(No Model.)

L. VOJÁČEK.

APPARATUS FOR BENDING RAILS AND BARS.

No. 274,678. Patented Mar. 27, 1883.

Fig. 1.

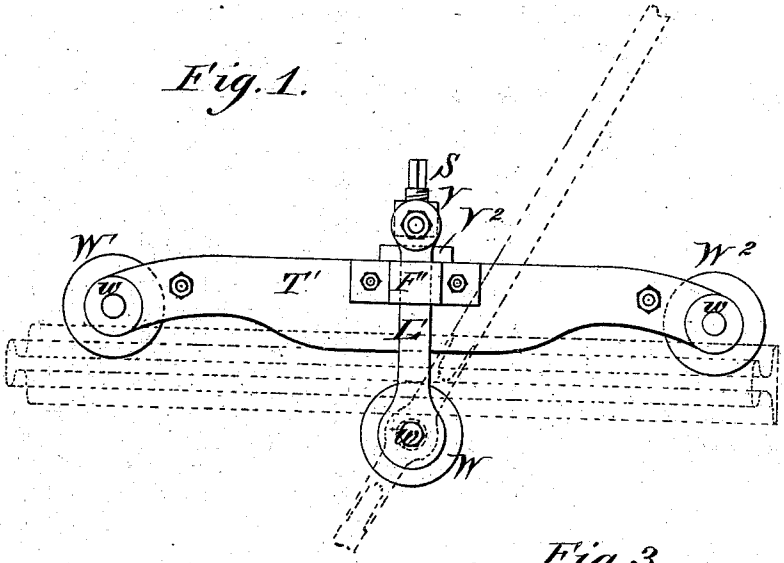


Fig. 2.

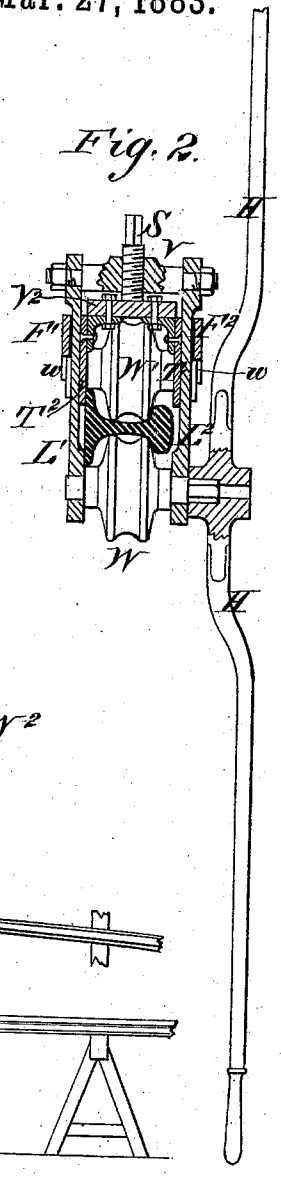


Fig. 3.

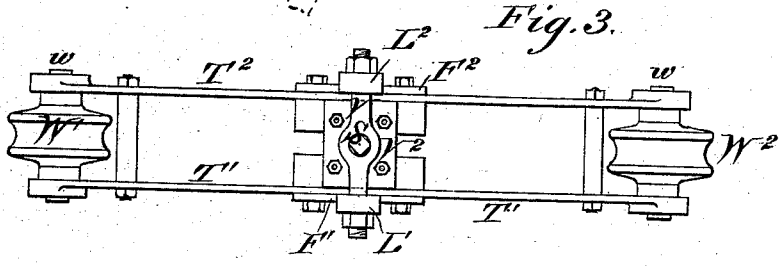


Fig. 4.

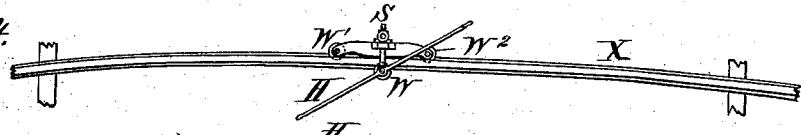


Fig. 5.

