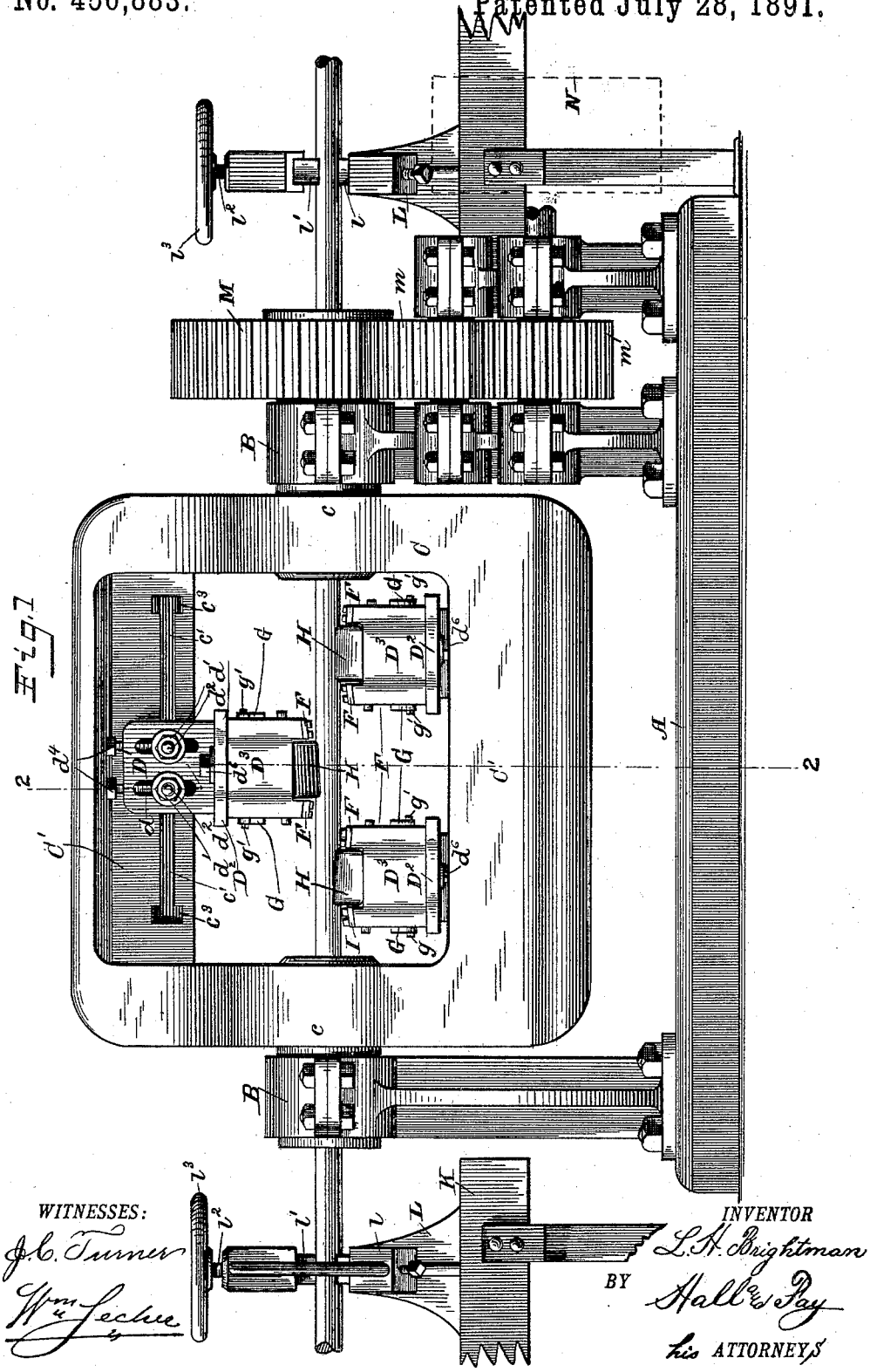
(No Model.) 4 Sheets—Sheet 1.

L. H. BRIGHTMAN.

MACHINE FOR STRAIGHTENING ROUND BARS.

No. 456,883. Patented July 28, 1891.



WITNESSES:
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Wm. Lecture

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(No Model.) 4 Sheets—Sheet 2.

