2 Sheets--Sheet 1.

T. S. COOK.

Rolls for Rounding and Smoothing Metallic Rods and Bars.

No. 162,155 Patented April 20, 1875.

Fig. 1.

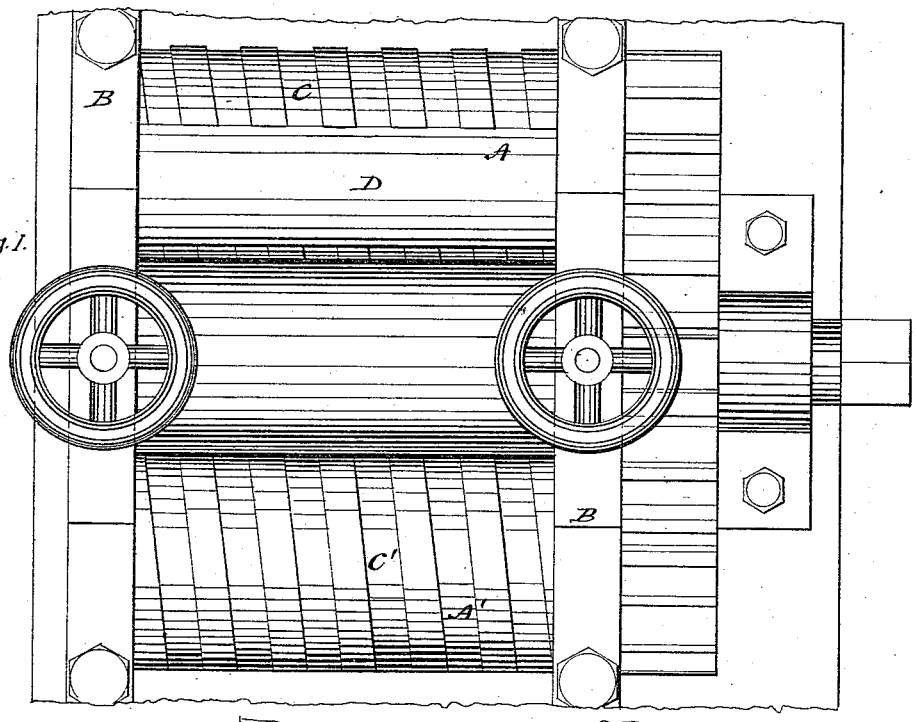
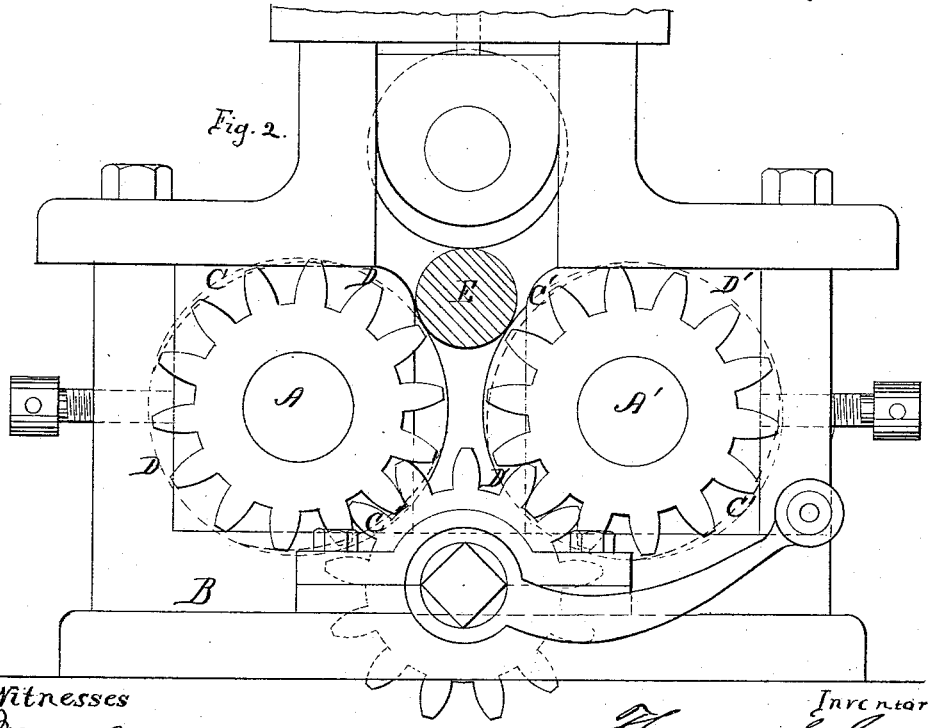


Fig. 2.



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Attorneys

2 Sheets--Sheet 2.

T. S. COOK.

Rolls for Rounding and Smoothing Metallic Rods and Bars.