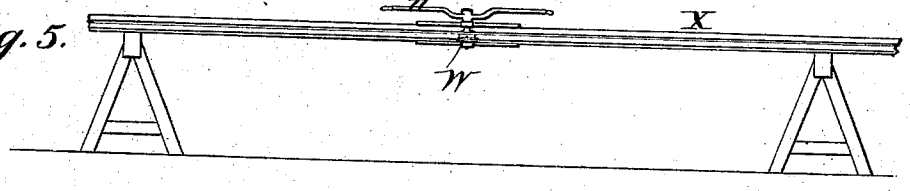


Fig. 6.

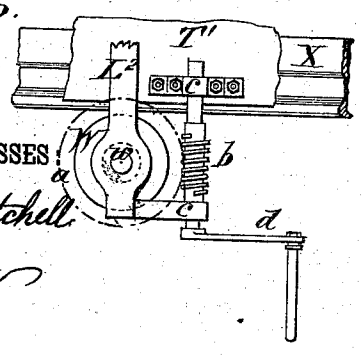
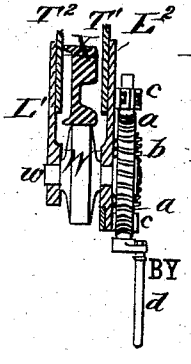


Fig. 7.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR BENDING RAILS AND BARS.

SPECIFICATION forming part of Letters Patent No. 274,678, dated March 27, 1883.

Application filed December 5, 1882. (No model.) Patented in Austria-Hungary June 4, 1881, No. 9,506 and No. 18,031; in Belgium August 16, 1881, No. 55,309; in England August 25, 1881, No. 3,701, and in France August 25, 1881, No. 144,545.

To all whom it may concern:

Be it known that I, LADISLAV VOJÁČEK, of Sinichov-Prague, Bohemia, Austria-Hungary, have invented a new and Improved Apparatus for Bending Rails and Bars, of which the following is a full, clear, and exact description.

This invention relates to apparatus for bending railway-rails, girders, angle-iron, bar-iron, and other like articles; and it consists in an arrangement whereby the bending is effected by causing the apparatus to travel along the article to be bent, which, according to this invention, does not necessarily partake of any motion in the direction of its length. The construction and operation are set forth hereinafter.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation, Fig. 2 is a transverse section, and Fig. 3 is a plan view, of my improved apparatus for bending rails and bars. Figs. 4 and 5 are views representing the application of the apparatus to use. Fig. 6 is a side view; and Fig. 7 a cross-section, showing a portion of the apparatus in which a worm-wheel and worm are employed to impart motion to the adjusting-roller.

Three rollers, marked respectively W, W′, and W^2, are employed, two of which—namely, those marked W′ and W^2—are capable of turning freely on journals *w*, working in bearings in a frame, $T' T^2$, constructed of cast-iron or built up with plate or angle iron, and which is shown as consisting of two plates connected together by bolts and nuts and distance-pieces, but which may be cut out of a single plate, as may be convenient. The third roller, W, is mounted in bearings carried by side bars, $L' L^2$, connected by a cross-head or distance-piece, V, at the top, and sliding in guides $F' F^2$, secured to the frame $T' T^2$. The screw S passes through a threaded hole in the cross-head V. One extremity of this screw is squared to receive a lever-handle or crank, the other extremity of the said screw bearing against the plate V^2, secured to the framing $T' T^2$, as shown most clearly in Fig. 2. The axis of the adjustable roller W is suitably prolonged to admit of the application of long levers or an endless screw and worm-wheel or toothed or other suitable gear for the purpose of imparting rotary moto the said roller. As shown, this axis terminates in a squared end for receiving the lever H. (Shown as applied in Fig. 2.)

