(No Model.)

J. W. THOMAS.

ROLLS FOR ROLLING SUSPENSION RAILS.

No. 560,949. Patented May 26, 1896.

Fig. 1.

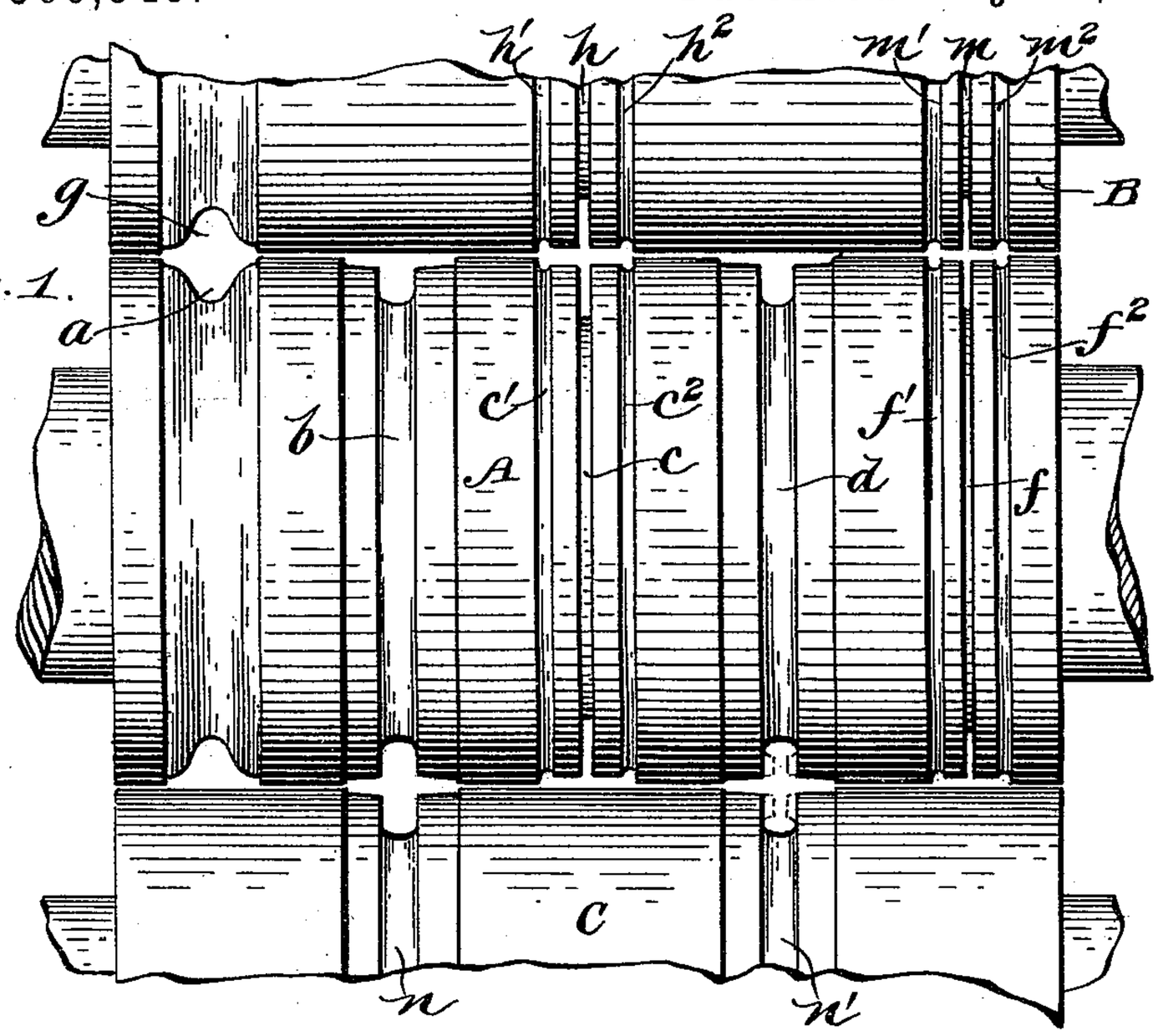


Fig. 2.