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Fig. 10.

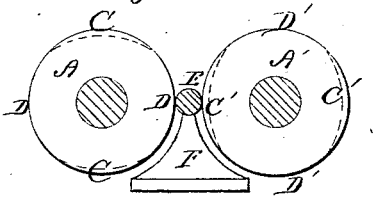


Fig. 3.

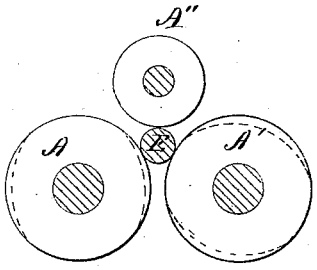
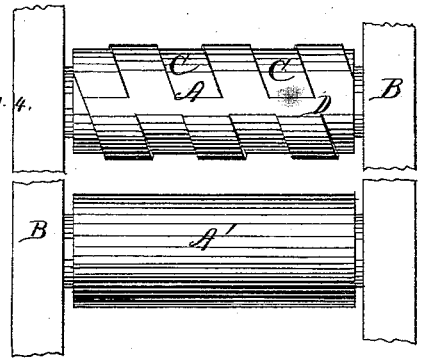


Fig. 4.



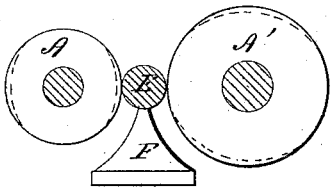


Fig 6

Fig. 5

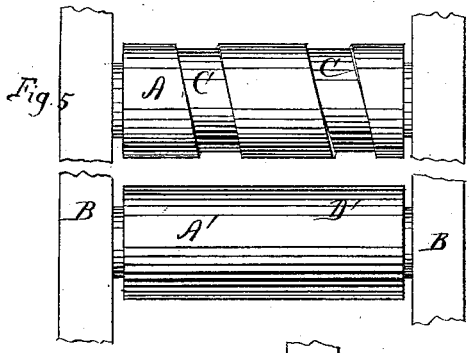


Fig. 7.

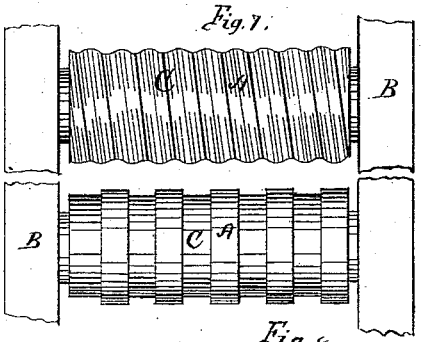
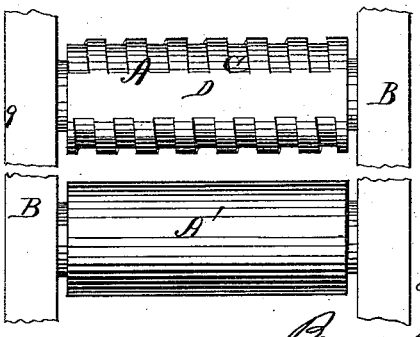


Fig. 8.

Fig. 9



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS S. COOK, OF CLEVELAND, OHIO.

IMPROVEMENT IN ROLLS FOR ROUNDING AND SMOOTHING METALLIC RODS AND BARS.

Specification forming part of Letters Patent No. **162,155**, dated April 20, 1875; application filed March 6, 1875.

To all whom it may concern:

Be it known that I, THOMAS S. COOK, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Rolls for Rounding, Smoothing, and Straightening Metal; 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.

The invention consists of rolls formed of alternate smooth and curved portions to receive the metal bars at the ends of the said rolls, the grooved and smooth portions on the different rolls being so disposed that a bar inserted between them will rest against the smooth portion of one roll while being operated upon by the grooved portion of the other roll. If desired to be fed forward by the rolls themselves, the said grooves are in worm or spiral form; but, if desired to feed the bar forward by external mechanism, they may be annular in form, or with their planes at right angles to the axes of the rolls.

In the drawings, Figure 1 is a plan view, and Fig. 2 an end view, of rolls embodying my invention. Fig. 3 represents a similar set of rolls, with a top roll constructed to bear upon the bar and to run in the same direction. Fig. 4 represents a similar set of rolls, wherein the lands and grooves are broader. Fig. 5 represents them still broader. Fig. 6 represents one roll larger than the other. Fig. 7 represents another form of roll with undulating surface. Fig. 8 represents a roll wherein the planes of the grooves are at right angles with the axes, in which condition it will be necessary to feed the bar forward. Fig. 9 represents the grooves as alternating with the position of the lands. Fig. 10 represents another form of roll embodying a variation of my invention.

