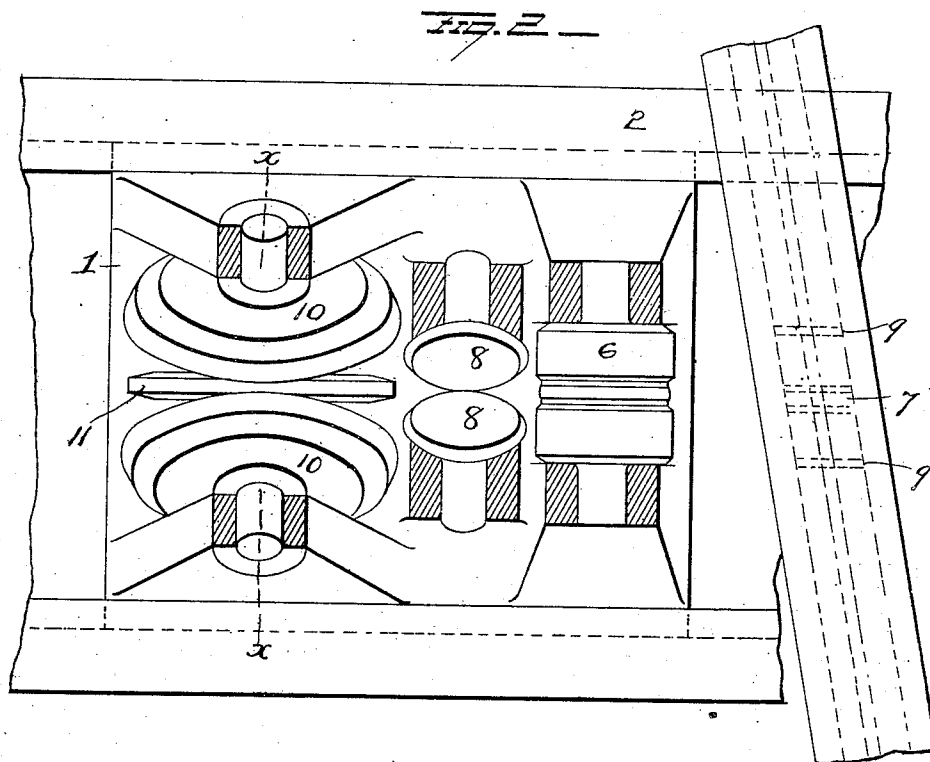
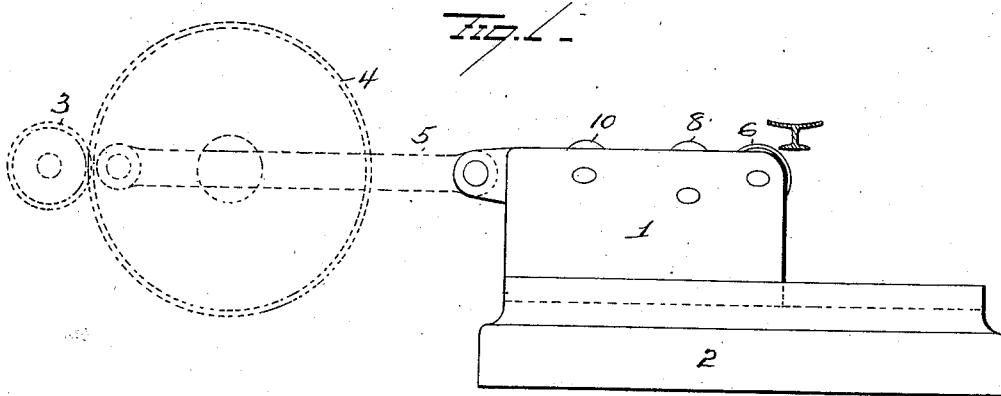


W. H. MORGAN.
METHOD OF AND APPARATUS FOR FORMING RAIL SEATS IN TIES.
APPLICATION FILED OCT. 12, 1909.

974,174.

Patented Nov. 1, 1910.

