

(No Model.)

H. ROBERTS.
GUIDE FOR WIRE ROD MILLS.

No. 381,582.

Patented Apr. 24, 1888.

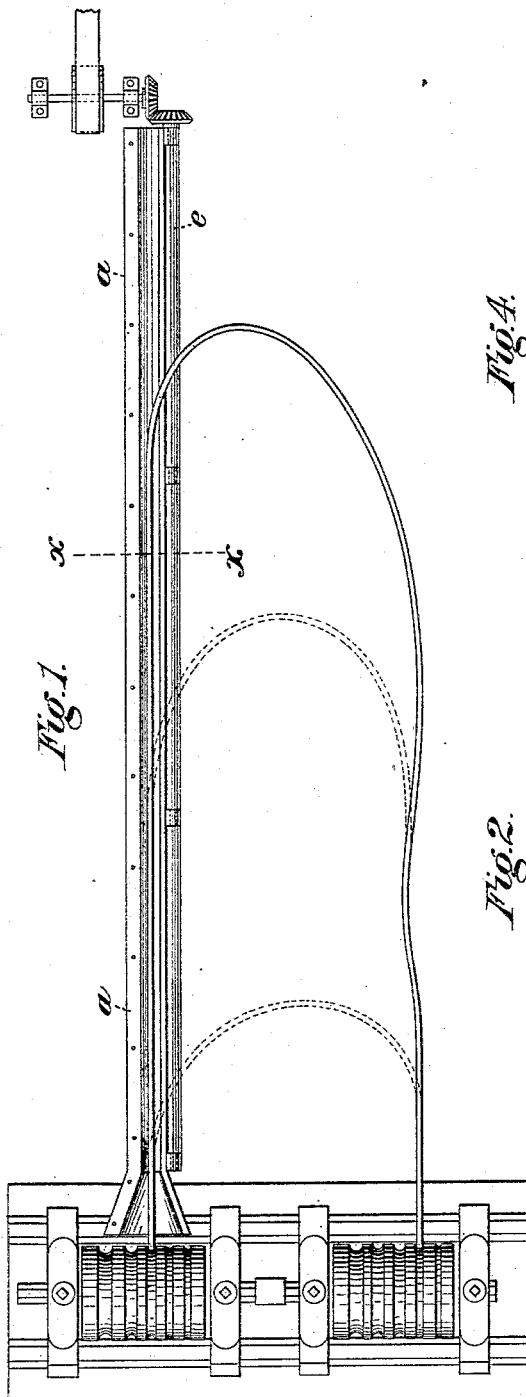


Fig. 1.

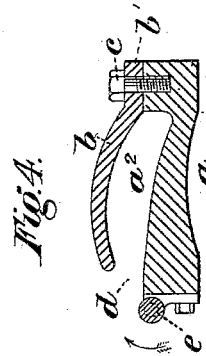


Fig. 4.

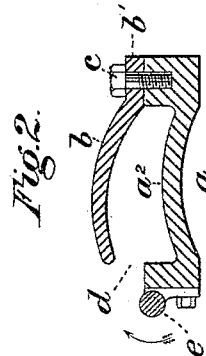


Fig. 2.

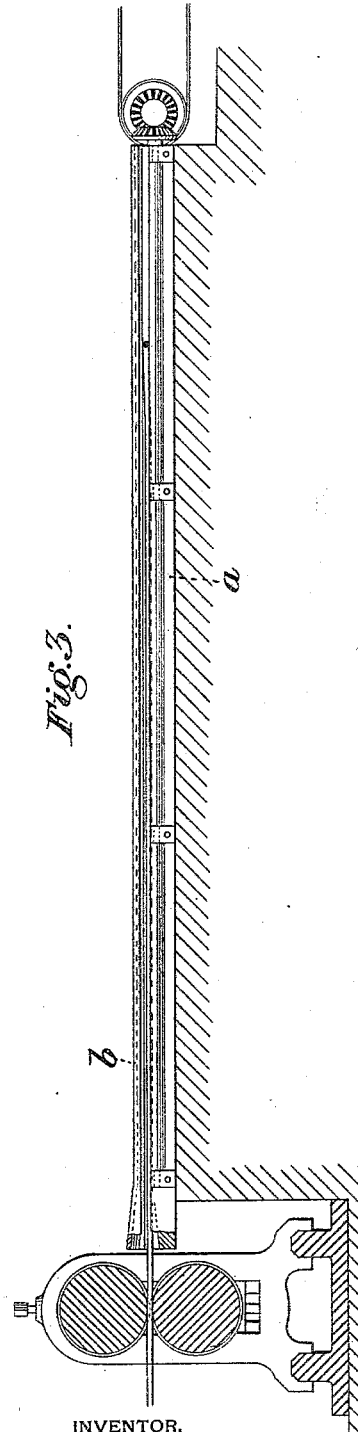


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY ROBERTS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF,
GEORGE T. OLIVER, AND ANDREW J. DAY, OF SAME PLACE.

GUIDE FOR WIRE-ROD MILLS.

SPECIFICATION forming part of Letters Patent No. 381,582, dated April 24, 1888.

Application filed December 17, 1887. Serial No. 258,153. (No model.)

To all whom it may concern:

Be it known that I, HENRY ROBERTS, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Guides for Wire-Rod Mills; and I do hereby declare the following to be a full, clear, and exact description thereof.

