2 Sheets—Sheet 1.

F. B. DAVIS.

Rolls for Forming Billets from Steel Railroad-Rails.

No. 226,982. **Patented April 27, 1880.**

Fig. 1.

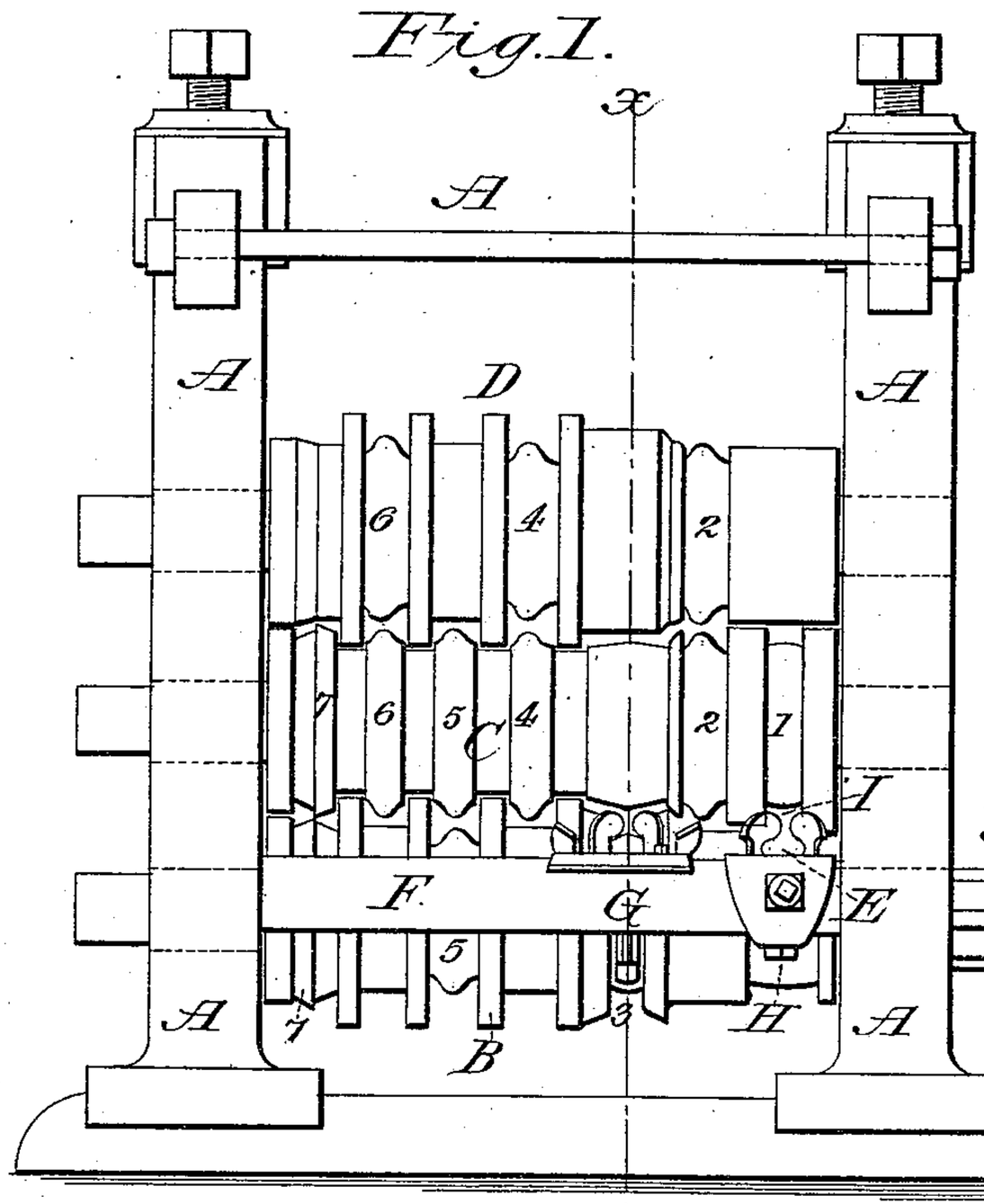
