Oct. 12, 1937. M. BLAGÉ 2,095,946

APPARATUS FOR TEMPERING RAILS

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FIG. 1

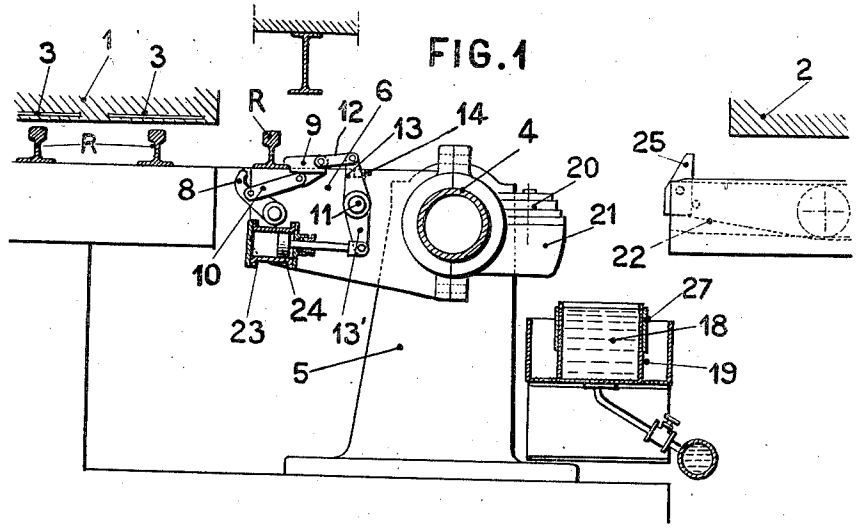
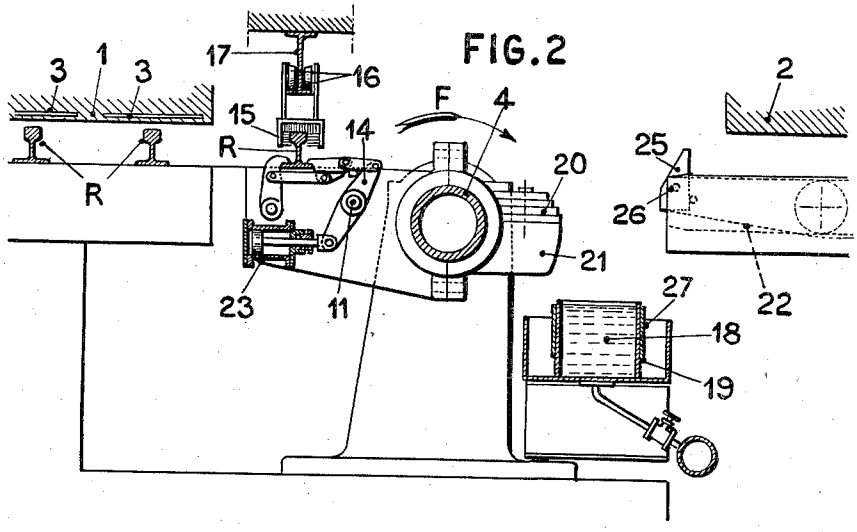


