

(No Model.)

2 Sheets—Sheet 1.

H. W. THOMAS.
ROLLS FOR ROLLING GIRDER RAILS.

No. 449,013.

Patented Mar. 24, 1891.

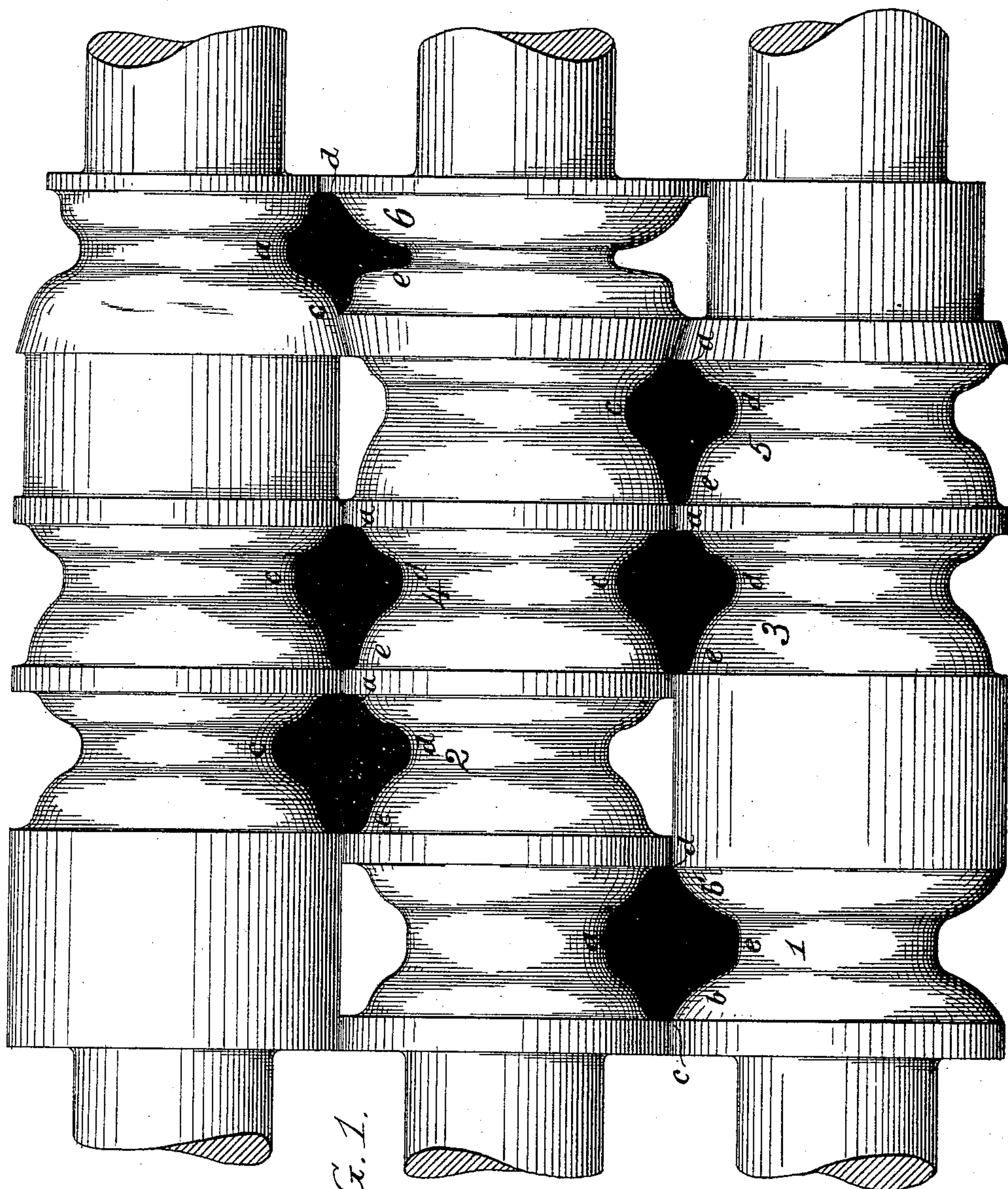


FIG. 1.

Witnesses:

John J. Beary
Alex. Barkoff

Inventor:

Henry W. Thomas
by his Attorneys
Howson & Howson

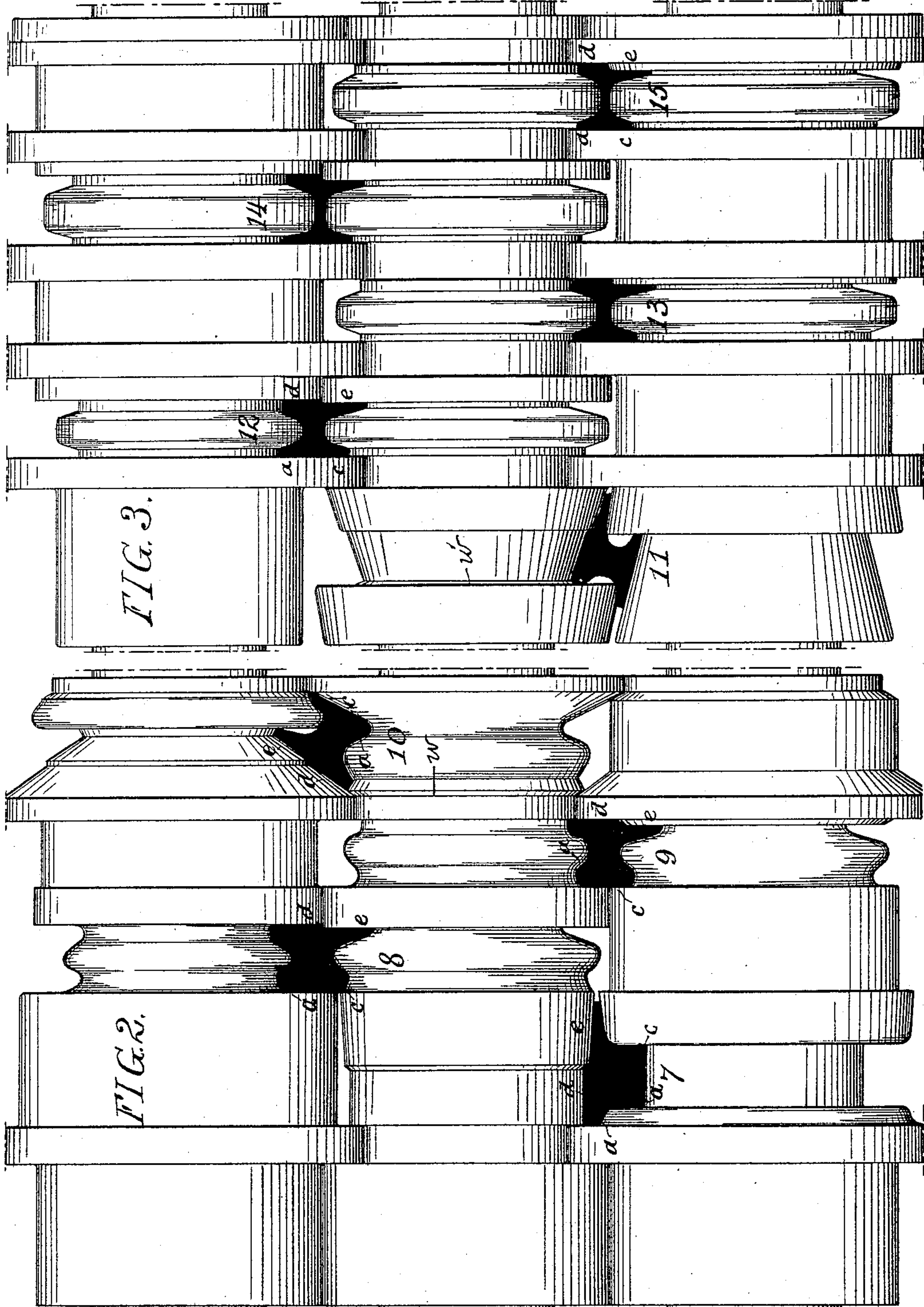
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UNITED STATES PATENT OFFICE.

HENRY W. THOMAS, OF DANVILLE, PENNSYLVANIA, ASSIGNOR TO THE
NORTH BRANCH STEEL COMPANY, OF SAME PLACE.

ROLLS FOR ROLLING GIRDER-RAILS.

SPECIFICATION forming part of Letters Patent No. 449,013, dated March 24, 1891.

Application filed May 1, 1889. Serial No. 309,174. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. THOMAS, a subject of the Queen of Great Britain and Ireland, residing at Danville, Montour county, Pennsylvania, have invented certain Improvements in Rolls for Rolling Girder-Rails, of which the following is a specification.

The object of my invention is to provide rolls for reducing a rectangular bloom into a side bearing flanged girder-rail.

In the accompanying drawings, Figure 1 is a side view of the first roughing-rolls with the passes indicated in section. Fig. 2 is a side view of the second roughing-rolls, also with the passes shown in section; and Fig. 3 is a side view of the finishing-rolls with the passes in section.

The first pass 1 is a quadrangular pass with rounded corners, the contour of the upper roll being practically flat at the center with ogee-curved sides, while the bottom roll has a practically flat center with curved sides, the groove in the lower roll being by preference deeper than that of the upper roll for the commencement of the formation of the tram portion of the rail. The bloom is passed into this pass diagonally, instead of flat, as in ordinary rolling. The bloom is concaved on two sides by the ogee sides of the upper roll, while the bottom roll simultaneously gives curvature to the two opposite sides, the bloom being thus reduced to the desired form of bar to be operated on in another direction in the four following passes 2, 3, 4, and 5. The portion *a* of the bar resulting from the first pass is gradually formed into one of the flanges of the rail, while the portion *c* is formed into the opposite flange, the portion *d* being formed into the head and the portion *e* into the tram of the rail. The action of the pass 2 is to reduce the section of the bar and at the same time to continue the shaping out of the tram portion. The same is the case with passes 3, 4, and 5, the contour of the passes gradually changing to suit pass 6. This pass 6 is peculiar in form and receives the bar turned one-quarter downward, one of the rolls having a deep groove to receive the long tram projection *e*, which was gradually formed in the proper passes.