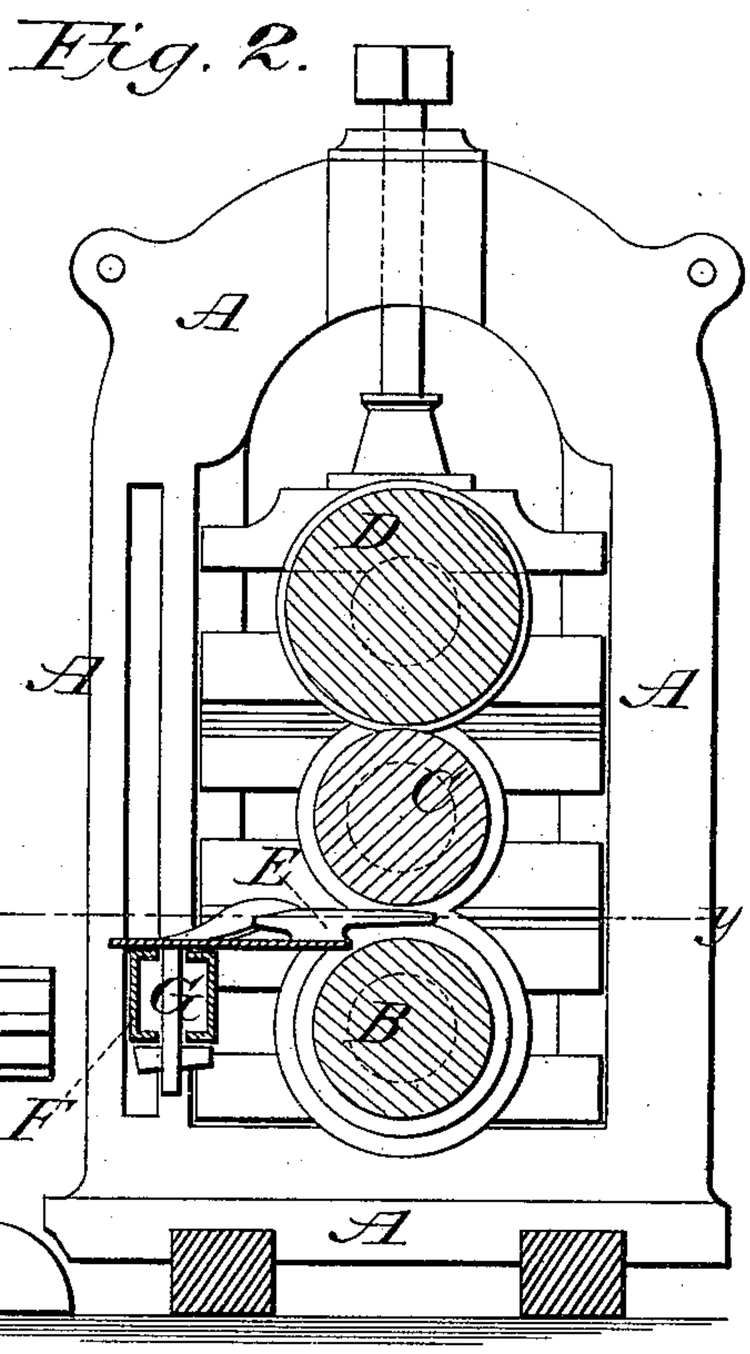
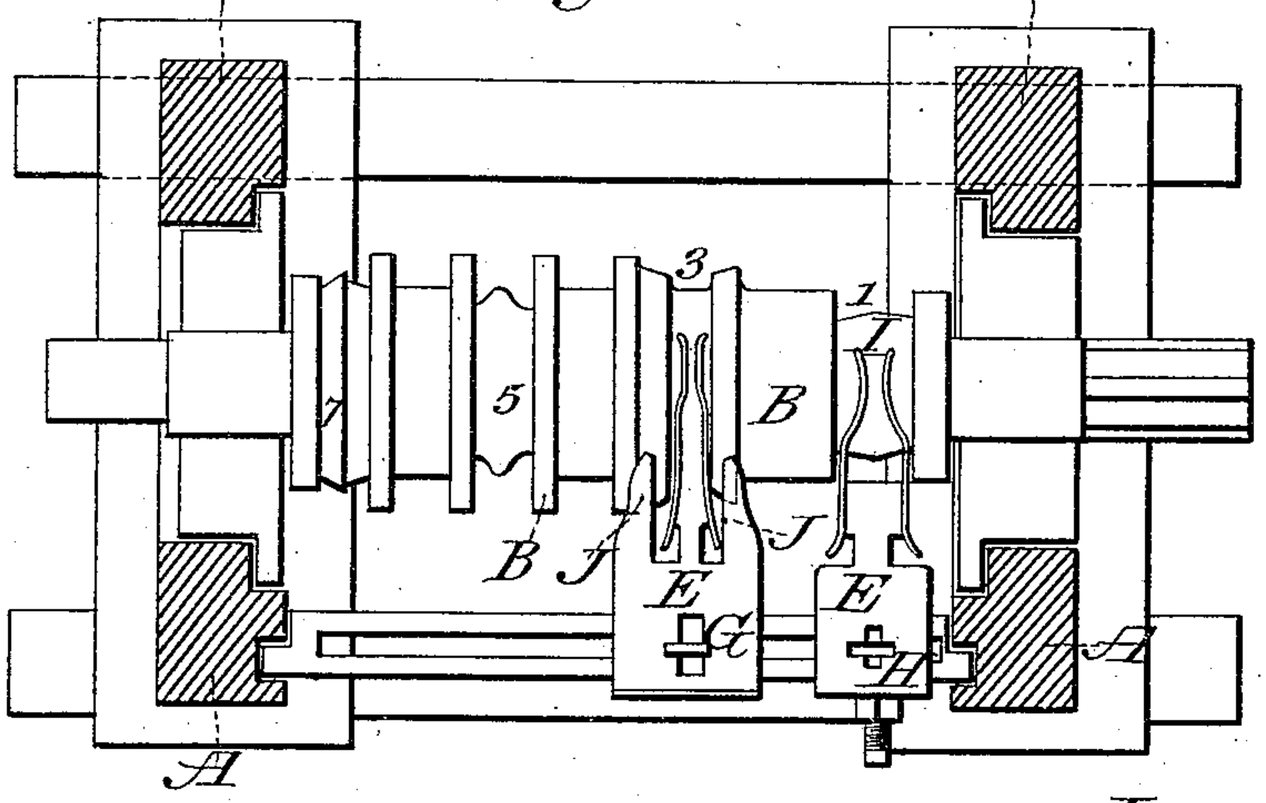