In rolling metal rods in a continuous mill, as now commonly practiced, it is customary to employ a series of trains of rolls set in line with each other and to pass the metal back and forth between these rolls. As the metal is reduced in diameter and increases in length, there is always difficulty in controlling it and preventing it from kinking, especially so when it is attempted to roll more than one rod at a time in a single mill. For this purpose it has been usual to employ boys, who stand with hooks opposite to the rolls and guide the elongating metal loop with a view of preventing it from kinking or injuring the workman. The work of these boys is very dangerous and requires the closest attention, and therefore the wages paid to them are quite high. Besides this, the least neglect on their part is apt to cause the kinking of the rod, and when this happens the delay in its passage through the mill chills the metal and unfits it for use, necessitating the cutting of it into pieces for scrap. In order to diminish these evils and to guide the metal loop as the rod is passing from one set of rolls to the next, there has been devised an apparatus consisting of a hollow transversely-corrugated tube having a flaring mouth, which is set opposite to the pass on the delivery side of the rolls, and which has its side slotted from end to end. When the end of the rod emerges from the rolls and is introduced between the next pair, the metal loop enters the tube, and, as it elongates, travels therein along the bottom and projects through the slot at the side. This tube was intended to guide the rod, to prevent its kinking or running uncontrolled over the floor of the mill, and to enable two rods to be rolled and guided simultaneously without interfering with each other. The plan, however, was defective for two reasons, because the interior shape of the tube causes rods when rolled at the same time

to converge at the center of the bottom, and if there is any tendency to kink one rod cannot separate from the other, and the evil is therefore aggravated rather than lessened, and also because the corrugations retard and interfere with the free passage of the rod. For these reasons these guides have not gone into successful use.

For the purpose of preventing the evils above noted and of giving to the trade a practically-operative guide which will lessen the danger and skill necessary in manipulating the rod and will enable more than one rod to be rolled at a time without danger, I have devised the present invention, which is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of the guide, shown in connection with two adjacent pairs of rolls, the top of the guide being removed. Fig. 2 is an enlarged vertical cross-section on the line *xx* of Fig. 1. Fig. 3 is a side view of Fig. 1, and Fig. 4 is an enlarged vertical cross-section of a modified form of guide.

Like symbols of reference indicate like parts in each.

As distinguished from the prior state of the art as above explained, my invention consists in a guide having an opening at the side, and having a bottom which, instead of being concave, is convex, as shown in Fig. 2.

It further consists in the combination, with the guide, of a shaft which extends parallel therewith beside the opening in the side thereof, and which rotates in a direction toward the guide, the effect being to direct the rod into the trough and to prevent it from leaving the same.

Referring, now, to the drawings, the guide consists of a base part or trough, *a*, and a cap-piece, *b*, which is secured to the bottom piece by bolts *c*, passing through flanges *b'*. At one side of the guide the cap and bottom casting do not meet, and therefore afford a narrow opening, *d*. The trough of the guide and the cap are made in sections, a sufficient number of which are placed together to form a guide of the desired length. The mouth or end of the guide next to the rolls is made flaring, the better to receive the rod. The bottom *a'* of the trough is inwardly convex, as shown, and when

the loop of the metal rod is being guided thereon its tendency is to hug the side, as shown in Fig. 2; but when two of the rods are in the guide at the same time, if one of them should kink, it would cause the other to rise up over the convexity to the other side of the trough, and thus to separate and to prevent danger of entanglement. In this regard my improved guide is vastly superior to the tubular guide heretofore invented and is a real success.

In order to direct the rod in the guide and to prevent any tendency it may have to leave the same, I journal a shaft, *e*, beside the trough parallel therewith, the top of the shaft being a short distance above the lower edge of the opening *d*. This shaft is driven by suitable power-connections so as to rotate in the direction of the arrow, and when the metal touches the shaft it tends to throw it over through the opening *d* into the guide.

Practical experience has demonstrated my invention to be of the greatest utility and to result in an economy of labor, a great diminution of loss of metal by waste, and in lessening the danger to the workmen.

The form of the parts may be changed somewhat without involving a departure from the principles of my invention. For example, the convexity of the bottom *a* may be much less than I have shown in the drawings, and its superficial outline may be varied. The purpose of having the cap *b* made separate from the bottom part, *a*, is that it may be removable for the purpose of cleaning the trough and that if the top or bottom be broken it may be replaced independently of the other part.

The rotary shaft *e* is an important feature of

my invention, and I believe it to be altogether novel. I do not, however, wish to limit myself strictly to its use, since, if desired, it may be omitted and good results had from the use of the guide alone. The rotary shaft may also be used with other forms of guides. If desired, the guide may be used, and in some cases with good results, without any cap *b*.

I claim—

1. In a rod-mill, the combination, with adjacent pairs of rolls, of an open guide extending transversely from the delivery side of one pair of rolls, said guide having a convex bottom, substantially as and for the purposes described.

2. In a rod-mill, the combination, with adjacent pairs of rolls, of an open guide extending transversely from the delivery side of one pair of rolls and a rotary shaft extending parallel therewith, substantially as and for the purposes described.

3. A guide of the character described, having a bottom piece or trough and a removable cap secured to the bottom piece at one side, and at the other side separated from the bottom piece, so as to afford an opening, *d*, substantially as and for the purposes described.

4. In a wire-rod mill, a guide-trough leading from a pair of rolls and having a convex bottom, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 13th day of December, A. D. 1887.

HENRY ROBERTS.

Witnesses:

W. B. CORWIN,

THOMAS W. BAKEWELL.