J. NOLL.

MACHINE FOR WORKING ON RAILS.

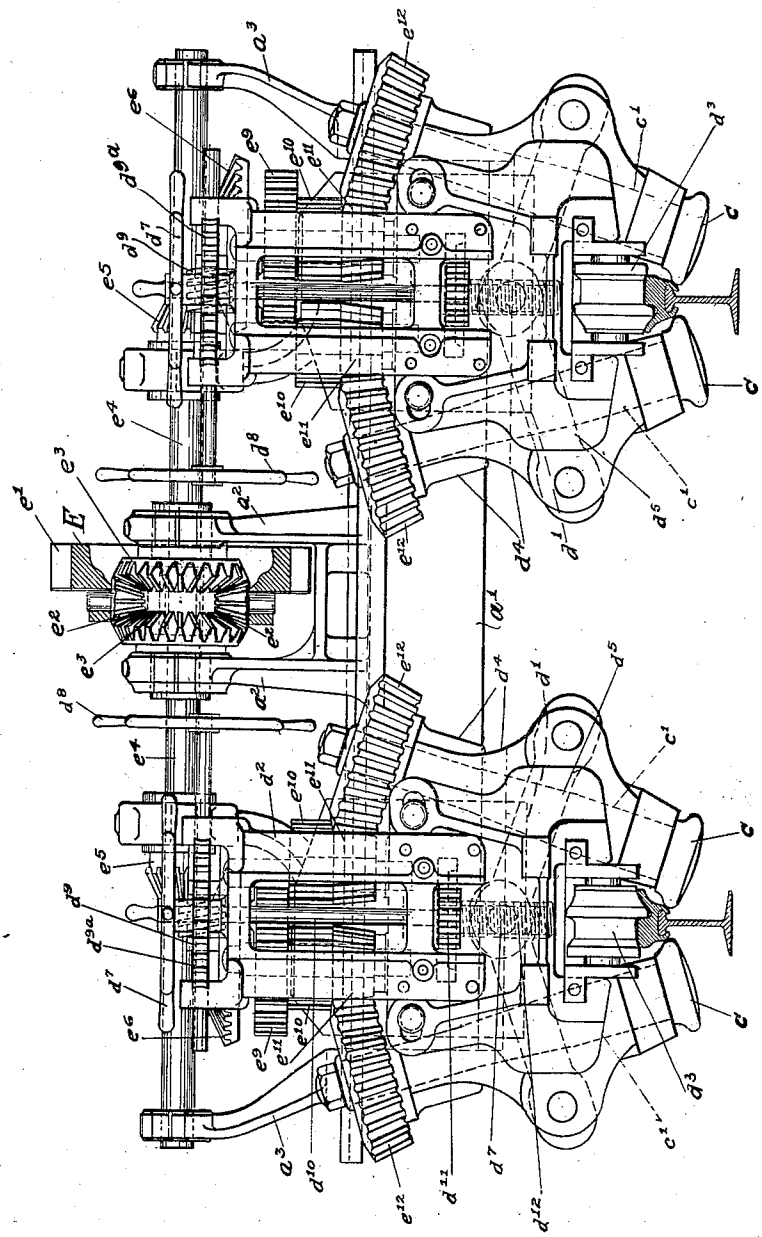
APPLICATION FILED SEPT. 7, 1912.

1,069,072.

Patented July 29, 1913.

3 SHEETS—SHEET 1.

Fig. 1



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3 SHEETS—SHEET 2.

