No. 730,549. PATENTED JUNE 9, 1903.

F. W. MALLETT.

MACHINE FOR STRAIGHTENING WIRE.

APPLICATION FILED SEPT. 20, 1902.

NO MODEL.

Fig. 1.

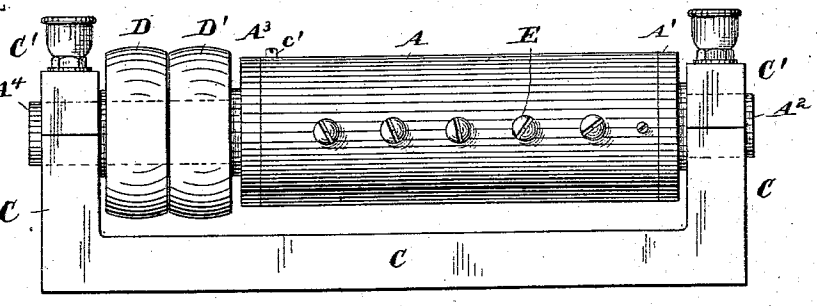



Fig. 2.

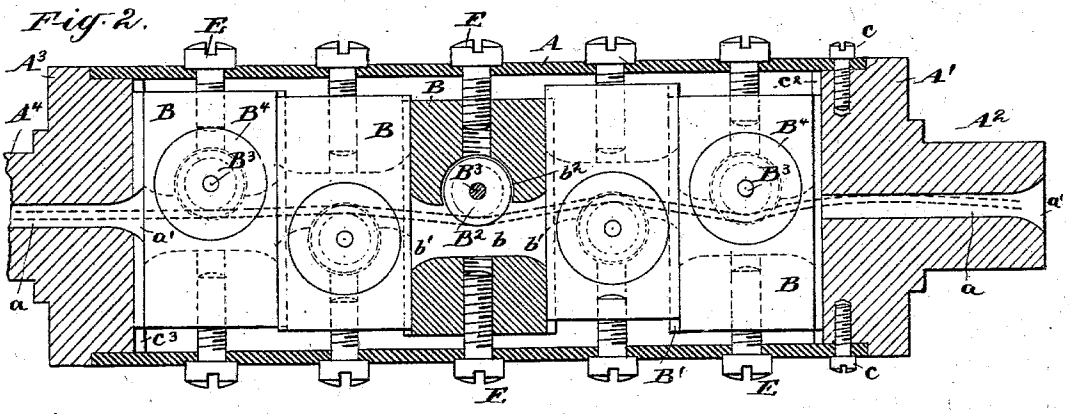



Fig. 3.

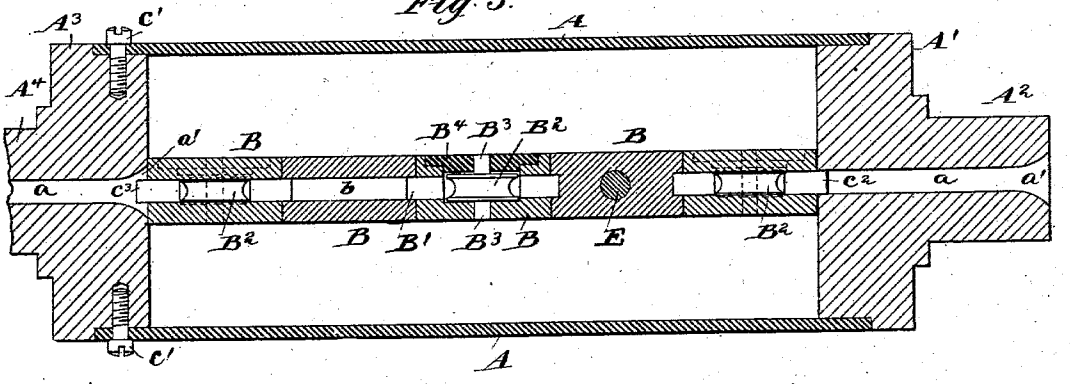



Fig. 4.

