No. 769,603. PATENTED SEPT. 6, 1904.

F. FORSBERG.

MANUFACTURE OF IRON OR STEEL WIRE.

APPLICATION FILED MAR. 25, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

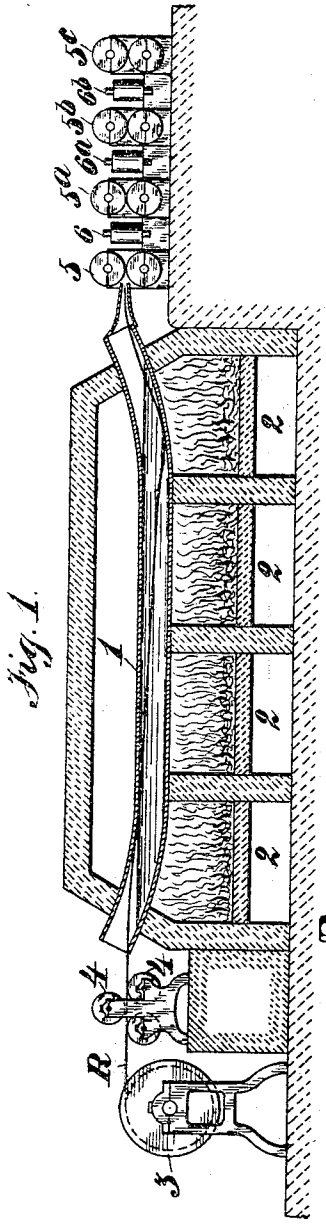


Fig. 1.

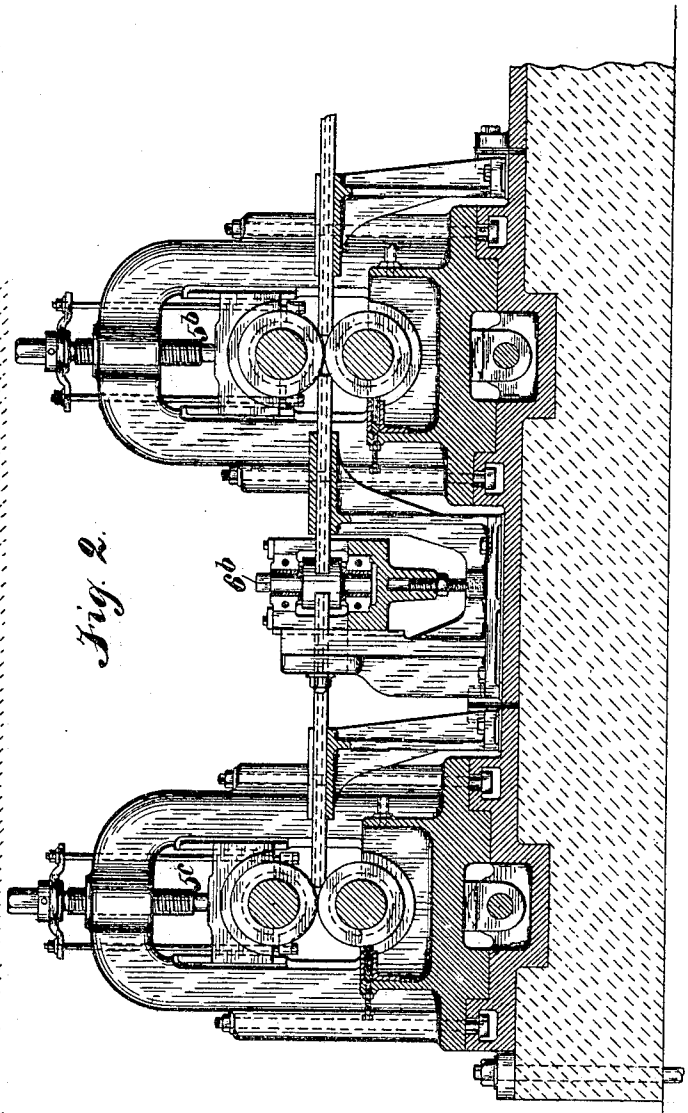


Fig. 2.

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NO MODEL. 3 SHEETS—SHEET 2.

