No. 617,223. Patented Jan. 3, 1899.

L. H. BRIGHTMAN.

MACHINE FOR STRAIGHTENING METAL BARS.

(Application filed Mar. 14, 1898.)

(No Model.) 2 Sheets—Sheet 1.

FIG. I

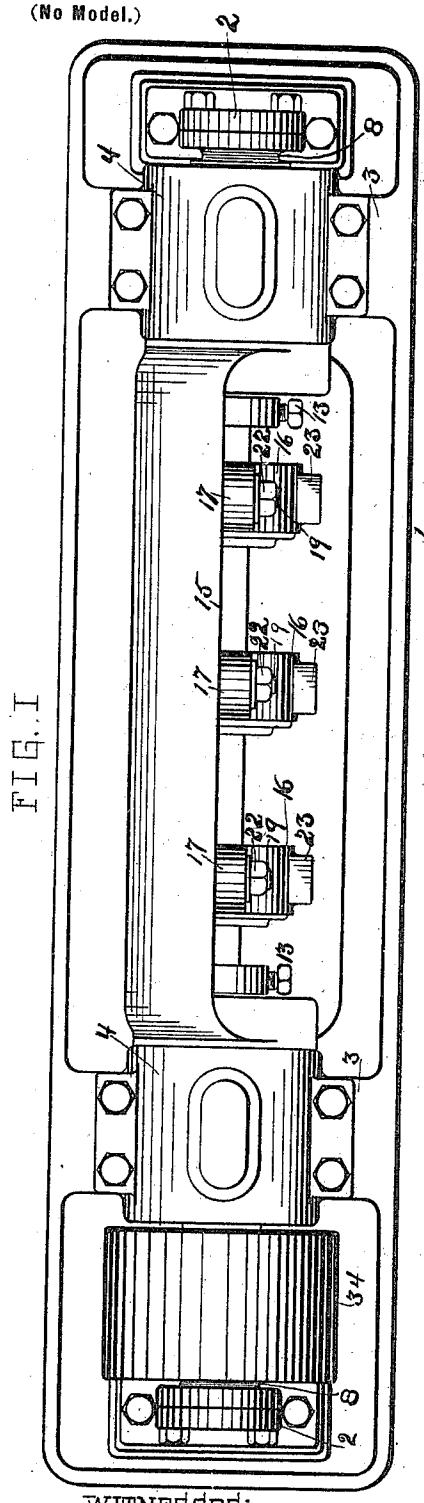
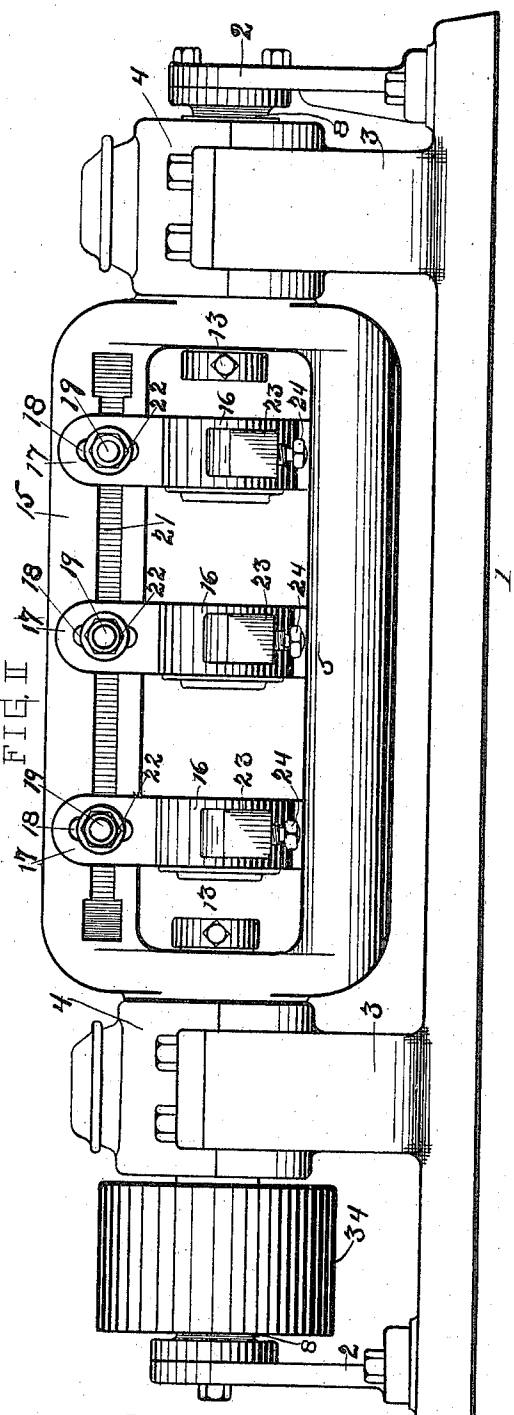


