N. RENDLEMAN.

RAIL.

APPLICATION FILED SEPT. 29, 1908.

939,319.

Patented Nov. 9, 1909.

FIG. 1.

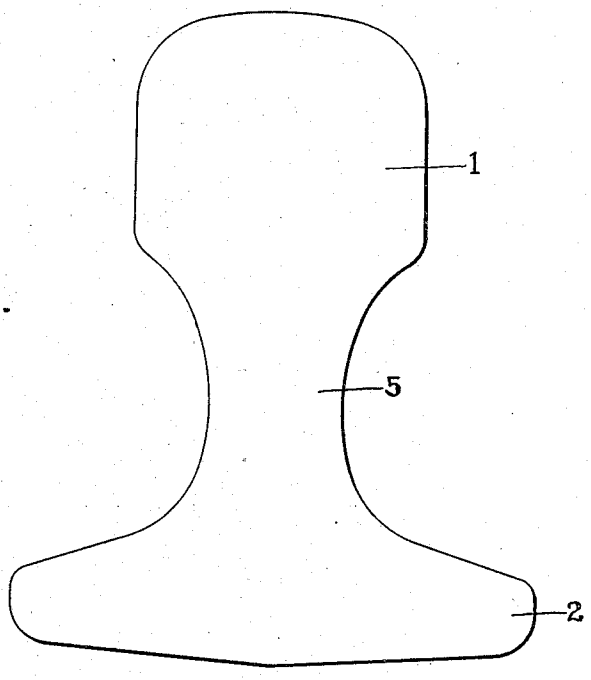
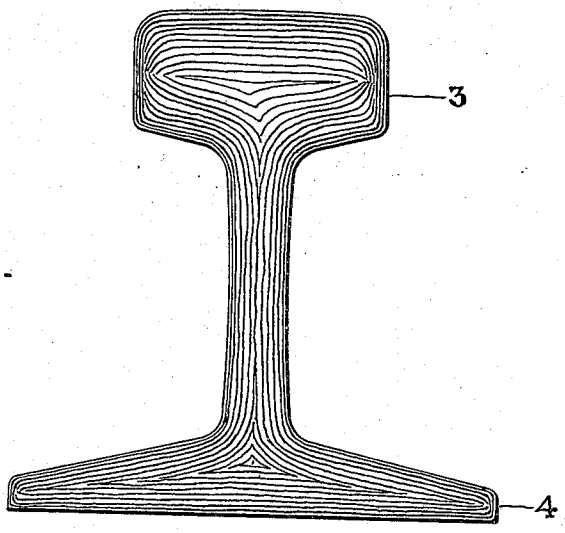


FIG. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

NORMAN RENDLEMAN, OF KNOXVILLE, PENNSYLVANIA, ASSIGNOR TO JONES & LAUGHLIN STEEL COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RAIL.

939,319. Specification of Letters Patent. Patented Nov. 9, 1909.

Application filed September 29, 1908. Serial No. 455,283.

To all whom it may concern:

Be it known that I, NORMAN RENDLEMAN, residing at Knoxville, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Rails, of which improvement the following is a specification.

Rails and other structural shapes produced by methods now in general use, have a stratified structure, the stratification being in planes parallel with the direction in which stress is applied to the rail when in use. As is well known a stratified structure will present little resistance to disintegration by pressure or blows applied in directions parallel with the planes of stratification compared to its resistance when the pressure or blows are applied in directions at right angles to such planes.

The invention described herein consists generally stated in structural shape and under this term is included rail beams, etc., having the planes of stratification of the parts directly subjected to injurious or disintegrating pressure or blows in planes substantially at right angles to the directions in which such forces are applied.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification Figure 1 is an end elevation of a "shape" or "form" from which my improved rail is produced and Fig. 2 is an end elevation of a completed rail.

In the practice of my invention, the reduction of the bloom or ingot is so effected that during a part at least of such reduction and while the metal is sufficiently plastic or ductile to permit of the free flow of the metal under reducing pressure, that the metal of the head and flange will stratify or tend to stratify in planes at right angles to the direction in which the load will be applied to the rail when in use. A desirable method of manufacturing my improved rail is shown and described in an application, Serial No. 455,284 filed September 29th 1908.

In manufacturing my improved rail the ingot or bloom is first reduced to a "shape" or "form" in any suitable manner, as by suitably shaped passes in horizontal rolls. The "shape" or "form" has a height greater than that desired in the finished rail, while the width of the head and flange portions 1 and 2 are only a little greater than the widths of the head and flange 3 and 4 of the finished rail. The web portion 5 of the "shape" is considerably thicker than the finished web. This "shape" is reduced in rolls having passes so constructed, that in such passes reducing pressure is applied in such manner that the head web and flange portions of the shape are progressively reduced in thickness, such reduction differing from the present practice in which the head and flange portions are reduced in width and but slightly in thickness. The thickness of the web portion of the shape is reduced by pressure applied in directions at right angles to that of the pressures applied to the head and flange portions.

As is well known the metal while being reduced, will stratify or tend to stratify in planes at right angles to the direction in which the reducing pressures are applied. Hence in forming a structural shape in the manner described, the metal will stratify in the manner indicated in Fig. 2. In the web, the planes of stratification are vertical and substantially parallel with the sides of the web, while in the flange and head the stratification is substantially horizontal. Where the web merges into the head and flange and the direction of application of reducing pressure changes, there is a change or curvature of the stratification, the vertical strata of the web being bent laterally and merging gradually into the horizontal strata of the head and flange. The horizontal strata of the head and flange will serve to prevent any splitting or separation of the strata of the web.

As is well known, a stratified structure will be quite rigid when subjected to a load in a direction parallel with the strata but will have some considerable flexibility or resilience if the load be applied at right angles to the planes of stratification.

My improved structural shape has the planes of stratification so arranged that the shape will present the greatest possible resistance to breakage under loads and also possesses considerable resilience or flexibility, and is therefore less liable to injury by suddenly applied loads.

I claim herein as my invention:

1. A structural shape having in the enlargement along one edge of the web a strata

produced in reduction, disposed in planes substantially at right angles to the direction in which stress is applied to the shape when in use.

2. A rail having the strata formed in the head and flange during reduction, disposed in planes substantially at right angles to the direction in which load is applied to the rail.

3. A rail having strata formed in the head, web and flange during reduction, so disposed that the strata in the head and flange are in substantially parallel planes and at right angles to the planes of the strata of the web.

In testimony whereof, I have hereunto set my hand.

NORMAN RENDLEMAN.

Witnesses:

CHARLES BARNETT,

FRANCIS J. TOMASSON.