

(No Model.)

S. JOHNSTON.
METAL ROLLING MACHINE.

No. 455,336.

Patented July 7, 1891.

Fig. 1.

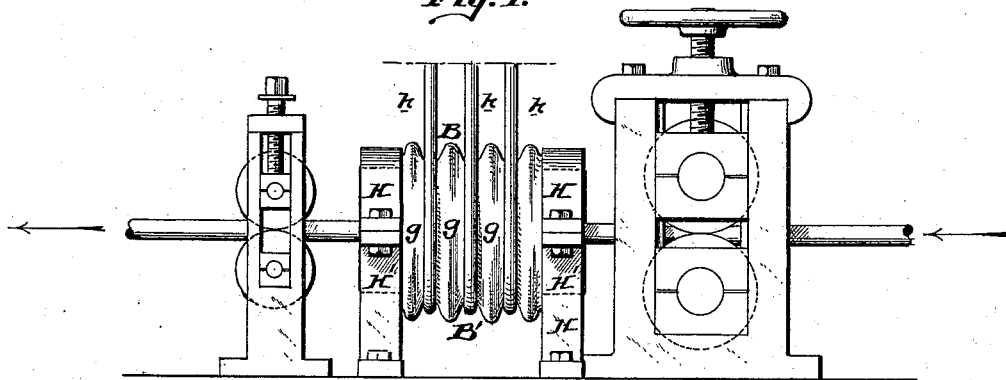


Fig. 2.

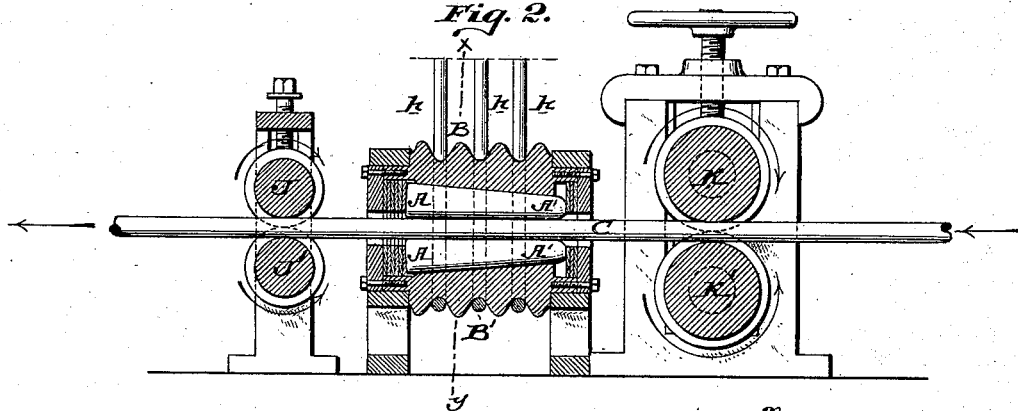


Fig. 3.

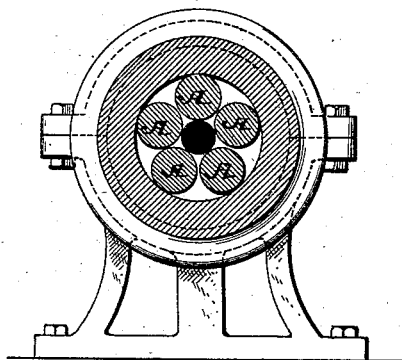
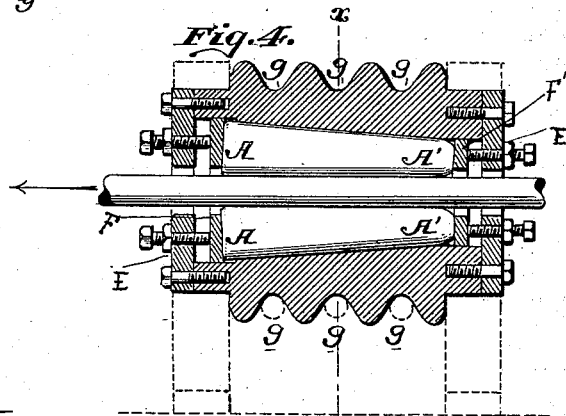


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

SAMUEL JOHNSTON, OF DENVER, COLORADO.

METAL-ROLLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 455,336, dated July 7, 1891.

Application filed July 14, 1890. Serial No. 358,727. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL JOHNSTON, a citizen of the United States, residing at Denver, county of Arapahoe, and State of Colorado, have invented a new and useful Improvement in Metal-Rolling Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

Figure 1 represents a front elevation of my improved arrangement of rolls; Fig. 2, a longitudinal section of the same; Fig. 3, an end view of rolls and shell on line *xy*, Fig. 2; Fig. 4, an enlarged sectional view of the drawing and finishing rolls.

