(No Model.)

A. J. ACASTER.

DEVICE FOR ROLLING RAILROAD RAILS.

No. 276,322. Patented Apr. 24, 1883.

FIG. 1.

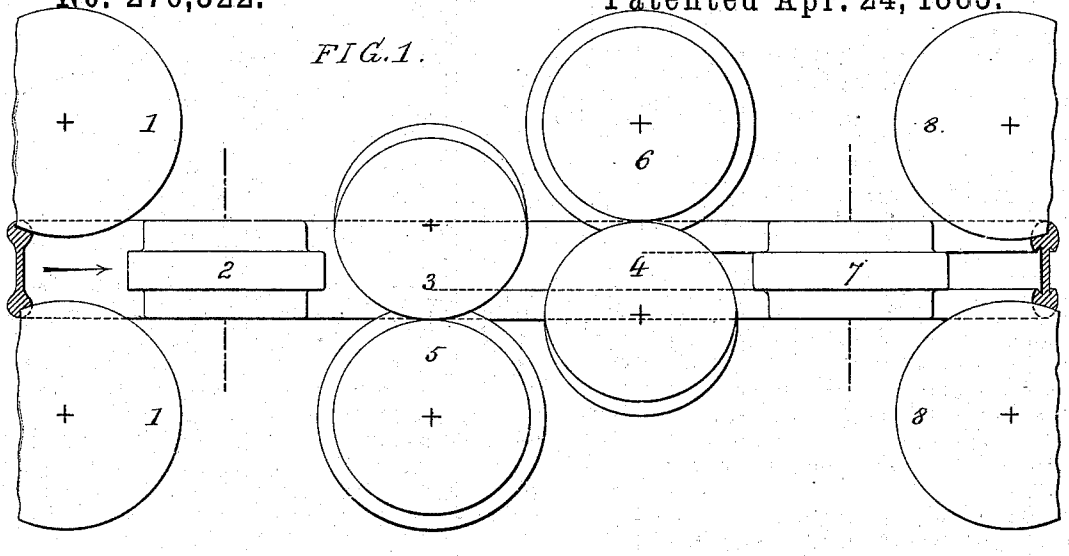
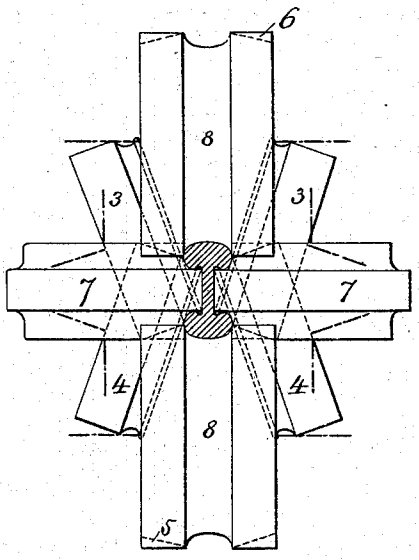


FIG. 2



WITNESSES:
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UNITED STATES PATENT OFFICE.

AMOS J. ACASTER, OF SHEFFIELD, COUNTY OF YORK, ENGLAND.

DEVICE FOR ROLLING RAILROAD-RAILS.

SPECIFICATION forming part of Letters Patent No. 276,322, dated April 24, 1883.

Application filed February 1, 1883. (No model.) Patented in England December 24, 1881, No. 5,644.

To all whom it may concern:

Be it known that I, AMOS JOSEPH ACASTER, of Sheffield, in the county of York, England, engineer, a subject of the Queen of Great Britain and Ireland, have invented certain Improvements in and connected with the Manufacture of Railway-Rails and other similar longitudinal devices, of which the following is a specification.

This invention has reference to certain improvements in or relating to the method of and means for manufacturing grooved or recessed or indented and ribbed or beaded railway-rails, and grooved or recessed or indented and ribbed or beaded bars, girders, joists, and other similar longitudinal or structural devices which are or may be required for use for railway or tramway rails, or for bridge-building, or for other constructive purposes.

