W. G. EVANS.

RAIL CUTTING MACHINE.

APPLICATION FILED FEB. 15, 1918.

1,277,891.

Patented Sept. 3, 1918.

2 SHEETS—SHEET 1.

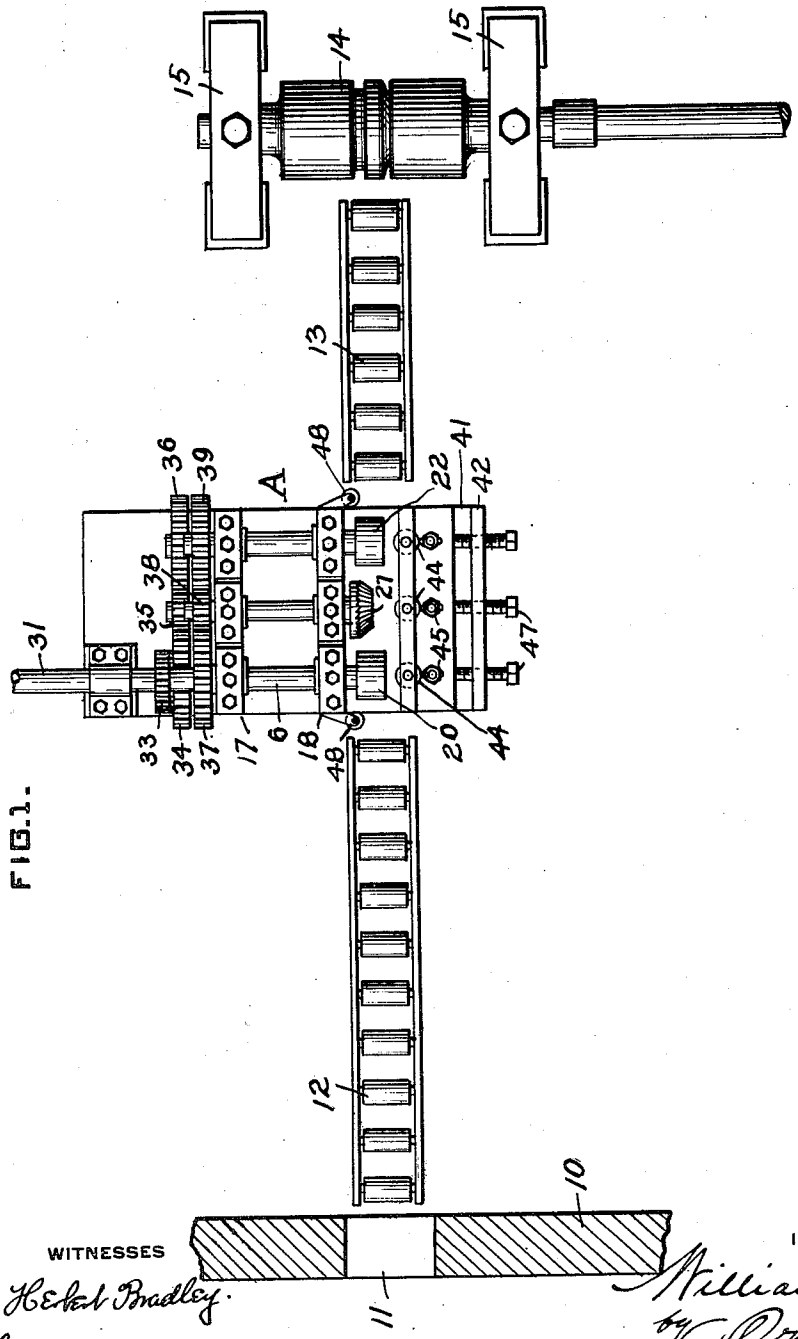


FIG. 1.

WITNESSES

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2 SHEETS—SHEET 2.

FIG. 2.

