(No Model.) 2 Sheets—Sheet 1.

W. S. SIMS.

ROLLS.

No. 421,625 Patented Feb. 18, 1890.

Fig. 1.

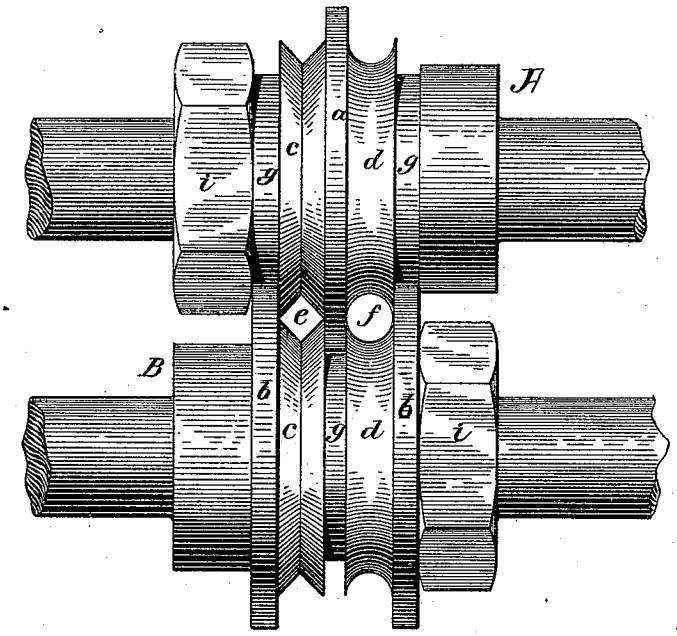
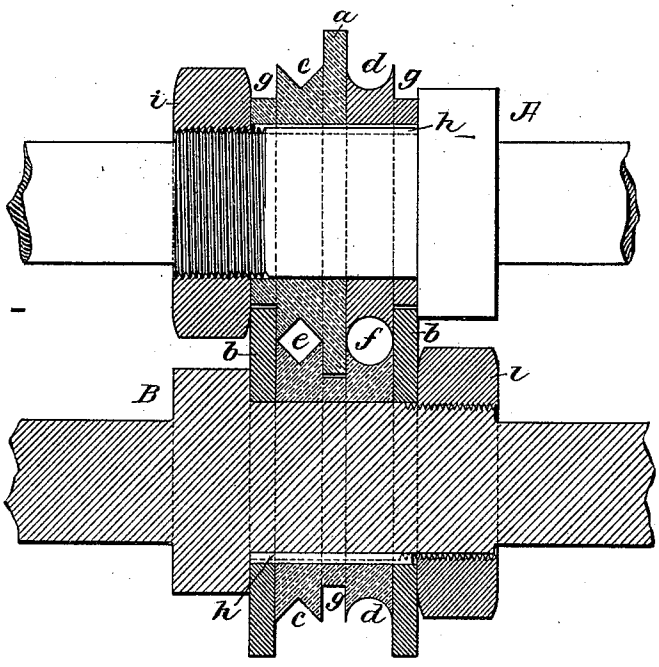