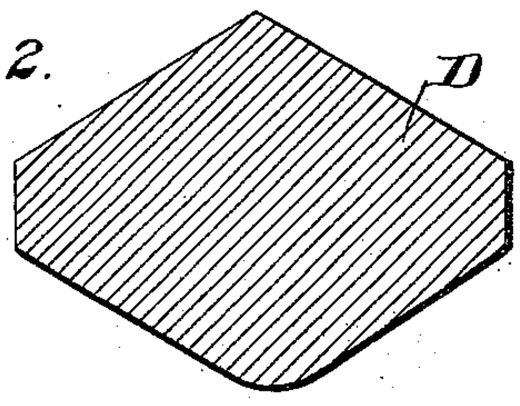


Fig. 3

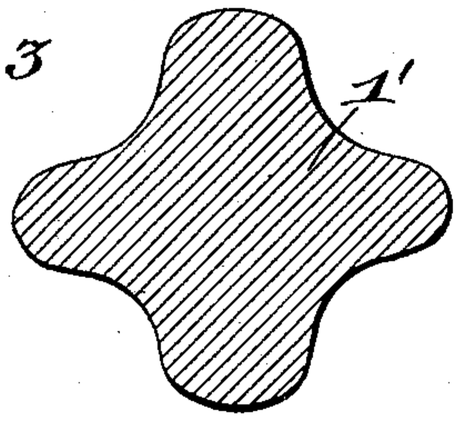


Fig. 4.

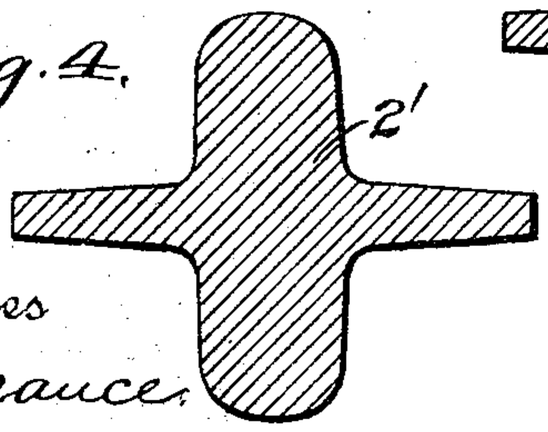


Fig. 5.

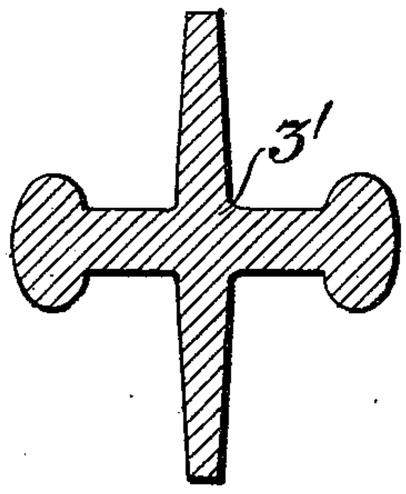


Fig. 6.

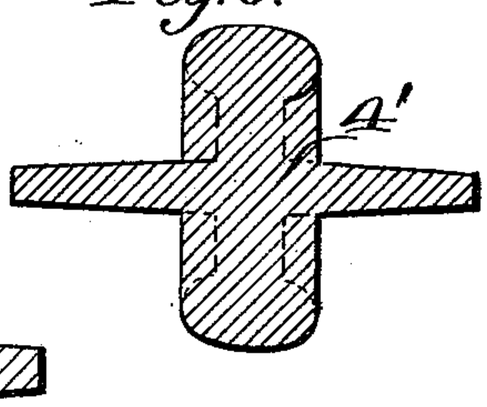


Fig. 7.

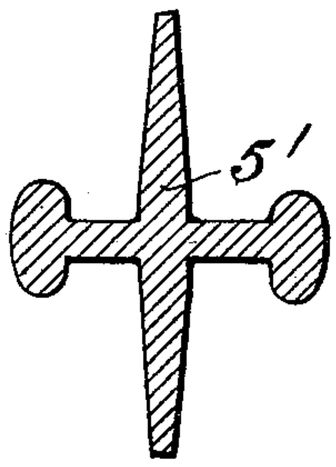
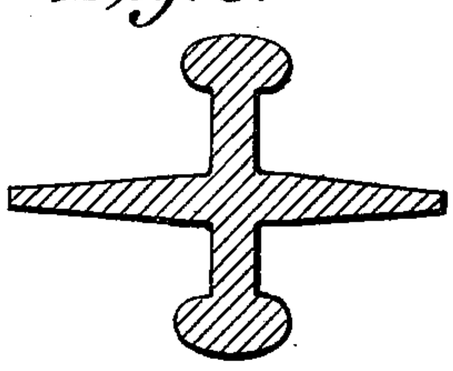


Fig. 8.