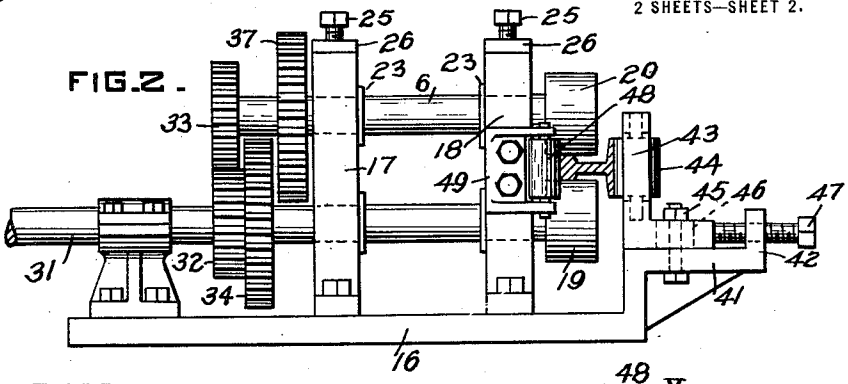


FIG. 3.

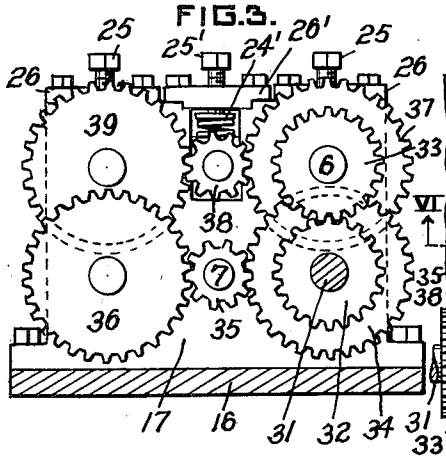


FIG. 4.

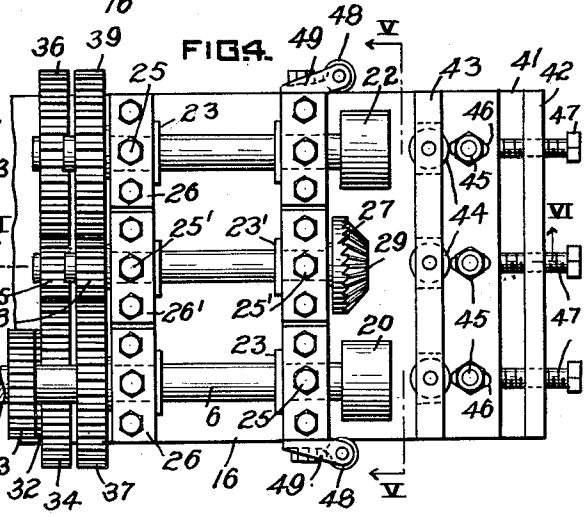


FIG. 5.

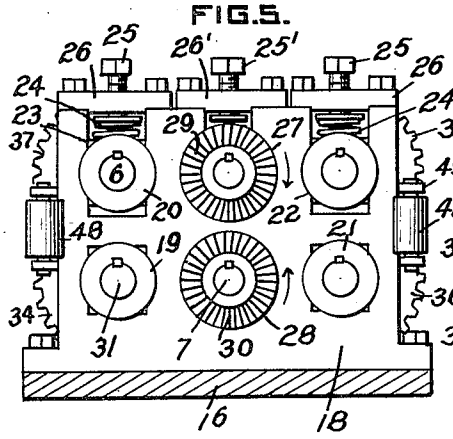
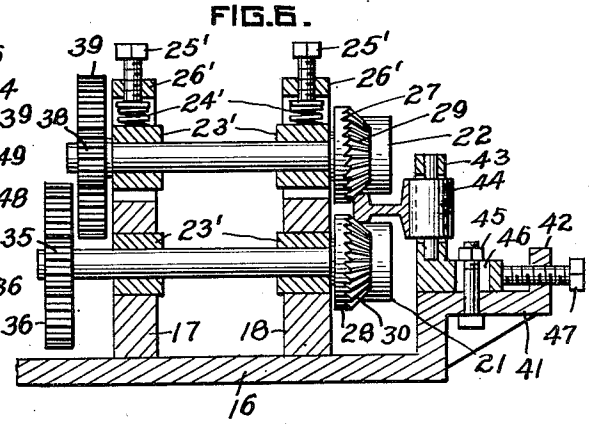


FIG. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

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RAIL-CUTTING MACHINE.

1,277,891. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed February 15, 1918. Serial No. 217,426.

To all whom it may concern:

Be it known that I, WILLIAM G. EVANS, a citizen of the United States, residing at Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Rail-Cutting Machines, of which the following is a specification.