L. H. BRIGHTMAN.

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Fig. 2

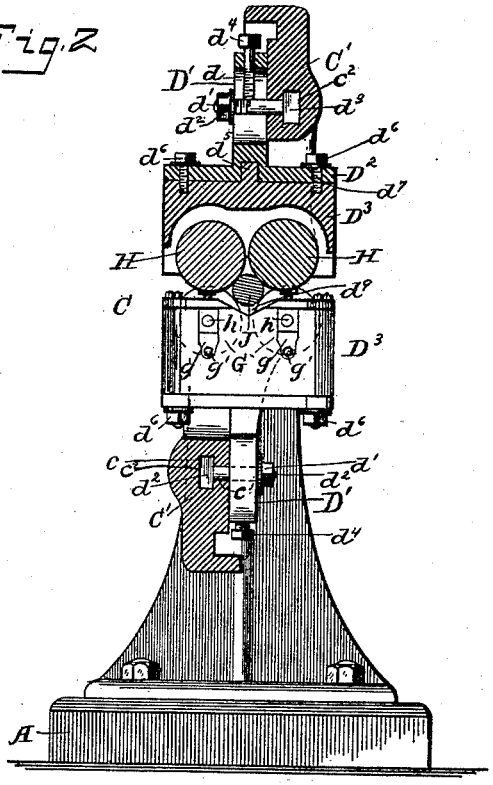
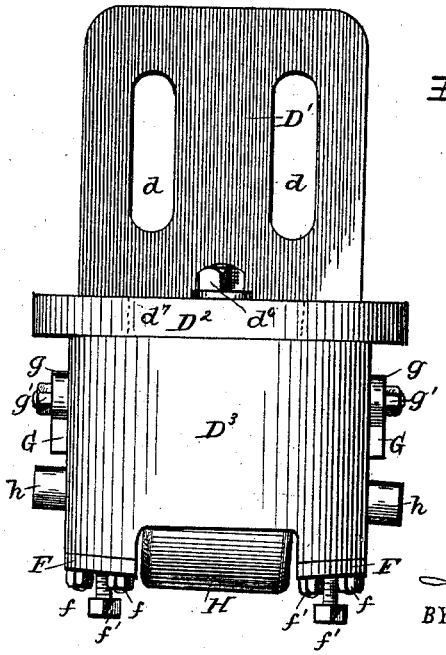


Fig. 3



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(No Model.) 4 Sheets—Sheet 3.

L. H. BRIGHTMAN.

MACHINE FOR STRAIGHTENING ROUND BARS.

No. 456,883. Patented July 28, 1891.

Fig 4

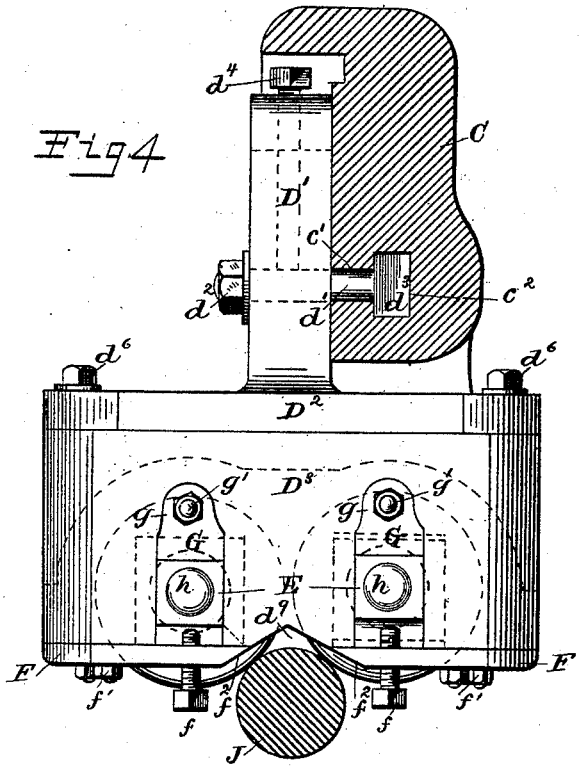
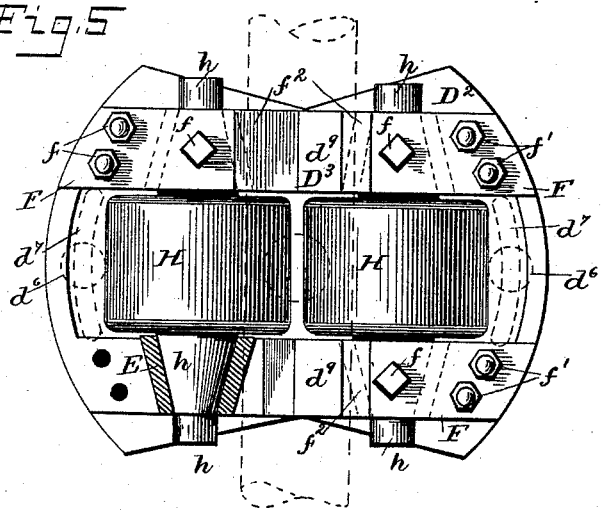


