J. CAIN.

ROLLS FOR THE MANUFACTURE OF SUCKER-ROD JOINTS.

No. 192,054. Patented June 19, 1877.

Fig. 1.

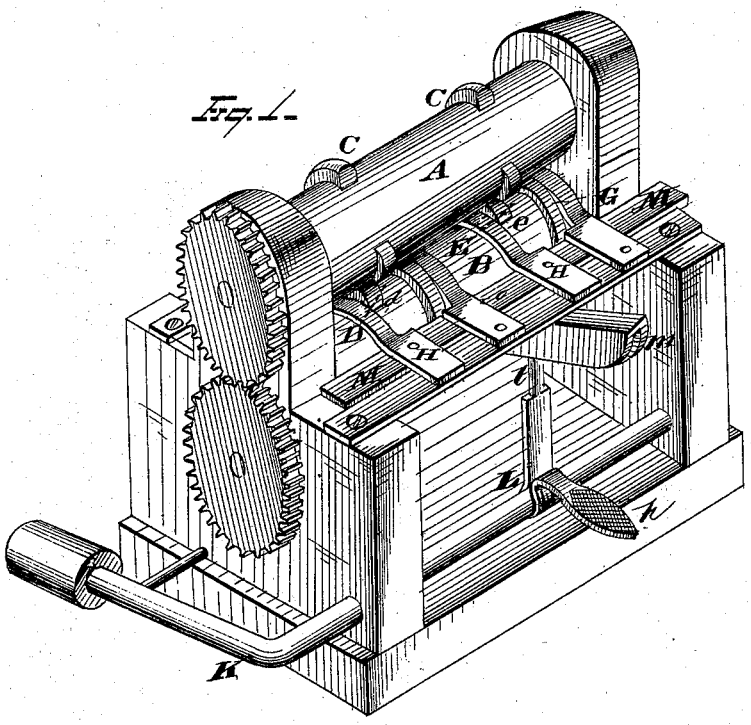



Fig. 3.

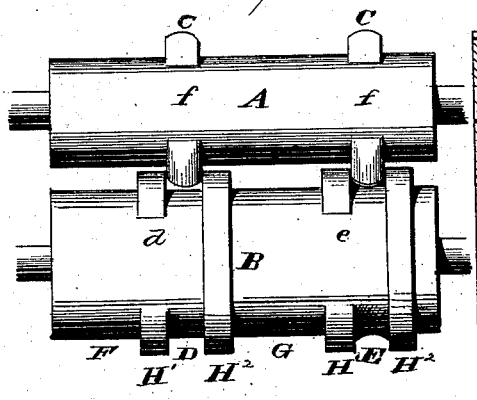
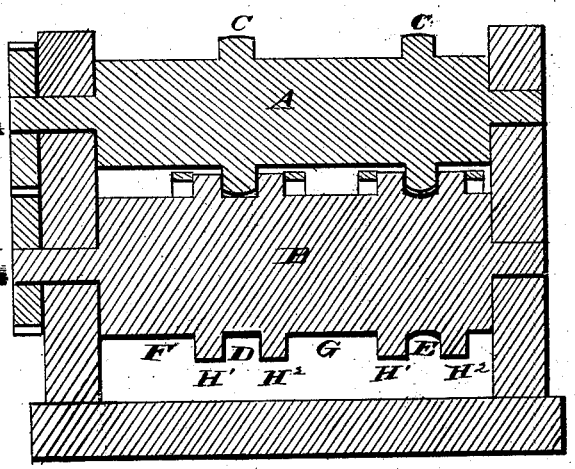



Fig. 2.




WITNESSES

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JOHN CAIN, OF SANDY LAKE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO W. S. EBERMAN & SONS, OF SAME PLACE.

## IMPROVEMENT IN ROLLS FOR THE MANUFACTURE OF SUCKER-ROD JOINTS.

Specification forming part of Letters Patent No. **192,054**, dated June 19, 1877; application filed May 16, 1877.

*To all whom it may concern:*

Be it known that I, JOHN CAIN, of Sandy Lake, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Rolling-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in rolling-mills for the manufacture of sucker-rod joints; and consists in a system of rolls of such construction that the metal may be introduced between the rolls while in motion, and by a lateral movement of the bar or blank the same is readily introduced between the working-faces of the rolls and reduced to the desired form.

My invention further consists in a system of rolls, one of which has raised working-faces, which engage with the working-faces of the opposite roll, while each roll has a plain surface leading to its respective working-face to allow the metal to be inserted by a lateral movement while the rolls are in motion.

My invention further consists in a system of rolls, one of which has a raised eccentric rib formed thereon, which engages with a rectangular groove formed between collars on the opposite roll, the eccentric rib and one of said collars formed with a section cut away on a plane with the rolls, whereby the metal may be introduced by a lateral movement while the rolls are in motion, and rolled out to form a tapering bar or strap.

My invention further consists in a system of rolls, one of which has a raised eccentric rib provided with a convex working-face, which engages with a groove formed between collars on the opposite roll, said groove formed with a concave working-face, the eccentric rib and one of said collars cut away on a plane with the rolls, whereby the metal may be introduced by a lateral movement while the rolls are in motion, and reduced to a tapering bar of concavo-convex form in cross-section.

My invention further consists in the combination, with a system of rolls, one of which has raised working-faces, and the other provided with working-faces formed between collars on the roll, a section of the raised working-face and one of the collars being cut away on a plane with the rolls, of a laterally-moving guide-frame extending between the rolls, whereby the metal may be introduced between the rolls while in motion, and by means of the guide-frame carried between the working-faces of the rolls.