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

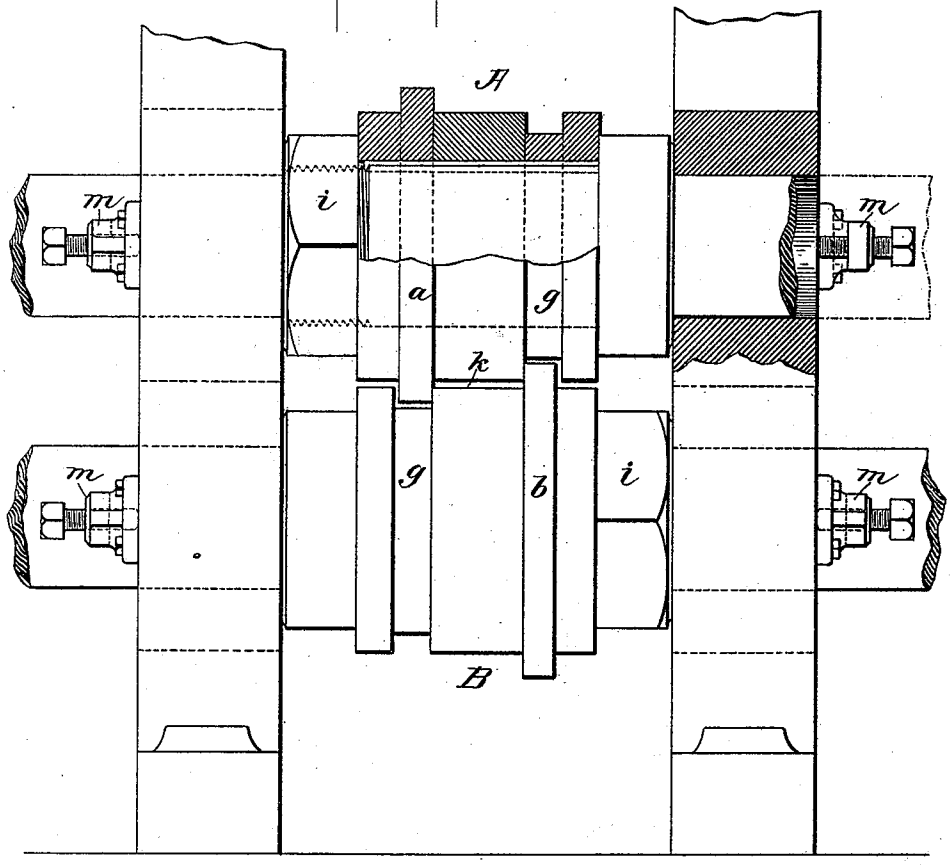
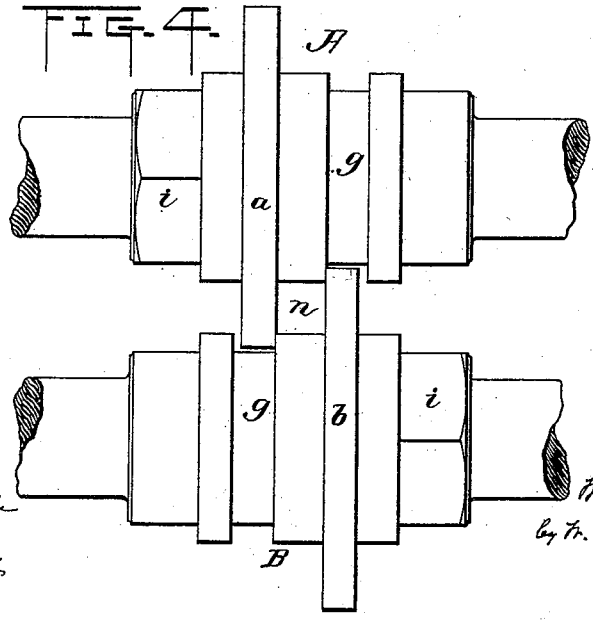


FIG. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM S. SIMS, OF PITTSBURG, PENNSYLVANIA.

ROLL.

SPECIFICATION forming part of Letters Patent No. 421,625, dated February 18, 1890.

Application filed February 11, 1889. Serial No. 299,408. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. SIMS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rolls, of which the following is a full, clear, and exact description.

My invention relates to an improvement in rolls for rolling rods, bars, or strips of metal; and it consists in the apparatus hereinafter described. Heretofore rolls of this character have generally been formed with the collars on one roll only, the second roller being provided merely with grooves or tongues, which rolls are known as "groove-and-tongue" rolls, and where round, oval, or square rods were to be rolled the "open-groove" roll has generally been employed, which rolls are not provided with collars.