Fig 5



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(No Model.) 4 Sheets—Sheet 4.

L. H. BRIGHTMAN.

MACHINE FOR STRAIGHTENING ROUND BARS.

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Fig. 6

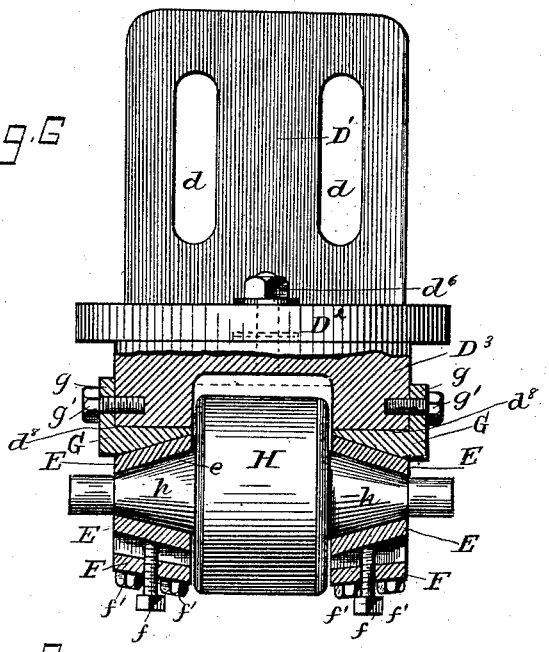


Fig. 7

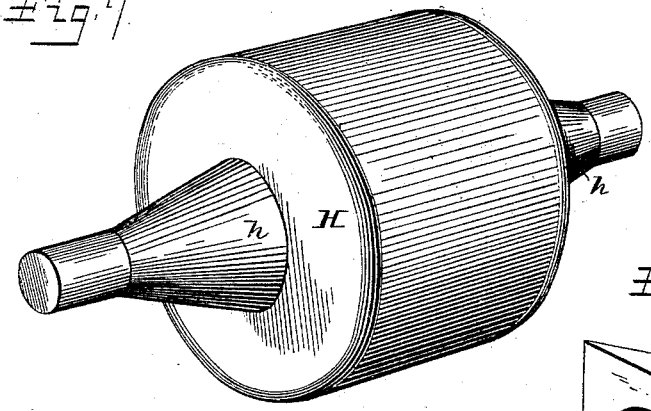


Fig. 8

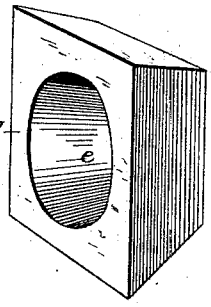


Fig. 9

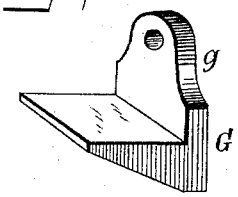
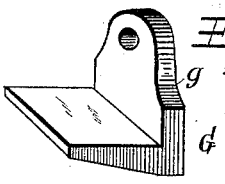


Fig. 10.



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UNITED STATES PATENT OFFICE.

LATHAM H. BRIGHTMAN, OF CLEVELAND, OHIO, ASSIGNOR TO THE BRIGHTMAN MACHINE COMPANY, OF SAME PLACE.

MACHINE FOR STRAIGHTENING ROUND BARS.

SPECIFICATION forming part of Letters Patent No. 456,883, dated July 28, 1891.