FIG. 2



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FIG.3

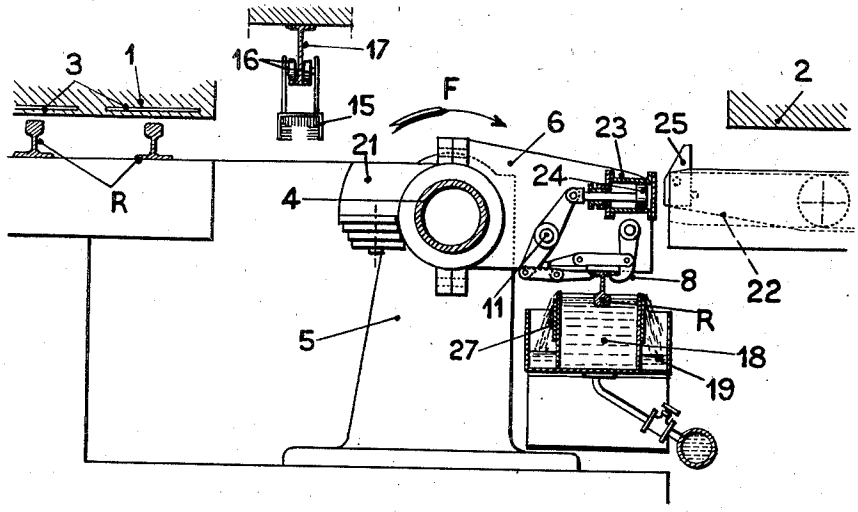
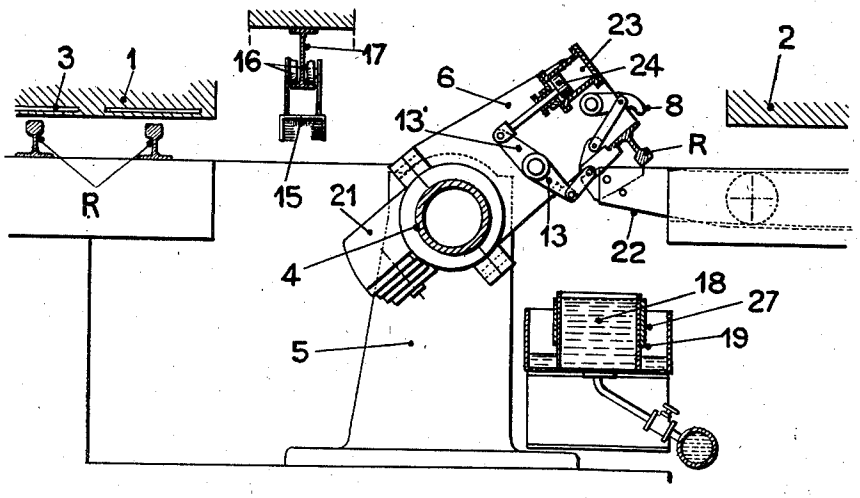


FIG.4



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FIG.5

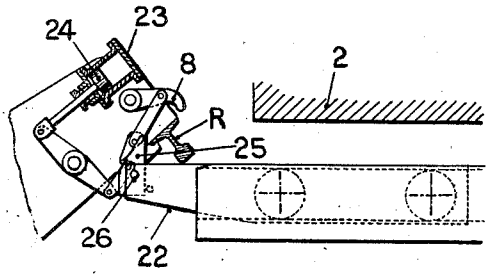


FIG.6

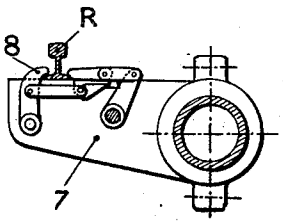
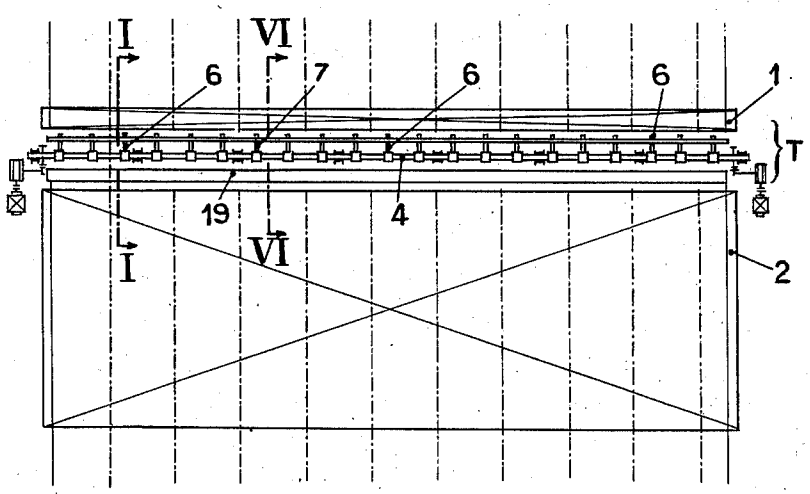


FIG.7



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UNITED STATES PATENT OFFICE

2,095,946

APPARATUS FOR TEMPERING RAILS

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Application March 20, 1935, Serial No. 12,083
In France March 31, 1934

3 Claims. (Cl. 266—4)

It has already been proposed to provide apparatus for tempering railway rails as they leave the rolling mill, but the installations of this kind known to the applicant are very complicated, occupy considerable space, and do not make it possible to ensure that the rail, at the moment of tempering will be exactly at the temperature necessary for obtaining the best results.

