

March 29, 1960

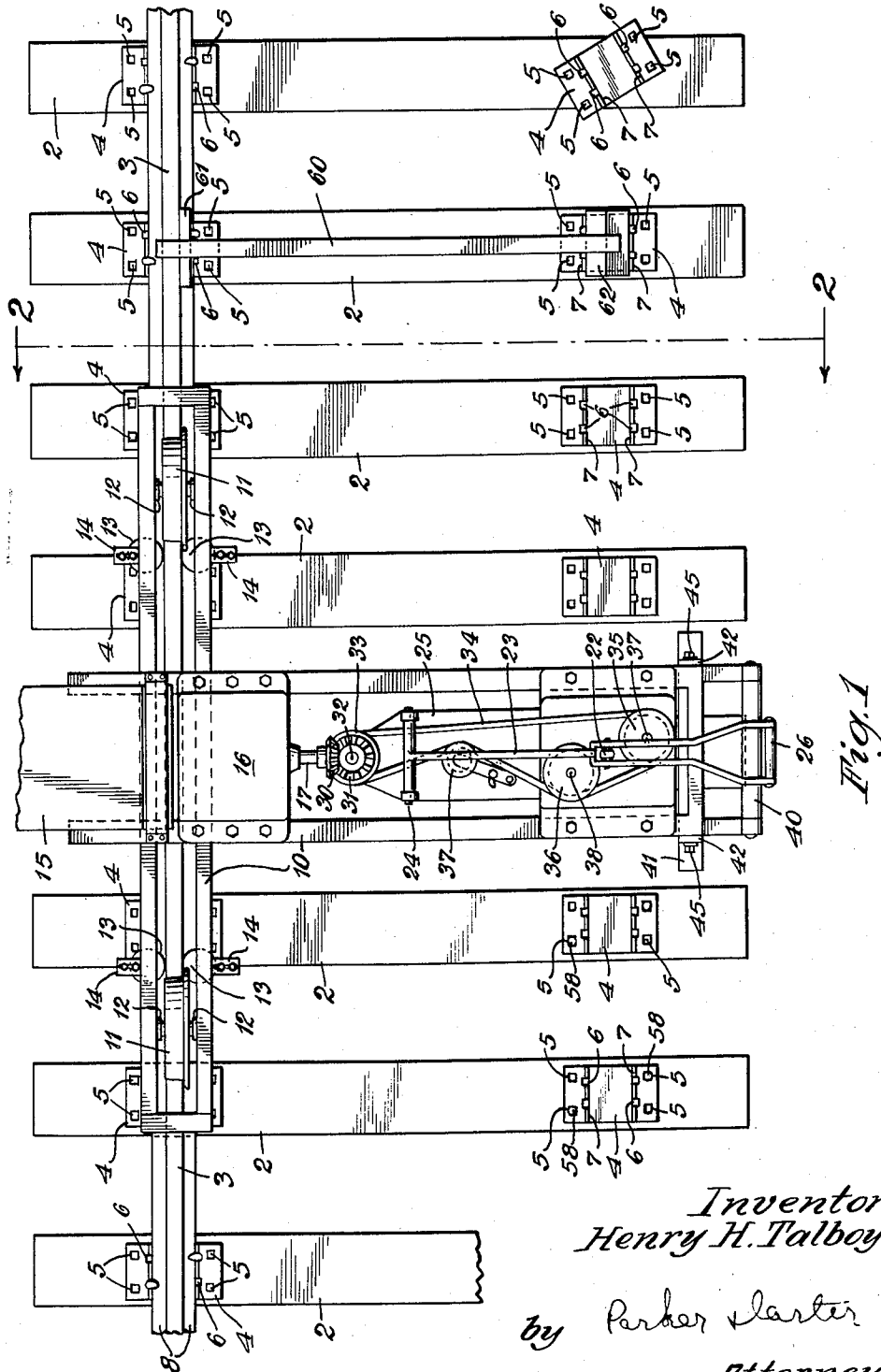
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2,930,328