The apparatus is to be operated as follows: The apparatus is slipped over the article to be bent in such a manner that the two outer or end rollers, W′ and W^2, bear against what is destined to become the convex side of the article, and the middle or adjustable roller, W, bears against the opposite or concave side, as shown in the plan and side elevations, respectively, in Figs. 4 and 5, the rail being marked X in those figures. The screw S in the cross-head, connected with the adjustable bearings of the roller W, as hereinbefore described, is then turned, and thereby the distance between the planes in which the roller W and the rollers W′ and W^2 are respectively situated is decreased until the said roller W is caused to exert the pressure necessary to bend the article to the desired extent. This roller is then rotated by means of the lever H, or by any other suitable or convenient means, whereby the whole apparatus is caused to travel along the article, and at the same time the pressure of the adjustable roller W on the one side and of the other two rollers W′ and W^2 on the opposite side imparts to the article a uniform bend or curvature throughout its entire length. By altering the position of the adjustable roller W the extent to which the rail or other article is bent may be varied at pleasure, and any desired curve will thus be produced. Small guide-rollers may be arranged with their axes at right angles to the axes of the bending-rollers, in order to maintain the article in position and prevent it from becoming twisted or distorted during the operation.

In bending an article presenting great lateral stiffness it is desirable to increase the power of the roller which propels the apparatus along the rails by means of suitable gearing, such as a worm-wheel driven by an endless screw or other equivalent arrangements. Figs. 6 and 7 show such a construction, in which the prolonged end of the axis of the roller W has keyed upon it a worm-wheel, *a*, with which gears a worm, *b*, upon a shaft, turning in bearings *c*, fixed to the adjustable bar

L^2 and the plate T′, respectively, said shaft being provided with a handle, *d*, for causing the worm to give motion to the worm-wheel, and consequently to the roller W.

In case of ordinary railway-rails it is most convenient to turn the adjustable roller by means of four long levers inserted in suitable holes formed in a species of capstan-head fixed on the axis of the said roller, after the manner shown in Fig. 2. When operating on other articles or bars presenting comparatively little resistance the roller W may be rotated by means of an ordinary crank-handle or fly-wheel.

In place of causing the bending apparatus to travel along the article by rotating one of the rollers, as hereinbefore described, a fixed or a stationary windlass may be employed to draw the apparatus over the article by means of a rope or chain, and it is evident that in case of need the required result may be obtained by fixing the bending apparatus so that it is stationary, and causing the bar or article to be bent to move through the said apparatus by means of feed-rollers or other suitable devices.

The advantages of this apparatus consist in its completeness and portability, which render it especially suitable for railway work. Rails of any length and elasticity may be bent with facility and expedition by means of this apparatus, either on the line or in the works, and caused to assume any desired regular or irregular curvature.

If desired, the end rollers, W′ and W^2, or one of them, may be adjustable in place of or in addition to the roller W.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In an apparatus for bending rails, the combination, with the frame T′ T^2, carrying rollers W′ W^2, journaled in its ends, and provided with the guides F′ F^2, of the adjustable side bars, L′ L^2, passing through said guides, roller W, journaled in the lower ends of the side bars, cross-head V, plate V^2, secured to the frame, and screw S, substantially as described, and for the purpose set forth.

2. In an apparatus for bending railroad-rails, the combination, with the frame T′ T^2, carrying end rolls, W′ W^2, and guides F′ F^2, and adjustable side bars, L′ L^2, provided with the roller W, journaled in their lower ends and having a prolonged axis, *w*, of means, substantially as described, for revolving said prolonged axis and causing the frame and bending-rolls to move along the rails to be bent, substantially as described.

3. In an apparatus for bending rails, the combination, with the frame T′ T^2, carrying end rolls, W′ W^2, and guides F′ F^2, and adjustable side bars, L′ L^2, provided with the roller W, journaled in their lower ends, and having a prolonged axis, *w*, of the worm-wheel *a*, worm *b*, and winch *d*, substantially as described, whereby the frame and bending-rolls are caused to be moved along the article to be bent, as set forth.

L. VOJÁČEK.

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F. SEEBALD.