The object of the present invention is to provide an apparatus designed to reduce the size of the installation to a minimum and to permit rails to be treated at the best tempering temperature.

The invention is essentially characterized by:—

(*a*) The fact that before undergoing the tempering treatment, the rails leaving the rolling mill are maintained for the necessary time under a heating roof which they leave at the exact temperature required.

(*b*) By the use of a tempering apparatus composed of a shaft upon which are keyed arms adapted to receive the rail when it leaves the heating roof.

(*c*) By the combination with the arms specified under (*b*) of a system of claws or grippers operating semi-automatically which seize the rail as it reaches the apparatus, and hold it in such a manner that the said rail can by an oscillation of suitable amplitude of the said arms be tempered in a bath situated parallel to the said shaft.

(*d*) By the use of a brush device operating mechanically which brush serves for removing from the head of the rail any scale or oxides which would impede the tempering treatment.

(*e*) Finally by the combination with the device indicated above of a pneumatic control serving for liberating the rail after tempering and of a system of conveying carriages which seize the rail and convey it into a muffle in which it is cooled slowly.

In the accompanying drawings one embodiment of apparatus according to the invention has been illustrated in an entirely diagrammatic manner:—

Figures 1 to 3 which are sections taken along the line I—I in Figure 7 and which illustrate the assembly of the installation, show the successive stages in the tempering operation proper.

Figure 4 shows a sectional view of the apparatus shown in Figures 1, 2 and 3 at the time of the removal of a rail after tempering.

Figure 5 is a vertical partial section showing the action of a conveying carriage for carrying the rail into the muffle after it has been tempered.

Figure 6 is a section taken along the line VI—VI in Figure 7.

Figure 7 finally, is a plan view of the whole of the installation shown in an entirely diagrammatic manner and to a very small scale.

As will be seen in Figure 7, the tempering apparatus proper which is designated in its entirety by T, is placed between the heating roof 1 and the muffle or cooler 2.

The rails R which are to be tempered are brought from the rolling mill by a set of rollers and are placed below the heating roof 1.

Electrical resistances 3 suitably arranged in this roof, permit the rails to be brought to the exact temperature required for obtaining a good temper.

The tempering apparatus proper is composed of a very strong shaft 4 supported by a strong frame 5 and upon which are keyed a certain number of arms 6 and 7 adapted to receive and seize the rail as it leaves the roof 1.

Each arm is provided with a system of claws or grips 8 and 9 connected together by links 10 and to a shaft 11 by links 12 and 13.

Upon its arrival on the arms 6 and 7 the rail R pushes the grips 9 and by the movement of the links 10 the grips 8 lock it automatically.

It is thus held rigidly, although a suitable abutment device 14 nevertheless permits it to be withdrawn freely.

As soon as the rail is thus locked upon the apparatus (Figure 2) a brush 15 actuated mechanically and supported by a roller 16 running upon a rail 17 brushes the head of the rail over the whole of its length in order to remove the oxides which may cover the surface of the said head and impede the tempering operation.

When this brushing operation has been completed the brush 15 is drawn out of the apparatus.

The tempering operation commences at this moment.

When the shaft 4 has been put into rotation in the direction of the arrow F, the head of the rail is brought into the tempering bath 18 contained in a vat 19, situated parallel with the shaft 4.

If necessary the arms 6 and 7 may be raised and lowered a number of times in order to immerse the rail a number of times in succession.

In order to balance the movable part of the tempering apparatus wholly or partly, masses 20 forming counterweights may be provided opposite the arms 6, these masses being fixed upon an extension 21 of the arms.

