No. 875,202. PATENTED DEC. 31, 1907.

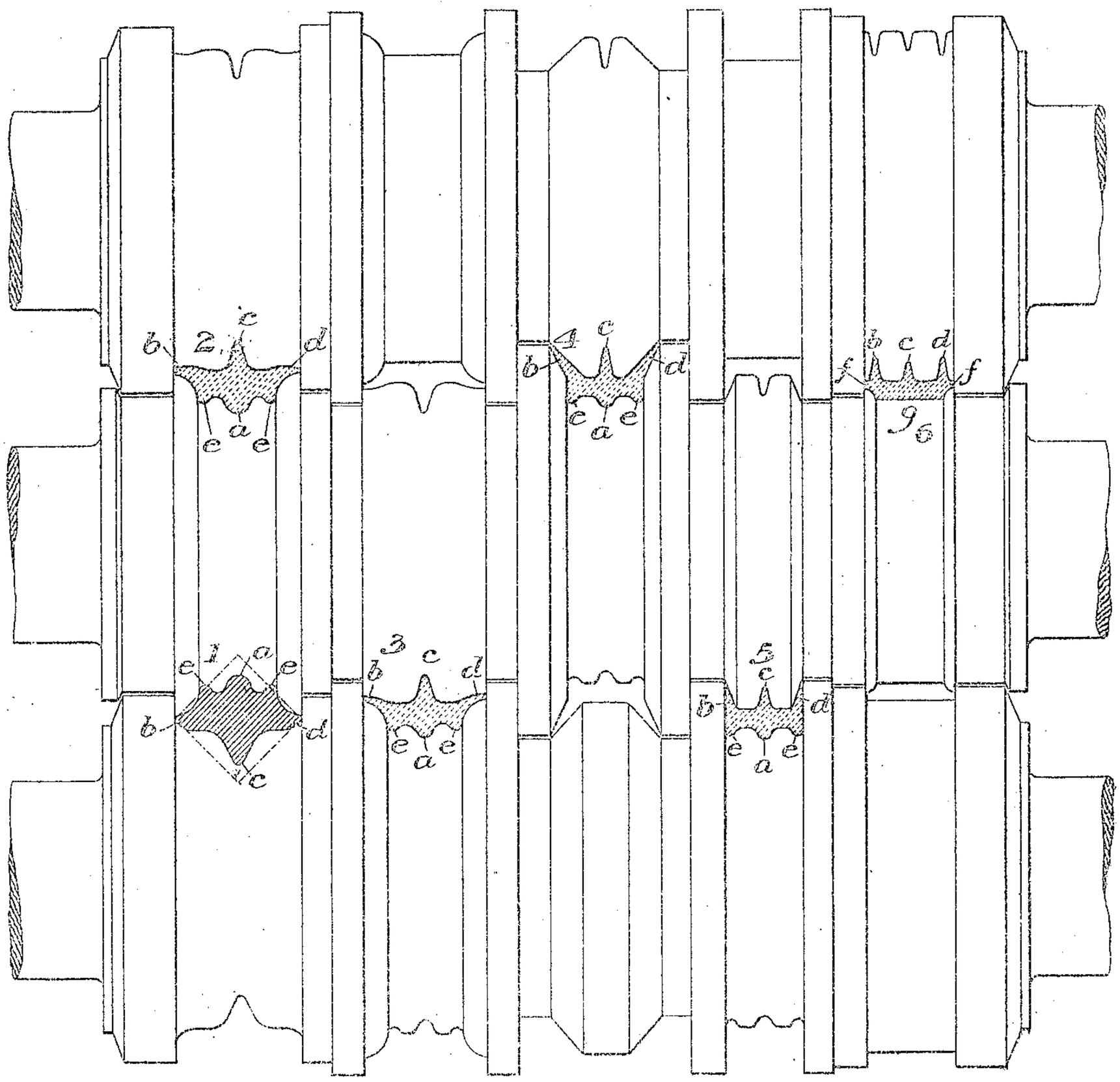
A. MORRISON.

