F. NEVEGOLD.

Machines for Rolling Band or Hoop Iron.

No. 198,667. Patented Dec. 25, 1877.

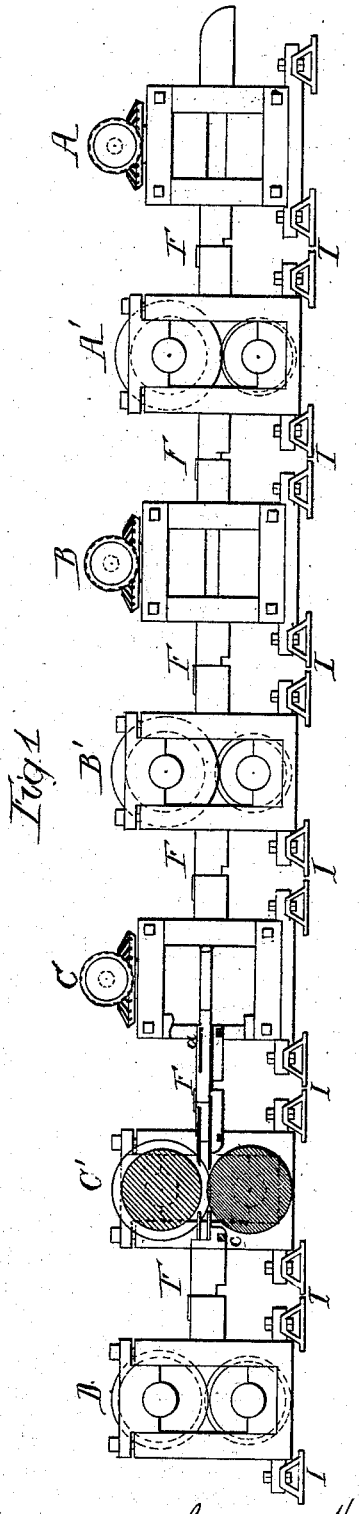

Fig. 1

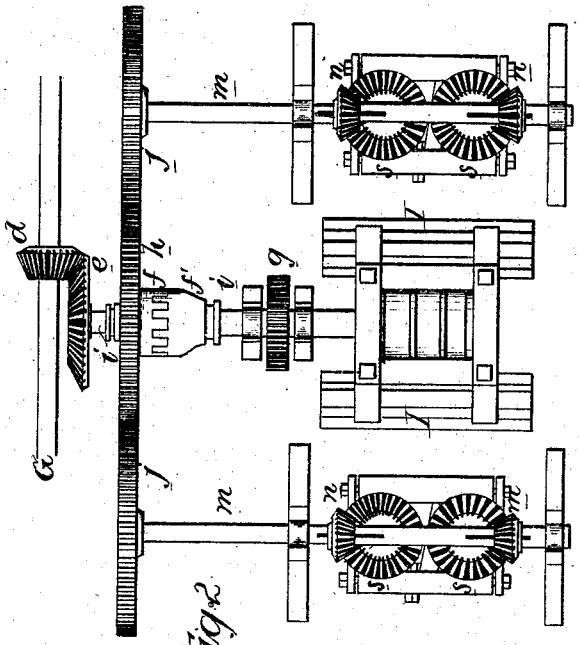

Fig. 2

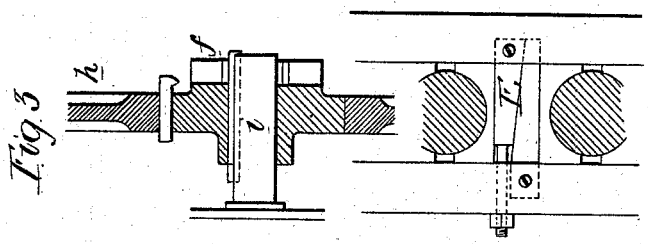

Fig. 3

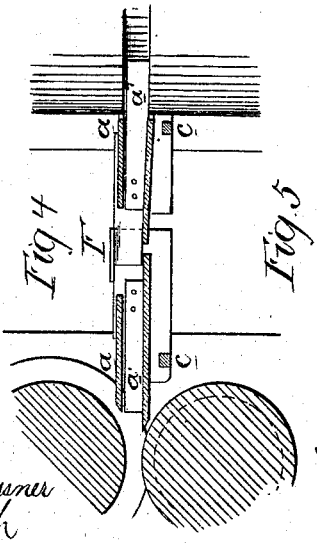

Fig. 4

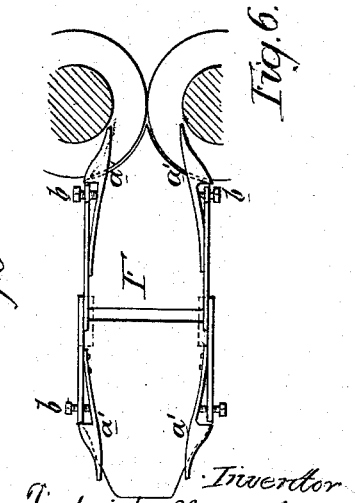

Fig. 5

Fig. 6

Witnesses Hermann Moessner
Harry Smith

Inventor
Frederick Nevegold
by his Attorneys
Howson & Howson

UNITED STATES PATENT OFFICE.

