

(No Model.)

3 Sheets—Sheet 1.

L. BRIGHTMAN.

MACHINE FOR STRAIGHTENING ROUND BARS OF METAL.

No. 299,727.

Patented June 3, 1884.

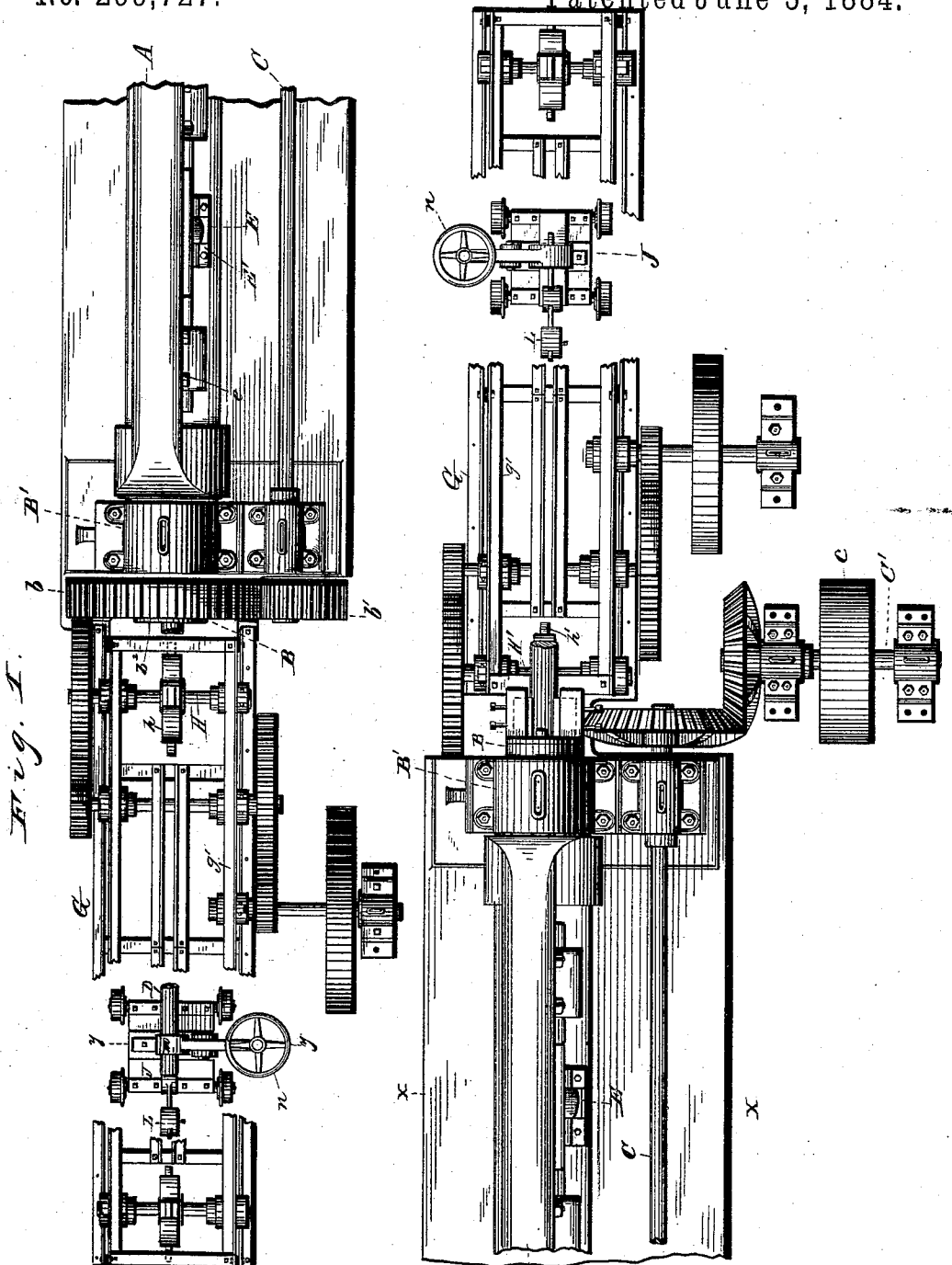


Fig. 1.