FIG. II



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FIG. III

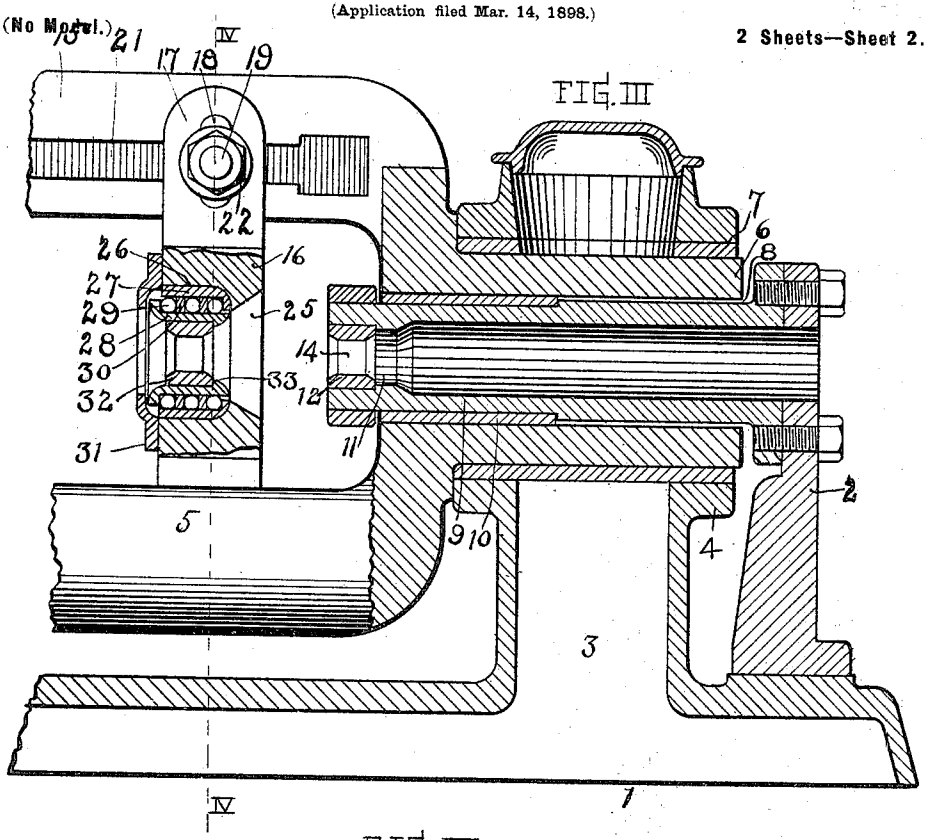
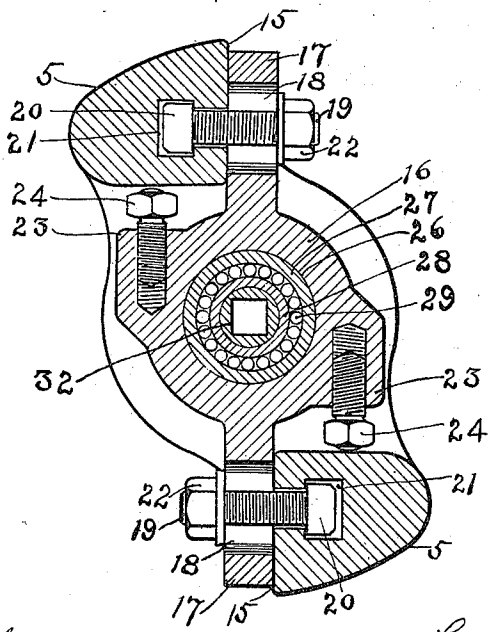


FIG. IV



WITNESSES:

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UNITED STATES PATENT OFFICE.

LATHAM H. BRIGHTMAN, OF CLEVELAND, OHIO.

MACHINE FOR STRAIGHTENING METAL BARS.

SPECIFICATION forming part of Letters Patent No. 617,223, dated January 3, 1899.

Application filed March 14, 1898. Serial No. 673,757. (No model.)

To all whom it may concern:

Be it known that I, LATHAM H. BRIGHTMAN, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Machines for Straightening Metal Bars, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a top plan view of my improved machine for straightening bars; Fig. II, a side elevation of the same; Fig. III, an enlarged axial section of one end of the flier-frame and of one bearing, and Fig. IV a transverse section on the line IV IV in Fig. III.

