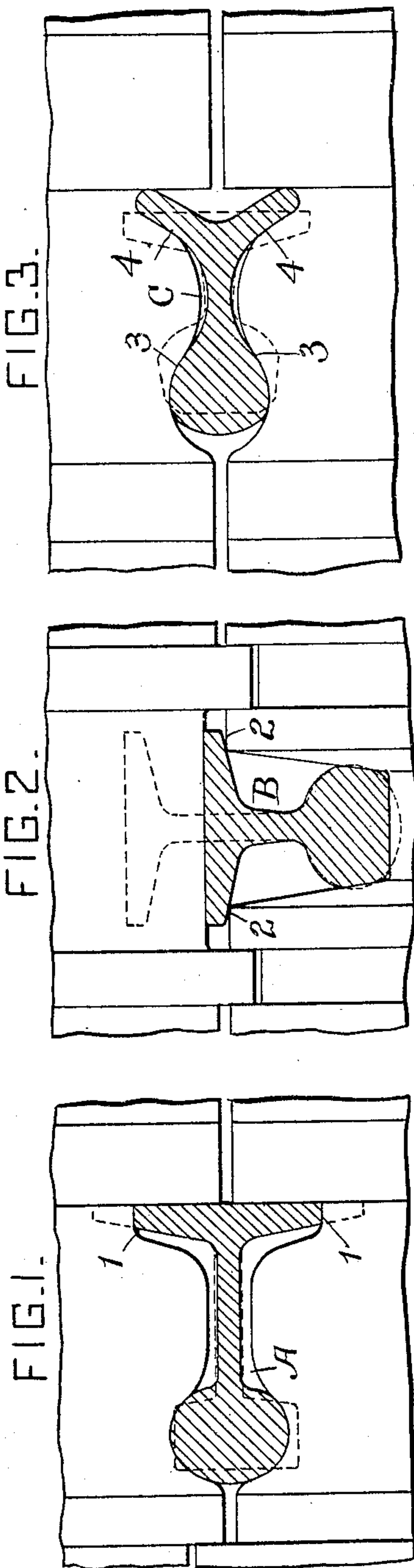


No. 872,056.

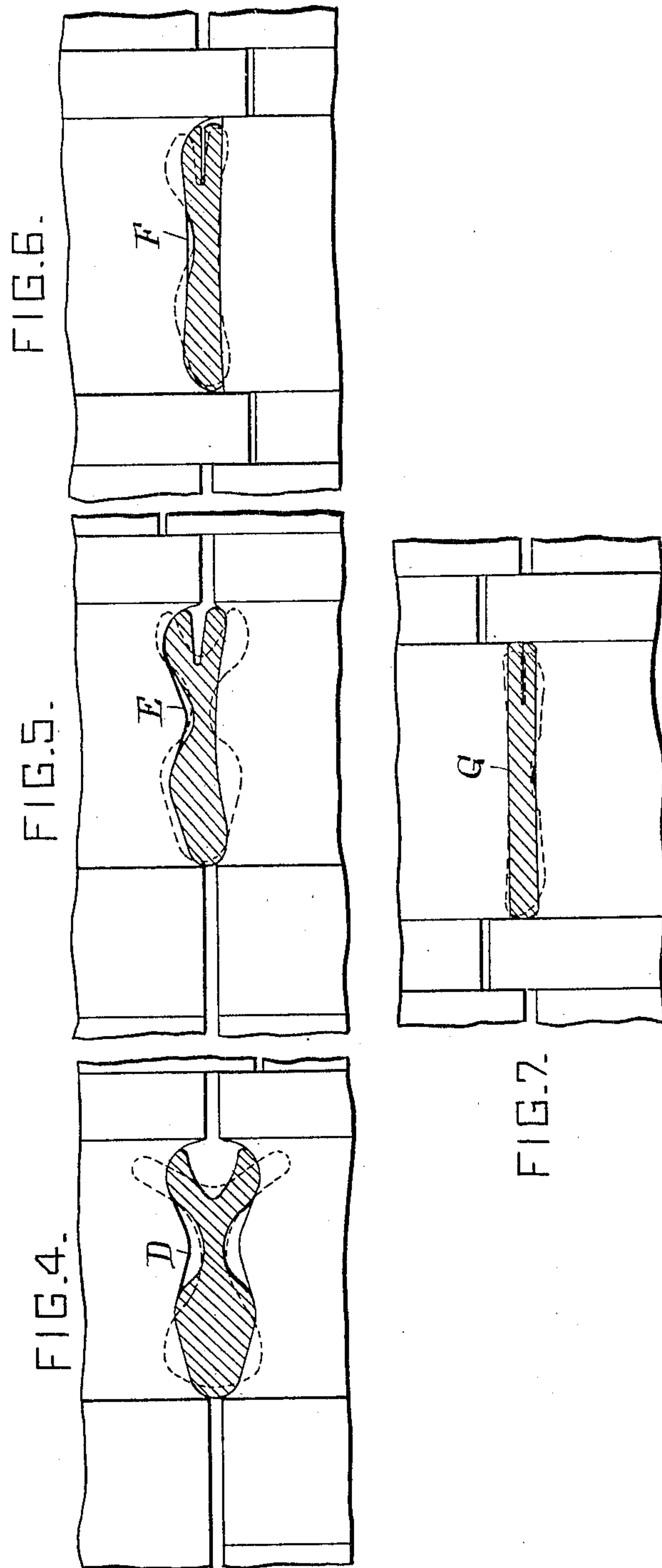
PATENTED NOV. 26, 1907.