Witnesses
Geo. Geverauce.
W. Harvey Muzzy.

Inventor
John W. Thomas
by Mason, Fenwick & Lawrence
his
Attorneys

UNITED STATES PATENT OFFICE.

JOHN W. THOMAS, OF CHICAGO, ILLINOIS, ASSIGNOR TO JOSEPH E. PORTER, OF OTTAWA, ILLINOIS.

ROLLS FOR ROLLING SUSPENSION-RAILS.

SPECIFICATION forming part of Letters Patent No. 560,949, dated May 26, 1896.

Application filed September 19, 1894. Serial No. 523,504. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. THOMAS, of Chicago, in the county of Cook, State of Illinois, have invented new and useful Improvements in Rolls for Rolling Suspension-Rails Having Upper and Lower Heads and Intermediate Flanges, of which the following, in connection with the accompanying drawings, is a full, clear, and exact description.

In the accompanying drawings, Figure 1 is a broken front elevation showing a set of rolls of a rolling-mill adapted for rolling a rail having upper and lower heads, a vertical web, and intermediate flanges. Figs. 2 to 7 illustrate in cross-section the different forms to which a billet of metal is rolled up to the completion of the rail, and Fig. 8 is an end view of the rail in the upright position in which it is used.

My invention consists in the novel construction and combination of a set of grooved rolls, three in the set, the grooves being shaped and constructed in the respective rolls in the novel manner hereinafter described, so as to produce successive changes in the form of a billet of iron or steel and finally produce the type of rail patented to Joseph E. Porter December 13, 1892, No. 487,966, which type of rail has an upper head, a lower head, vertical connecting-web, and broad horizontal flanges midway between the two heads for the wheels of a hay-carrier to run upon. A rail of the type mentioned requires the rolls of the peculiar construction that I have invented for rolling it on account of its having two narrow heads and two thin and broad intermediate horizontal flanges, all connected by a vertical web.

In the drawings, A, B, and C designate three rolls with journals and adapted to be arranged in suitable standards or housings (not shown) of a rolling-mill, the rolls being set one above another. The middle roll A is provided with ordinary preliminary reducing passes or grooves a b and special shaping grooves or passes c c' c^2 d and f f' f^2, as shown. The top rail B is provided with an ordinary preliminary groove or pass g and special shaping-grooves h h' h^2 and m m' m^2 and the bottom roll C with an ordinary preliminary reducing-groove n and a special shaping-groove n'. The rolls A and B have their grooves a and g shaped as shown, and they are adapted by a flatwise pass 1 for reducing a billet D of metal from the shape shown in Fig. 2 to the form of the partly-rolled bar 1′. (Shown in Fig. 3.) The rolls A and C have their grooves b and n shaped as shown and are adapted by a flatwise pass 2 for reducing the partly-rolled bar shown in Fig. 3 to the form of the partly-rolled bar 2′. (Shown in Fig. 4.) The rolls A and B have their grooves c c' c^2 and h h' h^2 shaped as shown and are adapted by an edgewise pass 3 for shaping the partly-rolled bar 2 to the form of the partly-rolled bar 3′. (Shown in Fig. 5.) The rolls A and C have their grooves d and n' shaped as shown and adapted by a flatwise pass 4 for reducing the partly-rolled bar shown in Fig. 5 to the form of the partly-rolled bar 4′. (Shown in Fig. 6.) In this latter pass of the bar the heads which have been formed upon it are adjusted to a vertical position and the flanges to a horizontal position, and during the operation the web of the partly-rolled rail is shortened and the horizontal flanges thinned on a taper, the crowded metal occupying, or nearly so, the spaces between the heads and flanges, as illustrated, and the rolls A and B have their grooves f f' f^2 and m m' m^2 shaped as shown and adapted by an edgewise pass 5 for reducing the partly-rolled rail 4 (shown in Fig. 6) to the form of the finished rail 5′. (Shown in Figs. 7 and 8.) In this last pass of the bar the heads and web are adjusted in the same position as when passed through the grooves c c' c^2 and h h' h^2, and the product is a rail corresponding in cross-section to Figs. 7 and 8. It will be observed that the flanges and web of the partly-rolled rail 3′ (shown in Fig. 5) are of nearly corresponding thickness and that the flanges are slightly tapered, which latter is also the case in Fig. 4; that the flanges of the partly-rolled rail shown in Fig. 6 are thinned on a greater taper outward from the web, and the web is shortened, this resulting from the metal between the heads and flanges, which is crowded downward, inward, and upward in this pass, having freedom to gradually spread in the spaces between the heads and flanges of the bar and in doing so give increased thickness, as represented in Fig. 6, to the web below the head.