It will be understood that the groove for forming the projection *e* may be turned in the upper roll in place of the lower one without departing from my invention.

In the pass 6 the portion *d* is compressed, so as to thin it and reduce it to a rudimentary form of head, and at the same time the web portion of the bar is reduced in thickness. The bar from pass 6 is inserted into pass 7 of the rolls, (shown in Fig. 2,) which are the second roughing-rolls. This pass 7 receives the bar one-quarter turned from pass 6, and reduces the height of the bar, and still further shapes the head and tram, forming at the same time the shoulder between these two portions of the rail. It will be noticed that in this pass 7 the metal is not only compressed at the tram portion *c*, but also at the head portion *a*, thus preventing any distortion or twisting of the metal as it is projected from the rolls.

The bar is introduced into pass 8 one-quarter turned. This pass is so formed as to compress the bar at the center, thus carrying forward the shaping of the web portion of the rail, and pass No. 9 continues the formation of the web.

Pass 10 is an oblique dummy pass, the object of which is to give the proper shape to the head and to the flange directly under the tram portion of the rail, as shown, the metal of the tram portion and of the flange under the head being practically undisturbed.

The first pass 11 in the finishing-rolls, Fig. 3, reduces the height of the rail, and also shapes the tram and the flange directly under the head of the rail in the same manner as the pass 10 shaped the head of the rail and the opposite base-flange.

In both of the passes 10 and 11 it will be noticed that the projecting portions on opposite sides of the rail-bar are simultaneously acted upon, so that the bar will pass through the rolls in a straight line without distortion. As the flat portions of the passes 10 and 11 are oblique, the rolls are provided with beveled fillets *w* and *w'*, so that the two portions of each pass corresponding to the top and outer side of the head of the rail are at right angles to each other, whereby the

proper shape of the outer corner of the head is maintained for its passage through the subsequent passes, in which such right-angled corner is present. The beveled corner w' ,
 5 also by bearing against the end of the head portion of the bar, prevents lateral displacement of this portion of the bar, so that the tram portion will be promptly acted upon.

The shaping of the tram portion of the rail
 10 from its junction with the web to the outer end without action upon or interference with the base-flange under said tram constitutes a distinctive feature of my invention, the said base-flange preventing a grip upon the tram
 15 portion of the rail down to the root of the same when ordinary methods of rolling are adopted.

The main purpose of the passes 12, 13, 14, and 15 is to reduce the rail to its proper form,
 20 which is done without interfering with the shape of the tram-head and opposite base-flange of the rail.

By the above-described operations I am enabled to form a wide tram-flanged girder-
 25 rail by simple rolling and without that disfiguring of a portion of the tram which frequently results when the ordinary flat dummy passes are used.

It will be understood that I do not limit
 30 myself to three-high rolls, as two-high rolls may be used, and the reducing-passes may be of different form or number, as required in rolling different sizes or weights of rails, and one or all of the passes may be transposed.
 35 For instance, the grooves in the bottom rolls may be cut in the top rolls, and vice versa, without departing from my invention.

The passes 1, 6, and 10 and the general combination I do not claim in this application,
 40 as they form the subject of a divisional application filed by me November 4, 1889, Serial No. 329,213.

I claim as my invention—

1. In rolls for rolling side-bearing flanged
 45 girder-rails, rolls having an oblique dummy pass, whereby the laterally-projecting tram is acted upon from about its junction with the

web to its outer end, substantially as described.

2. In rolls for rolling side-bearing flanged
 50 girder-rails, rolls having an oblique dummy pass of a contour substantially as described, whereby a laterally-projecting portion of the top of the rail and an opposite laterally-projecting portion at the base of the rail are
 55 simultaneously acted upon, substantially as specified.

3. In rolls for rolling side-bearing flanged girder-rails, rolls having an oblique dummy pass with beveled corner, substantially as
 60 specified.

4. In rolls for rolling side-bearing flanged girder-rails, rolls having the oblique dummy pass 11 with beveled corner w , against which the end of the head portion of the bar bears,
 65 substantially as specified.

5. In rolls for rolling side-bearing flanged girder-rails, rolls having edging-passes combined with an oblique dummy pass to act
 70 upon the laterally-projecting tram from about its junction with the web to its outer end.

6. In rolls for rolling side-bearing flanged girder-rails, rolls having edging-passes combined with an oblique dummy pass to act
 75 simultaneously upon the tram and the diagonally-opposite flange at the base of the rail.

7. In rolls for rolling side-bearing flanged girder-rails, rolls having two or more oblique dummy passes, one to act simultaneously
 80 upon the tram and the diagonally-opposite flange at the base of the rail and the other to act simultaneously upon the head and the diagonally-opposite flange at the base of the rail, in combination with edging-passes preceding and succeeding the oblique dummy
 85 passes.

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

HENRY W. THOMAS.

Witnesses:

WILLIAM D. CONNER,
 HENRY HOWSON.