(No Model.)

2 Sheets—Sheet 1.

E. B. MEATYARD.

ROLLING MILL.

No. 324,867. Patented Aug. 25, 1885.

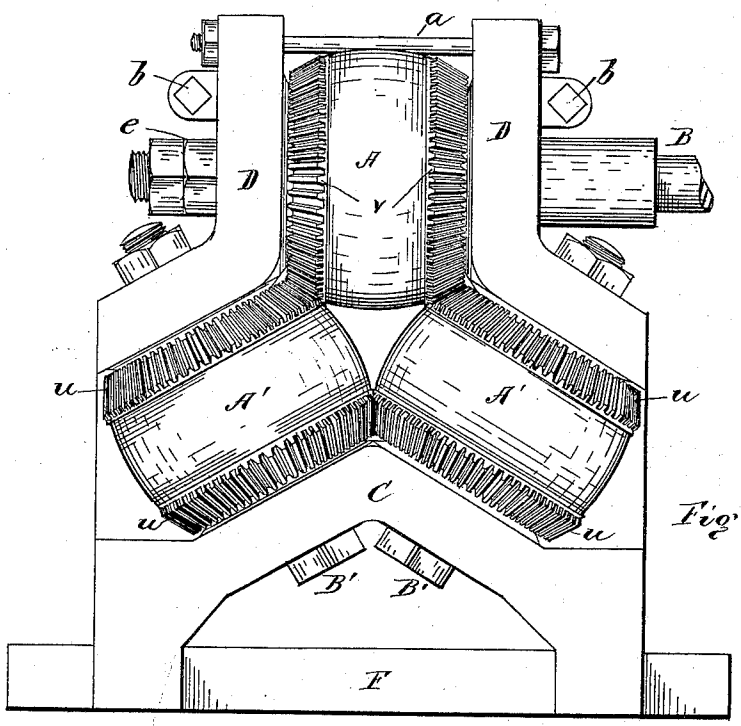


Fig. 2

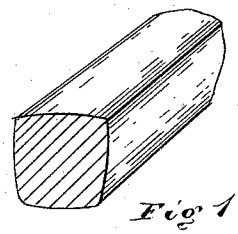


Fig. 1

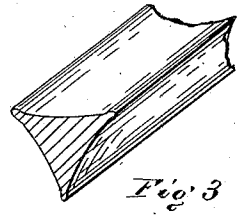


Fig. 3

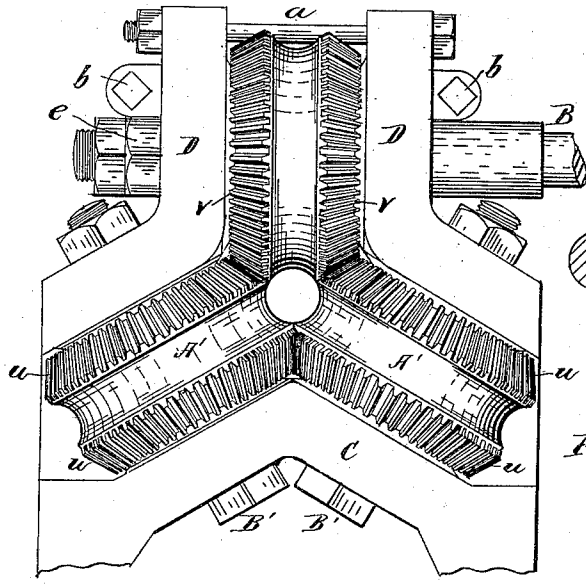


Fig. 4

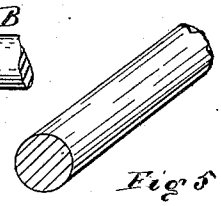


Fig. 5

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(No Model.) 2 Sheets—Sheet 2.

E. B. MEATYARD.

ROLLING MILL.

No. 324,867. Patented Aug. 25, 1885.