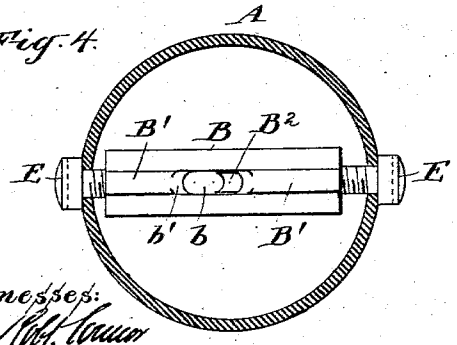
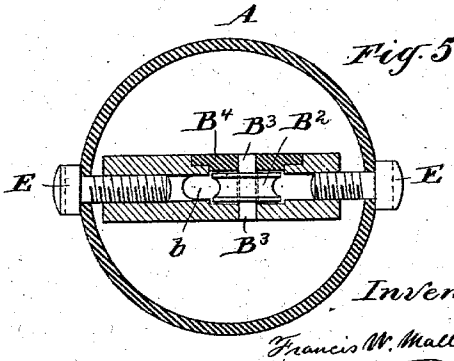



Fig. 5.




Witnesses:
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No. 730,549. Patented June 9, 1903.

# UNITED STATES PATENT OFFICE.

FRANCIS W. MALLETT, OF NEW YORK, N. Y., ASSIGNOR TO PH. J. BENDER & SONS, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## MACHINE FOR STRAIGHTENING WIRE.

SPECIFICATION forming part of Letters Patent No. 730,549, dated June 9, 1903.

Application filed September 20, 1902. Serial No. 124,148. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS W. MALLETT, a citizen of the United States, residing in the city of New York, borough of Manhattan, in the county and State of New York, have invented a certain new and useful Improvement in Machines for Straightening Wire, of which the following is a specification.

The invention relates to that class of wire-straighteners in which the wire is traversed longitudinally through a series of transversely-adjustable dies mounted in a revolving support or carrier.

The principal object of the invention is to reduce the friction between the dies and wire during its traverse, and thus avoid objectionable die-marks on the finished product and also to allow soft and finely-surfaced wire to be treated without injury.

Another object of the invention is to relieve the adjusting means from torsional strains by securing the dies to the carrier in such manner that the strains are transferred directly thereto.

The invention consists in certain novel features of construction and arrangements of parts by which the above objects are attained, to be hereinafter described.

The accompanying drawings form a part of this specification and show the invention as I have carried it out.

Figure 1 is a side elevation of a straightening-machine constructed in accordance with the invention. The remaining figures are on a larger scale and show the carrier and dies alone. Fig. 2 is a longitudinal section through the carrier, showing one of the contained dies in horizontal section and the others in plan view. Fig. 3 is a similar section taken at a right angle to the preceding figure and showing the dies in several planes of section. Fig. 4 is a transverse section through the carrier, showing one of the dies in side view; and Fig. 5 is a corresponding view with the plane of section passing through the die.

Similar letters of reference indicate the same parts in all the figures where they appear.

A is the tubular body of the carrier, having sufficient inside diameter to receive the series of dies B, arranged longitudinally therein in a single plane, and allow each to be adjusted relatively to the other and to the carrier.

A′ is a head fitted to one end of the body A, having an extension $A^2$, bored axially to serve as a guide for the entering wire and as a bearing for the carrier. $A^3$ is a similar head at the delivery end, having a similar but longer extension $A^4$, serving to guide the treated wire and as a bearing and also to receive the tight and loose pulleys D D′, by which the carrier is revolved by a belt (not shown) at the desired rapid rate in the boxes C′ C′ in the frame C. The heads are secured to the body by screws *c c′*, and the entrances to the bores *a a* in the extensions $A^2$ $A^4$ are flared, as indicated at *a′ a′*, to facilitate the entrance and delivery of the wire.

The series of blocks or dies B are of such width collectively as to fill the space between the heads, and the latter are each grooved transversely at $c^2$ $c^3$ to receive corresponding tongues or ridges B′ on the adjacent blocks, and each block or die is correspondingly tongued or grooved, so that all are connected and held in the same plane and caused to turn with the carrier.

With the exception of the alternate tongue and groove on the several blocks all are similar, and a description of one will suffice.

The block or die B is rectangular and of a length somewhat less than the internal diameter of the carrier, so that it may be adjusted transversely therein, and is provided with a channel or opening *b*, extending from side to side at the mid-thickness and near the mid-length, of sufficient depth to accommodate the largest wire to be treated and of sufficient width to inclose the axial line of the carrier in all positions of adjustment. The channels *b* in the several dies or blocks, with the holes *a a* in the heads, form a continuous inclosed passage from end to end of the carrier, serving to facilitate the introduction of the wire and to guide it in its traverse. The outer ends of each channel *b* are flared laterally, as at *b′ b′*, to present the openings favorably and permit the easy entrance of the first end of the wire in starting the operation. Adjacent to each channel and projecting slightly there-

in is a hardened-steel roller $B^2$, lying in the plane of the channel and having a grooved face of a width corresponding to the depth thereof. The roller is received in a cavity $b^2$, formed by boring, and is loosely mounted on a steel pin $B^3$, fixed at one end in the block and at the other in a circular plug or cap $B^4$, serving to close the cavity.