METHOD AND APPARATUS FOR GAUGING RAIL

Filed Feb. 16, 1953

4 Sheets-Sheet 1



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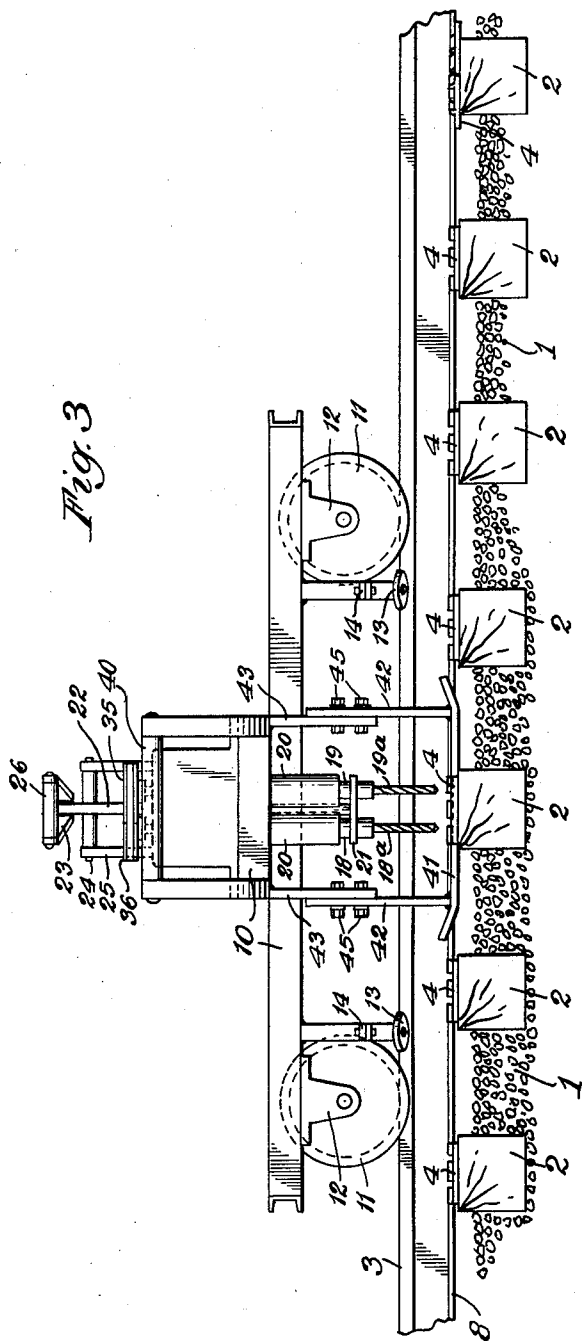
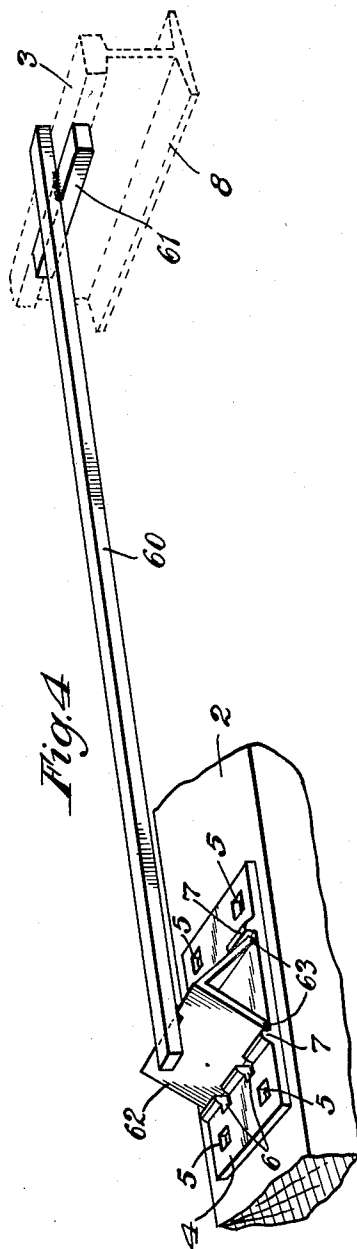
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Fig. 5