The present invention has especial reference to improvements in or connected with the practical carrying out, manufacture, or working of a material part of the invention secured to me by Letters Patent of the United States of America, bearing date the 2d day of July, A. D. 1878, and numbered 205,600, and which were granted unto me in respect of certain improvements in rail-joints for railways, the part whereof to which my present improvements have reference being the rails, various forms of which were described in the specification of the said Letters Patent, and were illustrated in the drawings annexed thereunto, the peculiarity of their formation being the manufacture thereof with grooves, recesses, or indentations (hereinafter referred to for conciseness of description simply as "grooves") or ribs or beads (hereinafter referred to simply as "ribs") longitudinally of the rails for the purposes of dispensing with the use of nuts and bolts in jointing or connecting the ends of adjacent rails, and with the necessity for drilling the usual holes therein, to reduce the cost and lessen the number of the parts required, and to provide a strong self-locking joint. The principle of the invention as therein described is equally applicable to longitudinal bars, and to girders, joists, and to other similar longitudinal or structural devices which it is required to unite end to end for various constructive or other useful purposes, and which it has been usual to unite, join, or connect together by means of side plates—such as fish-plates and bolts and nuts, which are always liable to loosen and come apart—and which have necessitated the drilling or perforating, and consequent weakening, of the connected parts; and therefore I desire it should be understood that where hereinafter the term "rails" is used (being used alone simply for conciseness of description) the reference comprehends rails of any usual section, and also comprehends the applicability of the improvements to such other similar longitudinal devices as are immediately hereinbefore referred to. Rails formed with such grooves or ribs in suitable positions for the intended purpose hereinbefore indicated cannot be properly rolled by any usual appliances without alteration of their shape adjacent to the grooves or ribs being rolled, as such grooves and ribs are formed (for the greater advantage as regards their intended use) at such angular relation to each other that the ordinary process and means of rolling rails cannot be used for their formation without, as aforesaid, alteration of the shape of the rails adjacent to the said grooves or ribs, which it is most important should not be effected, as there is thus given an imperfect and insecure means of retaining the wedge-keys by which the parts are united. Moreover, a great difficulty hitherto experienced in the manufacture of rails is that when rolled to form as regards their usual cross-sections they are not straight at the ends, which are more or less out of truth.

The accompanying drawings illustrate the apparatus herein described so far as it is necessary to render the same, and the method of operation thereof clear of comprehension without confusing the same by showing the neces sary standards, framing, or gearing, to none of which my present invention has any particular reference, all of which may be of any usual or suitable formation or description; and it should be understood, although the accompanying drawings only illustrate the manufacture of a double-headed rail, that the invention is equally applicable to the forming of bull-headed or other rails, or of bars, joists, or girders of any usual or required cross-section, in or on which it is required to form

grooves, or recesses, or indentations, or ribs, or beads longitudinally thereof, suitable for the purposes hereinbefore indicated.

My present invention has reference to a novel formation and arrangement of rolls which are so shaped, conformed, and arranged that at one operation the rails are perfectly rolled to the desired contour, and have the required grooves or ribs rolled into or onto them, and are consolidated and greatly strengthened, and issue from the mill straight and true in every respect. This arrangement of rolls is illustrated in the accompanying drawings in side view in Fig. 1 and in end view in Fig. 2; and it consists of the combination of series of horizontal, vertical, and inclined rolls, which are so shaped, conformed, and arranged as to encircle, confine, and support the rail at every part of its figure and for some portion of its length, so as at the one operation to roll it perfectly to form with the required grooves or ribs and straight and true throughout its length.

1 represents an opposite pair of horizontal rolls, which are shaped to the desired contour of the heads of the rail and between which rolls the rail is entered into the mill. These rolls may freely turn or may be driven. 2 is a succeeding pair of freely-turning vertical rolls, which are shaped to the desired contour of the inner sides of the heads and web of the rail, and guide the rail true to the grooving or ribbing rolls 3 4, which are also arranged in pairs, and are set in angular relation to each other, as shown. The pair of rolls 3 are shaped to give the required grooved or ribbed formation to one head of the rail, and opposite the rolls 3 the head being operated upon is encircled by a properly-shaped horizontal roll, 5, which is driven (or may freely turn) and confines the head of the rail against the pressure of the rolls 3 and prevents it from being improperly shaped. The pair of rolls 4, with their opposite roll 6, perform the same functions as the rolls 3 5, but they operate upon the other head of the rail. The pair of vertical rolls 7 receive the grooved or ribbed rail from the rolls 4 6 and keep it true, and can be shaped to partly close the grooves or turn down the ribs of the rails, and with the exit pair of horizontal rolls 8 to perfect the general contour of the rail and its grooves or ribs and keep it quite straight and true. In this arrangement of rolls the sets of rolls 1 2 and 7 8 may each be replaced by one pair of vertical rolls, which may be driven or freely turn on shafts, and each of these rolls would then be shaped to one-half of the desired section of rail. This improved arrangement of rolls may be used in connection with an ordinary rolling-mill for grooving and straightening rails rolled thereby, and for consolidating and strengthening them by giving the desired conformation to the rails when they are in a comparatively cool state.

I claim as my invention—

1. The combination of opposite pairs of horizontal and vertical rolls at the feeding and exit ends of a rail-rolling mill, with intermediate pairs of grooving or ribbing rolls 3 4, set at an angle, and opposite bearing-rolls 5 6, substantially as set forth.

2. The combination of opposite pairs of vertical rolls at the feeding and exit ends of a rail-rolling mill, with intermediate pairs of grooving or ribbing rolls 3 4, set at an angle, and opposite bearing-rolls 5 6, substantially as described.

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

A. J. ACASTER.

Witnesses:
CHARLES AUBREY DAY,
PERCY DAVIES DAY.