METHOD OF ROLLING TIE PLATES.

APPLICATION FILED JULY 24, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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2 SHEETS—SHEET 2

Fig. 2.

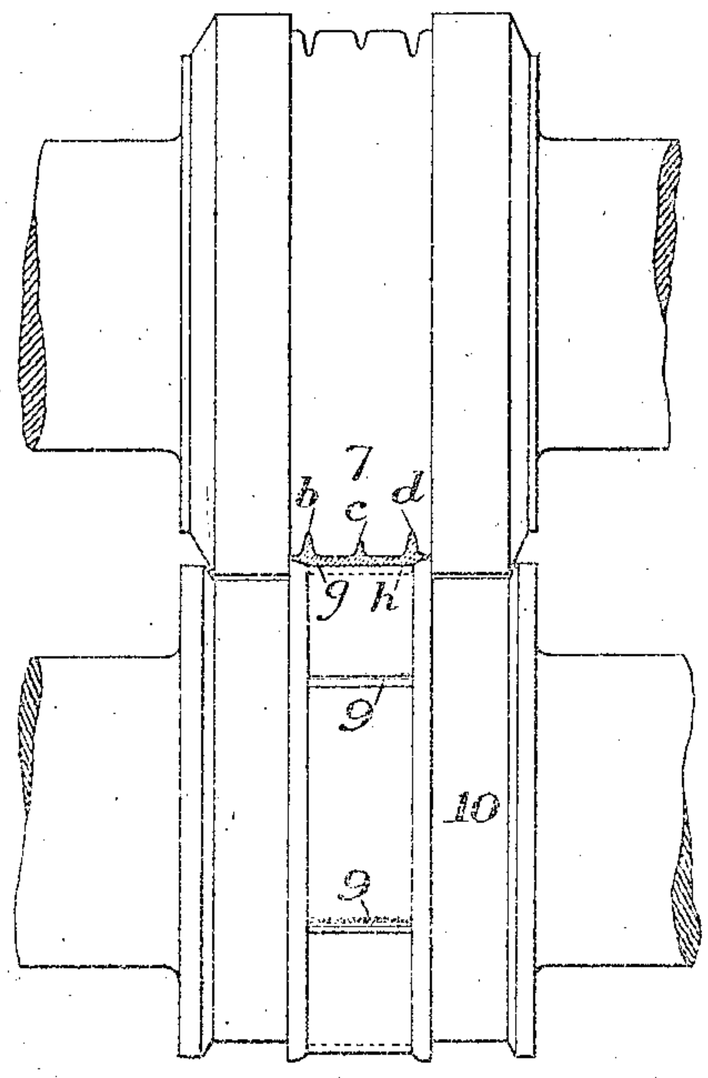
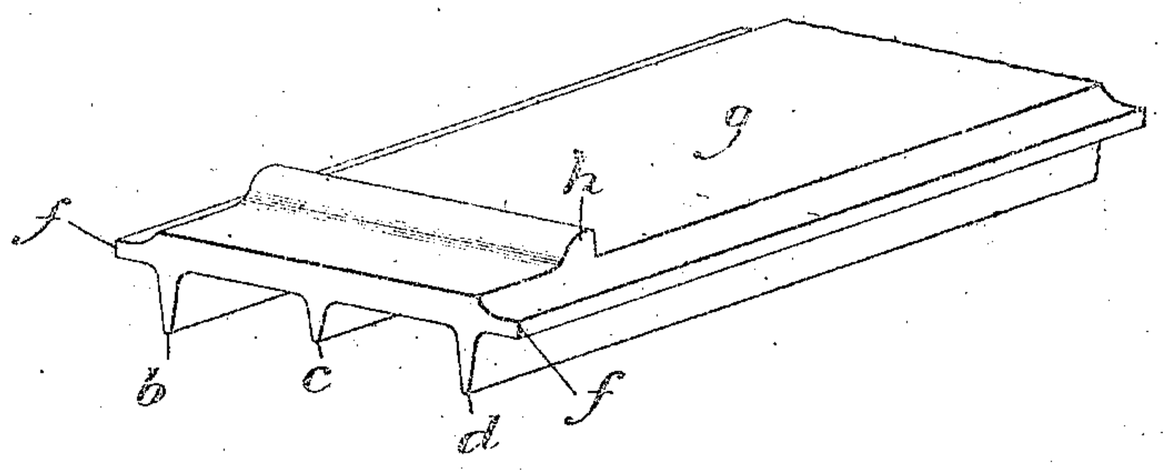