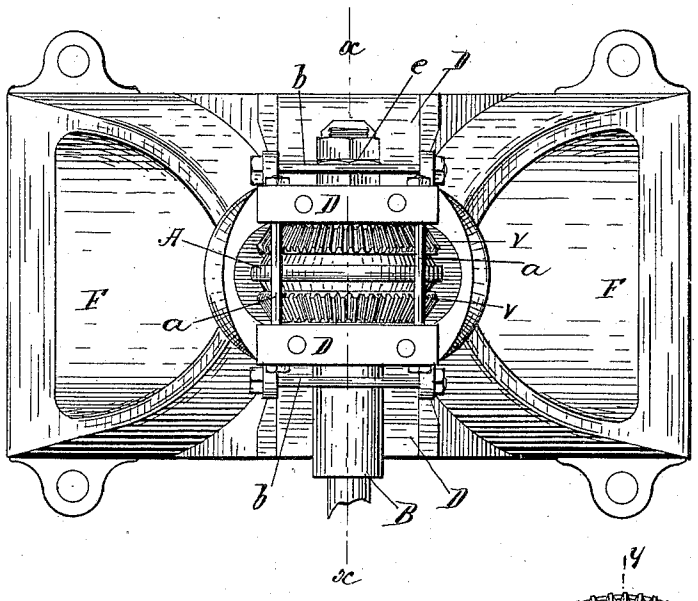


Fig. 6



Fig. 8

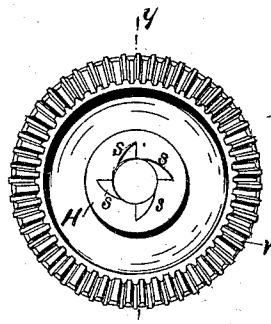


Fig. 9

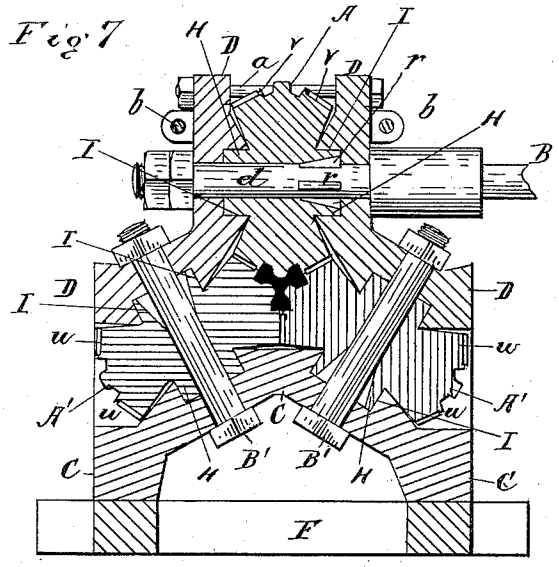


Fig. 7

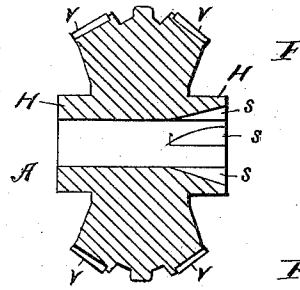


Fig. 10

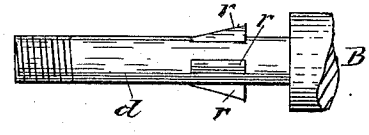


Fig. 11

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UNITED STATES PATENT OFFICE.

EDWARD B. MEATYARD, OF LAKE GENEVA, WISCONSIN.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 324,867, dated August 25, 1885.

Application filed April 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. MEATYARD, a citizen of the United States, and residing at Lake Geneva, in the county of Walworth and State of Wisconsin, have invented certain new and useful Improvements in Rolling-Mills, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the steel ingot. Fig. 2 is an end elevation of the stand of rolls through which the ingot first passes. Fig. 3 is a perspective view of the bloom or product of the first pass. Fig. 4 is an end elevation of the second stand of rolls. Fig. 5 is a perspective view of the product of the second pass. Fig. 6 is a plan of the third and last stand of rolls. Fig. 7 is a sectional view of Fig. 6, through the line *x x*. Fig. 8 is a perspective view of the product of the third pass—the finished rail. Fig. 9 is a side elevation of the driving-roll, showing a device for securing the roll to its journal. Fig. 10 is a sectional view of Fig. 9 through the line *y y*; and Fig. 11 is a side elevation of the driving-roll journal, showing a device for securing it to the driving-roll.

My invention relates particularly to machinery used in making steel rails, it being specially adapted for use in operating upon pressed ingots.

It consists, especially, in the housing and securing of the rolls in their proper position and adjustment, by the means and in the manner hereinafter fully set forth.

I will now explain in detail the construction and operation of my invention, reference being had to the drawings which accompany this specification and form a part hereof.