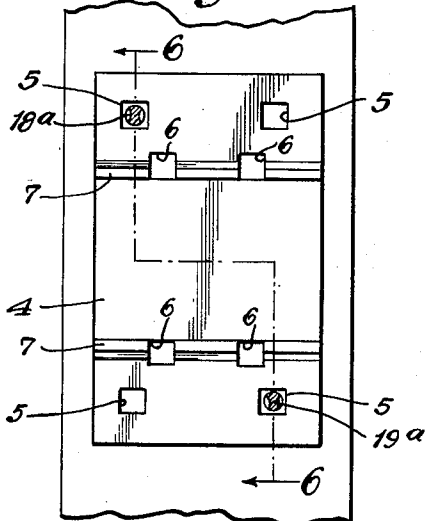


Fig. 6

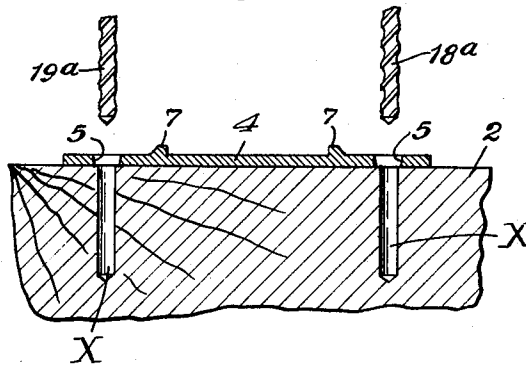


Fig. 7

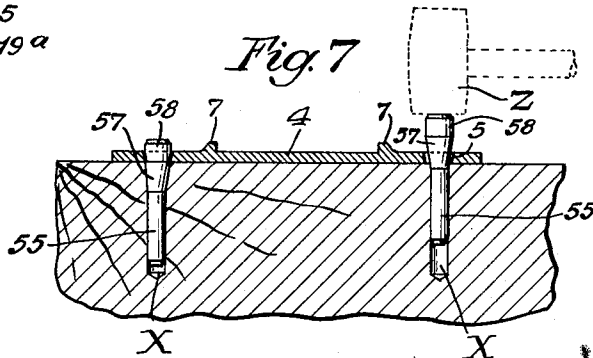


Fig. 8

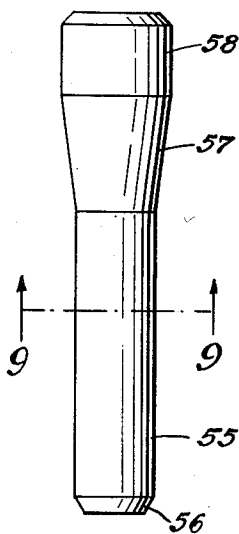


Fig. 10

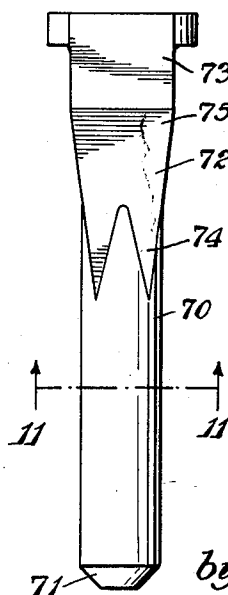


Fig. 12

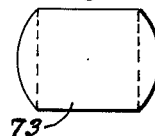


Fig. 11

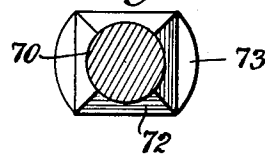
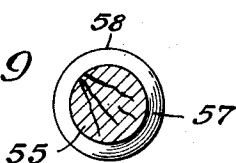


Fig. 9



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2,930,328

METHOD AND APPARATUS FOR GAUGING RAIL

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Application February 16, 1953, Serial No. 336,973

3 Claims. (Cl. 104—16)

The present invention relates to a method and mechanism for gauging the rail of a track, before it is secured to the ties.

