

W. D. EYNON & W. LLOYD.
Rolling Iron.

No. 220,818.

Patented Oct. 21, 1879.

Fig. 1.

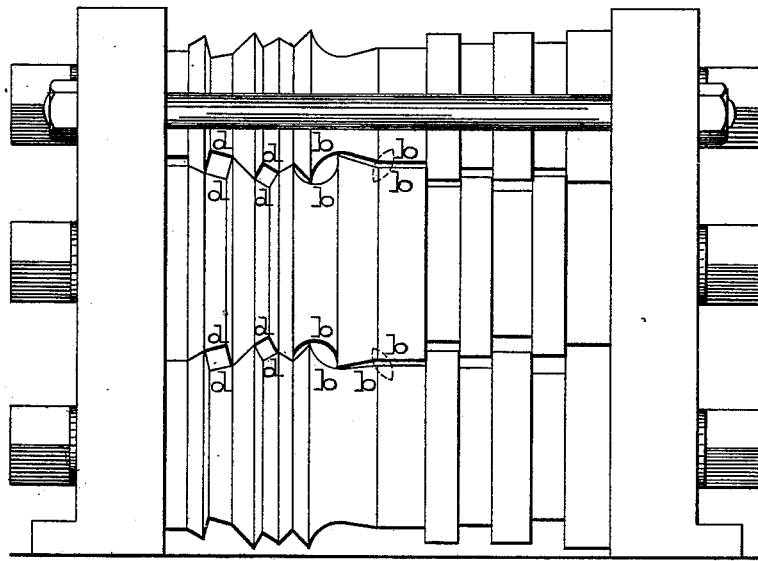


Fig. 2.

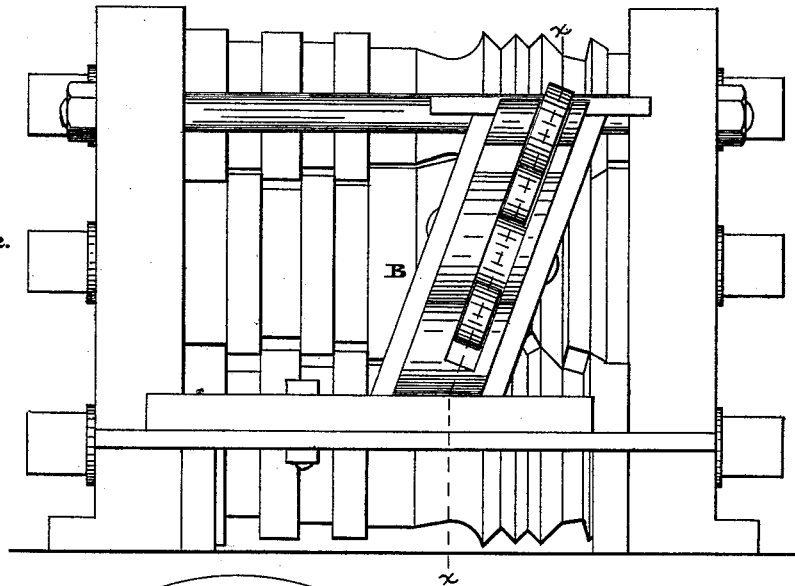
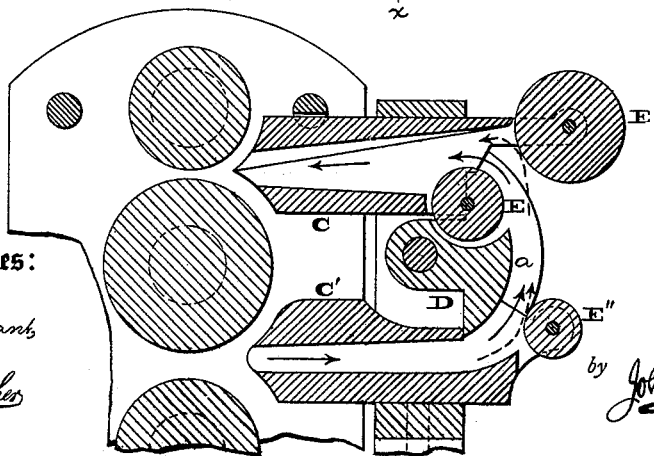


Fig. 3.