A. P. DIESCHER.
REROLLING RAILS.
APPLICATION FILED MAY 23, 1904.



WITNESSES:

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UNITED STATES PATENT OFFICE.

AUGUST P. DIESCHER, OF PITTSBURG, PENNSYLVANIA.

REROLLING RAILS.

No. 872,056.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed May 23, 1904. Serial No. 209,322.

To all whom it may concern:

Be it known that I, AUGUST P. DIESCHER, residing at Pittsburg, 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 Rerolling Rails, of which improvements the following is a specification.

The invention described herein relates to certain improvements in reducing old rails to other shapes. In carrying out my improved method the head and flange of the rail are brought to or approximately to the thickness of the web of the rail, which is not subjected to any transverse reduction except at or near the end of the rolling operation, in the finishing passes. As the web is not subjected to any reduction by the rolls during practically the entire reducing operation. Any elongation during the reduction of the head and flange must be due to longitudinal stretching. But as is well known in the art of rolling the stretching to which any portion of an article can be subjected is very limited, hence in reducing the rails, reducing pressure is so applied to the head and flange that the latter during reduction are spread laterally, and to a very limited extent elongated.

As is well known rails vary greatly in transverse dimension, hence while a mill having its passes constructed to operate on rails of certain transverse dimensions would successfully reduce such a rail, it would be inoperative to reduce rails differing from such dimensions. If a rail having a less height or narrower flange than that on which the passes were designed to operate, the passes would not be filled and some portions of the rail would be reduced very little if at all and a camber would be given to the rail. If on the other hand it would be attempted to reduce a larger rail than that for which the passes were designed, such rail could not be entered into the passes. To overcome this difficulty provision is made in the practice of my invention, for standardizing the rails, i. e. bringing them to or approximately to a given width of head and flange and to given height. In bringing the rails to the desired width of head and flange the metal of the head is so distributed that the subsequent reduction of rail to standard height, the metal of the web will flow into the head enlarging the latter and not enter the head as a wedge.

In the accompanying drawings forming a part of this specification Figures 1 to 7 show portions of rolls having passes for producing the desired reduction of the rail to the finished blank.

In illustrating my invention the outlines of the passes and the shape produced by such passes are shown in full lines while the cross-sectional shape of the article prior to its reduction is shown by dotted lines. It will be understood by those skilled in the art that the passes shown may be embodied in either two or three mills.

In the practice of my invention the rail having been properly heated is entered into the pass A, which is constructed and proportioned to have a reducing effect only upon the sides of the head and the edges of the flanges of the rail. The reduction effected on the head portion of the rail is more particularly for the purpose of effecting a uniform distribution of the metal with reference to the web of the rail and to produce an elongation of the head portion equal to that effected by the portions 1 of the pass on the flanges, which are subjected to edgewise reduction to increase the thickness of the flange and to bring it to a standard width. It will be observed that, as before stated, no other portions of the pass A than those operative on the head and flanges come into contact with the rail. It will be observed that the underside of the head of the rail before introduction into pass A is nearly flat, and its surface is in a plane approximately at right angles to the web. In the pass A the metal of the head is so distributed as to form a fillet a along the junction of the head and web. By this disposition of the metal of the head, the proper flow of metal in the next pass is insured.