In this pass the flanges are finished, being thinned and tapered outward. In Figs. 7 and 8 is shown the manner in which the web is thinned relative to the web shown in Figs. 5 and 6, this latter shape of the web being imparted to the bar in the last pass.

The operation of rolling is as follows: The billet D, Fig. 2, is inserted flatwise in preliminary pass 1, Fig. 1, forming shape 1′, Fig. 3. It is then inserted flatwise in pass 2, Fig. 1, slightly tapering the wheel-supporting intermediate flanges and forming shape 2′, Fig. 4. It is then inserted edgewise in preliminary pass 3, Fig. 1, forming the horizontal heads and the web, making shape 3′, Fig. 5, grooves *c h* being wide enough to allow the thickest parts or roots of the flanges to pass, so that no action to change the taper of the flanges takes place in said pass 3. It is then inserted flatwise in pass 4, Fig. 1, finishing the taper of the flanges and depressing the heads, making shape 4′, Fig. 6, dotted lines showing the shape of rail in pass. It is then inserted horizontally in pass 5, Fig. 1, finishing the head and web and making rail complete, as shown in shape 5′, Fig. 7, grooves *f m* in pass 5 being wide enough to admit the thickest parts or roots of the flanges without changing the form of the flanges. The grooves marked *c h* and *f m* are not tapered, the flanges being tapered entirely in lower passes 2 and 4.

The great object sought in rolling the rail (shown in Figs. 7 and 8) is to have the web, heads, and flanges form right angles as nearly as practicable where they unite and to have the flanges broad and the web as short as possible, so that the heads, respectively, shall have a nearly horizontal under and upper surface beyond the web and thus provide a suitable means for connecting suspending hooks of hay-carrier tracks and also a suitable means for clamping a knocker-block upon the under head afforded, as is now commonly done with hay-carrier rails of the Porter type.

The rolls herein described have been practically employed in rolling the rail herein described and shown and found successful, they turning out rails weighing only about two pounds to the foot, which are stiff and strong and perfectly adapted for forming suspended hay-carrier tracks.

The rolls, by slightly changing the size of the grooves, will produce rails of a greater or less weight, and the product will answer for other purposes than hay-carrier tracks.

I claim—

1. A set of rolls for rolling side-bearing suspension-rails, having flat passes for preliminarily reducing a billet to a cross-shaped form having side flanges, an edge-pass for further developing said form and for producing a lateral projection at each edge of the vertical web portion thereof, a flat pass provided with grooves for reducing by endwise compression the cross-shaped form and thereby thickening the web, and with side grooves for further reducing the flanges, and a pass for rolling out the thickened web and finishing the rail, substantially as and for the purpose specified.

2. A set of rolls for rolling side-bearing suspension-rails having passes 1 and 2 for reducing a billet to a cross-shaped form having a thickened vertical web and tapering side flanges, a pass 3 for rolling out flatwise the thickened web and producing a lateral projection on each edge thereof, a pass 4 having grooves for vertically compressing and thickening the web and for further reducing and tapering the side flanges, and a pass 5 for reducing the rail to its finished form, substantially as and for the purpose specified.

3. A set of rolls for rolling a rail of the type herein described, said rolls having flat passes for preliminarily reducing a billet to a cross-shaped form, to wit: with a vertical web and intermediate horizontal side flanges; an edge-pass for further developing said form and producing upon the billet laterally-extending projections or heads, the same being on the edges of the vertical web portion thereof, and one or more passes for finishing the rail.

4. In a set of rolls for rolling the type of rail herein described, the combination of a roll A having ordinary preliminary reducing-grooves, and special grooves *c*, *c′*, *c²*, *d*, *f*, *f′*, *f²*; a roll B having an ordinary preliminary reducing-groove and provided with the special grooves *h*, *h′*, *h²*, *m*, *m′*, *m²*; and a roll C having an ordinary preliminary reducing-groove and the special groove *n′*; whereby the billet of metal after passing flatwise, twice, through the preliminary reducing-grooves is brought by an edgewise pass to the form 3, and then by a flatwise pass, to the form 4, and finally by an edgewise pass to the form 5, substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JOHN W. THOMAS.

Witnesses:

PRESTON T. LANGE,

WM. M. ADAMS.