WITNESSES

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Geo. W. King

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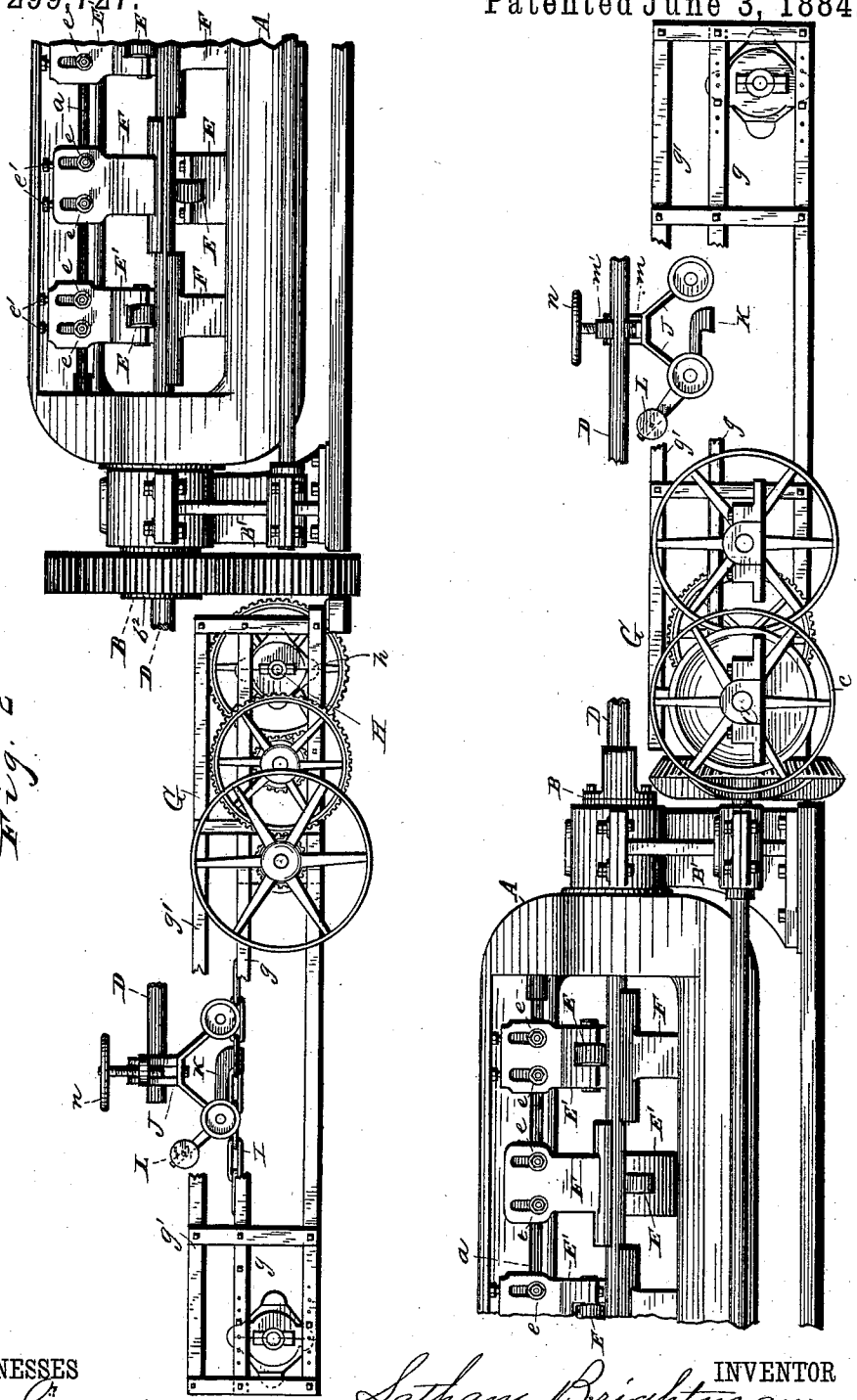
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Fig. 2



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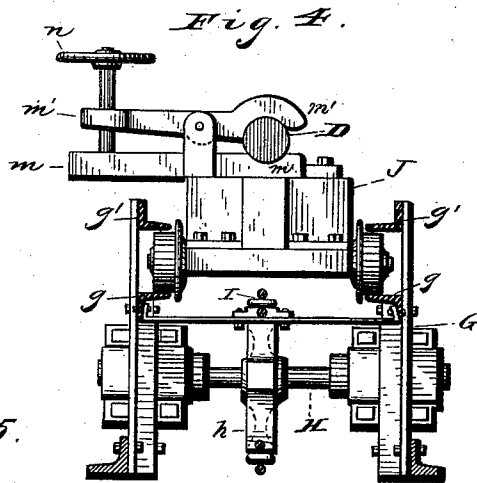
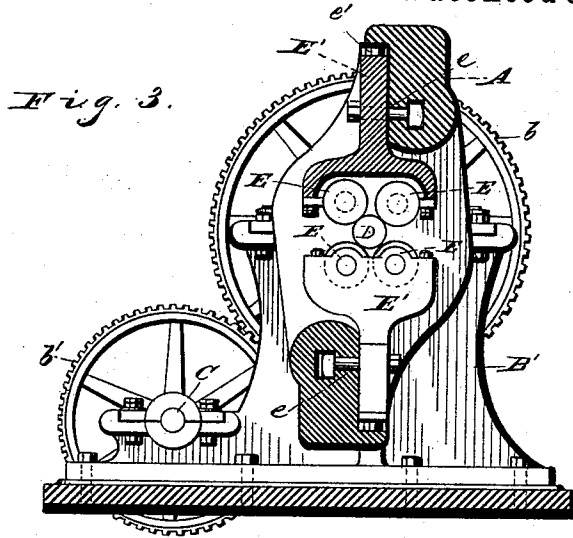


Fig. 5.