3 SHEETS—SHEET 1.



WITNESSES
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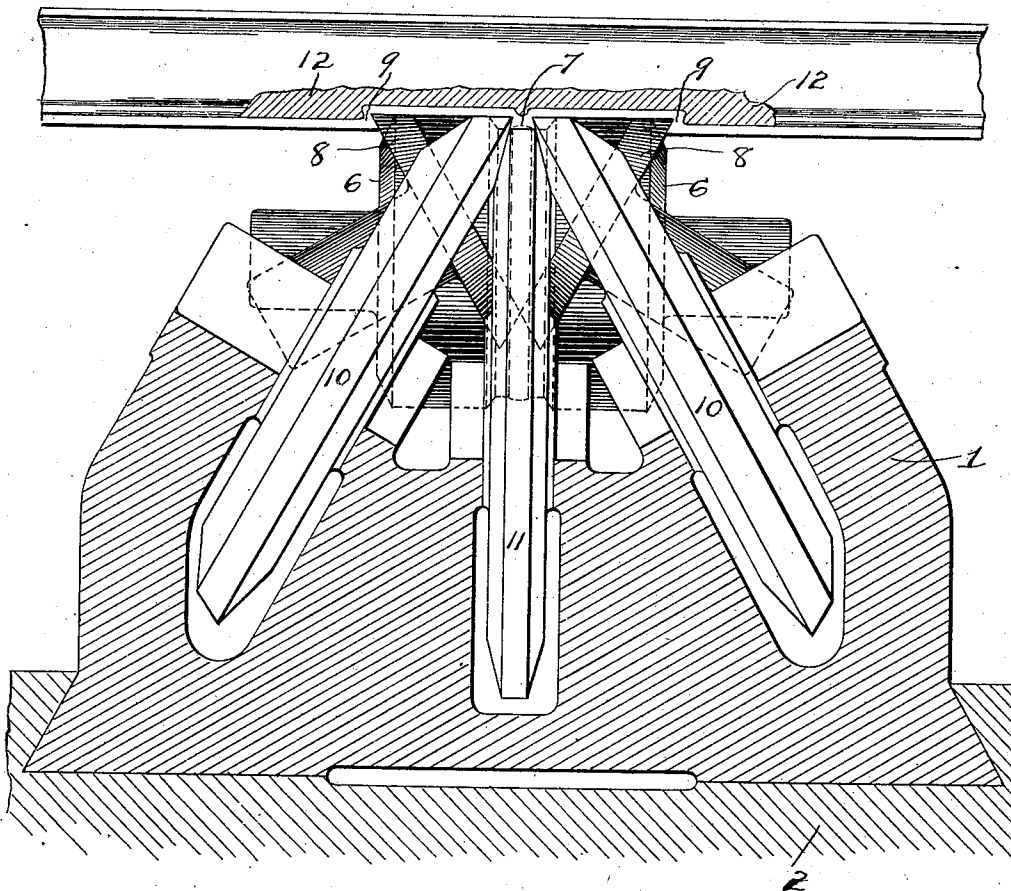
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Fig. 3.



WITNESSES

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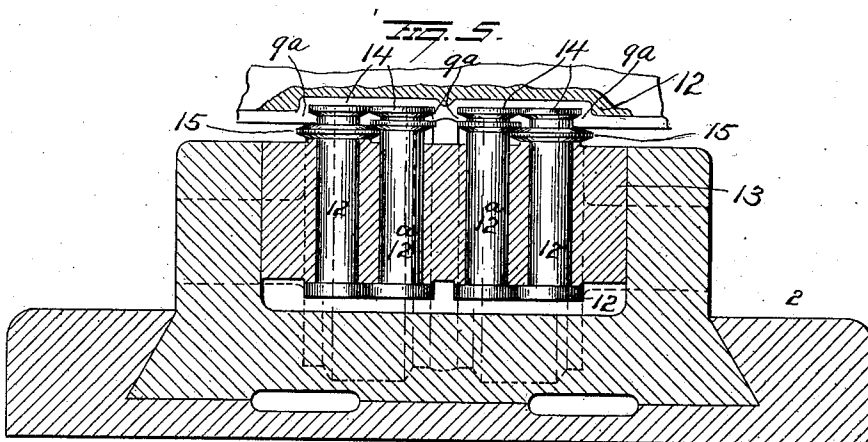
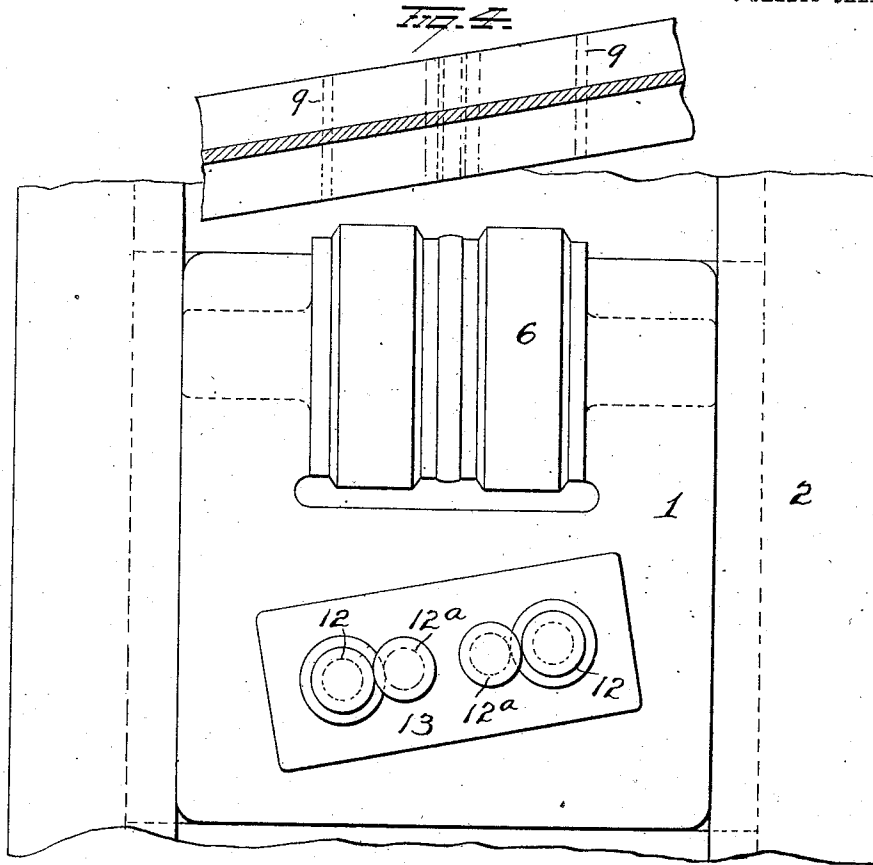
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UNITED STATES PATENT OFFICE.