Application filed February 6, 1891. Serial No. 380,466. (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 Round 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 objects of my invention are to provide a machine for straightening and finishing round bars of metal, such as shafts, which will automatically feed the bar through it without extraneous means; to provide improved means for adjusting the straightening and finishing rollers in transverse planes or planes at right angles to the plane of and substantially parallel to the axis of the revolving frames which support them, and to provide improved means for adjusting the angles of inclination of the straightening and finishing rollers or adjusting said rollers in planes substantially parallel to the plane of the revolving supporting-frame.

In the accompanying drawings, Figure 1 represents a front elevation of my improved machine for straightening and finishing round metal bars; Fig. 2, a transverse vertical section of the same on the line 2 2, Fig. 1; Fig. 3, a front detail view of one of the roller-supports and rollers on an enlarged scale; Fig. 4, a side view of the same; Fig. 5, a bottom view; Fig. 6, a section; Fig. 7, an enlarged perspective view of a roller; Fig. 8, a similar view of one of the bearings for the same, and Figs. 9 and 10 perspective views of two wedges for the bearings.

In said drawings, the letter A indicates the bed or base of the machine, from which two upright bearings B project. A substantially rectangular frame C, having hollow trunnions c, is journaled with said trunnions in said bearings. The horizontal sides C′ of said frame are cut away upon opposite faces, and said faces have narrow longitudinal slots c', which open into wider channels c^2, said slots and channels forming inwardly-widening grooves. The slots c' are formed with enlargements c^3 at their ends for the insertion of the heads of the bolts which are inserted to adjustably slide in said grooves. The flat shanks D′ of the roller-supports D have longitudinal slots d, through which the screw-threaded ends of bolts d' are inserted and secured by washers and clamping-nuts d^2, said bolts having their enlarged heads d^3 fitting and sliding in the channels c^2 and projecting out through the slots c'. Bolts d^4 are inserted through screw-threaded holes in the ends of the shanks projecting into the slots of the same so as to bear against the bolts d' and serving to adjust the roller-supports toward and from the axis of the frame, the nuts d^2 securing the supports in their adjusted positions. The shanks D′ project from plates D^2, and the boxes D^3 are pivotally secured to the inner faces of said plates D^2. Each box D^3 has a central stud d^5 upon its outer flat face, which fits into a corresponding hole in the inner face of the plate D^2, and screw-bolts d^6 are inserted through segmental slots d^7 in said plate into the box, so that said box may be adjusted by said bolts in various positions turned upon its pivotal stud d^5. The box D^3 is open at its inner side and has dovetailed or inwardly-widening recesses d^8 in its ends, into which recesses correspondingly-shaped bearing-blocks E are fitted. Said bearing-blocks have truncate conical recesses e, and are supported from below upon the ends of screw-bolts f, inserted through caps F, secured over the open ends of the recesses d^8 by screws f'. Wedges G bear against the upper sides of the bearing-blocks and have lips g at their outer ends, through which screws g' pass into the ends of the box. Said wedges are interchangeable with other wedges, thicker or thinner, according to requirements. Rollers H, having rounded corners, are journaled with truncate conical trunnions h in the bearings formed by the bearing-blocks E. The inner edges of the ends of the box D^3 are formed with notches d^9, which, together with the beveled inner ends f^2 of the caps F, form a longitudinal passage for the shaft J to be straightened. Guideways or rails K are arranged at the ends of the base of the machine in a line with the axial line of the revolving frame, and clamps L slide in said ways and have stationary and adjustable jaws l and movable jaws l', operated by a screw l^2 and

hand-wheel l^3, so that the bar or shaft to be straightened may be clamped and held by said jaws in a perfect axial line to the revolving frame. A cog-wheel M is secured to one of the hollow trunnions *c* of the revolving frame and may receive rotary motion from a power-driven pulley N through suitable gearing *m* or from any other source.

