(No Model.)

J. R. JAMES.

RAIL BENDING TOOL.

No. 534,108. Patented Feb. 12, 1895.

Fig. 1.

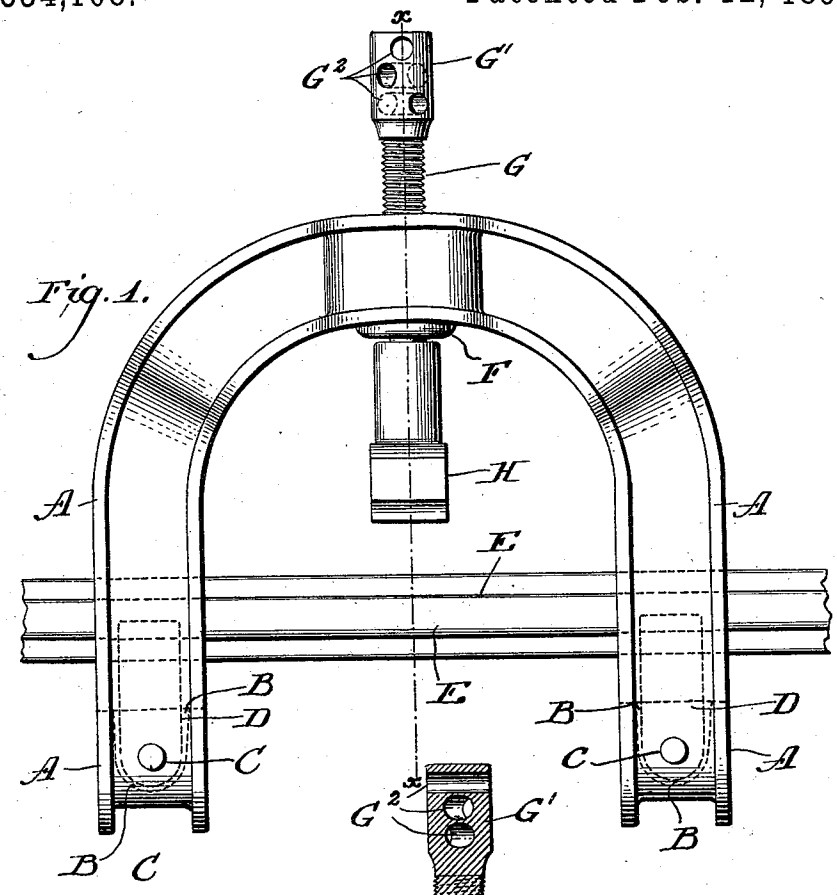

Fig. 2.

WITNESSES:
W. Barnet Le Van.
Chas. C. Collier.

INVENTOR:
James R. James,
by Chas. B. Collier.
Atty.

UNITED STATES PATENT OFFICE.

JAMES R. JAMES, OF PHILADELPHIA, PENNSYLVANIA.

RAIL-BENDING TOOL.

SPECIFICATION forming part of Letters Patent No. 534,108, dated February 12, 1895.

Application filed April 7, 1894. Serial No. 506,672. (No model.)

To all whom it may concern:

Be it known that I, JAMES ROWLAND JAMES, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Rail-Bending Tools, of which the following is a specification.

My invention relates to a rail bending tool in which a beam or yoke is provided at its respective extremities with jaws for holding or supporting the rail at two points, and in which a bending-head engaging with the rail between the two jaws is moved vertically in order to bend the portion of the rail between the two points of support.

It relates more particularly to mechanism for imparting a vertical movement to the bending-head.

In the ordinary construction an externally threaded bending head is inserted in a threaded aperture in the yoke. By turning the former transverse motion is imparted to it so that it bears down upon and bends the rail to the desired extent. This arrangement is attended in practice by certain disadvantages specifically enumerated in Letters Patent No. 426,277, issued to me April 22, 1890, and which it was the design of the invention described and claimed therein to obviate. This I succeeded in a great measure in accomplishing by the arrangement which, briefly described, consisted in attaching to the yoke an internally threaded bushing and in providing the bending-head with an externally threaded lug adapted to engage with the internal thread of a sleeve having an external thread engaging with the internally threaded bushing. This construction enables the bending-head to be removed when worn or when it is desired to substitute a bending-head of a different configuration suitable to operate upon a differently shaped rail. It enables the bushing when the threads formed or cut upon the inner surface become worn or abraded to be removed and a new one substituted. The internally and externally threaded bolt or sleeve may likewise be removed and replaced. Elements of weakness, however, still attach to this improved construction. The main sleeve is less strong than it would be were it not bored out centrally and longitudinally to permit engagement with the externally threaded lug of the bending-head. The lug itself in the construction is necessarily of much smaller diameter than the sleeve with which it meshes, and while it is less able, possibly, than any other working part to bear the strain to which it is subjected, it is the part which suffers the greatest strain. Then, too, on account of its small diameter and comparative weakness, it is not feasible to attach to it a bending-head having a bearing surface of sufficient width to engage the entire width of the rail.