WILLIAM H. MORGAN, OF ALLIANCE, OHIO.

METHOD OF AND APPARATUS FOR FORMING RAIL-SEATS IN TIES.

974,174.

Specification of Letters Patent.

Patented Nov. 1, 1910.

Application filed October 12, 1909. Serial No. 522,238.

To all whom it may concern:

Be it known that I, WILLIAM H. MORGAN, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Methods of and Apparatus for Forming Rail-Seats in Metal Ties; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in method of, and apparatus for forming recessed seats in metal ties.

In my application Serial Number 522,659 filed October 14th, 1909, I disclose recessed seats formed obliquely across the face of the top flange of the tie, the end walls of the recess, and the sides of rib located centrally in said recess, being beveled to form overhanging lips which engage and lock the rail clamps in place.

The object of this invention is to form these seats having beveled or overlapping end walls at a single operation, by a series of rolls moving transversely of the tie, and it consists in subjecting the tie, while hot, to the action of a roughing roll traveling obliquely to the tie for forming a depression in the upper face of the latter, and to the subsequent action of obliquely arranged rolls for beveling the end walls of the recess formed by the roughing roll, and also to the action of obliquely arranged rolls for beveling the side walls of the central rib.

In the accompanying drawings, Figure 1 is a view in elevation showing the sliding cross head carrying the roughing and finishing rolls, means for reciprocating the cross head and a section of a tie. Fig. 2 is an enlarged view in plan partly in section of the cross head, and the tie, the dotted lines on the latter showing the position of the seat formed by the rolls; Fig. 3 is a view in section on the line *x x* of Fig. 2, the rolls being shown in elevation and also showing a section of the tie and a section of the die for holding the tie, and Figs. 4 and 5 are views in elevation and section respectively showing rolls for dovetailing the end walls of the recess and side walls of the central rib.

This apparatus comprises a cross head 1 mounted in a guide 2, and adapted to be reciprocated on said guide by gearing 3 and 4, the former being driven by a motor, and the latter connected to the cross head by the

pitman 5. As the tie leaves the tie forming machine with the base flange of the rail (which is the top flange of the tie) below, and as this mechanism acts on the top flange of the tie (base flange of the rail) the cross head above referred to is located under the tie as shown in Fig. 1. This cross head is arranged to move obliquely to the tie as shown in Fig. 2, and is provided with a roughing roll 6 and a series of finishing rolls, the latter being located in line with the roughing roll and operating to bevel the end walls of the recessed seat and the side walls of the rib 7 located centrally in the recess.

The roughing roll is cylindrical with beveled ends, is cut away centrally so as to leave metal to form the rib 7, and moves obliquely to the tie so as to form the depressed seat oblique to the latter as shown by dotted lines in Fig. 2. This roughing roll is not driven but is loosely mounted in the cross head 1, and is free to roll or rotate by its frictional contact with the tie, as its cross head 1 is reciprocated under the tie, and operates by its passage across the tie, to produce a recess or depressed seat and centrally located rib 7 as shown in Fig. 3.