Fig. 2.



x

Fig. 3.



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2 Sheets—Sheet 2.

F. B. DAVIS.

Rolls for Forming Billets from Steel Railroad-Rails.

No. 226,982. **Patented April 27, 1880.**

Fig. 4

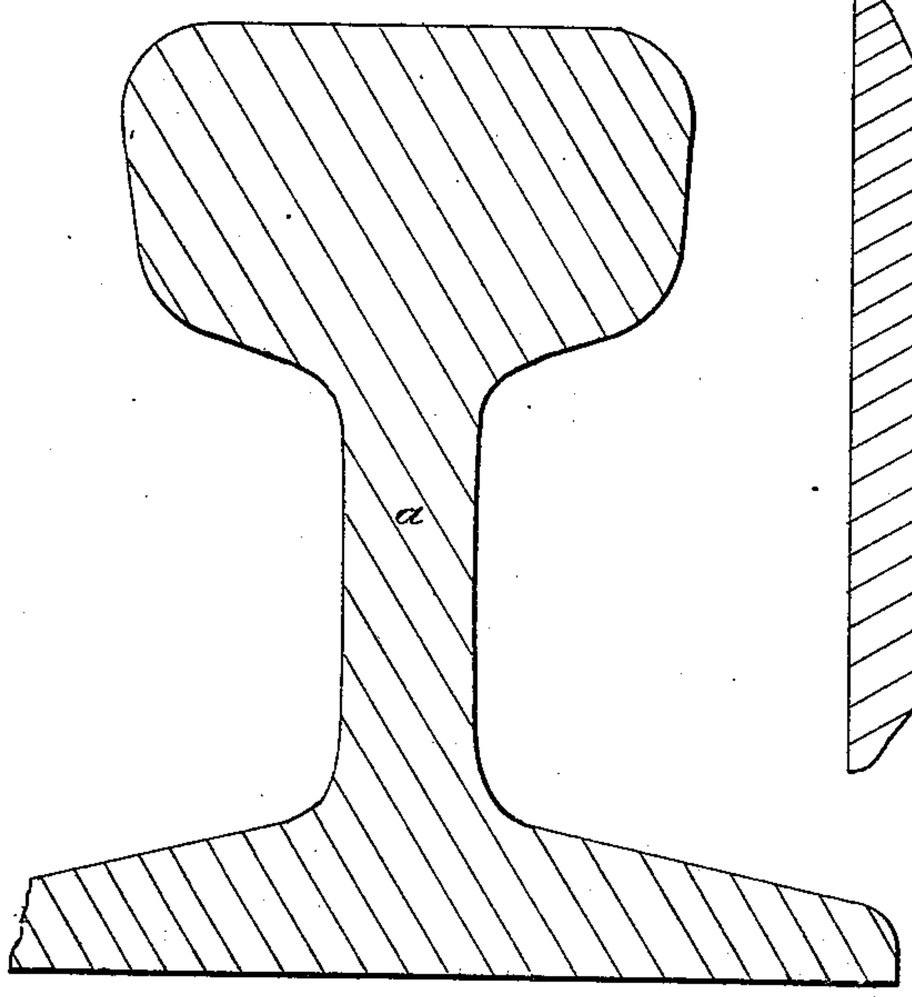


Fig. 5.

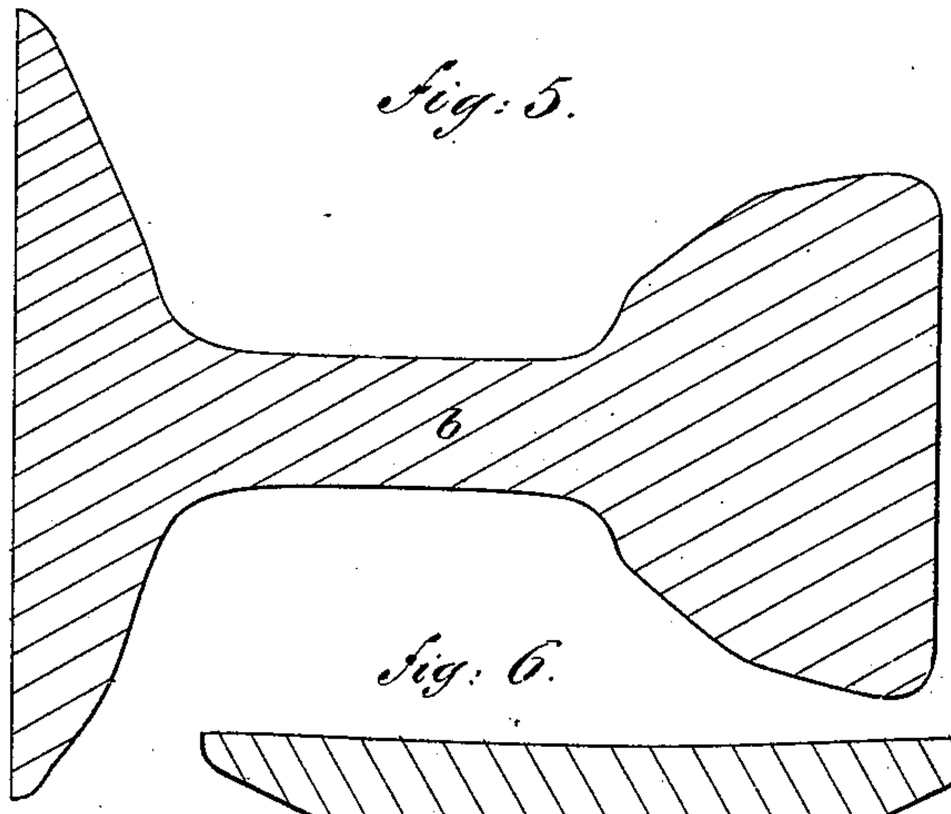


Fig. 6.