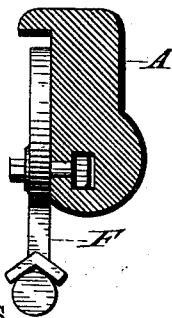
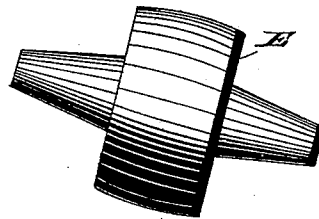


Fig. 6.



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UNITED STATES PATENT OFFICE.

LATHAM BRIGHTMAN, OF YOUNGSTOWN, OHIO.

MACHINE FOR STRAIGHTENING ROUND BARS OF METAL.

SPECIFICATION forming part of Letters Patent No. 299,727, dated June 3, 1884.

Application filed November 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, LATHAM BRIGHTMAN, of Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Machines for Straightening Round Bars of Metal; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in machines for straightening round bars of metal; and it consists in certain features of construction, and in combination of parts, hereinafter described, and pointed out in the claims.

The object of my invention is to improve a machine on which I obtained Letters Patent No. 260,278, dated June 27, 1882.

In the drawings, Figure 1 is a plan view, and Fig. 2 an elevation, of my improved machine. Figs. 3 and 4 are vertical transverse sections, respectively, on the lines *xx* and *yy* of Fig. 1. Fig. 5 is an end view of one of the guides, showing also the manner of attaching it to the revolving frame. Fig. 6 is an elevation of one of the straightening rollers.

A represents a revolving frame with hollow trunnions B, journaled in the pillow-blocks B'. The frame A is provided with the longitudinal slots *a*, that are chambered at the bottom of the slots to receive bolt-heads, as shown in Fig. 3, by means of which the guides and rollers, hereinafter described, are secured to the frame A in the desired position. A preferable way of revolving the frame A is shown in the drawings, where *b* is a spur-gear secured to one of the trunnions B, and engaging a gear, *b'*, on the shaft C, that may be provided at the other end with bevel-gears, as shown, when it is desired to change the line of motion, and in such a case a second shaft, C', is had provided with the driving-pulley *c*.

D represents a piece of shafting extending through the machine in the process of straightening.

E are straightening-rollers with a crowning face and conoidal or conical bearings journaled in housings E', that are adjustable crosswise of the frame A by means of slots in the housings, as shown, through which pass the bolts *e*, that secure the housings to the frame. The hous-

ings are also provided with the set-screws *e'*, that butt against projections or ledges of the frame A, as shown, and furnish a means of pressing the rollers against the shaft D. These rollers and housings alternate with the guides F, that are secured to the frame A in the same manner as the housings, and so arranged that a guide comes opposite a pair of rollers. The guides should be of such length along the shaft D that their respective ends will come opposite or overlap each other. In the process of straightening, the rollers are pressed down so hard upon the shaft D that it would be bent out of its course and butt against the next pair of rollers. The office of the guide is to hold the shaft to its place and guide it to an engagement with the next pair of rollers, after which the guide is released from further duty until the end of another shaft requires the same guidance.

It is found that conical or conoidal shaped journals, being smaller toward the end, where less strength is required, and moving with less surface velocity, cause less friction than cylindrical journals, and also hold the rollers laterally. By means of the crowning face of the rollers the shaft or bar of iron is made to engage and mount the rollers without having to be so far deflected by the guide. The axes of the rollers are not parallel with the axis of the revolving frame, but are set obliquely thereto, so that the rollers lead onto the shaft, and their track around the shaft would be like the thread of a screw, and by means of which the shaft is drawn through the machine during its engagement with the rollers.

The trunnions B are provided with reducing-bushings *b''*, that are chamfered on the inner edge of the end in which the shaft enters. The bore of the bushings is of suitable size to accommodate the size of the shaft that is to pass through them, and are of course changed with every different size of shafting that is straightened.