One purpose is to provide such a method in which an unlaidd rail, and the plates therefor, are gauged in relation to a rail already in place.

Another purpose is to provide an improved method for securing tie plates to ties.

Another purpose is to provide an improved method of gauging rail which includes gauging the tie plates, accurately drilling or otherwise aperturing the ties through the holes of the gauged tie plates, and thereafter employing securing members for truing and securing the tie plates in relation to the accurately placed holes in the ties.

Another purpose is to provide an improved method of gauging rail, which includes initially making or drilling gauged apertures in the ties and thereafter employing securing or positioning members for truing and positioning the tie plates in relation to the previously accurately placed holes in the ties.

Another purpose is to provide a method of tie plate securing, which avoids the disadvantages of the employment of the conventional metal cut spikes.

Other purposes will appear from time to time in the course of the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings wherein:

Figure 1 is a plan view illustrating the embodiment of the method;

Figure 2 is a section on the line 2—2 of Figure 1; Figure 3 is an end elevation of the structure of Figure 2;

Figure 4 illustrates a tie plate pregauging member which, under some circumstances, may be employed;

Figure 5 illustrates a tie plate in position;

Figure 6 is a section on the line 6—6 of Figure 5 illustrating the procedure of drilling gauged apertures through the tie plate;

Figure 7 diagrammatically illustrates the insertion of securing or positioning members;

Figure 8 illustrates one type of securing member;

Figure 9 is a section on the line 9—9 of Figure 8;

Figure 10 illustrates another type of securing member;

Figure 11 is a section on the line 11—11 of Figure 10; and

Figure 12 is an end view of the tie securing member of Figure 10.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to the drawings, 1 generally indicates the ballast beneath and between the ties of a track. The individual ties are illustrated at 2. In the particular showing herein, one rail 3 is shown as already positioned on and secured to the ties 2. It rests upon tie plates 4, each such tie plate being shown as having four outside apertures 5, although two may be used, and four more closely spaced inner apertures 6. The tie plates are conventional

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tie plates of the type in use and include also the shoulders 7 which, between them, define the space to be received by the bottom flange 8 of the rail 3.

Let us assume that the rail 3 is already in position. It is found advantageous to drill the holes for the opposite tie plates in predetermined gauged relation to the already secured rail 3. As an example of a mechanism which may be employed for that purpose, a cross frame 10 may be employed which is balanced on the rail 3 by flanged rail engaging wheels 11 suitably journaled, in turn, to extending supports 12. The wheel 11 may be held in predetermined and uniform relation to the rail 3, for example by any suitable positioning rollers 13 which, if desired, may be made adjustable by any suitable adjusting and securing means generally indicated at 14. Thus, by a proper setting of the rollers 13, the drill heads at the opposite end of the cross frame 10, which will later be described, may be precisely positioned in relation to the rail 3.

15 is any suitable counterweighting structure located to the right of the rail 3, referring to the parts in the position in which they are shown in Figure 2. 16 diagrammatically illustrates any suitable motor, with its motor shaft, or motor-driven shaft 17. 18, 19 indicate drill spindles which may receive any suitable drill bits 18a and 19a. 20 are any suitable spindle guides extending downwardly from the cross frame 10. 21 is any suitable centering and positioning yoke, actuated for example by the vertical member or rod 22, which may be raised and lowered for example by the lever 23, pivoted at 24 to any suitable support 25. 26 is an end handle. It will be understood that the user, by pressing downwardly on the handle 26, depresses the member 21, which is received in suitable circumferential slots in the drill elements 18 and 19. Thus the result of depressing the handle 26 is to move the drill bits 18a and 19a downwardly into the tie to drill apertures which are precisely positioned in relation to the rail 3. Any suitable driving means may be employed for driving the bits 18a and 19a, continuously turning their movement into the tie.