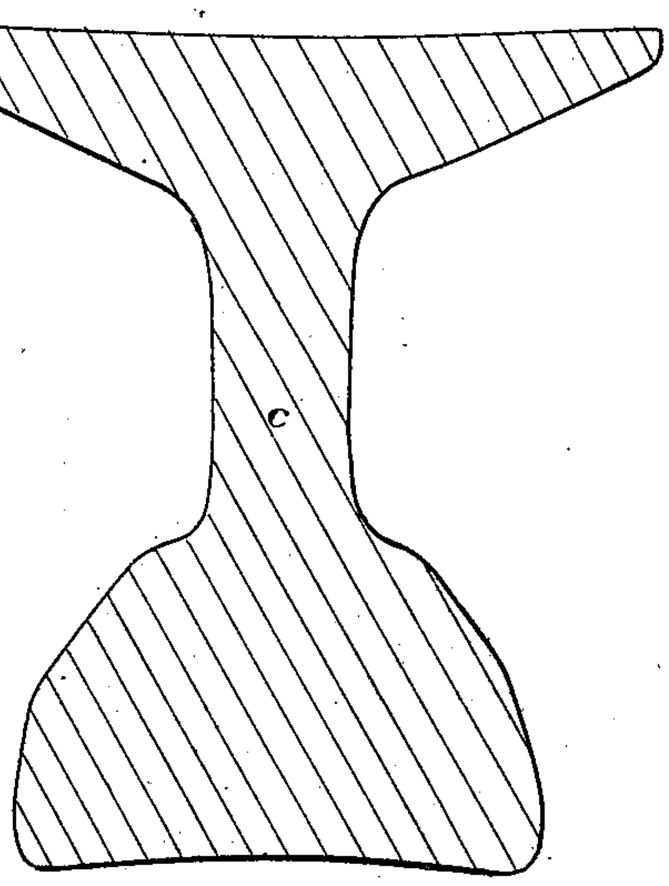


Fig. 7.

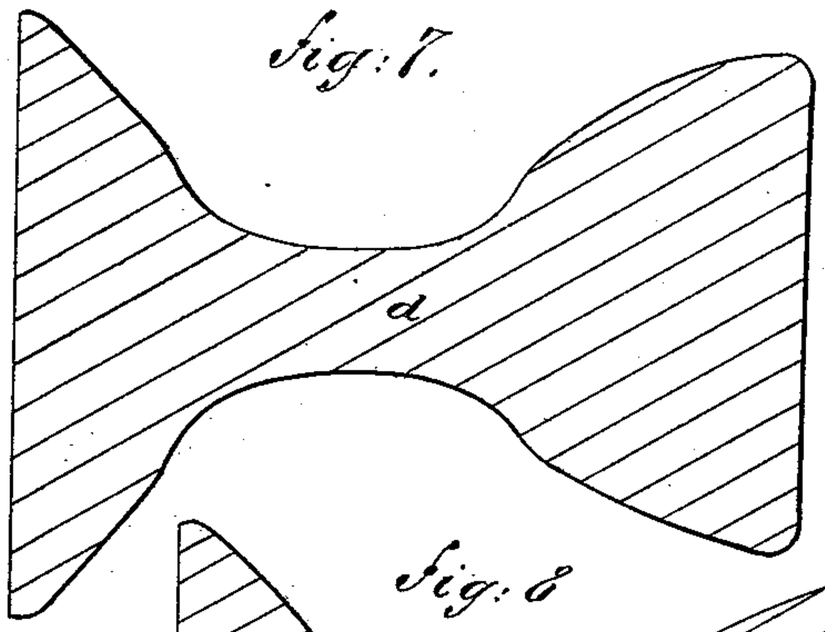


Fig. 8

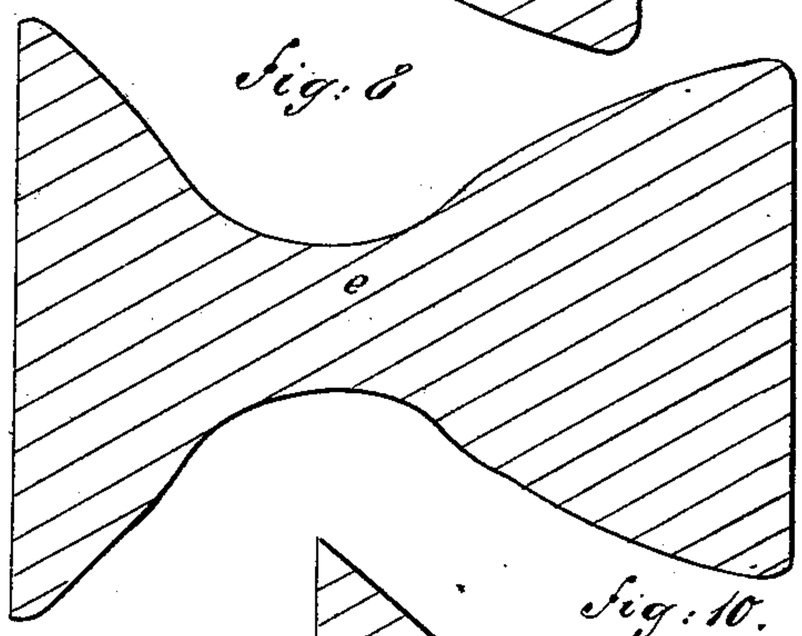


Fig. 9.

