No. 619,144. Patented Feb. 7, 1899.

P. L. DAY.

WIRE ROD MILL.

(Application filed Feb. 8, 1898.)

(No Model.) 2 Sheets—Sheet 1.

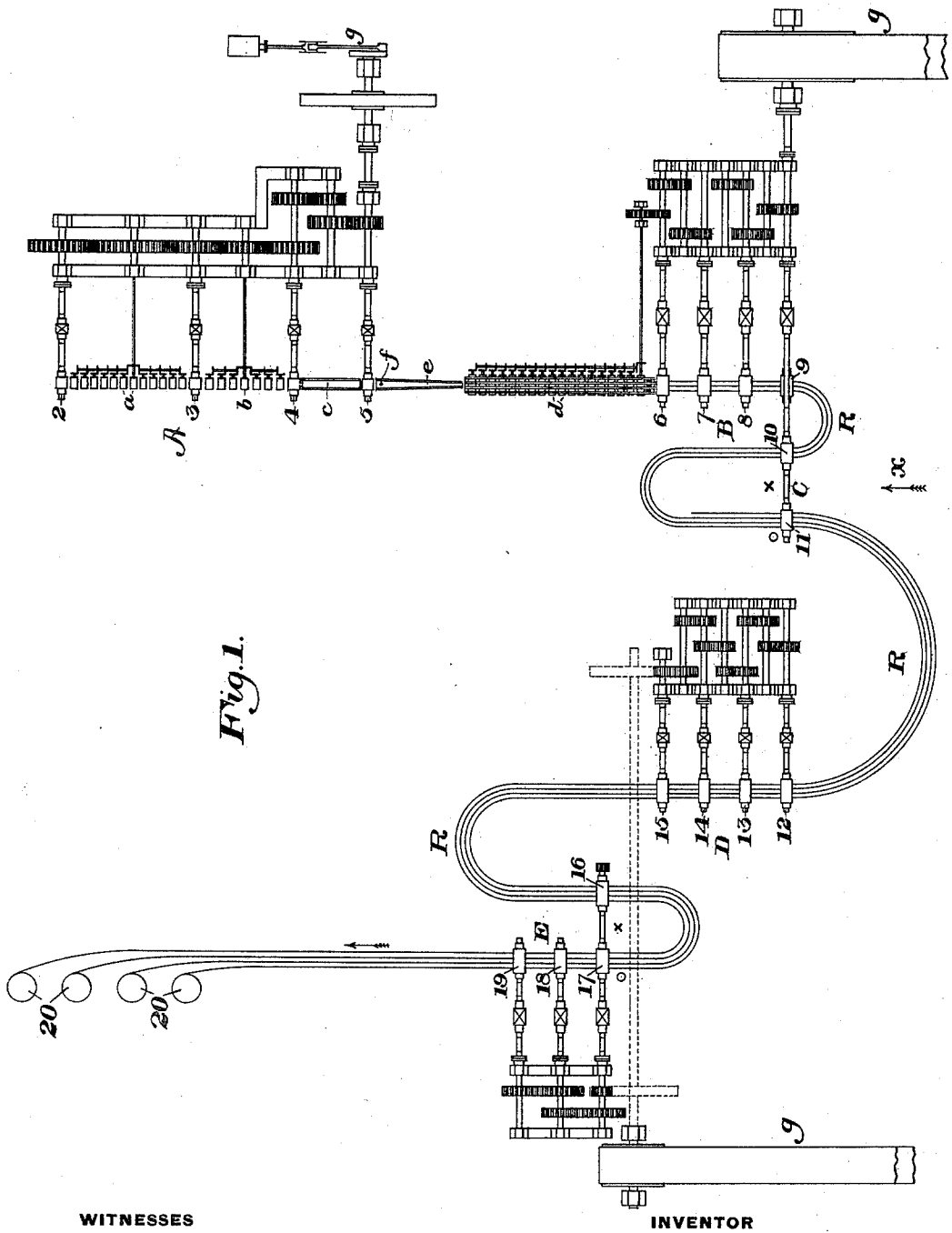


Fig. 1.

WITNESSES

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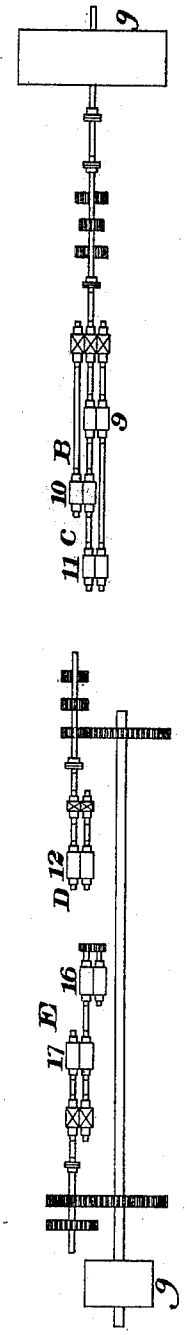
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Fig. 2.