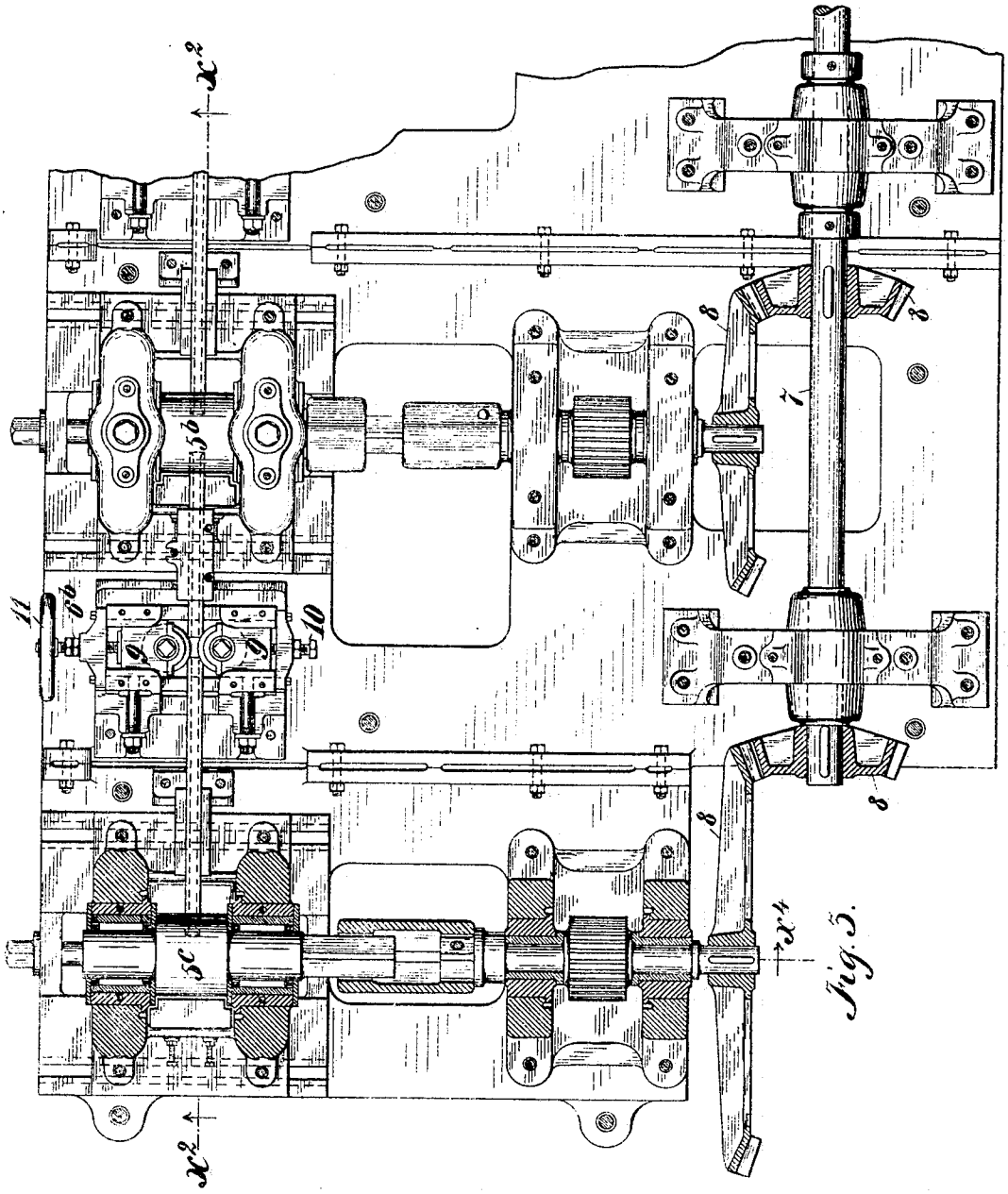


Fig. 5.

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NO MODEL. 3 SHEETS—SHEET 3.

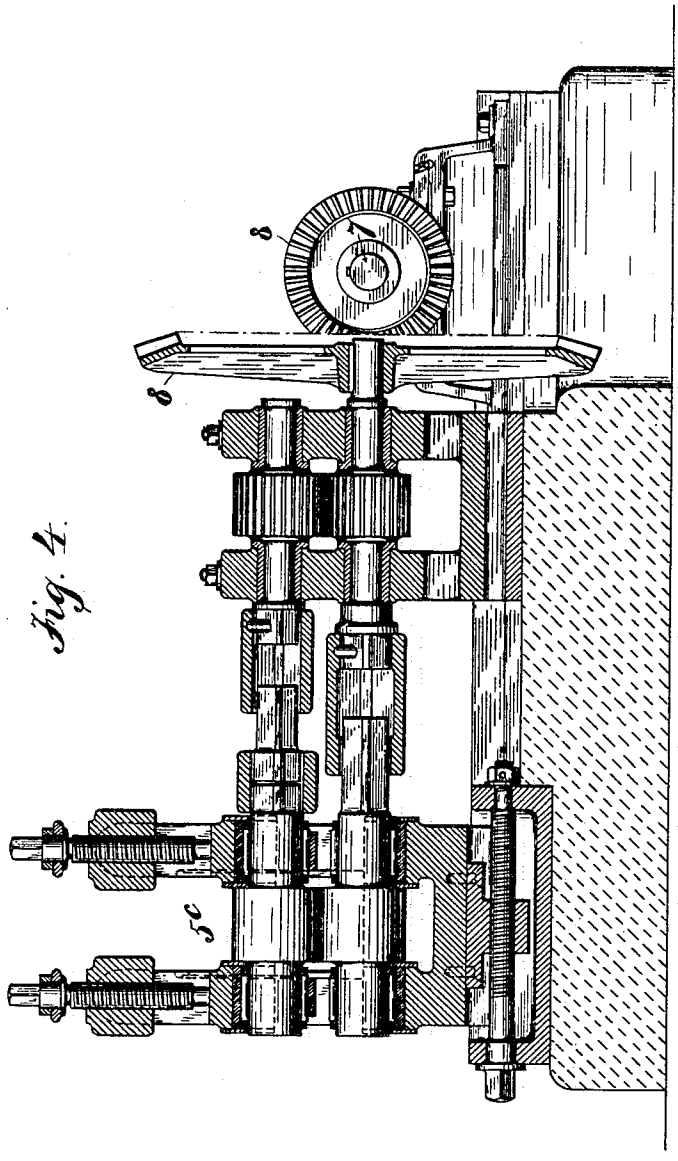


Fig. 4.