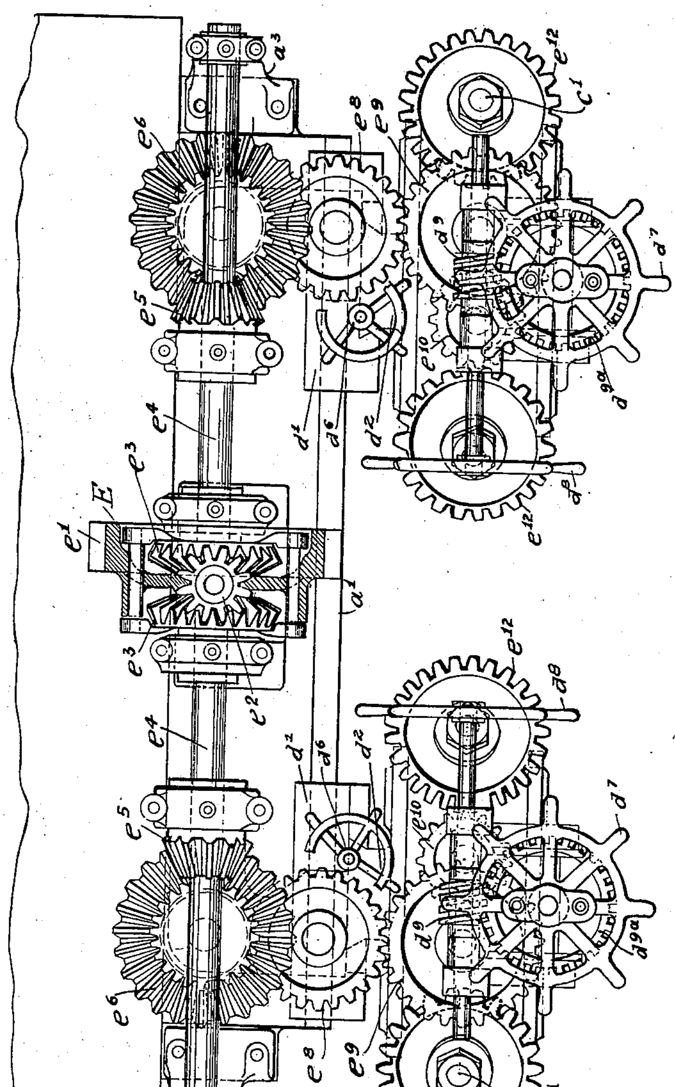

Fig. 2

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3 SHEETS—SHEET 3.

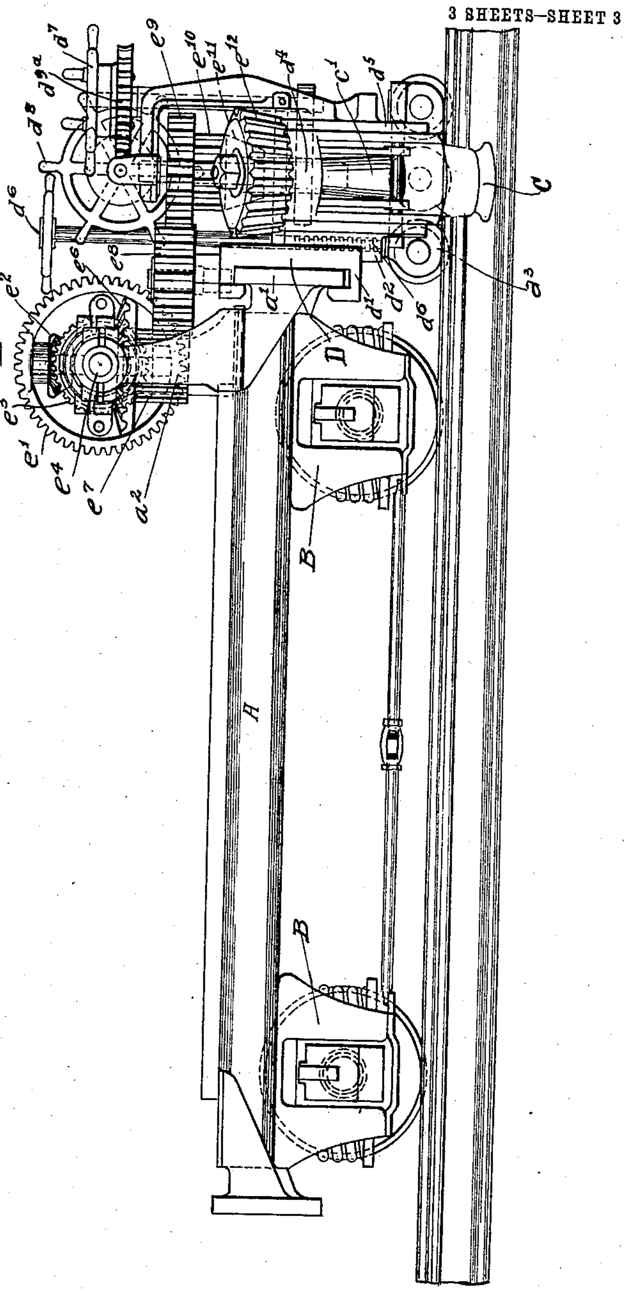

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN NOLL, OF NEW YORK, N. Y., ASSIGNOR TO CONTINUOUS RAIL COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

MACHINE FOR WORKING ON RAILS.

1,069,072. Specification of Letters Patent. Patented July 29, 1913.

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To all whom it may concern:

Be it known that I, JOHN NOLL, a citizen of the United States, and a resident of the borough of Brooklyn, in the city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Machines for Working on Rails, of which the following is a specification.