Owing to the construction heretofore in use serious difficulties have occurred. In the first place, in hoop-iron or flat rolls, the grooves soon become worn and widened and the tongue becomes worn and narrow, which produces an opening through which the metal flashes or fins, and at the same time the width of the product becomes ununiform and the proper finish is destroyed; secondly, in all tongue-and-groove rolls of the former construction the edges of the grooves wear rough, which is apt to cause the metal to stick in the groove and wind itself around the roll, which sometimes destroys the groove and in all cases causes delay and trouble; thirdly, in rolling round, square, oval, or other rods in open-groove rolls the metal is apt to fin between the edges of the grooves, also in rolling round or square bars from those which are oval or diamond shaped it is necessary to insert the oval or diamond shaped rod by hand, and to hold it in its proper position by the use of guides or shoes. To obviate these difficulties is the object of my invention, which I will now proceed to describe, so that others skilled in the art to which it appertains may manufacture and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved rolls. Fig. 2 is a longitudinal sectional view. Fig. 3 is a side elevation of the improvement as applied to rolls for rolling hoop-metal. Fig. 4 is a side elevation of rolls for rolling square iron.

Like letters of reference refer to like parts wherever they occur.

In the drawings, A represents the upper roll, and B the lower roll, which are provided with collars *a* and *b b*, and with grooves *c c* and *d d*, forming the square and round apertures *e f*. It will be noticed that on each side of these apertures there is a collar—one on the upper and one on the lower roll—which collars enter grooves *g* in the opposite roll, extending beyond the edges of the grooves *c* and *d*. Owing to this construction the formation of fins is prevented by the side faces of the collars, which, as will be seen, form a complete box-groove. Moreover, when the grooves wear open they may be narrowed, as is hereinafter described. Not only do the side faces of the collars prevent finning, but they also perform another important function by turning oval and diamond shaped bars on their longitudinal axis as they enter square or round grooves, whereby the services of the attendant, as well as of guides and shoes, may be dispensed with. This rotary movement is caused by the two collars moving in opposite directions, which turn the bar until it comes into the position, when it is free, to enter the groove. To obtain the desired advantages from this feature of my invention, I prefer to form each pair of rolls with but a single groove and place the several pairs of rolls directly one in front of the other, so that the bar or rod after passing through the groove in the first pair of rolls shall be fed automatically into the grooves of the succeeding rolls. By this latter arrangement I am also enabled to overcome the evil incident to the wearing of the faces of the collars and grooves, as by having but a single collar and groove in each roll of the pair I am enabled to move the rolls longitudinally in opposite directions by means of the usual set-screws *m* on the housings, so that when the groove becomes widened by wear it may be narrowed as desired, and the opening which would permit finning be closed.

In Fig. 3 a pair of rolls is shown having but a single groove *k*. These rolls are designed to roll hoop-iron, and although a groove of

this shape does not have the property of turning the rod, owing to the width of the metal being so much greater than its thickness, yet it serves to illustrate the means by which the evil incident to finning, caused by wear, may be obviated.

Another feature of my improvement is that the collars and groove-pieces are formed separately from the body of the roll and each other and secured thereon by passing the annular collars over the roll, the parts being attached by a feather and spline *h*, or a suitable key and securing-collars *i*, which are screw-threaded and engage with threads on the body of the roll.

In rolling round bars, where the groove *n* is square, as shown in Fig. 4 of the drawings, the rotary movement imparted to the rod by the side faces of the collars continues while the bar is passing through the rolls, which has the additional effect of planishing or smoothing the surface of the bar.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A series of two or more rolls having substantially equilateral or circular grooves, in combination with collars arranged upon opposite rolls and upon opposite sides of the said grooves, and having their adjacent faces straight, parallel, and at right angles to the axes of the rolls and extending beyond the bottoms of the grooves and forming with the grooves close box-grooves and extending in advance of such grooves relatively to the incoming bar or rod, so as to impart a rotary movement to the bar or rod on its longitudinal axis before it enters the grooves, substantially as and for the purpose set forth.

2. The combination of a roll, annular collars, a key or feather and spline, and a threaded retaining collar or collars, substantially as and for the purpose specified.

3. The combination of a pair of rolls, each having a single groove and a single collar, and devices for adjusting the rolls laterally, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 11th day of January, A. D. 1889.

WILLIAM S. SIMS.

Witnesses:
THOMAS B. MORELAND,
JAMES B. HYNDMAN.