From the pass A the rail in a vertical position is put through the pass B which is constructed and proportioned to effect a reduction of the height of the rail. It is found that in this pass there will be very little upsetting or enlargement of the web portion, reduction in height being the result of the metal of the web being forced into the head. By reason of the change in shape of the head in pass A and the formation of the fillet a the metal of the web will flow into the head and be incorporated therewith. Only when rolling rails differing considerably in height from the predetermined standard will there be any material upsetting of the web in that

pass. In order to prevent the bending of the flanges of the rail in this pass, shoulders 2 are provided on the middle roll for supporting but without any material reducing action upon the flanges.

The rail having been standardized as regards its height, and the width of the head and flanges, it is entered into pass C. It will be seen that the shoulders 3 and 4 which bear respectively against the inner portions of the head and flange, are a greater distance apart than said surfaces of the head and flange, so that these shoulders will have a wedging action forcing the head away from the flanges. As the head is more rigid than the flanges, the transverse strain brought upon the web will tend to pull the flanges towards the head. But as the shoulders 4 will not only prevent such movement of the outer portions of the flanges, but will force them in the opposite direction, only the portions of the flanges adjacent to the web will be moved towards the head, and the bending of the flanges is due to pressure exerted in one direction on the outer portions of the flanges and a pull exerted in the opposite direction on intermediate portions of the flanges. During this same pass an upsetting of the flanges will occur the metal being forced towards the web and the head will be flattened. It will be observed that during this pass as in the previous passes, the web portion of the rail is not reduced by the active operation of the shoulders. If any reduction occurs, it is due to the transverse pull and some slight elongation to which the web is subjected. But such reduction will be wholly or partially compensated for by the metal forced into the web by the upsetting of the flanges. The rail with its partially bent flanges is then put through pass D, whereby the head of the rail is reduced transversely or flattened in the direction of the height of the rail, and the partially bent flanges are bent more towards parallelism and further upset. As the web portion is not operated on by the rolls, there may be some slight enlargement of the web by the flow of metal from the head and flanges. From pass D the rail is entered into pass E where further reduction of the head is effected, and the flanges are brought almost into contact with each other. In this pass one side of the web is for the first time brought into reducing contact with the rolls so that one side of the rail or article is brought to a uniform plane. From pass E the rail is put through pass F where the slight transverse bend given by pass E is removed, and the article reduced to or approximately to rectangular form by the reduction of the head and flange portions the metal flowing into

the web. The article is reduced to the desired shape or commercial form by the box-pass G.

It is characteristic of each of the passes until the article has assumed or nearly assumed its final shape, that only the head and the flanges are subjected to the active reducing action of the rolls, and that the reduction of the head and flange result in a lateral flow of the metal and produces comparatively little elongation. The elongation of the head and flanges will have a stretching effect on the web, but it will be observed that in each pass metal is forced from the head or flanges or both into the web, thus compensating for the stretch to which the web may be subjected.

It is also characteristic of the invention that the initial bending of the flanges is due to the outward pressure exerted against the inner sides of the head and flanges, while the middle portion of the flange or that connected to the web, serves as a fulcrum around which the flanges are bent or moved by the wedge action of the rolls.

I claim herein as my invention:

1. As an improvement in the art of utilizing rails, the method herein described, which consists in reducing the width and increasing the thickness of the flanges of rail and simultaneously reducing the transverse and increasing the vertical thickness of the head of the rail and finally reducing the height of the rail.

2. As an improvement in the art of utilizing rails, the method herein described which consists in subjecting the head and flange of the rail to transverse reduction and simultaneously applying a lateral spreading pressure to the inner walls of the head and flange thereby bending the flanges outwardly and elongating the head in the direction of the plane of the web.

3. As an improvement in the art of utilizing rails the method herein described which consists in laterally spreading the head and flange portion and in applying pressure to edges of the head and flange without subjecting the web to reduction.

4. As an improvement in the art of utilizing rails, the method herein described which consists in causing the flanges to approach each other, while subjecting them to an upsetting action and in forcing the metal of the head transversely of the rail while reducing its thickness.

In testimony whereof, I have hereunto set my hand.

AUGUST P. DIESCHER.

Witnesses:

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F. E. GAITHER.