C. L. JOHNSON.

Machine for Rolling Metal Tubes

No. 168,026. Patented Sept. 21, 1875.

Fig: 1

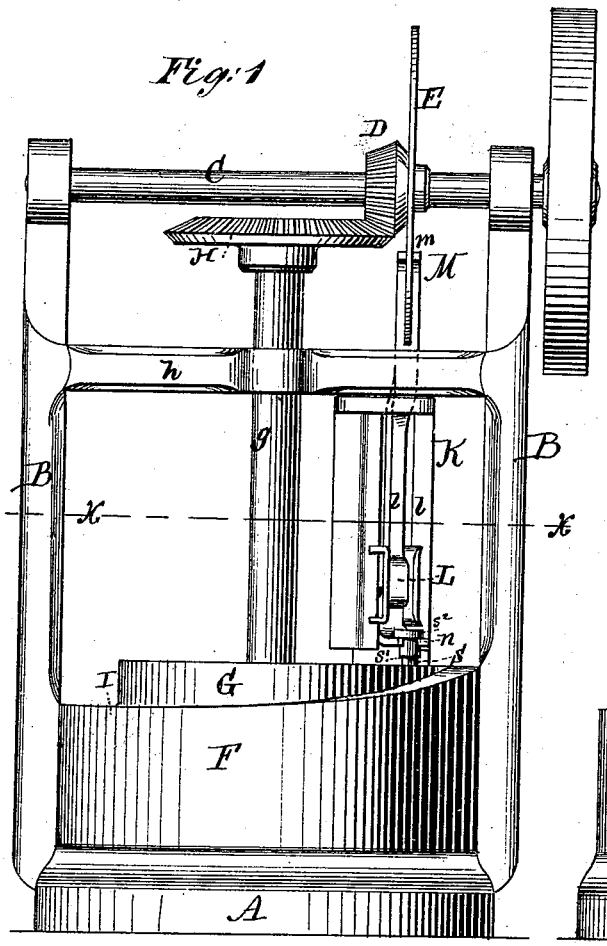


Fig: 2

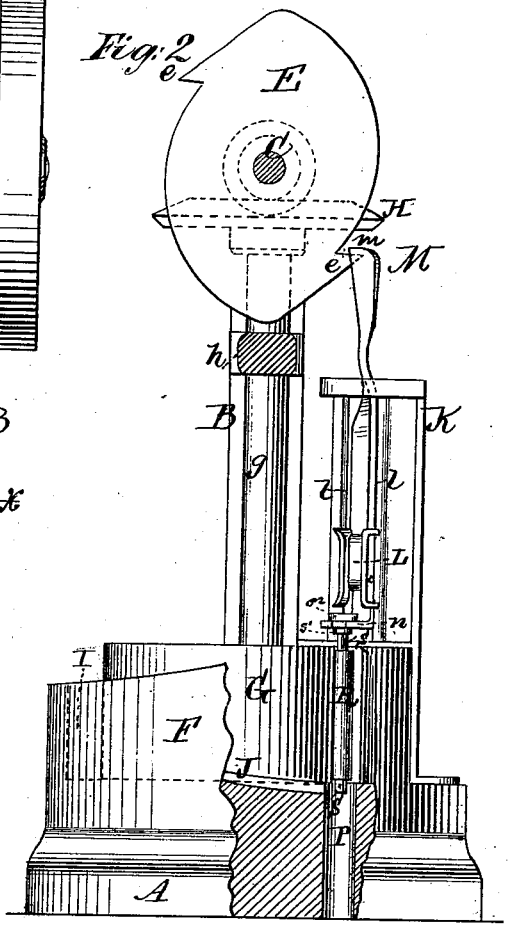
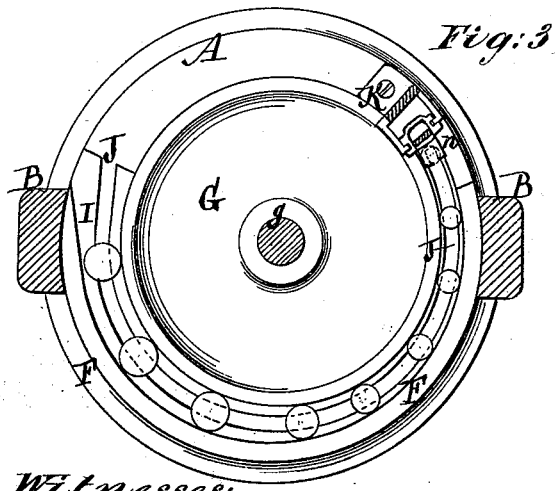


Fig: 3



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C. L. Johnson
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UNITED STATES PATENT OFFICE.

CHESTER L. JOHNSON, OF WHITESBOROUGH, ASSIGNOR OF ONE-HALF HIS RIGHT TO BENJAMIN T. BABBITT, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR ROLLING METAL TUBES.