This invention relates to a machine for use in connection with rolling mills, and more particularly to a mill adapted for re-rolling used and worn rails, and has for its primary object the provision of a mill of this class that will remove the worn or swaged down edges of the heads of such old rails, after they are heated and before they pass into the rolls.

Broadly, my invention consists of guiding and feeding mechanism and a pair of milling cutters and suitable gearing, and is adapted to be set between the furnace and the rolls, for action on the heads of rails in passing from one to the other.

While I have shown but one specific form of my invention, it will be understood that I do not wish to be limited to such form since various changes may be made by one skilled in the art without departing from the spirit of my invention as set forth in the appended claims.

In the drawings:

Figure 1 is a plan view of a mill showing my invention in position for operation.

Fig. 2 is a rear end view of the rail cutting machine;

Fig. 3 is a side view showing the gearing;

Fig. 4 is a top plan view thereof;

Fig. 5 is an inner face view on the line V—V, Fig. 4;

Fig. 6 is a transverse sectional view of the cutting mechanism showing a rail in position, indicated by the line VI—VI of Fig. 4.

Referring more particularly to the drawings, the numeral 10 designates a furnace of any suitable form adapted for heating billets or rails and having a door opening 11 on a line with a roll table 12. The table 12 is of well known construction and adapted to carry the heated rails to my rail head cutting machine, designated as a whole by the letter A.

The rails pass through the cutting machine beyond and onto a table 13, and are carried to the rolls 14 which are mounted in the usual housings 15.

The cutting device A is adapted to remove the swaged down or worn edge or edges which are formed on the tread of old rails, before they are re-rolled. It has been found in practice that when re-rolling old rails, such swaged over portion at the worn edge of the tread or head of a rail, becomes changed in texture or like a partly adhering wire so hard and brittle that it will not amalgamate with the metal of the head in re-rolling, and therefore leaves a flaw or imperfect portion or portions along the heads of re-rolled rails.

To overcome this objection I have provided my cutting machine which comprises a base 16, and housing stands 17 and 18. A set of four feed rolls 19, 20, 21 and 22 are mounted by their journals in the stands 17 and 18. The upper rolls 20, 22, are flexible and adjustably mounted to provide for unevenness in the width of the rail heads being cut and to permit of the passage of different sizes of rails. The flexible and adjustable mounting of the rolls 20, 22, comprises bearing members 23 which are mounted in the housings 17, 18, and are cushioned by coil-springs 24 adjustably tensioned by adjusting screws 25 mounted in removable caps 26 secured to the stands.

Cutting or milling members 27—28 are mounted in the stands between the upper rolls 20 and 22 and lower rolls 19 and 21, and the member 27 has an adjustable mounting similar to the mounting of the rolls 20—22, and is designated by similar reference numerals primed.

The cutting members 27—28 are adapted to be rotated in opposite directions and are therefore provided with cutting teeth 29—30 respectively facing in opposite directions.

The feed roll 19 is adapted to be rotated by a shaft 31 which receives its power from any suitable prime mover, and has a gear 32 thereon meshing with a gear 33 of equal size on shaft 6 of roll 20. A gear 34 is mounted on shaft 31 of roll 19 and meshes with a small gear 35 on shaft 7 of cutter 28, which in turn meshes with a gear 36 of equal size to the gear 34 and mounted on the shaft of roll 21. It will thus be seen that the rolls 19 and 21 are rotated at an equal speed and in unison, while the cutter is rotated in the opposite direction much faster, or about the proportion of three to one.

Roll 20 will also be rotated in unison and at the same speed as the roll 19 by gear 33 in mesh with gear 32.

A large gear 37, equal in size to either gear 34 or 36, is mounted on the shaft 6 of roll 20 and meshes with a small gear 38 on the shaft of upper cutter 27, similar to gear 35, and this gear in turn meshes with gear 39 on the shaft of roll 22, similar to gear 37. By the above arrangement of the gearing, all of the four feed rolls will move at the same speed, in advancing direction, while the cutters will move at a greater speed, in a reverse direction.

Base 16 is provided with an outwardly projecting base flange 41 terminating in an upwardly projecting portion 42.

A guiding pressure member 43 having guide rolls 44 for the base of the rail journaled therein, is adjustably mounted on the flange 41 by bolts 45 mounted in slots 46 in the member 43 and secured in the flange member 41, and is adapted to be adjusted by set-screws 47.