FREDERICK NEVEGOLD, OF BRISTOL, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR ROLLING BAND OR HOOP IRON.

Specification forming part of Letters Patent No. **198,667**, dated December 25, 1877; application filed May 1, 1877.

To all whom it may concern:

Be it known that I, FREDERICK NEVEGOLD, of Bristol, Bucks county, Pennsylvania, have invented certain Improvements in Machinery for Rolling Band or Hoop Iron, of which the following is a specification:

The object of my invention is to construct a mill for rolling hoop and band iron direct from a billet or pile at one pass—an object which I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, in which—

Figure 1 represents a side view, partly in section, of a train of rolls for carrying my invention into effect; Fig. 2, a plan view of a portion of the same; and Figs. 3, 4, 5, and 6, enlarged views of parts of the apparatus.

The main feature of my invention is the use of a series of alternate vertical grooved edging-rolls, Figs. 1 and 5, and horizontal tongued and grooved flattening-rolls, Figs. 1 and 4, the size of the opening formed by the grooves in the rolls gradually diminishing from one end of the machine to the other, so that the draft upon the bar shall be uniform and continuous, a billet or pile introduced into the machine at one end being reduced alternately on its flat sides and its edges until it is finally discharged in the condition of a thin strip.

In the present instance I have shown three pairs of vertical rolls, A, B, and C, and four pairs of horizontal rolls, A′, B′, C′, and D, two pairs of horizontal rolls being arranged at the rear end of the machine, and the others alternating with the vertical rolls.

The number and arrangement of the rolls may, however, be varied as circumstances may suggest.

The grooves of the vertical rolls are in line with each other; but the grooves of the upper horizontal roll are in line with the collars on the lower horizontal roll, and said horizontal rolls are provided with collars and grooves of varying widths, so that by sliding the housings of these rolls on the foundation-plates I the mill may be adapted to the rolling of strips of different sizes.

The adaptation of the vertical rolls to the working of strips of different sizes is effected by moving the said rolls from and toward each other by operating wedge-shaped blocks E, which are used in connection with both the upper and lower bearings for the necks of the rolls, and are illustrated in Fig. 6.

From each pair of rolls to the adjacent pair extends a box or guide, F, which serves to receive the strip from one pair of rolls and guide it to the groove in the next pair, the guiding being effected by a top strip, *a*, and side strips *a′* at the ends of the boxes. The strips *a′* and, if desired, the strips *a* are rendered adjustable by means of set-screws *b*, so that they may be made to conform to the size of the groove or opening from which they receive or to which they deliver the strip. By this means I am enabled to properly guide the strip in its passage from roll to roll, and yet overcome that excessive friction on the strip which results when the entire length of the sides or top of the box are in contact with the strip. The box F is rigidly carried at either end by a rest-bar, *c*, on the housing adjacent to that end; and in order to allow for the longitudinal expansion and contraction of the box, owing to the varying degrees of heat to which it is subjected, I make said box in two or more sections, connected together in such a manner that they can slide longitudinally on each other. By this means the truth of the guide is never affected by that warping or twisting to which a rigid guide would be subject.

All the rolls are driven from one countershaft, G, one bevel-wheel, *d*, on said shaft serving to impart movement to both a pair of vertical and a pair of horizontal rolls, or to a pair of horizontal rolls and two pairs of vertical rolls, in the manner hereinafter described. The bevel-wheel *d* gears into a bevel-pinion, *e*, on a shaft, *i*, which carries a clutch, *f*, the latter engaging with a clutch, *f′*, on the shaft of one of the horizontal rolls, and said shaft being geared to the shaft of the other horizontal roll by cog-wheels *g*. The clutch *f* carries a cog-wheel, *h*, which gears into pinions *j* carried by shafts *m*, the latter being provided with bevel-wheels *n n*, which gear into bevel-pinions *s s* carried by the shafts of the pairs of vertical rolls on either side of the pair of horizontal rolls. The shafts *m* are provided with feathers adapted to slots in the hubs of the wheels *n n*, so that the latter may be moved

to and fro on the shaft as the rolls are moved from and toward each other, for the purpose hereinbefore mentioned.

When but one pair of vertical rolls is to be driven from the shaft *i*, one of the shafts *m* and its connections is dispensed with.

It should be noticed that my invention is distinct from that class of hoop or band rolling mills in which plane-faced rolls or simple grooved rolls are used, as mills of this class require the billet to be first rolled into a size of about the same width as that of the finished strip, the reduction effected being merely in the thickness of the strip, whereas, in my case, the use of vertical grooved rolls and horizontal tongued and grooved rolls enables me to reduce both in width and thickness, so that a strip of, say, one inch by one-sixteenth of an inch may be produced from a billet or pile of, say, two and a half inches square.

I claim as my invention—

1. A mill for rolling hoop or band iron in which vertical grooved edging-rolls alternate with horizontal tongued and grooved flattening-rolls, all substantially as specified.

2. The combination of the two sets of rolls with an intervening box or guide, F, having guiding-strips *a a'* at each end, as set forth.

3. The combination of the two pairs of rolls with an intervening box or guide, F, made in sections, adapted to and arranged to slide longitudinally on each other, as specified.

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

FREDERICK NEVEGOLD.

Witnesses:
HERMANN MOESSNER,
HARRY SMITH.