The invention relates to machines comprising a plurality of sets of rotary tools that simultaneously operate upon and along different rails in a track.

One of the objects of the present invention is to provide between the different sets of rotary tools in such a machine a means which allows said sets of tools to automatically assume and maintain their proper positions along the rails.

Another object of the invention is to construct a machine with a set of rotary tools arranged to operate upon one of the rails at one side of the track, with a set of rotary tools arranged to operate upon the rails at the other side of the track, with a common driving means for both sets of tools and with a differential gear means in said driving means to permit the surface speeds of the tools in one set to vary relative to the surface speeds of the tools in the other set.

A further object of the invention is to provide a machine having companion sets of mechanisms each of which comprises opposing rotary tools that are geared together, with a common driving means having therein a differential gear mechanism whereby the speed of the tools in one set of mechanism can vary relative to the speed of the tools in the other set of mechanism, thus allowing the opposing tools in each set of machines to automatically assume the proper position along the workpiece between the rolls.

A still further object of the invention is to construct a machine for working on compound rails in a track so that it comprises a carriage or frame that moves horizontally along the track, a set of rotary opposing tools which is vertically and horizontally movable relative to the carriage or frame and the opposing tools of which are arranged to engage the rails at one side of the track, a similar set of rotary opposing tools arranged to engage the rails at the other side of the track and a differential gear mechanism between the sets of tools whereby the tools may be driven by a common means and also be automatically maintained at the proper surface speeds as the machine moves along the track.

As showing a specific embodiment of the invention reference is made to the drawings forming a part of this specification and in which—

Figure 1 is a partial end view of a machine for working on rails, which machine comprises two sets of opposing rotary tools that are operated from a common source of power by means comprising a differential gear mechanism whereby the speed of the tools in one set may vary relative to the speed of the tools in the other set. In this view the differential gear mechanism is shown partly in section. Fig. 2 is a partial plan view showing one end only of the carriage of the machine, two sets of tools and the common operating means therefor. In this view the differential gear mechanism is also shown partly in section. Fig. 3 is a side elevation showing the carriage, supporting trucks therefor, tools at one end of the carriage for operating on the rails and part of the means for driving the tools.

The carriage is designated by the reference character A and is supported at each end by the trucks B which rest upon the track rails. At one end of the carriage there is provided a horizontally extending transverse member a' on which there is mounted a frame D carrying two sets of opposing rotary tools for operating on the rails at opposite sides of the track. These tools are designated by the reference character C.

The frame D above referred to preferably comprises a horizontally movable member d' and a vertically movable member d^2, which carries the pressing rollers d^3, and the pivoted bearings d^4 in which there is mounted the tool carrying shaft c'. The frame member d' is mounted so that it can slide along the horizontal member a' that extends transversely of the track and the vertically movable member d^2 is slidably mounted on the member d'. Any suitable means may be provided between the horizontally movable member d' and the vertically movable member d^2 whereby the latter may be vertically adjusted as desired. Such a means is indicated by the reference character d^6.

The rotary tools C of each set are geared

together in the manner hereinafter described and so that they may be operated from a common driving means E having the differential gear mechanism therein.

Each set of pivoted bearings is connected by a mechanism comprising the toggle links d^5 whereby the tools may be forced toward each other as desired.

The driving means E comprises a main driving gear e' which may be driven from any suitable source of power, as for example, a motor supported on the carriage. This main driving gear e' supports thereupon a plurality of idle gears e^2 which serve as a means to transmit the power from the main driving gear to two beveled gears e^3 which mesh with the idle gears e^2. One of the beveled gears e^3 is secured to a horizontal shaft e^4 which extends transversely of the machine from the central portion to one side thereof, and the other beveled gear e^3 is secured to another shaft e^4 which extends transversely of the machine from the central portion to the other side thereof.

It will be noted that the main driving member e', the idle beveled gears e^2 and the beveled gears e^3 provide a differential gear construction which permits both of the horizontal shafts e^4 e^4 to be driven from the same main driving member, but at varying speeds relative to each other, should occasion demand it.

At each side of the machine a gear e^5 is mounted on the shaft e^4 in a manner that permits said gear to slide along the shaft and also to be driven by the shaft. This gear e^5 (see Fig. 1) and the gears e^6, e^7 and e^8 (see Fig. 3) are all connected to the horizontally movable portion d' of the tool carrying frame, so that when the latter moves along the bar a', the gears will move with the frame.