Fig. 3



WITNESSES

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UNITED STATES PATENT OFFICE.

ANDREW MORRISON, OF PITTSBURG, PENNSYLVANIA.

METHOD OF ROLLING TIE-PLATES.

No. 875,202. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed July 24, 1906. Serial No. 327,473.

To all whom it may concern:

Be it known that I, ANDREW MORRISON, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Method of Rolling Tie-Plates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of a three-high rolling mill having a series of passes suitable for carrying out my invention and showing the different steps of the operation; Fig. 2 is a similar view showing the final or finishing pass; and Fig. 3 is a sectional view showing the completed tie plate.

My invention has relation to the manufacture of longitudinally-flanged tie plates, and is designed to provide a novel efficient and economical method of rolling the same, in which the number of passes and the number of operations required are reduced to a minimum; and the invention consists in the novel steps and combination of steps all substantially as hereinafter described and pointed out in the appended claims.

In carrying out my invention a bar, billet or bloom of rectangular cross section is introduced in diagonal position into the first pass 1 of the mill, and its corner portions are reduced to form the rudimentary flanges *a*, *b*, *c* and *d*; that is to say, the bar or billet is sent through the first pass with one of its diagonals in vertical position; and the converging walls of the pass-grooves in the rolls reduce the four corner portions to form the said rudimentary flanges. At the same time I preferably form at each side of the flange *a* auxiliary projections or bumps *e*. After this first reduction, the partially-reduced shape is inverted and sent through the pass 2, in which the flanges *b*, *c* and *d*, together with the body portion are further reduced and shaped. The bar is then sent in succession through the passes 3 and 4 in which a further reduction is effected and the flanges are further shaped, the flange or bump *a* supporting the flange *c* and being gradually rolled into the body portion and support of said flange. In the pass 5, the flanges *b* and *d* are bent into position at substantially right angles to the body, and in the sixth pass, these flanges are crowded inwardly towards each other and at the same time, the body of the metal is crowded laterally beyond the flanges to form the longitudinally-extending reduced lateral flange extensions *f* at each side of the rail bearing surface *g* of the bar. These two steps may, however, be performed in separate passes. In this sixth pass the bumps *a* and *e* are rolled entirely into the body and support the other flanges as well as form the lateral extensions of the plate. I do not, however, confine myself to rolling out the bump *a* in this pass, as this may be done in one of the preceding passes or in a subsequent pass. The bar is now sent through the finishing pass 7, (Fig. 2), where it is reduced to its final thickness, and rail bearing shoulders *h* are rolled therein by means of the grooves 9 in one of the rolls 10, these shoulders extending preferably across the entire rail bearing surface of the tie-plate. The finished bar is then sheared into lengths and punched.

In some cases the bumps *a* and *e* may be omitted, and the upper corner portion of the billet rolled down into the body and the central flange *c*. The formation of the shoulders *h* in the final or finishing pass may also be dispensed with, or their form and length varied, as may be desired, by a corresponding change in the roll 10. Neither do I confine my elf to reversing the bar at the second pass as that is merely done to reduce the required length of rolls.