Mounted in the cross head 1 in rear of the roughing roll 6 are the diagonally disposed rolls 8 which latter are constructed and arranged as shown in Figs. 2 and 3 so as to apply sufficient pressure to the sides or walls of the grooves so as to form the bevel overlapping end walls 9 of the recess, and journaled to the cross head 1 in rear of the rolls 8 are the two obliquely arranged rolls 10 and the vertical roll 11, the oblique rolls 10, bearing as shown in Fig. 3 against the vertical roll at the point where the said rolls make contact with the rib 7. The two oblique rolls 10 work against the opposite sides of the central rib 7, with sufficient pressure to produce the undercuts or bevels, while the vertical roll smooths the outer face of the rib and prevents distortion or outward displacement of the metal of the latter by the oblique rolls.

The ties, or tie beams are clamped or supported between dies 12, (a part only of one die being shown in Fig. 3) one on each side having forms or recesses as shown in Fig. 3, and the metal displaced by the rolls above referred to is, as shown in Fig. 3 forced into these forms or shapes, and is supported by the latter.

The movement of the cross head 1 carrying the entire series of rolls takes place when the tie (or bar to be cut into a plurality of ties) is at rest, and I prefer to give the cross head 1 one complete reciprocating movement in the formation of each seat. In the first stroke, the roughing roll 6 precedes the beveling rolls, whereas on the return stroke the rolls 10 and 11 are in the lead, and is simply the finishing pass.

By this apparatus and process I form recessed seats adapted to receive and lock the rail securing clamps in place, and thus make it possible to secure a rail to a steel tie without danger of the parts working loose. Similarly shaped seats could be formed by cutting away the surface of the tie, but such process would not only be costly but would materially weaken the tie. By my improved process I simply displace the metal of the web of the tie by pressure, which displacement results in a shortening and thickening of that portion of the web of the tie immediately under the seat thus leaving the tie structurally as strong as it was prior to the formation of the recess.

In the construction shown in Figs. 4 and 5, I have dispensed with the obliquely arranged finishing rolls, and employ in lieu thereof four vertical rolls 12 and 12^a mounted obliquely in a bronze box 13 carried by the cross head 1. These rolls are located in rear of the roughing roll 6, and each is provided at its upper end with two peripheral flanges 14 and 15 which operate to form the horizontal or dovetail lips 9^a, the outer rolls 12 forming the lips on the end walls of the recessed seats and the inner rolls 12^a forming the lips on the opposite sides of the central rib 7. These rolls as shown in Fig. 4 are disposed diagonally in the cross head and parallel with the tie, so that the outer rolls 12 will engage the tie at the same instant. With this arrangement the rolls 12 and 12^a, of each pair, brace each other, and as the outer rolls engage the tie at the same time, all tendency to endwise or dragging movement of the tie is prevented.

It is evident that many slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and scope of my invention hence I would have it understood that I do not wish to confine myself to the exact construction and arrangement of parts shown and described, but,

Having fully described my invention what

I claim as new and desire to secure by Letters-Patent, is:—

1. The method of forming a depressed seat in a metal shape which consists in forming a transverse groove in the top face of the shape and then applying lateral forging pressure to the side of the groove so as to form an overhanging lip.

2. The method of forming a depressed seat in a metal tie, which consists in subjecting a portion of the upper surface of the tie to a pressure sufficient to form a depression transversely of the upper surface of the tie, and then applying lateral forging pressure to the sides of the groove so as to form overhanging lips.

3. The method of forming a depressed seat having a central rib, in a metal tie, which consists in subjecting a portion of the upper surface of the tie to a pressure sufficient to form the depression and rib transversely of the upper surface of the tie, and then applying lateral forging pressure to the side walls of the groove and to the opposite sides of the rib so as to form overhanging lips.

4. An apparatus for forming depressed rail-seats in ties, comprising a movable frame, a roughing roll carried thereby for forming the depression and rolls obliquely arranged with reference to the roughing roll and also carried by said frame in rear of the roughing roll, and engaging the end walls formed by the roughing roll to produce overhanging lips.

5. An apparatus for forming depressed rail-seats in ties, comprising a frame adapted to move laterally with respect to the tie, a roughing roll mounted to rotate in said frame for forming a depression and a central rib transversely throughout the surface of the tie, and two series of oppositely disposed rolls arranged obliquely with reference to the roughing roll and carried by the frame in rear of the roughing roll, one pair of diagonal rolls operating on the end wall of the depression and the other pair against the side walls of the rib, to produce overhanging lips.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

WILLIAM H. MORGAN.

Witnesses:

WILBUR ZIMMERMAN,
A. W. BRIGHT.