Metal bars, as they come from the ordinary train-rolls, by which they are drawn out, are rough and uneven upon their outer surface, are covered with scales of oxide, and are seldom straight. It is the object of my invention to at once straighten the bar, to remove the scales, and to render it smooth and even upon its outer surface. This I effect in the following manner:

A A′ are rolls, suitably housed in frames B. C C′ are grooves formed in the surfaces of the said rolls, which grooves diminish in depth, and finally vanish into the surface of the cylindrical roll, in such a manner that the roll will possess two or more flat, unbroken surfaces, D D′. The grooves C C′ are formed by recessing into the cylindrical rolls A A′. The two rolls A A′ are so geared that the flat or smooth portion D shall, in revolving, come opposite to the grooved portion D′ of the other roll, and vice versa, so that, in revolving, there will be, in the position where the rod rests, always a smooth portion of one roll opposite to the grooved portion upon the other roll. E is a rod that is being operated upon. It is supported upon suitable supports or standards E′, and the rolls A A′ are made to revolve in the same direction, so that a rod, E, will be continually rolled between the rolls A A′. The grooves C C′ are arranged in screw form in the rolls, so that, as they revolve and exert pressure against the rod E, this screw form of the grooves will feed the rod E forward until it finally passes out from the rolls at the end opposite from which it entered them.

It will be seen from the above description that the rod will always have a solid, firm bearing upon a continuous or smooth surface, D D′, while the grooved portion of the other roll is operating upon it. The action of the grooved portion is to straighten out and smooth the outer surface of the bar, and at the same time permit the scale to drop off into the said grooves and be carried away. These grooves may be arranged in a great many different ways without departing from the principle of my invention. Thus the grooves may be formed very close together, or they may be made broad, with wide lands between them; or they may be made alternate with the lands, as shown in Fig. 9. In all cases, however, they must be so constructed that they will terminate into the cylindrical surface of the roll at given points, so as to leave alternate surfaces of the roll at D′ smooth and unbroken.

In Figs. 4, 5, and 9, the roll having the alternate smooth and grooved surface is opposite to plain or smooth rolls. This form of

roll will answer a good purpose, but is not so effective as when both rolls are similarly formed, because the bar would at times be interposed between two smooth surfaces.

In feeding the bar to the rolls, it may be well in some instances to employ rolls whose corrugations and lands form an undulating surface instead of square-cut grooves, as shown in the drawing. The rolls exert a considerable degree of pressure upon the bar, and, as the two rolls revolve in the same direction, the tendency is to cause the bar to jump up through the action of the ascending roll. To obviate this difficulty, another roll, A″, may be placed over the said bar, and having a bearing thereon; or it may be obviated by making that roll which acts upon the bar with a descending motion larger than the other roll.

The operation of the device is as follows: A metal bar, E, is introduced between the rolls, as shown; it is griped by the rolls, and is revolved rapidly between them; at the same time the grooves, because of their worm form, feed the bar forward; it is acted upon successively and alternately by the grooved portions of each of the rolls A A′, and the said grooved portions press the rod firmly against the flat portion of the other roll. In this way every part of the bar is many times subjected to the action of the grooved parts of one of the rolls, while it is firmly backed by the flat part of the other roll; the scale upon the bar is rapidly loosened and dropped into the grooves, and by them carried around and dropped down below, and in this way the bar is caused to emerge from the rolls in a smooth, straight, and round condition.

It is not absolutely necessary that the grooves should vanish gradually into the smooth portion of the roll; but, instead thereof, they may be maintained at a uniform depth, and made to terminate abruptly, instead of gradually, into the said smooth surface, the object being to form one portion of the roll grooved, while another portion remains smooth.

It is often necessary to dress down the rolls after they have been used for considerable time; and if the grooves were made to vanish gradually into the smooth surface, then dressing down would have the effect of widening the smooth surface, which effect is not produced when the grooves are made to vanish abruptly.

When it is desired that the bar shall be fed forward automatically by the rolls themselves, the grooves should be made in worm or screw-thread form. If, however, it is desired that the bar shall not be fed forward by the rolls themselves, but by external mechanism, then the said grooves may be formed so that their planes shall be at right angles to the axis, but with grooved and smooth portions alternating, as before explained.

What I claim as new is—

1. A device for the straightening, rounding, and smoothing of bars of metal, consisting of rolls A A′, provided with alternate worm-grooves C C′ and smooth surfaces D D′ substantially as and for the purposes described.

2. In a device for rounding, smoothing, and straightening metallic bars, grooves C, constructed in worm or screw-thread form, whereby the bar is automatically fed to the rolls, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS S. COOK.

Witnesses:

JAMES S. HIGTON,

R. COWLES.