

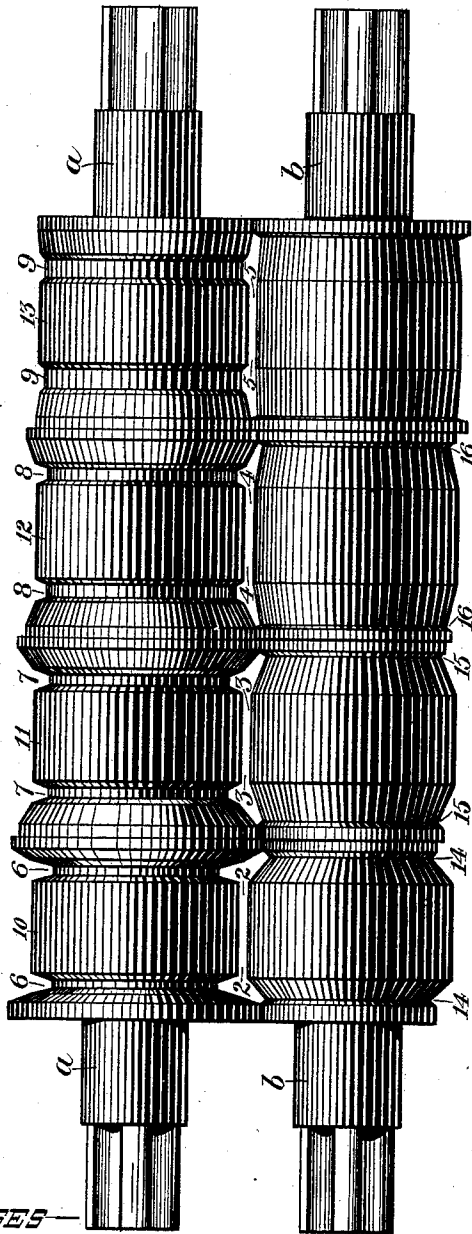
(No Model.)

W. H. GRAHAM.  
ROLLING I-BEAMS INTO PLATES.

No. 341,569.

Patented May 11, 1886.

FIG. 1.



—WITNESSES—  
*Nary L. Gill*  
*N. T. Corwin*

FIG. 6.



FIG. 5.

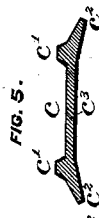


FIG. 4.

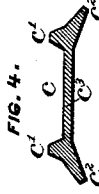


FIG. 3.

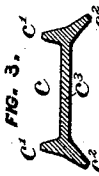


FIG. 2.



—INVENTOR—

*William H. Graham*

—By *Bakewell & Kern*

—ATTORNEYS—

# UNITED STATES PATENT OFFICE.

WILLIAM H. GRAHAM, OF PITTSBURG, ASSIGNOR OF TWO-THIRDS TO HAY WALKER, JR., TRUSTEE, OF ALLEGHENY, AND A. C. MILLIKEN, OF MILLVALE BOROUGH, PENNSYLVANIA.

## ROLLING I-BEAMS INTO PLATES.

SPECIFICATION forming part of Letters Patent No. 341,569, dated May 11, 1886.

Application filed January 18, 1886. Serial No. 188,839. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. GRAHAM, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rolling I-Beams Down into Plates; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention has for its object the rolling down of the butts and ends of steel I-beams into flat plates, for use in the manufacture of cut nails and other articles to which such plates may be applicable. The beams which are used for structural purposes are made of Bessemer steel, which is lacking in welding qualities, so that if two surfaces are laid or plicated upon each other in rolling they will not unite perfectly, but will form a seam or defect and render that part of the plate useless for most purposes.

My invention is designed to effect the reduction of the double-flanged I-beam to a flat plate without plication, seam, or similar defect, and at the same time to produce by longitudinal rolling a plate of greater width than the bar or beam from which it is made.

To enable others skilled in the art to make use of my invention, I will now describe it by reference to the accompanying drawings, in which—

Figure 1 is an elevation of a pair of rolls of my improved construction. Figs. 2 to 6 are sections of the beam before and after the successive passes through the rolls.

Like symbols of reference indicate like parts.

The rolls *a* and *b* are mounted in housings, and are driven in the usual way. Four passes, numbered 2, 3, 4, and 5, are shown. The upper roll has at each pass a pair of reducing-grooves, for receiving the upper flanges, *c'* *c'*, of the beam end *c*, and a wide tongue which enters the top channel of the beam. These grooves are numbered, respectively, 6 7 8 9, and the tongues 10 11 12 13. The lower roll has shallow grooves 14 15 16, with inclined bottoms in the first three passes, 2 3 4, the angle of inclination decreasing in each successive pass, and at the last pass, 5, the face of the lower roll is nearly plain. The ends of the passes are bounded by the collars of the rolls.

With rolls thus constructed the operation of reducing the beam end or butt *c* is as follows, viz: The beam *c*, properly heated, is inserted at the first pass, 2, the top flanges, *c'*, entering the grooves 6, and the bottom flanges, *c''*, entering the grooves 14 and resting on the inclined bottoms of the same. The grooves 6, being shallower than the flanges *c'*, reduce the height of the latter sufficiently to enable them to be entered into the grooves 7 of the second pass, and the inclined grooves 14 turn the lower flanges, *c''*, out sufficiently to enable them to be entered into the grooves 15 of the second pass, producing a bar having a cross-section like that shown in Fig. 3. This bar is then put successively through the passes 3, 4, and 5, being thereby transformed into the shapes shown by Figs. 4, 5, and 6. It is then ready to be put through the plain finishing-rolls, by which it is formed into a smooth flat plate, which may be cut up into nail-plates or other articles.

If desired, the rolls *a b* may be provided with plain finishing-surfaces, so that the plate may be finished therein, and thus obviate the necessity of taking it to another pair of rolls; or, if desired, the several grooves may be made in separate rolls.

I do not limit myself to any particular number of reducing-grooves.

In the operation thus described the top flanges, *c'*, are forced down into the body or web *c''* of the beam, and are not plicated or folded on the same, so that the top of the plate is made without crease or seam. The bottom flanges are not reduced, but are turned out sidewise until they are added to the width of the beam, and thus I produce a plate of greater width than the beam *c*.

In this manner I am enabled to utilize the butts and short pieces of steel I-beams, which are produced in quantities in shearing off the ends of such beams, without first slitting them longitudinally to separate the flanges and web, and by thus reducing the entire piece to a single seamless plate I obtain a much larger and more useful plate.

Iron beams can be rolled in the same way. What I claim as my invention, and desire to secure by Letters Patent, is—

1. The method of transforming I-beams into plates, which consists in rolling the top flanges

down into the web without plication or seam, and at the same time turning the lower flanges out into line with the web, substantially as and for the purposes described.

5 2. The combination, in a rolling-mill for rolling the butts and ends of I-beams down into plates, of a pair of rolls, one having a series of vertical grooves for reducing the height of the top flanges gradually by succe-  
10 sive passes down into the web, and the other

having opposite inclined grooves for turning the lower flanges gradually out into line with the web, substantially as and for the purposes described.

In testimony whereof I have hereunto set 15  
my hand this 8th day of January, A. D. 1886.

WILLIAM H. GRAHAM.

Witnesses:

W. B. CORWIN,

THOMAS B. KERR.