Each end of the block or die is drilled and tapped to receive the screws E E, by which the die is adjusted transversely of the axis of the carrier to bring the roller $B^2$ into the desired relation to such axial line.

The several dies are arranged with the pins $B^3$ alternately on opposite sides of the axis of the carrier, and the grooved peripheries of the rollers correspondingly project alternately on each side thereof.

The wire, drawn through the machine by any suitable feeding device, (not shown,) passes from one roller to the next, alternately deflected from one side of the axial line to the other in the serpentine path common to machines of this class, the degree of deflection being determined by the character of the wire and other conditions and controlled by the adjusting-screws E E. The rollers slowly revolve under the traction of the wire, thus reducing the friction at the points of contact and presenting new portions of the smoothly-finished grooves to the wire in its advance, and thus avoiding the spiral marks on the finished product due to the action of the relatively fixed die-surfaces usually employed and especially apparent when such dies have become marred or worn.

Wires of soft metal, as silver, German silver, brass, or copper or wires coated or plated with softer metals, may be successfully treated in my improved straightener without damage to the surfaces and without changing the rollers.

Modifications may be made in the forms and proportions without departing from the invention or sacrificing its advantages, and parts of the invention may be used without the whole. The tongues and grooves on the dies and heads may be omitted, depending upon the adjusting-screws, as usual, to hold the dies in position and take the torsional strains; but I prefer to transmit such strains directly to the carrier.

A greater or less number of dies may be employed, and the carrier instead of being a closed cylinder, as shown, may be an open frame.

The curvature of the grooves in the rollers may be of greater or less radius than shown or may be otherwise varied.

I claim—

1. In a machine of the character set forth, a series of dies mounted in a revolving carrier and each adjustable transversely thereof, and a series of rollers mounted one in each die, arranged with their axes transverse to the axis of said carrier and adapted to receive the wire at the points of flexion in the latter and facilitate its passage through the machine.

2. In a machine of the character set forth, a series of dies mounted in a revolving carrier and each adjustable transversely thereof, a series of rollers mounted one in each die in a plane in the axis of said carrier, and having each a grooved periphery adapted to receive and act on the wire during its passage through the machine.

3. In a machine of the character set forth, a series of dies mounted in a revolving carrier and each adjustable transversely thereof, a channel in each die on the line of the axis of said carrier forming collectively a continuous passage through the series, a roller mounted in each die and having a grooved periphery extending into said channel and adapted to receive and act upon a wire traversing said passage.

4. In a machine for straightening wire, a series of rollers mounted in a revolving carrier and means for adjusting each relatively to the axis of said carrier, the said rollers arranged with their axes transverse to the axis of said carrier and serving to receive the wire to be treated and induce the required flexion therein.

5. In a machine for straightening wire, a revolving carrier, a series of dies therein arranged to deflect the wire in a serpentine path during its passage through said carrier, and a series of rollers carried by said dies, arranged one at each angle or change of direction in said path with their axes transverse to the axis of said carrier.

6. A die for a rotary wire-straightener comprising a block having a transverse channel therethrough, a roller having a grooved periphery projecting into said channel, a pin on which said roller is mounted with liberty to revolve, and a screw at each end of said block for adjusting the position of the latter relatively to the axis of a revolving carrier with which it is adapted to serve.

7. In a machine for straightening wire, a revolving carrier, a series of dies mounted therein each comprising a rectangular block having a tongue or groove on its sides adapted to match to a corresponding tongue or groove on the sides of the adjacent blocks in the series or to engage the inner faces of the heads for said carrier, a transverse channel through each block, a roller mounted in said block and having a grooved periphery projecting into said channel, and an adjusting-screw at each end of said block adapted to serve with said carrier in adjusting the position of said roller relatively to the axial line of said carrier.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

FRANCIS W. MALLETT.

Witnesses:

ROBT. CONNOR,

CHARLES R. SEARLE.