In the drawings, A is the driving-roll, and A′ A′ are the two driven rolls. B is the securing-bolt of the driving-roll and also the power-shaft. B′ B′ are the securing-bolts of the driven rolls. F is the frame in which the stand of rolls run. C is the arched base, rigidly attached to the frame F, and supports the driven or secondary rolls. D D are the housings which hold the rolls in adjustment by means of the bolts B, B′ B′, *a a*, and *b b*.

In forming the rail by means of the machinery shown in the drawings, the ingot is first passed through the stand of rolls shown in Fig. 2. The bloom there formed, Fig. 3, then passes through the stand of rolls, Fig. 4, and the product, Fig. 5, is then passed through the stand of rolls, Fig. 7, forming the finished rail, Fig. 8. In making this change from the ingot to the finished rail, which by this process is drawn out into a tough, longitudinally-fibrous or rather amorphous mass, and is not flattened out and then transversely upset, forming a kinky, curly fiber, the mass of steel is rapidly reduced in size while being augmented in length and increased in density, thus producing a severe distending strain on the rolls, for overcoming which no means have hitherto been discovered, thus rendering impractical the manufacture of rails by means of the tripartite rolls.

In a stand of rolls embracing my invention, the rolls are formed substantially as shown in the drawings. The hollow journals H have their bearings I in the housing D and in the base C. These bearings should be made of the best material, with proper device for correct adjustment, and the whole are secured in place by the bolts B B′. The strain is so great that, to secure perfect adjustment of the rolls, I preferably use bolts which are of large diameter. The factor of safety should be at least 40. The bolt B is formed with the smooth body *d*, the outer end of which is formed with some device suitable for holding the coupling through which the power is conveyed to the shaft, and the nut *e* secured by a pin or other device for properly holding in place the roller A and housings D D. It is necessary that this bolt B, which is also the power-shaft, should turn with the driving-roll A. Any suitable device may be used; but I have provided it with the lugs *r*, Fig. 11, which fit into and engage the slots *s*, Fig. 9, thereby causing the bolt and roll to turn together. The other bolts, B′ B′, are not provided with lugs, as it not necessary that they should turn with the rolls A′ A′, because these rolls are driven rolls provided with the spur-cogs *u*, which engage with corresponding cogs, *v*, on the driving-roll. This cog-gearing is preferably made of the best machine-cut steel-work, with broad but strong and shallow cogs. The bolts are simply to secure in place the rolls

and housings. The housings should be properly secured at the top, as by the bolts *a a* and *b b*.

In addition to the other advantages of this form of roll-stand, the rail can be formed at a low temperature, and with three passes instead of the eighteen or twenty passes requisite with the roll-stands now in use.

I am well aware that heretofore various efforts have been made to construct a three-part roll for the purpose of rolling railway-rails and other like heavy articles; but these efforts have produced structures deficient in the strength necessary to resist the severe strains to which they are necessarily submitted while in practical use.

By reason of the construction which I have adopted, in which the rolls are provided with hollow journals, necks, or axles, through which pass bolts connecting the housing or framework on one side of each roll to the corresponding part on the other side, I am enabled to keep the said parts from slipping off the journals or necks under the severe strain to which they are submitted, and thereby keep the rolls in correct adjustment and always up to their work, with their several axes forming the sides of an equilateral triangle.

I am also aware of Letters Patent No. 204,787, granted to Wilhelm Bansen June 11, 1878, and do not wish to be understood as claiming anything shown therein.

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

1. The combination, with the rolls A A′, having the hollow journals H, and the housings D, and the arched base C, and the frame F, of the bolts B B′, to secure correct adjustment of all the parts while under severe strains, substantially in the manner and for the purpose set forth.

2. The combination, with the driven roll A, of the bolt B, so arranged and with the proper devices to act not only as a bolt to hold the housings in place, but also as a power-shaft, substantially in the manner and for the purposes set forth.

3. The combination, in a three-part roll, of the three rolls, arranged as described, and provided with hollow journals through which extend bolts connecting that portion of the housing or framing at one end of each roll to the corresponding portion at the other end, substantially as and for the purposes specified.

4. The combination, with the three rolls, arranged as described, of the base C and housings D, in which the said rolls are mounted, and bolts passing through the hollow journals of the said rolls and connecting the said housings to each other and to the base, substantially as and for the purposes specified.

EDWARD B. MEATYARD.

Witnesses:

LEONARD WATSON,

THOMAS H. PEASE.