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WILLIAM D. EYNON AND WILLIAM LLOYD, OF PHILADELPHIA, PA.

IMPROVEMENT IN ROLLING IRON.

Specification forming part of Letters Patent No. **220,818**, dated October 21, 1879; application filed March 10, 1879.

To all whom it may concern:

Be it known that we, WILLIAM D. EYNON and WILLIAM LLOYD, both of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Rolling Iron, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figures 1 and 2 are views of opposite sides of rolls embodying our invention. Fig. 3 is a vertical section in line *x x*, Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

Our invention relates to metal-working rolls, which are provided with guideways extending from the lower grooves to the upper grooves thereof.

The said invention consists of certain improvements in mechanism for transferring blanks or bars through said guideways from groove to groove.

It also consists in constructing said grooves so that the bars may be passed from elliptical grooves to angular ones without turning them.

Our invention is hereinafter described and shown as applied to a set of "three-high" rolls arranged in the ordinary manner. To the bearings or attachments of the said rolls there is secured a frame, B, which extends upward, incline from the lower part of the set of rolls to the upper part thereof. Said frame supports at upper and lower ends tubular guides C C', the guide C leading to the groove between the top and middle rolls, and the guide C' leading from an adjacent groove between the middle and bottom rolls.

To the frame B there is secured a block, D, having a curved outer face, as at *a*, and occupying a position between the outer ends of the tubular guides C C'. Adjacent to the block D is mounted a roller, E, and diagonal thereto a roller, E'. At the outer end of the guide C', diagonal to the block D, is mounted a roller, E'', so that a passage is left between the block D and roller E'', and the roller E and roller E'.

As the iron is passed between the grooves of the middle and bottom rolls it enters the guide C', and is directed by the roller E'' upward around the face of the block D, and reaching the roller E is guided by the roller E' into the guide C, and thus to the groove of

the middle and upper rolls, so that the pass from one groove to another is automatic.

Rollers E' E'' also act as stops or guards to prevent the escape of metal bars from the guides. It will be noticed that the roller E' is so disposed that it directs the iron around the roller E.

It is evident that this guiding, passing, or conveying mechanism may be applied to the rolls to operate with the several grooves throughout the extent of the rolls, and the rolls may be arranged in pairs side by side, and a conveyer communicate from one pair to the other. The shape of these rolls is such that the grooves formed by their contact are in some cases elliptical, in others quadrangular.

The quadrangular grooves preferably alternate with the elliptical grooves, but any convenient arrangement may be adopted. The former are designated *d* in the drawings, and the latter are designated *b*.

In operation, a bar of metal is first passed through a lower elliptical groove between the middle and bottom rolls, then through an upper quadrangular groove between the middle and upper rolls, then to a lower elliptical groove again, and so on. Of course this succession may be reversed; but it is important that pressure in elliptical grooves should alternate with pressure in quadrangular grooves to secure a thorough kneading of the metal.

It is evident a bar pressed into elliptical shape in cross-section by an elliptical groove can enter one of the quadrangular grooves only when its longer diameter coincides with one of the diagonal lines of said quadrangular grooves. This line must be the line which terminates in the angles that extend into the bodies of the rolls, as otherwise the greatest pressure on the metal would be brought to bear at the joint-angles, whereby small quantities of metal would be forced out of the grooves laterally and the working of the rolls impeded. If, however, the diagonal line referred to as necessarily receiving or coinciding with the longer diameter of the elliptical bar be not parallel to the longer diameter of the groove which that bar has just left, it becomes necessary to turn the bar *in transitu*. This involves considerable labor by hand or

unnecessary complication of mechanical devices. We avoid both these objections by making the longer diameter of such elliptical groove parallel to the proper diagonal line of the quadrangular groove which the bar next enters.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The frame B and tubular guides C C', in combination with the block D and rollers E E' E'', substantially as and for the purposes set forth.

2. The frame B and tubular guides C C', in

combination with block D and suitable stops for preventing the escape of metal.

3. In combination with suitable guides, the rolls producing jointly elliptical grooves *b* and angular grooves *d*, the longer diameter of each elliptical groove being parallel to the line of greatest pressure of the succeeding angular groove, so that the bar may be passed from one to the other without turning it.

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