Figure 2 includes a more or less diagrammatic showing under which the bevel gear 30 drives the pinion 31 journaled on the vertical pin 32 upwardly extending from the support 25. Moving in unison with the gear 31 is a pulley 33 about which passes the belt 34 which, in turn, passes about the driven pulleys 35 and 36 and is suitably tensioned by a suitable tensioning pulley 37. The members 20 may be splined or otherwise secured to the shafts 37 and 38, which rotate with the pulleys 35 and 36 respectively. Thus, a constant driving connection is maintained through the preferably constantly driven belt 34 at a position of depression and elevation of the yoke 21 and of the bits 18a and 19a. The operator may raise and lower the cross frame 10 by any suitable manual handle 40. If desired, the elevation of the cross frame 10 may be adjusted and, if desired, it may be supported by the skid or shoe 41, which rests on the outer ends of the ties 2. This shoe is adjustably supported for example by the frame members 42, 43, provided with adjusting slots 44 and securing members 45.

It will be understood that whereas accurately gauged drilling can be done manually, it is advantageous and important to have a drilling device, of which an example is above described, to drill precisely gauged holes into the ties. Such holes are shown for example at X in Figures 6 and 7.

The tie plates 4 to be applied are conventional and are previously described in detail. The apertures 5 are provided to receive means for positioning the tie plates themselves. The tie plates may be positioned in advance of the drilling, as diagrammatically illustrated for exam-

ple in Figures 2, 5 and 6. Or the drilling may be done before the tie plates are applied. In the former case, any suitable means may be provided for gauging the tie plates in the proper position. A tool for example may be employed as shown in Figure 4, including a cross bar 60, an abutment 61 to engage the rail 3, and an outer abutment 62 having lower edges 63 which are positioned between the shoulders 7 of the tie plate 4 and define the space occupied by the bottom flange of the second rail later to be applied. This gauge or pregauging member is given merely as an example of a cheap and practical and easily used tool for initially gauging the position of the tie plate sufficiently closely so that the bits 18a and 19a will pass through the outer apertures 5 of the tie plates. Where, as is generally the case, the apertures will be drilled before the tie plates are placed, some such gauging means may be useful for thereafter preliminarily positioning the plates. Or the operator may simply manually drop the tie plates into an approximately correct position in relation to the already drilled apertures.

Assume that a tie plate is in the position as shown in Figure 6, generally aligned with the already drilled apertures X. The operator then inserts a securing member or peg or spike, which will now be described. Referring for example to the forms of Figures 8 and 9, the spike includes a cylindrical body portion 55, preferably with a bottom taper 56. It has also a generally conic outwardly expanding camming surface 57 and a generally cylindrical head 58. When such a member is used, as shown in Figure 7, the cylindrical body portion or pin 55 enters the accurately drilled hole and the conic surface 57 cams the plate into precisely gauged position. It will be clear that as a minimum of two of the pins are inserted and driven into place, a gauge plate is then properly positioned with its shoulders 7 gauged to receive and position the bottom flange of the rail. The form of Figures 8 and 9 is formed of wood, or some substance softer than the tie plate, and the head 58 and the upper part of the conic portion 57 are of greater diameter than the apertures 5 through which they pass. In the case of the employment of wooden pegs or pins, the pegs may be treated with a preservative having the general characteristics of creosote. As the operator uses any suitable mechanical or manual means, such as the hammer Z, to drive the members into position, the initial result is a camming of the plate shoulders into proper position and the final result is the shearing off or compression of the relatively soft head, completely filling the apertures 5.