When the tempering operation has been completed, the rail is liberated by raising the apparatus (see Figure 4) by the necessary amount to permit the conveying carriages 22 of the rear cooler 2 to become placed below the rail in such

a way that they can collect it after it has been liberated.

In order to release the rail the oscillating pneumatic cylinders **23** carried by the arms **6** are made to act.

In these cylinders move pistons **24** the rod of which is pivoted to an extension **13'** of the links **13**. When compressed air is admitted behind the pistons **24**, the consequent movements of the said pistons cause the links **13**, **13'** to swing, thereby bringing the grips **8** into the position shown in Figure 4. The hooks **25** of the conveying carriages 22 which have lifted automatically by pivoting about their axes **26** and have thus moved into the position shown in Figure 5, then seize the rail and convey it into the muffle **2**, where it is cooled slowly.

When it has thus abandoned the rail the tempering apparatus continues to rotate backwards in the opposite direction to the arrow F in order to return into the position shown in Figure 1 in which it received the next rail coming from the roof **1**.

The various necessary movements of the rail are obtained in the known manner by means of conveyers.

The method carried out by means of the apparatus described above possesses great advantages:—

(1) The tempering can be effected at a strictly accurate and uniform temperature over the whole length of the rail; by regulating the temperature existing below the heating roof **1**, the rail can be raised and maintained at the most suitable temperature with very great accuracy.

(2) On account of the electrical heating of the roof, the temperature of the head of the rail can easily be controlled and rapidly regulated.

(3) The number of times the rail is immersed in the tempering bath and the duration of each immersion can be varied as required.

(4) The tempering bath is fixed and the level of the bath is regulated according to the height of the rails by movable plates **27** which are displaced on the vertical walls of the vat so as to raise or lower the height of the tempering bath as required. The temperature of the bath can easily be controlled and accurately regulated according to requirements.

(5) The rail remains completely visible during the tempering treatment.

(6) The productive capacity is very high. By way of example it is indicated that it reaches 50 tons per hour. It is consequently sufficient to follow the normal working of a rail train with a single tempering apparatus.

(7) The size of the installation is reduced to a minimum, thereby permitting the invention to be fitted upon any existing cooler, consequently first costs are greatly reduced.

(8) The transverse displacements of the rails only require a minimum of space corresponding to the length of the rail to be treated as will be seen from an examination of Figure 7, while the greater part of existing known systems require a space corresponding to two or three times the length of the rails and a plurality of apparatus.

(9) Finally the apparatus forming the subject of the invention is simple and is suitable for any type of rails.

What I claim is:

1. An apparatus for treating rails comprising a heating roof below which the rails are fed upon leaving the rolling mill, a vat containing a tempering bath, an oscillating shaft located between said vat and said heating roof, arms fixed to said shaft, cooperating claws upon said arms, a link connecting said claws, a second shaft mounted in said arms, an arm fixed to said second shaft and one of said claws being pivotally connected to said last named arm so that upon impact of a rail against said pivotally connected claw said other cooperating claw will close upon and lock said rail, and means cooperating with said last named arm for releasing said claws from a rail after said rail has been tempered in said bath.

2. An apparatus for treating rails comprising a heating roof below which the rails are fed upon leaving the rolling mill, a vat containing a tempering bath, an oscillating shaft located between said vat and said heating roof, arms fixed to said shaft, cooperating claws upon said arms, a link connecting said claws, a second shaft mounted in said arms, an arm fixed to said second shaft and one of said claws being pivotally connected to said last named arm so that upon impact of a rail against said pivotally connected claw said other cooperating claw will close upon and lock said rail, and means for separating said claws to release a rail after said rail has been tempered in said bath.

3. An apparatus for treating rails comprising a heating roof below which the rails are fed upon leaving the rolling mill, a vat containing a tempering bath, an oscillating shaft located between said vat and said heating roof, arms fixed to said shaft, cooperating claws upon said arms, a link connecting said claws, a second shaft mounted in said arms, an arm fixed to said second shaft and one of said claws being pivotally connected to said last named arm so that upon impact of a rail against said pivotally connected claw said other cooperating claw will close upon and lock said rail.

MARCEL BLAGÉ.