the movable rack in such selected positions of adjustment, each movable rack serving rotatably to support one of the roller sections.

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