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UNITED STATES PATENT OFFICE.

PATRICK L. DAY, OF CLEVELAND, OHIO.

WIRE-ROD MILL.

SPECIFICATION forming part of Letters Patent No. 619,144, dated February 7, 1899.

Application filed February 8, 1898. Serial No. 669,489. (No model.)

To all whom it may concern:

Be it known that I, PATRICK L. DAY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Wire-Rod Mills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 shows in plan view a wire-rod mill constructed in accordance with my invention; and Fig. 2 is an elevation of the rolls, looking in the direction of the arrow *x*.

My invention relates to the class of wire-rod mills set forth in my copending application, Serial No. 669,488, filed February 8, 1898, and is designed to provide a mill of this character and possessing the advantages thereof, and wherein between two of the continuous trains a set of rolls is provided consisting of two or more pairs of rolls arranged end to end, as in a Belgian mill, and through which the rod passes in two or more loops.

In the drawings, A represents a continuous train of rolls 2 3 4 5, which are the roughing-rolls, and between which are arranged series of conveying-rollers *a b* and a trough *c*. B is a second continuous set of rolls 6 7 8 9, and between the sets B and A is a line of conveying-rollers *d*. The rollers are adapted to convey the metal rod from the rolls 5 to the rolls 6 and are provided with surface guide-rails by which the metal may be directed to any one of the several passes of the rolls 6. For directing the metal to the proper one of said guides I employ between the rolls 5 and the ends of the rollers *d* a swinging guide-trough *e*, which may be pivoted at a point *f*.

Succeeding the continuous set of rolls B is a set of rolls C, arranged end to end relatively to the rolls 9, as in a Belgian mill, and the rod as it comes from the rolls 9 passes through the rolls 10 and 11 of the set C in loops.

Succeeding the set of rolls C is a continuous train of rolls D, comprising rolls 12 13 14 15, the rod passing from the rolls 11 to the rolls 12 in a loop.

Succeeding the set of rolls D is a pair of rolls 16, to which the rod passes in a loop from the rolls 15, and succeeding the rolls 16 is a set of continuous rolls E, comprising rolls 17 18 19, to which the rod passes in a loop from the rolls 16. From the rolls 19 the rods pass to the reels 20.

R R are repeaters arranged to take care of the square loops, it being understood that the rod is converted alternately from oval or diamond section to a square section in the ordinary manner.

g g are driving mechanisms or motors by which the several parts of the mill are driven.

I have indicated on the drawings by an X the position where a man may stand to reflex the oval rods to form the loops and by circles *o* places where shears may be put to shear off the end of the rod. In cases where the billet is supplied to the mill of sufficiently small cross-section the train of rolls A may be dispensed with, or where a larger size of billet than the four-inch billet is supplied to the mill additional rolls may be added to the train A in order to provide for such greater section.

The advantages of the invention are numerous. The alternation of the loop arrangement of rolls with the continuous trains of rolls reduces and takes out the surplus amount of stock from the rear end of the rod which has always occurred in continuous trains and prevents to a great extent finning of the rod. Moreover, the successive trains of rolls can be provided with a successively greater number of grooves instead of all the rolls of the continuous mill having the same number of grooves. The difficulty heretofore incident to continuous mills in causing the finishing of a rod while it is too hot is obviated.

As set forth in my copending application above referred to, by dividing the finishing-train into two separate continuous trains and placing a loop-roll or rolls between these parts I avoid the common difficulty of the rod not properly entering one or more of the lateral passes of the continuous finishing-train.

I claim—

1. A rod-mill having a continuous train, a finishing-train divided into separate continuous trains, and loop-trains between the continuous train and the first part of the finishing-train and between the two parts of the

finishing-train, at least one of said loop-trains having two or more pairs of rolls arranged end to end; substantially as described.

2. A rod-mill having continuous trains of rolls A and B, positively-driven feed mechanism between the same, a finishing-train divided into separate continuous trains and loop-trains before the first part of the finishing-train and between the parts of the finishing-train, the first-mentioned loop-train having more than one pair of rolls; substantially as described.

In testimony whereof I have hereunto set my hand.

PATRICK L. DAY.

Witnesses:
THOS. E. PIGOTT,
H. A. WILLIAMS.