It will be noted that by employing a rectangular bar which is rolled in diagonal position, the breaking down of the bar to form the rudimentary flanges is easily effected in a single pass, and that these rudimentary flanges are of such form and so disposed as to make the subsequent reduction and shaping of the bar easily effected by a minimum number of operations.

By utilizing two of the corner portions of the bar or billet for the purpose of forming the middle flange of the finished plate, I am able to produce a deeper middle flange than is possible by any method heretofore known.

The novel form of tie-plate formed by the method herein described, forms the subject-matter of another application, Serial No. 327472 filed July 24, 1906.

What I claim is:—

1. The method of rolling tie-plate bars having a body portion and longitudinal flanges projecting at substantially right angles thereto, which consists in first reducing the corner portions of a rectangular billet to form a body portion having rudimentary flanges, then rolling the shape in successive passes with its body portion in a plane paral-

lel to the axis of the rolls, in which passes said flanges are acted upon by combined lateral and vertical pressure to reduce them and bring them at substantially right angles to the body portion, said body portion being at the same time reduced and shaped; substantially as described.

2. The method of rolling tie plate bars having right-angled longitudinally-extending middle and lateral flanges, which consists in first passing a rectangular billet through an initial pass in diagonal position to form rudimentary flange portions, working two opposite corner portions of the bar into a middle flange and the other two corners into the lateral flanges, and subsequently rolling the shape to reduce and shape such flanges; substantially as described.

3. The herein described method of rolling longitudinally flanged tie plate bars, which consists in first simultaneously reducing the four corner portions of a rectangular billet to form a body portion with four rudimentary flanges, then rolling the bar in successive passes to reduce and shape its body portion and three of said flanges, and at the same time remove the fourth flange by rolling it into the body of the bar; substantially as described.

4. The method of rolling tie plate bars having a body portion and longitudinally-extending middle and lateral flanges which project at substantially right angles to the body portion, which consists in first passing a rectangular billet through an initial pass in diagonal position to form rudimentary flange portions from the corner portions of the rectangular billet, working two opposite rudimentary flange portions of the bar into the body portion and into a middle flange and the other two rudimentary flange portions into the lateral flanges, and subsequently rolling the shape to reduce and shape such flanges and to reduce and shoulder the body portion of the tie plate; substantially as described.

5. The method of rolling longitudinally-flanged tie plate bars, which consists in first reducing the corner portions of a rectangular billet to form four rudimentary flanges at least one of which is temporary and auxiliary bumps adjacent to the temporary flange, then rolling in a series of subsequent passes to remove said bumps and temporary flange by rolling the metal thereof into the body portion and into the other flanges, and at the same time reducing and shaping the body portion of the other flanges into final angular flanges; substantially as described.

6. The method of rolling tie-plate bars having a body portion and longitudinally extending middle and lateral flanges which project at substantially right angles to the body portion, which consists in first passing a rectangular billet through an initial pass in diagonal position to form two horizontally extending rudimental flanges from the two horizontally extending corner portions of the blank and a rudimentary vertical flange from one of the vertically extending corner portions of the billet, then working the two horizontally extending rudimentary flanges to shape and bend the same and also working the vertically extending rudimentary flange to reduce and shape it; substantially as described.

7. The herein described method of rolling tie plate bars having longitudinally-extending lateral flanges, which consists in first forming a shape having rudimentary lateral flanges, and then rolling said shape in a pass in which the lateral flanges are moved bodily inward by lateral pressure against their outer sides towards each other; substantially as described.

8. The herein described method of rolling tie plate bars having longitudinally-extending lateral flanges, which consists in first forming a shape having rudimentary lateral flanges at its edges, and then passing said shape through a pass in which said flanges are moved bodily inward towards each other by lateral pressure against their outer sides, and at the same time the metal is forced laterally outward in the plane of the body portion beyond said flanges by vertical pressure on said body portion; substantially as described.

In testimony whereof, I have hereunto set my hand.

ANDREW MORRISON.

Witnesses:
H. M. CORWIN,
GEO. H. PARMELEE.