A second set of guide rolls 48 for the head of the rail are mounted in bearings 49 on the stand 18.

The operation of my device is as follows:

A rail being heated in the furnace 10 is passed out of the opening 11 onto the table 12, and carried to the rolls 19, 20, of the head cutting machine which feed it through the cutters 27, 28, which cut or mill the opposite edges of the tread portion of the rail and thus remove any worn or swaged over portions. The rail is fed beyond the cutters by rolls 21, 22, and onto the table 13 and through the rolls 14, which re-roll it as in the usual practice of rolling such rails.

The cutting device A is adjustable to different sized rails by means of the adjustable mounting of the rolls 20, 22, and the cutter 27 and the adjustable mounting of the guide rolls 44 which are journaled in the pressure member 43.

It will be understood that the cutting operation on the rails does not interfere with the running of the mill, which may be run continuously or in any other manner, as is the practice in the ordinary mill without the use of my cutter.

Having thus described my invention, what I claim is:

1. A cutting machine for removing the worn or swaged edges of rail heads consisting of a supporting base having a pair of oppositely rotating cutter wheels, a plurality of pairs of feed rolls therefor, actuating gearing, and oppositely arranged guiding and pressing rolls adapted to maintain the rail with its head in operative relation to the cutter wheels, some of said last-named rolls being adjustable to or from other of said rolls.

2. A cutting machine for removing the worn or swaged edges of rail heads consisting of a supporting base having a pair of oppositely rotating cutter wheels, a plurality of pairs of feed rolls therefor, actuating gearing, means for adjusting and cushioning the cutter wheels, and guiding and pressing rolls adapted to maintain the rail with its head in operative relation to the cutter wheels, said last named rolls being adjustable horizontally.

3. A cutting mechanism of the class described comprising a base, a plurality of pairs of feed rolls, a pair of cutting heads, said feed rolls and said cutter heads being adjustable vertically, and horizontally adjustable guide rolls.

4. A cutting mechanism of the class described comprising a plurality of pairs of feed rolls, a pair of cutter heads, the upper of said rolls and the upper of said cutter heads having an adjustable and flexible mounting, said rolls and said cutter heads being so geared that they will operate in unison, and co-acting guide rolls.

5. A cutting mechanism of the class described comprising a base, upwardly projecting stands on said base, a plurality of feed rolls mounted in said stands, cutter heads mounted in said stands, gearing connecting said cutter heads and said feed rolls, guide rolls secured to one of said stands, and other guide rolls journaled in a side member formed on said base.

6. A cutting mechanism of the class described comprising a base, upwardly projecting stands on said base, a plurality of feed rolls journaled in said stands, a cutter head journaled in said stands, a second plurality of feed rolls journaled in said stand above said first named feed-rolls, a second cutter head journaled above said first named cutter head, said last named feed rolls and cutter having a flexible bearing and being adjustable vertically with respect to said stands, said feed rolls and cutter heads all being geared together, guide rolls on one of said stands, and other guide rolls journaled in an adjustable side member.

7. The combination with a rolling mill for rolling old rails and a heating furnace, and conveying roller tables, of a cutting mechanism comprising a base, a plurality of pairs of feeding rolls, a pair of cutting heads, said feed rolls and said cutter heads being adjustable vertically, and adjustable guide rolls.

8. The combination with a rolling mill for rolling old rails, a heating furnace, and conveying tables therefor, of a cutting mechanism mounted between said furnace and said mill comprising a base, a plurality of pairs of feed rolls, a pair of cutter heads, the upper of said rolls and the upper of said cutter heads having an adjustable and flexible mounting, said rolls and said cutter

heads being geared to operate in unison, and adjustable guide rolls.

9. The combination with a rolling mill for rolling old rails, a heating furnace, and conveying tables therefor, of a cutting mechanism comprising a base having a two-piece adjustable member, upwardly projecting stands on said base, a plurality of feed rolls mounted in said stands, cutter heads mounted in said stands, gearing connecting said cutter heads and said feed rolls, guide rolls secured to one of said stands, and other guide rolls journaled in said adjustable side member.

In testimony whereof I hereunto affix my signature.

WILLIAM G. EVANS.