The vertically movable portion d^2 of the tool carrying frame has secured thereto the spur gears e^9 (see Figs. 1 and 3), e^{10}, and beveled gears e^{11}.

From an inspection of the drawings it will be apparent that the gears e^5, e^6, e^7, e^8, e^9, e^{10}, e^{11} and e^{12} constitute a chain of gearing whereby the opposing rotary tools C—C can be driven from the horizontal shafts e^4. It will also be noted from an inspection of the drawings that each of the sets of rotary tools can occupy different horizontal and different vertical positions and that they can be driven in any of the adjusted positions. It will also be observed that the speed of the tools which engage the rail at one side of the track can vary relative to the speed of the tools which engage the rail at the other side of the track, due to the differential gear mechanism above described.

The toggle link operating mechanism comprises the hand wheels d^7 and d^8, the worm d^9, the worm gear d^{9a}, the shaft d^{10}, the gears d^{11}, and a screw and nut mechanism d^{12}, the nut being directly connected to the adjacent ends of the links d^5. The handle d^7 is directly connected to the shaft d^{10} whereby a quick rough adjustment of the toggles and consequently the tools may be made as desired. The worm wheel d^{9a} can be disconnected from the hand wheel d^7. When disconnected the hand wheel d^7 can readily adjust the toggle in the manner above described. When the gear wheel d^{9a} is connected to the hand wheel d^7 so that the two must rotate together, then a slow, accurate and powerful adjustment can be affected from the hand wheel d^8 through the worm d^9 and the worm gear d^{9a}, the hand wheel d^7, shaft d^{10}, gears d^{11}, and the screw and nut mechanism to the toggles and consequently the tools.

The improvements herein set forth are not limited to the precise construction and arrangement of the parts as shown and described, but they may be embodied in various forms and modifications without departing from the spirit and scope of the invention.

What I claim is:

1. In a machine of the class described which progressively moves along the work when operating thereupon, the combination of a plurality of sets of rotary tools and a common connecting driving means therebetween comprising a differential gear.

2. In a machine of the class described, the combination of a plurality of sets of opposing rotary tools and a common driving gear means therefor comprising a means which permits the surface speeds of the tools in one set to vary relative to the surface speeds of the tools in the other set as the tools move along the work.

3. In a machine of the class described, the combination of a plurality of sets of opposing rotary tools for progressively engaging and moving along the work, a common driving means for said sets and a differential gear mechanism in said driving means.

4. The combination of a carriage, supporting trucks therefor whereby the carriage may be moved along a track, a set of opposing rotary tools connected to the carriage and arranged to engage the rails at one side of the track, a set of opposing rotary tools arranged to engage the rails at the other side of the track, each of said sets of tools being vertically movable relative to the carriage and also horizontally in a direction transverse to the track, and a common member having connected thereto the idle gear members of a differential gear mechanism through which power is imparted to the tools for rotating them when in engagement with the rails at the sides of the track.

5. In a machine of the class described, the

combination with a carriage, of trucks therefor for supporting the carriage so that it can move along the rails in a track, mechanisms supported at the opposite sides of the carriage, each of which mechanisms comprises horizontal pressing rollers and opposing rotary rail engaging tools having vertically extending axes, the rollers and tools of each set being mounted on a frame member which is movable vertically and also horizontally in a direction transverse to the track, and a driving member having connected thereto the idle gear members, of a differential gear mechanism through which idle gear members the power is transmitted to other gears of the differential gear mechanism and from thence to the opposing rotary tools.

6. In a machine of the class described for working on compound rails the combination of a set of opposing rotary tools, a second set of opposing rotary tools, and between the said sets a common driving member for propelling the tools along the work, said driving means comprising a differential gear whereby the speed of said tools may adapt itself to the requirement of the work.

7. The combination of a frame supporting a plurality of sets of rotary compression rollers and a common connecting driving means therebetween comprising a differential gear.

8. In a machine of the class described the combination of a frame supporting a plurality of sets of opposing rotary tools for engaging the side of the work-piece and a common driving gear means for said sets of tools, which common gear means comprises a means that permits the surface speeds of the tools in one set to vary relative to the surface speeds of the tools in the other set as the tools move along the work.

9. In a machine of the class described, a frame, a plurality of sets of opposing rotary tools supported on and by the frame, and a common driving mechanism for said sets, which driving mechanism comprises a differential gear mechanism located between said sets.

This specification signed and witnessed this 5th day of Sept. A. D. 1912.

JOHN NOLL.

Signed in the presence of—

EUGENE DELMAR,

EDWIN A. PACKARD.