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UNITED STATES PATENT OFFICE.

FREDRIK FORSBERG, OF SANDVIKEN, SWEDEN.

MANUFACTURE OF IRON OR STEEL WIRE.

SPECIFICATION forming part of Letters Patent No. 769,603, dated September 6, 1904.

Application filed March 25, 1903. Serial No. 149,443. (No model.)

To all whom it may concern:

Be it known that I, FREDRIK FORSBERG, a subject of the King of Sweden and Norway, residing at Sandviken, in the Kingdom of Sweden, have invented certain new and useful Improvements in the Art of Manufacturing Iron or Steel Wire, of which the following is a specification.

This invention relates to the art of rolling and drawing iron or steel rods in order to reduce them to the form of wire having any desired contour in cross-section.

Heretofore, so far as known to me, iron or steel wire has been made either by drawing cold the rods primarily rolled for the purpose or by drawing such rods cold down to a dimension found suitable by experiment and then by subjecting same to repeated hot and cold rolling to bring them down to the dimensions desired or by rolling while hot in a single pair of rolls the previously cold-drawn wire, thus bringing it down to the dimensions required.

The present invention has for its object to reduce the ordinary rods to the sectional dimensions required while hot, cold-drawing being wholly eliminated; and the invention consists, essentially, in submitting a heated rod of the metal—iron or steel—simultaneously to roll-drawing and rolling operations, as will be hereinafter explained.

In order that the procedure may be the better understood, the apparatus preferably employed for effecting it is illustrated in the accompanying drawings, wherein—

Figure 1 is a longitudinal vertical section of the apparatus somewhat diagrammatically represented on a relatively small scale. Figs. 2, 3, and 4 are views illustrating the rolls on a much larger scale. Fig. 2 is a vertical section taken substantially at line x^2 in Fig. 3. Fig. 3 is a plan, and Fig. 4 is a vertical transverse section taken substantially at line x^4 in Fig. 3.

Referring primarily to Fig. 1, 1 designates a heating-bath, suitably a lead-bath, disposed over a furnace or furnaces 2. The rod R to be operated on is fed forward from a reel 3 in the usual manner by straightening-rolls 4 through the bath 1 to the rolling and drawing rolls seen at the right in Fig. 1, where it passes successively through pairs 5, 5^a, 5^b, and 5^c of horizontally-disposed and positively-driven rolls and through pairs 6, 6^a, and 6^b of vertically-disposed non-driven rolls—that is to say, these pairs of vertically-disposed rolls, which alternate in position with the pairs of horizontal rolls, are rotated solely by the friction of the moving rod or wire thereon. The vertical rolls clamp frictionally on the heated rod or wire as it is carried along by the horizontal rolls, and the result is as follows: The rolls 5 draw the heated wire from the bath, the rolls 5^a draw it through the vertically-disposed pair of rolls 6, disposed between the pairs of rolls 5 and 5^a, the rolls 5^b draw the rod or wire through the vertically-disposed pair of rolls 6^a, and the pair of rolls 5^c draw the rod or wire through the pair of vertically-disposed rolls 6^b. In consequence of this alternation of positively-driven rolls and non-driven rolls there is a straining of the wire or rod between each pair of non-driven rolls and the pair of driven rolls next ahead, and as a result of this straining of the rod or wire the reduction of the dimensions or size of the wire when passing between the driven rolls will be considerably greater than if this straining of the wire did not exist—that is to say, if the vertically-disposed rolls were positively driven and not rotated merely by the wire itself.

Referring to the detailed drawings, Figs. 2, 3, and 4, it will suffice to say that the horizontal rolls are driven from a shaft 7 through gear-wheels 8, the rolls being of course speeded gradually higher toward the end of the series by reason of the gradual elongation of the rod or wire. The vertically-disposed pairs of rolls are mounted, each roll of the pair, in a sliding block 9, and these blocks are adjusted and set up so that the rolls clamp on the rod by suitable screws 10 and 11, as seen in Fig. 3.

I am aware that a method similar to that above described has been employed in the art of manufacturing brass and copper wires from metal in a cold state, and therefore I do not

claim this. My invention is restricted to the manufacture of wires from heated rods of iron and steel. In this art my method is an essential improvement.

Having thus described my invention, I claim—

The herein-described improvement in the art of forming wire from a rod of iron or steel, which consists in first heating said rod, and then, while it is hot, subjecting it to alternate rolling and roll-drawing operations simultaneously applied at different parts of the rod.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FREDRIK FORSBERG.

Witnesses:
ERNST SVANQVIST,
AUG. SORENSEN.