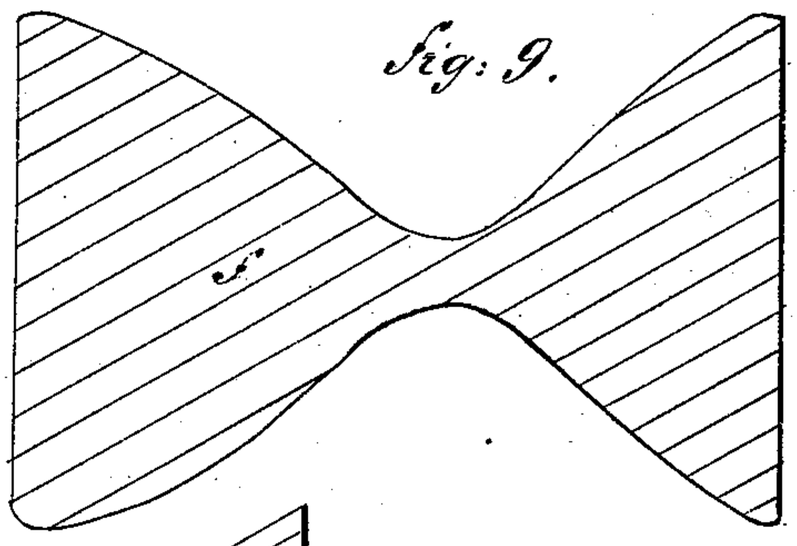
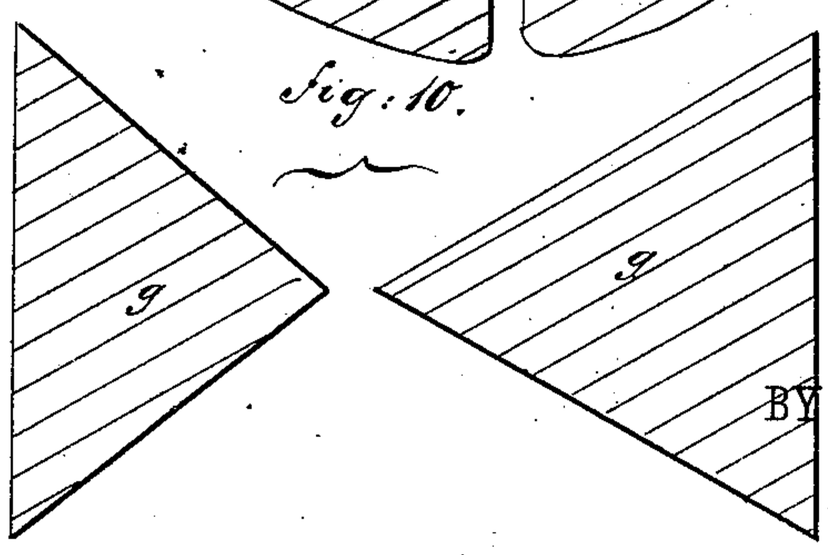


Fig. 10.



WITNESSES:

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INVENTOR:

F. B. Davis

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANK B. DAVIS, OF JOHNSTOWN, PENNSYLVANIA.

ROLL FOR FORMING BILLETS FROM STEEL RAILROAD-RAILS.

SPECIFICATION forming part of Letters Patent No. 226,982, dated April 27, 1880.

Application filed November 22, 1879.

To all whom it may concern:

Be it known that I, FRANK B. DAVIS, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Improvement in Rolls for Forming Billets from Steel Railroad-Rails, of which the following is a specification.