In practice the roller-supports are adjusted in the revolving frame in such manner that they will project so far within the path of the shaft that they may deflect the latter just as much as it will bear and again return to a perfectly-straight line, the degree of such deflection being governed by the thickness of the shaft and the elasticity or springiness of the metal in the same. When a round bar or shaft is inserted through one hollow trunnion of the revolving frame, being supported in the traveling clamp at that end, and the frame is revolved, the rollers will press from all sides upon the shaft and continuously deflect it equally from all sides, and will thus straighten the shaft perfectly. The action of the rollers upon the surface of the shaft will obliterate all marks of turning or finishing tools upon the shaft and will render the shaft smooth and polished when it leaves the machine. The oblique position of the rollers will cause them to describe a spiral track around the shaft, and will thus, as the rollers cannot move endwise, force the shaft longitudinally through the machine. The feed or degree of proportionate speed with which the shaft is moved through the machine may be regulated by adjusting the pitch or angle of the rollers to the shaft, and such adjustment may take place by adjusting the rollers in planes transverse to the plane of the revolving frame by swinging the roller-supporting boxes upon their studs and adjusting them by their segmental slots and screws so as to vary the angles of the axes of the rollers to the axis of the shaft and by adjusting the pitch of the rollers in planes substantially parallel to the plane of the revolving frame by inserting wedges of varying thicknesses above the bearings of the rollers and making up for the variation of said wedges by the screws supporting the bearings from below. The feed may thus be adjusted according to the diameter of the shaft or bar to be straightened, and the roller-supports and rollers may be adjusted by the slots *d*, screws d^4, and bolts and nuts d' d^2. One bar or shaft may be fed through the machine after the other, with the ends of the succeeding shaft abutting against the end of the preceding shaft. By having changeable wedges for adjusting the bearings of the rollers, each set of wedges, however, being all of the same size, the pitch of the rollers may be evenly adjusted for all of the rollers.

The foregoing description and accompanying drawings set forth in detail mechanism embodying my invention. Changes may be made therein, provided the principles of construction respectively recited in the following claims are employed.

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

1. In a machine for straightening round bars of metal, the combination, with a revolving frame having hollow trunnions, of pairs of rollers arranged to project alternating from opposite sides of said frame to straddle the bar to be straightened, and provided with means for adjusting them in planes transverse to the plane of and substantially parallel to the axis of the revolving frame, substantially as set forth.

2. In a machine for straightening round bars of metal, the combination, with a revolving frame having hollow trunnions, of pairs of rollers arranged to project alternating from opposite sides of said frame to straddle the bar to be straightened, and provided with means for adjusting the pitch of their axes in planes substantially parallel to the plane of said revolving frame, substantially as set forth.

3. In a machine for straightening round bars of metal, the combination, with a revolving frame having hollow trunnions, of pairs of rollers arranged to project alternating from opposite sides of said frame to straddle the bar to be straightened, and provided with means for adjusting them in planes transverse to the plane of and substantially parallel to the axis of said frame and for adjusting the pitch of their axes in planes substantially parallel to the plane of the frame, substantially as set forth.

4. In a machine for straightening round bars of metal, the combination, with a revolving frame having hollow trunnions, of plates having their flat shanks alternatingly secured to the faces of the opposite sides of said frame, facing the axial line of said frame, and formed with central holes and with segmental slots, boxes having central studs pivoted in said holes, and screw-bolts in said slots, and rollers longitudinally journaled in the open inner sides of said boxes, substantially as set forth.

5. In a machine for straightening round bars of metal, the combination, with a revolving frame having hollow trunnions, of roller-supporting boxes alternatingly secured to the faces of the opposite sides of said frame and having recesses in their ends, bearing-blocks in said recesses, rollers journaled in said bearing-blocks, changeable wedges inserted above said bearing-blocks, and screws bearing with their ends beneath said bearing-blocks, substantially as set forth.

6. In a machine for straightening round bars of metal, the combination, with a revolving frame having hollow trunnions, of roller-supporting boxes alternatingly secured to the faces of the opposite sides of said frame and having recesses in their ends, caps for the lower open sides of said recesses, bear-

ing-blocks in said recesses, rollers journaled in said bearing-blocks, changeable wedges inserted above said bearing-blocks, and screws bearing from below with their ends against said bearing-blocks, substantially as set forth.

7. In a machine for straightening round bars of metal, the combination, with a revolving frame having hollow trunnions, of plates having their flat shanks alternatingly secured upon the faces of the opposite sides of said frame, facing the axial line of said frame, and formed with central holes and segmental slots, boxes having central studs in said holes, and screw-bolts in said slots and formed with recesses in their ends, bearing-blocks in said recesses, rollers journaled in said bearing-blocks, changeable wedges inserted above said blocks, and screws bearing from below with their ends against said blocks, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 23d day of December, A. D. 1890.

LATHAM H. BRIGHTMAN.

Witnesses:
J. B. FAY,
WM. SECHER.