Specification forming part of Letters Patent No. **168,026**, dated September 21, 1875; application filed April 26, 1875.

To all whom it may concern:

Be it known that I, CHESTER L. JOHNSON, of Whitesborough, in the county of Oneida and State of New York, have invented an Improved Machine for Rolling Metal Tubes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification.

My invention relates to a machine which is particularly intended for use in the manufacture of gun-barrels, but which may be applied to the rolling of tubes for various purposes.

The invention consists in a novel construction, arrangement, and combination of a roller, a mandrel, and other devices, whereby a short cylinder of metal, having a bore of the desired size of the bore of the tube, is brought to the proper external size and length by rolling it around the mandrel in a gradually-decreasing space between the roller and a stationary bearing-surface arranged eccentrically thereto, and whereby provision is made for holding the tube and mandrel in proper position during the rolling operation, and for withdrawing the mandrel from the finished tube, and delivering said tube from the machine.

In the accompanying drawing, Figure 1 is a side elevation of a machine constructed according to my invention. Fig. 2 is a partly-sectional side view at right angles to Fig. 1. Fig. 3 is a horizontal section taken in the line line *x x* of Fig. 1.

A represents the base of the machine, from which rise two standards, B B, in the upper portions of which is journaled a horizontal shaft, C, carrying a bevel-wheel, D, and a lifting-cam, E. The base A has a circular vertical rim, F, extending around it for about three-fourths of a circle, more or less, and gradually increasing in height from one end to the other. G is a cylindrical roller attached to the lower end of a vertical shaft, *g*, the upper end of which carries a bevel-wheel, H, meshing into the wheel D on the shaft C. The vertical shaft *g* has its lower bearing in the base A and its upper bearing in a horizontal cross-bar, *h*, connecting the two standards B B. The width or height of the roller G is equal to the greatest height of the rim F, and greater than the least height of said rim. The rim F is arranged eccentrically with relation to the roller G, so that the space I between said roller and rim is gradually decreased in width from one end to the other. If preferred, the eccentricity relatively to the shaft *g* may be divided between the roller and the rim by properly changing the form. In the bottom of the space between the roller G and rim F is a groove, J, extending the entire length of said space. This groove is of uniform width throughout its entire extent, and occupies a position exactly midway between the surfaces of the roller G and rim F at all portions of its length.

The surfaces of the roller G and rim F may be exactly parallel with each other in their vertical direction, or they may be slightly tapering, according to the form to be given to the tube to be rolled. The bottom of the space between the roller and rim may be perfectly level, or it may be gradually inclined in a direction opposite to that of the inclination of the rim.

At the end of the narrowest portion of the space between the roller and rim is a standard, K, provided with grooved ways *l*, in which works a slide, L, to which slide is attached, by a pivot or otherwise, the lower portion of a rod or bar, M. The upper end of the bar is provided with an overhanging portion or projection, *m*, for engagement with lifting-hooks *e* on the cam E, and the lower end of the bar is bent at about a right angle, and provided with a fork or notch, *n*. Immediately under this fork or notch is an opening, P, extending through the base to a receptacle beneath the same.

The operation is as follows: A cylindrical piece of metal is punched longitudinally, so as to form a tube, R, and into the hole thus formed is inserted a mandrel, S, which is formed with a shoulder, s^1, and a head, s^2. The tube R, carrying the mandrel S, is placed in an upright position in the widest portion of the space between the roller G and rim F, with the lower end of the mandrel inserted in the groove J. Motion being imparted to the

roller G, the tube R is rotated and moved along in the space between the roller and rim, the mandrel serving as its axis, and the friction of the roller serving to propel it. As the tube is carried along in the gradually-decreasing channel I the metal is compressed laterally and extended longitudinally of the tube, so that on reaching the narrowest end of the channel it has acquired the desired length and thickness, whereupon one of the lifting-hooks *e* on the cam E engages with the projection *m* on the upper end of the bar M at the same instant that the head s^2 of the mandrel enters the fork or notch *n* on the lower end of said bar, by which means the mandrel is drawn out of the tube, which then drops through the opening P to a receptacle below the base.

The shafts C and *g* may be so geared as to revolve at any desired speed with relation to each other, and the cam E may be provided with any suitable number of lifting-hooks, *e*, according to the speed at which it revolves, and the number of tubes undergoing the operation of rolling at the same time.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the roller G and rim F, of the groove J in the bottom of the channel I, for engagement with the mandrel, and the opening P at the narrowest portion of said channel, for delivering the finished tube, substantially as shown and described.

2. The combination of the lifting-cam E and vertically-reciprocating notched or forked bar M, for withdrawing the mandrel from the finished tube, substantially as shown and described.

CHESTER L. JOHNSON.

Witnesses:
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