P. S. BRADFORD.
Metal-Rolling Machinery.

No. 205,945. **Patented July 16, 1878.**

Fig. 1.

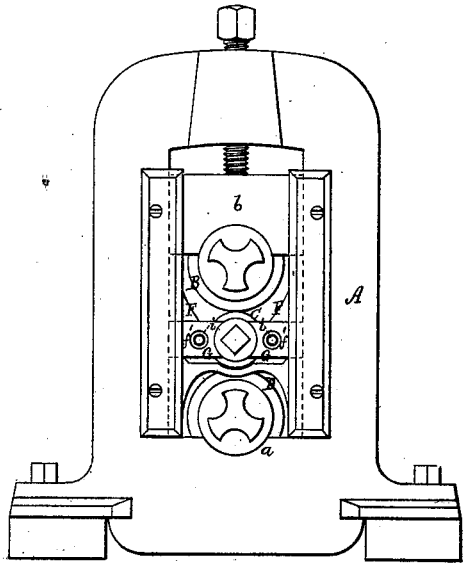


Fig. 4.

Fig. 5.

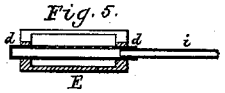


Fig. 3.

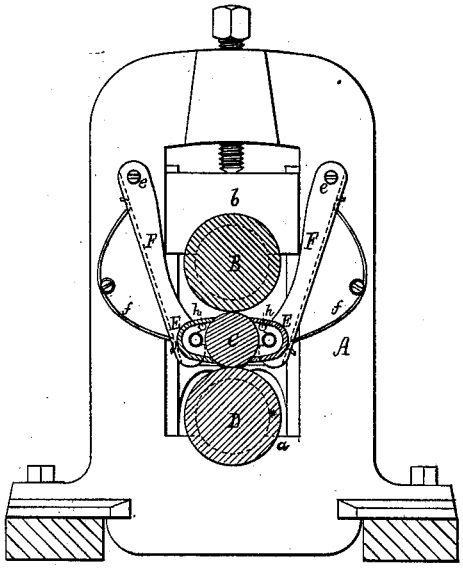
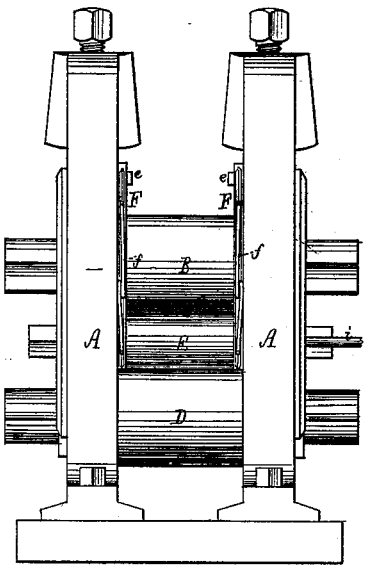


Fig. 2.



Witnesses.
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L. A. Foller.

Inventor
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by his attorney.
R. H. Eddy

UNITED STATES PATENT OFFICE.

PELEG S. BRADFORD, OF BRIDGEWATER, MASSACHUSETTS.

IMPROVEMENT IN METAL-ROLLING MACHINERY.

Specification forming part of Letters Patent No. **205,945**, dated July 16, 1878; application filed January 4, 1878.

To all whom it may concern:

Be it known that I, PELEG S. BRADFORD, of Bridgewater, of the county of Plymouth and State of Massachusetts, have invented a new and useful Improvement in Machinery for Rolling Metal; and do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side elevation, Fig. 2 a front view, and Fig. 3 a longitudinal section, of a rolling-machine provided with my invention.

In reducing iron or steel by means of rolls, the process is greatly facilitated by using with and over the bed-roll a roll of much less diameter, in which case it becomes essential to employ a third and larger roll directly over and upon the smaller roll to give to it the necessary support.

There is, however, incident to such employment of such smaller roll a difficulty which operates to prevent it from being long used to practical advantage, such difficulty consisting in the roll readily becoming too hot, and, in consequence thereof, being soon impaired or rendered useless.

My invention is to preserve or keep the said smaller roll sufficiently cool to prevent it from being burned or injured by the heated metal while in the process of being reduced by the rolls.

To this end I combine with the rolls one or a pair of self-adjusting coolers or water-backs, which I arrange directly against the smaller roll, in manner as represented in the accompanying drawings, in which—

A A denote the standards for supporting the roll boxes or bearings *a b*. B C D are the three rolls, and E E the coolers or water-backs. Each of these latter consists of a cast-iron box or hollow vessel curved concavely on its inner edge to fit to the periphery of the intermediate roll C.

The said box or vessel E has tubular journals projecting from its ends, as shown at *d d* in Figs. 4 and 5, the first of such figures being a top view, and the second a longitudinal section, of the vessel. These journals have bearings in two arms, F F, arranged against the inner sides of the standards A A. Each of the said arms, near its upper end, is pivoted to the standard, the pivot being shown at *e*. Furthermore, there is fixed to the standard, and to bear against the outer edge of the arm, a spring, *f*, such being to cause the cooler or water-back to bear closely against the roll C.

From the above it will be seen that, owing to the means by which the cooler or water-back is supported, it not only can rise and fall with the roll C, but will be constantly pressed against it.

The intermediate roll has each of its journals supported by a pair of guide-bearings, G G, through which holes *f' f'* are made for the reception of the induction-pipes *i i*, by which the coolers or water-backs are to be supplied with cool water, which, after having performed its office, is to be discharged through one or more educts or apertures, *h h*, in the upper part of each of such coolers or water-backs.

Each hole *f'*, to allow of the necessary movements of the cooler, should have a diameter somewhat larger than that of its pipe *i*, and when the cooler is in use and has two tubular journals, one of them is to be plugged to prevent the escape of water through it.

By my arrangement of each of the coolers a bar of metal to be reduced may be run between the intermediate roll and either of the others.

I claim—

1. In combination with the rolls B C D, one or a pair of coolers, E E, substantially as described, arranged with the intermediate roll C, in manner and provided with operative mechanism essentially as and for the purpose or purposes set forth.

2. The guide-bearings G G, provided with the holes *f' f'*, in combination with the three rolls B C D and one or more coolers, E E, substantially as described, arranged with the intermediate roll C, in manner and provided with inducts and educts and operative mechanism essentially as set forth.

PELEG S. BRADFORD.

Witnesses:
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