The object of my invention is, therefore, primarily, to obviate these disadvantages, while at the same time to retain the advantages of my prior structure, and my invention consists of a rail bending tool provided with mechanism for moving the head transversely of the beam and that shall be applicable whether suspended, resting on a bed-plate, on the ground, or in place upon the ties, the preferred embodiment of which I will proceed to describe and particularly point out in my claims.

In the accompanying drawings, Figure 1, is a rear elevation of a rail-bending tool embodying my invention and showing the mechanism for moving the bending-head transversely of the yoke. Fig. 2, is a section on the line *x*—*x* of Fig 1.

A, is a yoke composed of steel or other material, preferably in section of **H**-shape, the respective extremities of which have the projections *a* provided with recesses B through which, and the projections, extend bolts C which act as shafts for the pivoted upright arms D. The latter, however, fits easily in a seat within the recess so that should the retaining bolts C C yield in any degree to the pressure or become reduced in diameter through wear the arms find their seats in the recesses and the stress is removed from the bolts. The arms D in turn support the rail E, and are of a configuration conforming to that of the rail, as may be seen by reference to Fig. 2.

F, is an internally threaded nut or bushing fitted and keyed, as in Fig. 2, to place in an aperture formed in the center of yoke A.

G is a rod having an external thread to engage the internal thread formed upon the bushing F, and provided with a head G′ hav-

ing the holes g^2 through which may be inserted hand bars to rotate the same.

The bushing F may be omitted and the yoke A internally threaded, this construction, however, being inadvisable because the wearing away or abrasion of the thread of the aperture would render unfit for use the entire yoke. As it is the bushing when worn may be removed and replaced. The rod G is also provided at the lower end with another external thread of opposite pitch to the thread at its upper portion. This thread is adapted to engage the interiorly threaded bending-head H, which is shaped on its lower or bending surface to conform to the configuration of a section of the rail E.

The mode of operation of my invention is as follows:—The rail E rests upon the supporting arms D. The threaded rod is rotated in the direction that will impart to it a downward movement through the stationary bushing F. The bending-head H is held from rotation manually and will, of course, by reason of the opposite pitches of the upper and lower threads of the threaded rod, have a movement relative to the movement of the rod. The operation is continued, with little friction and no resistance, inasmuch as the mechanism performs no work, until the bending-head is brought in contact with the rail. The rotation of the rod is continued until the desired bend of the rail is effected, the bending-head in the meanwhile being held from rotating by reason of the sides thereof being confined between the flange and head of the rail. The rail bending tool is then moved along longitudinally and the rail subjected to repeated bending actions until it is bent to the desired curvature. As the rail is bent the arms D, keep their entire bearing surface in contact with the rail; that is they are constantly at right angles and swing inwardly on their pivots to an extent corresponding with the extent of the bend of the rail, being limited, however, in their movement by the jaws of the recesses.

If the rail, by accident or mistake, is bent too much this may be corrected and the required curvature obtained by turning the rail bending machine over and placing the highest point of the curve of the rail against the bending-head and then force the latter forward as above described.

I have shown the rod G of smaller diameter throughout that portion which engages the bending-head H than throughout that portion which engages the bushing F. This construction is not essential, but is preferable, inasmuch as it permits the bending-head to have the annular walls of a thickness and strength calculated to resist the strain to which it is subjected, and besides enables the rod when the several parts are placed in position or attached, to be inserted or withdrawn from above without occasioning interference between the lower exterior thread and the interior thread of the bushing.

I am enabled, thus to provide the mechanism with a bending-head of requisite strength and bearing surface, while at the same time the rod G is not weakened by being bored out internally.

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

1. The combination in a rail bending tool, of a beam or yoke, an attached bushing removable therefrom but non-revoluble therein and suitably held in place, and having a threaded aperture, an internally threaded bending head adapted to engage a rail and conforming thereto in outline, and a rod having a lower external screw thread adapted to engage with the interiorly threaded bending head, and an upper external screw thread adapted to engage with the internally threaded bushing, substantially as described.

2. In a rail bending tool, the combination of a beam or yoke having recesses at its opposite extremities, vibrating arms, within said recesses for supporting the rail and conforming in outline to the rail its entire height, an internally threaded bushing rigidly secured to said beam or yoke, an internally threaded bending-head adapted to engage the rail and conforming to the rail at the point of contact therewith, a rod having an upper external screw thread adapted to engage with said internally threaded bushing, and a lower external screw thread adapted to engage with the internally threaded bending-head, substantially as described.

3. The combination in a rail bending tool of a yoke having recesses at its opposite extremities, a bolt extending through each of said recesses, upright rail-supporting arms pivoted to said bolts, an internally threaded bushing keyed to said yoke, an internally threaded bending-head adapted to engage a rail, a rod having an upper external screw thread adapted to engage with said internally threaded bushing, and a lower external screw-thread adapted to engage with the internally threaded head, substantially as described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

JAMES R. JAMES.

Witnesses:
GEO. W. REED,
CHAS. C. COLLIER.