Referring to the drawings, Figure 1 is a view in perspective; Fig. 2, a view in longitudinal vertical section; and Fig. 3 represents the two rolls detached from the mill.

The upper and lower rolls, respectively lettered A and B, are mounted in suitable standards, and are formed one with grooves, and the other with raised working-faces or eccentric ribs, whereby the two rolls are adapted to roll the straps on sucker-rod joints. The upper roll is provided with the eccentric ribs D, extending partially around the roll, but leaving plane smooth surfaces *f* on the same, of sufficient width to allow the metal bar to be operated upon, to be moved longitudinally of the roll when this plane surface is opposite the lower roll. This lower roll B is formed with the rolling grooves, respectively lettered D and E, the same being located between collars $H^1$ $H^2$. Collars $H^1$ are cut away or extend only partially around the roll, to constitute openings *d* and *e* on a plane with the rolls, whereby the bar may be inserted between the rolls while in motion at either the portion F or G of the roll, and by a lateral movement of the blank or bar it is inserted between the working-faces of the rolls and reduced by the same.

Any suitable guide-frame is placed between the two rolls, and serves to shift the metal bar from the plane portions F G of the roll through the connecting openings into the rolling grooves.

In the form of guide given, by way of example, in the present instance, a series of cross-bars, H, are supported on longitudinal strips, which latter have horizontal sliding movement as they are operated by the foot-treadle *h* in one case, and the weighted lever-arm K in the other case. The rock-shaft L has an arm, *l*, secured thereto. The upper end of arm *l* engages in the diagonal guideway *m*, which latter is attached to the sliding plate M. Pressure being applied to the treadle, operates to move the shifting-guide H in a

line of direction away from the rolling grooves, while upon the removal of this foot-power the weighted lever throws the guide in the opposite direction or toward the said grooves.

The rolls being driven by any suitable means so as to roll the metal toward the side of the mill where the operator stands ready to shift the sliding guide, the bar of iron is introduced first between the rolls at the plain portion F until a suitable length thereof is between the rolls, which, by way of illustration, is about six inches of a bar whose cross-section is approximately one-half by seven-eighths of an inch.

This bar is permitted to be thus introduced by the workman operating the treadle which moves the sliding guide, so as to admit the bar, as described. Upon removal of power from the treadle the weighted lever-arm operates to cause the guide to bear with side pressure against the bar, so that when, under the revolution of the rolls, the transverse opening *d* comes to the top of its roll, the side bearing against the bar will automatically throw it through this connecting opening into the groove D. The operation of the eccentric rib C in conjunction with the rectangular working-face D of the opposite roll serves to spread the iron out laterally and reduce it to a tapering form. A similar operation upon the opposite end of the same bar repeats the former result, and a partial or incomplete strap is rolled upon both ends of the bar.

The bar is then presented to the action of the second or finishing pass E, in a similar manner. The strap on one end is introduced into the plain portion G of the rolls while the mill is still running, and when the opening *e* comes to the top of the roll the strap is shifted into the groove E, formed with a curved working-face, and the same is rolled out of this pass finished. The strap on the other end is subjected to the same process, when the middle portion of the bar not operated upon, and still reserving its original section, is ready to be cut centrally nearly in twain, bent over, and welded together to form the sucker-rod joint complete.

By thus constructing the rolls the metal is introduced between them while they are in full revolution, and is automatically thrown into the working-grooves, rolled, and finished complete; and the operation may be carried on indefinitely for any number of straps without stopping or in anywise interfering with the constant revolution of the rolls.

The eccentric form of the ribs C on the upper roll serves to roll out the straps with tapering ends, and no vertical adjustment or closing of the rolls is required in order to form the same.

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

1. A rolling-mill consisting, essentially, in a system of rolls, one of which has a raised working-face extending only partially around the roll, and the other a grooved working-face bordered by collars extending above the plane of the roll, one of said collars extending only partially around the roll, whereby the blank may be inserted between the rolls while in motion, and by imparting lateral movement to the blank the same may be inserted between the working-faces of the opposite rolls, substantially as described.

2. In a rolling-mill, the combination, with a roll having an eccentric rib formed thereon, the same extending only partially around the roll, of an opposite roll provided with a working-face bordered by collars extending above the plane of the roll, one of said collars extending only partially around the roll, substantially as described.

3. In a rolling-mill, the combination, with a roll having an eccentric rib provided with a convex working-face, said rib extending only partially around the roll, of an opposite roll provided with a working-face bordered by collars extending above the plane of the roll, one of said collars extending only partially around the roll, substantially as described.

4. In a rolling-mill, the combination, with a roll provided with an eccentric rib having a convex working-face, said rib extending only partially around the roll, of an opposite roll, provided with a concave working-face bordered by collars extending above the plane of the roll, one of said collars extending only partly around the roll, substantially as described.

5. The combination, with a roll provided with the eccentric ribs extending only partly around the roll, of a roll having flat and concave working-faces, each face of which is bordered by a pair of collars, one of the pair extending only partly around the roll, substantially as described.

6. The combination, with a pair of rolls, one of which is provided with eccentric ribs extending only partly around the roll, while the other is provided with working-faces bordered by collars, one of the collars adjacent to each working-face extending only partly around the roll, of a laterally-moving guide, a portion of which is located between the plain surfaces on the rolls, substantially as described.

7. A pair of rolls, one having eccentric ribs extending only partly around the roll, and the other provided with working-faces bordered by collars, one of the collars adjacent to each working-face extending only partly around the roll, in combination with a laterally-moving guide, and a rock-shaft having a treadle and weigted arm or lever secured thereto, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of May, 1877.

JOHN CAIN.

Witnesses:
J. W. EBERMAN,
I. H. ROBB.