Figure 1, Sheet 1, is a front elevation of my improvement. Fig. 2, Sheet 1, is a sectional end elevation taken through the line *x x*, Fig. 1. Fig. 3, Sheet 1, is a sectional plan view taken through the line *y y*, Fig. 2. Figs. 4, 5, 6, 7, 8, 9, 10, Sheet 2, show the form of the rail after each successive operation.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish rolls for forming billets from steel railroad-rails, said rolls being so constructed as to reduce the rails to the form of two triangular billets free from grooves, lines, marks, or other imperfections.

The invention consists in constructing the rolls with a series of grooves so formed as to gradually lower and thicken the web and fill out the angles between the web and the flanges and head, and then bring the rail into the form of two triangular parts connected by a thin web, and separate the two parts, forming two triangular billets.

A represents the frame of the machine. B C D are the three rolls, which are placed in the same vertical plane and are designed to be connected and driven in the usual way. In the faces of the rolls B C D are a series of pairs of grooves, so formed as to bring the rail gradually to the shape of triangular billets. The first pair 1, of grooves is formed in the lower and middle rolls, B C. The second pair, 2, of grooves is formed in the middle and upper rolls, C D, the third pair, 3, in the lower and middle rolls, B C, and so on through the series. Each roll is also provided with grooves or depressions to receive the projections of the adjacent rolls.

The first pair, 1, of grooves simply press the head and flanges of the rail toward each other, thickening the web slightly, to reduce the rails to a uniform height, as shown by the blank *a*, Fig. 4. The second pair, 2, of grooves have depressions to receive the flanges and head of a rail and projections to receive the web of the rail. The depressions that receive the flanges of the rails are so formed as to press the metal of the flanges inward toward the web, partially filling the angle between the said flange and web and preventing the formation of a sharp angle, which angle, when formed, can never be removed, but will be traceable even should the billet be reduced to a wire. The second pair, 2, of grooves bring the rail to the form *b*, (shown in Fig. 5.) The third pair, 3, of grooves press the flanges and head a little nearer each other, thickening the web, filling up the angles a little more, and slightly concaving the base of the flanges and the face of the head, bringing the rail to the form *c*, (shown in Fig. 6.) The fourth pair, 4, of grooves thicken the web and fill out the angles a little more, and give a rude triangular form to the head and flanges of the rail, giving it the form *d*, (shown in Fig. 7.) The fifth pair, 5, of grooves further thicken the web, fill out the angles, and make the triangular form of the head and flanges more marked, as shown by the form *e*, Fig. 8. The sixth pair, 6, of grooves bring the head and flanges of the rail nearly to triangular form and thin the middle part of the web, so that it may be cut by the cutters. The grooves 6 bring the rail to the form *f*, (shown in Fig. 9.) The cutters 7 are so formed as to cut the rail into two billets, *g*, and bring the billets *g* into triangular form, as shown in Fig. 10.

In this way each rail or section of rail will be formed into two triangular billets, *g*, without having any sharp angles, creases, or marks formed in them, so that they can be worked as readily as ordinary steel bars.

The first and third pairs, 1 3, of grooves, in which the rails are subjected to a pressure in the plane of the web, are provided with guards or supports E, which rest upon a cross-bar, F, to which they are secured adjustably and detachably by a bolt and key, G, or a bolt and nut, H. The cross-bar F is made with a longitudinal slot to receive the fastening-bolts G H, and its ends are placed in grooves in the end frames, A. The guards E are made with two arms or jaws, I, which extend to the vertical plane of the centers of the rolls B C D, and are designed to rest against the sides of the

web of the rail with sufficient force to prevent the web from buckling when subjected to pressure.

The guard or support E that enters the wide grooves 1 rests upon the bottom of the lower groove. The guard or support E that enters the narrow groove 3 is made with shoulders or points J, which rest upon the shallow side parts of the lower groove, 3.

With rolls thus constructed a steel rail can be rolled into two triangular parts connected by a thin web, and then separated into two triangular billets free from grooves, lines, marks, or other imperfections caused by the formation of re-entrant angles or other causes during the process of rolling, so that the said billets may be as readily worked as ordinary steel bars.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination of the three rolls B C D, provided with the series of grooves 1 2 3 4 5 6 and the cutters 7, substantially as herein shown and described, the said grooves being so formed as to gradually lower and thicken the web of the rail and fill out the angles between the web and the flanges and head, and then bring the rail into the form of two triangular parts connected by a thin web, and separate the two parts, forming two triangular billets, as set forth.

FRANK B. DAVIS.

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