The machine has a base-frame 1, upon the ends of which are secured two uprights 2, and near the ends of which are two upright pedestals 3, having trunnion-bearings 4 at their upper ends. A flier-frame 5, of substantially rectangular outline, has hollow trunnions 6 at its ends, which trunnions are journaled in the trunnion-bearings. The bearings are provided with suitable bushings 7. Guide-tubes 8 are secured by their outer flanged ends to the upper ends of the uprights to project axially through the hollow trunnions. The inner portions 9 of the guide-tubes are reduced and fit into bushings 10 in the inner portions of the bores of the trunnions. The inner portions of the bores of the guide-tubes are contracted at 11, and guide-dies 12 are secured in the innermost ends of the bores by means of set-screws 13. Said guide-dies have passages 14 of the shape of the cross-section of the bar to be straightened, and said passages are flaring toward the faces of the dies. The sides of the frame have flat faces 15, facing in opposite directions and parallel to each other and to a plane through the axis of the frame. Heads 16, of circular outline, have arms 17 at diametrically opposite points of their peripheries formed with longitudinal slots 18, which arms are secured to the flat faces of the sides of the frame by means of screw-bolts 19, having their heads 20 sliding in T-grooves 21 in the sides of the frame and having their shanks passed through the slots in the arms, which are clamped against the flat faces of the sides of the frame by nuts 22 upon the bolts. The heads have shoulders 23 at diametrically opposite sides, into which shoulders screw-bolts 24 are threaded so as to have their heads bear against the inner faces of the sides of the frame. The heads are formed with central circular openings, having flaring mouths 25 facing toward the discharge end of the machine and having annular recesses 26 toward the feed end. A ring 27, having a flange at its inner edge and preferably made from hardened steel, is fitted in each annular recess. A ring 28, having a flange at its outer edge, is placed within said outer ring with its inner end fitting within the flange of said ring, so as to form an annular ball-race between said rings. Annular rolls of antifriction-balls 29 are arranged in the ball-race and are spaced one row from the other by means of spacing-rings 30. An annular face-plate 31 is secured upon the face of the head to bear against the flange upon the outer edge of the inner ring, and to thus retain said ring, the balls, and spacing-rings and the outer ring in position in the recess of the central opening in the head. A guide-die 32, having a passage of the shape of the cross-section of the bar to be straightened, is secured in the inner ring, bearing against a shoulder 33 in said ring. A pulley 34 or other suitable gear for communicating rotary motion to the flier-frame is secured upon one of the hollow trunnions of the frame.

This machine is intended for straightening metal bars having a cross-section other than circular, the machine illustrated in the drawings being constructed for straightening bars which are square in cross-section.

In practice the bar to be straightened is fed through the machine by any suitable means, through the guide-tube at the receiving end, through the guide-dies in the heads, and out through the guide-tube at the discharge end. The heads are so adjusted by the adjusting-

screws and the bolts in the slotted arms as to be adjusted at the proper distances in the frame and to be just sufficiently staggered out of the axial line of the frame to alternately spring the bar to the extent of its elasticity to opposite sides, thereby straightening the bar as it is fed through the machine. As the flier-frame and the eccentrically-adjusted heads rotate the bar will be sprung in all directions. The dies being journaled in the ball-bearings in the heads will admit of the flier-frame and heads rotating, while the bar receives no rotary motion upon its axis, the dies remaining in the same position while the frame and heads rotate.

The ball-bearings are easily accessible for cleaning or repairing purposes, as the bearing-rings may be drawn out of the head when the annular face-plate is removed. Dies having differently shaped or sized passages may be inserted in the heads, according to the cross-sectional shape and size of the bar to be straightened.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus disclosed, provided the principles of construction set forth, respectively, in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a machine for straightening metal bars, the combination of rigid guide-tubes supported to project toward each other and provided with guide-dies having passages of the shape of the cross-section of the bar to be straightened, a flier-frame having means for rotating it and journaled with its hollow journals upon said guide-tubes, heads supported in the flier-frame and provided with means for adjusting them longitudinally in the frame and transversely to the axis of rotation and formed with central antifriction-bearings, and dies journaled in said bearings and having passages of the shape of the cross-section of the bar to be straightened, substantially as set forth.

2. The combination of the head formed with a central passage having an annular recess, an outer ring fitted in said recess and having a flange at its inner edge, an inner ring having a flange at its outer edge and fitted within the outer ring to form an annular ball-race, rows of balls in said race, a spacing-ring between each two rows of balls, and an annular face-plate secured to the face of the head and bearing against the flange of the inner ring and the outer edge of the outer ring, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 6th day of March, A. D. 1897.

LATHAM H. BRIGHTMAN.

Witnesses:
WM. SECHER,
PHILIP E. KNOWLTON.