On either hand of the revolving frame A are supporting-frames G, on which are journaled in suitable boxes the shafts H and H', to which are attached the sprocket-wheels *h* and *h'*, carrying the chains I, the upper part of which moves in the direction that the shaft D moves in passing through the machine. These shafts,

with the sprocket-wheels, may be driven by gearing and a driving-pulley, as shown, or in any manner most convenient.

The carriages J are provided with wheels 5 that operate on tracks *g*, attached to the frame G. There are also guards *g'* above the wheels, that prevent the carriage from lifting, as shown in Fig. 4. The central portions of the frames 10 G are broken away to show the carriages J and attachments. The carriages J are provided with clamps, that grasp the bars of iron and hold them from revolving, and also furnish a means of forcing the bar D into and from the machine. The carriages are provided with 15 the hooks K, that when required engage the chains I. These hooks, when not held to an engagement with the chains by a draft on the same, are raised away from the chains by the balance-weights L. The clamps aforesaid have 20 jaws *m* and *m'*, the former attached to the carriage and the latter pivotally attached to the former in the central part, and provided with the hand-wheel and screw *n*, by means of which the back ends of the jaws are separated and 25 the front ends made to grasp the bar of metal.

The operation of the device is as follows: The machine is set in motion and the bar of metal to be straightened is clamped on the left-hand carriage and near the left-hand end 30 of the bar, when the opposite end is entered into the opening in the hollow trunnion of the revolving frame. The hook K is dropped into a link of the chain I, by means of which the carriage and bar of metal are forced along 35 until the front end of the bar has engaged two of the rollers E. This frame A, with its oblique rollers, is so geared as to move the shaft longitudinally faster than it is moved by the carriage J. As soon as the bar or shaft is 40 grasped by the rollers, it is carried along by the action of the rollers faster than by the chain, so that the hook is loosened and tilted back away from the chain by the weight L, as aforesaid, and the clamp may then be loosened from the bar and the carriage run back 45 by hand, ready for the next bar. In the meantime as the forward end of the bar passes out of the revolving frame it is clamped to the carriage there in waiting for it, and when the 50 rollers in the revolving frame cease to advance the bar the hook of this carriage is dropped into a link of the chain, and by means of which the shaft is drawn out of the revolving frame and may then be released from the clamp and 55 be removed from the machine. As soon as the shaft is so far withdrawn from the revolving frame as to offer little resistance, the hook will be released from the chain by the attached balance-weight. The straightening-rollers 60 press against the bar and deflect it as far as a straight bar can be deflected and regain its straight condition by its own elasticity after it is released. As the bars are subjected to this deflection in all parts and in every direction, 65 they are in a straight condition when removed from the machine.

What I claim is—

1. In a machine for straightening round bars of metal, the combination, with the rotating frame having hollow journals, of the diagonally-arranged pairs of rollers journaled in said 70 frame, substantially as set forth.

2. In a machine for straightening round metal bars, the combination, with the rotating frame having hollow journals, of the obliquely- 75 arranged rollers journaled in said frame, and guides secured in the frame opposite the respective rollers, substantially as described.

3. In a machine for straightening round metal bars, the combination, with the rotating 80 frame having hollow journals, of the obliquely-arranged rollers, the guides, and the means for adjusting said rollers or guides (either or both) crosswise of the axis of the revolving frame, substantially as described. 85

4. In a machine for straightening round metal bars, the combination, with the revolving frame provided with hollow journals, of pairs of rollers having crowning faces and conical or conoidal journals, said rollers being 90 mounted in the frame obliquely to the axis thereof, substantially as set forth.

5. In a machine for straightening round metal bars, the combination, with the revolving frame provided with hollow journals, of 95 pairs of rollers mounted diagonally with relation to the axis of the frame and alternating at opposite sides of said axis, substantially as set forth.

6. In a machine for straightening round 100 metal bars, the combination, with the revolving frame provided with hollow journals, of carriages having clamps adapted to support a bar in line with the hollow journals of the frame, a chain traversing beneath the carriages, and a hook secured to each carriage 105 for engaging the chain, substantially as described.

7. In a machine for straightening round metal bars, the combination, with the revolving 110 frame having hollow journals, of carriages provided with clamps adapted to support a bar in line with the hollow journals of the frame, chains traversing beneath the carriages, and a counterbalanced hook secured to each 115 carriage, substantially as described.

8. In a machine for straightening round metal bars, the combination, substantially as before set forth, of the feed-chain, the carriage provided with a bar-clamp, a hook to engage 120 the chain, the revolving frame having hollow journals, and the rollers journaled obliquely in the frame to traverse the bar in spiral paths and draw it endwise, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 23d 125 day of October, 1883.

LATHAM BRIGHTMAN.

Witnesses:

J. S. CUNNINGHAM,
GEO. E. ROSE.