In the form of Figures 10 and following, a harder member is employed, which may be of metal, and which has a cylindrical bottom shank 70 preferably with a bottom bevel as at 71, and includes a generally pyramidal camming portion 72 ending in a head 73. The lower end 74 of the pyramidal camming portion 72 is smaller than the aperture 5, while the upper end 75 is larger. The peg, Figure 10, is driven until the sides of the pyramidal portion 72 completely fill the aperture 5, thus camming the plate, Figure 5; into proper gauging position and holding it there. In either event, with the use of either of the securing and positioning means shown, the apertures X serve as the gauging means and the insertion and driving home of the spike, or pin, or peg first moves the tie plate accurately to correct gauging position by snugly filling the tie plate apertures. Thereafter, the rail is applied, properly positioned by the tie plate shoulders 7, and is secured by any suitable spikes driven through the inner tie plate apertures 6.

It will be realized that whereas I have described and shown a practical and operative method and practical and operative means for carrying out that method, nevertheless many changes may be made in the order and details of the method steps and in the details, size, shape, number and disposition of parts of the mechanism used.

The description and drawings should therefore be taken as in a broad sense illustrative or diagrammatic rather than as matters of limitations.

The use and operation of the invention are as follows:

The particular advantage of the herein described mechanism and method is that when one rail has been laid, the second rail of a track can be precisely gauged in relation to it by drilling holes in the opposite ends of the ties at a predetermined distance from the already laid and secured rail. The drilling mechanism generally shown in Figures 3, 4 and 5 shows means for drilling a plurality of holes in unison. Only two drills are indicated, but it will be understood, of course, that it is within the scope of the present invention to drill simultaneously or separately all the holes necessary.

Either before or after drilling the holes, the tie plates are positioned in approximately accurate relationship to the holes drilled or to be drilled. When the tie plates are in position over the holes, the operator or operators can precisely position the tie plates in gauged position by merely driving into the already drilled apertures securing and positioning means which cam or draw the tie plate to proper position. While the hole can be drilled through initially positioned tie plates, it is, in most circumstances, advantageous to drill the holes first and thereafter to position the tie plates in proper position to receive the securing members.

Two practical securing elements are shown herein, one of compressible or shearable material and the other of harder material or metal. A characteristic of both is that when they are driven into the already drilled apertures, they do not have any tendency to push or pull the tie plate out of its desired position. On the contrary, they pull or cam it into precisely gauged position, ready to receive the rail. When conventional cut spikes are driven through a gauge plate in the usual manner, they tend to push the gauge plate out of position, a disadvantage which is entirely obviated by the procedure and elements herein described.

I claim:

1. A method of laying a second rail along a railroad right-of-way having a series of railway ties along which a first rail is already secured in position, by the use of an assembly having a drilling mechanism thereon and tie plates with positioning apertures therein; including the steps of supporting the assembly for movement along the right-of-way, positioning the drilling mechanism on the assembly at a predetermined lateral gauge distance with relation to the first rail, moving the assembly with the drilling mechanism thereon along the right-of-way in a step-by-step manner while holding the drilling mechanism at the predetermined gauge distance, drilling positioning holes between the steps in at least some of the ties at the predetermined gauge distance with respect to the first rail without regard to the position of the tie plates, laterally camming the tie plates into accurate gauged position on the drilled ties by driving preliminary positioning pegs having enlarged heads into the thus drilled positioning holes in the ties through the apertures in the tie plates so that the tie plates will be accurately gauged relative to the first rail and will also be preliminarily secured to the ties, and thereafter laying and spiking a second rail on the thus positioned and secured tie plates.

2. The method of claim 1, further characterized by and including the steps of preliminary positioning the tie plates in approximate gauged position, and thereafter drilling the positioning holes into the ties through the apertures in the tie plates.

3. The method of claim 1 further characterized by the step of positioning the tie plates in approximate gauged position only after the positioning holes have been drilled in the ties.

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