My improvement has for its object the reduction and finishing of rods, shafting, tubes, &c., of metal, of iron, steel, or steely-iron; and it consists in the employment of a series of rolls inclosed in a strong shell which surrounds the rolls. These rolls are arranged so that the rod or tube shall be passed between the rolls in a line parallel to their axes. The rolls with the inclosing shell are made to revolve around the rod. The rods are progressively fed between these rolls by means of a pair of feeding-rollers opposite each end of the shell. These feeding-rolls at the same time that they feed the rod longitudinally forward between the shell-rolls prevent the rod from revolving and hold it steadily against all tendency to turn.

AA' AA' AA' AA' AA' represent the rollers, of about one foot to three feet in length and of about one-fourth to twelve inches in diameter, depending on the diameter of the rod to be treated. These rollers AA' AA' AA' AA' are made of hardened steel or chilled iron and are frustums of cones very slightly tapering and rounded at the receiving ends A' A' A' A' A'. A series of five of these rolls AA' AA' AA' AA' AA' are arranged within a strong iron shell BB', made of cast-iron, of a cylindrical exterior BB', and the interior is the shape of the frustum of a cone. This interior has a chilled-iron surface. When the rolls AA' AA' AA' AA' AA' are placed within the shell and surround the rod C, the slightly-tapering rolls AA' AA' AA' AA' AA' correspond with the reverse taper of the shell, so that the interior space occupied by the rod

C will present a space adapted to receive a cylindrical bar, the circle thereof being tangent to the rolls AA' AA' AA' AA' AA', and the diameter of the space between the rolls and the cylinder being uniform throughout, as shown in Figs. 2 and 4.

The rolls AA' AA' AA' AA' AA' are not journaled, but are placed loosely in the shell B. The pressure on each of the rolls AA' AA' AA' AA' AA' is brought by the inner surface of the shell in contact with the outer surface of each of the rolls AA' AA' AA' AA' AA' throughout their length.

There are end brackets or projections at E E', which extend from the shell internally, and against them the ends of the rolls AA', &c., abut. Adjusting-screws are placed in these projections E E', which bear upon the washers F F', whereby the rolls AA', &c., can be adjusted longitudinally, as may be required by the varying diameter of the rod treated, or wherever the wear of the rolls requires it these adjusting-screws may be used so as to approximate the rolls, and thus make up for the wear. The shell revolves in boxes or end bearings. (Shown at H H' in Figs. 1, 2, 3, and 4.) The shell is made with exterior corrugations *g g g* or grooves on its outer circumference and is driven by rope belting *k k*. Opposite each end of this set-off are placed a pair of ordinary grooved rolls K K', which feed the rod into the center space between the rolls AA' AA', &c., and force it along the central space between those rolls, so that the rod gradually progresses while it is compressed, drawn, and finished by the rolls AA' AA', &c. At the opposite end another pair of rolls J J' receive the rod as it emerges from the series of rolls AA' AA', &c. The rolls K K' and J J' are geared and driven in the usual manner.

The operation is as follows: The rod or tube, either heated or cold, is passed between the rolls K K' and forced by these rolls into and through the central space between the rolls AA' AA', &c. As the rod is forced through this space, the rolls AA' AA', &c., revolving freely in contact with the rod, produce the drawing, straightening, and finishing process upon the rod. The rod as it emerges passes between the rolls J J'. The rolls K K' and J J' co-operate in feeding the

rod through and prevent it from turning, while the constant passage of the rolls AA' AA', &c., in the revolving shell around the rod finishes it and draws it in a more perfect manner than has been heretofore effected.

For drawing and reducing wire the feeding-rolls K K' should be dispensed with and the rods drawn between the rolls AA' AA', &c., by the rolls J J'.

Having now fully described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. The combination of the longitudinal drawing and finishing rolls AA' AA' AA' AA' AA', the revolving shell BB', and the feeding or holding rolls K K'.

2. The combination of the longitudinal drawing and finishing rolls AA' AA' AA' AA' AA' with the feeding-rolls J J'.

3. The combination of the longitudinal drawing and finishing rolls AA' AA' AA' AA' AA' with the feeding-rolls K K' and J J'.

4. The combination of the longitudinal drawing and finishing rolls AA' AA' AA' AA' AA', the revolving shell BB', and the adjusting-screws for regulating the relative positions of the rolls AA' AA' AA' AA' AA'.

5. The use of tapering rollers within a tapering shell as a method of adjusting mechanism for drawing and reducing metal rods, substantially as described.

In testimony of which invention I have hereunto set my hand.

SAML. JOHNSTON.

Witnesses:

ERNEST HOWARD HUNTER,
FRANK S. BUSSE.