(No Model.) 2 Sheets—Sheet 1.

F. A. ELLIS.

MEANS FOR DRAWING AND PLANISHING TUBES OF ALUMINIUM ALLOY.

No. 582,191. Patented May 11, 1897.

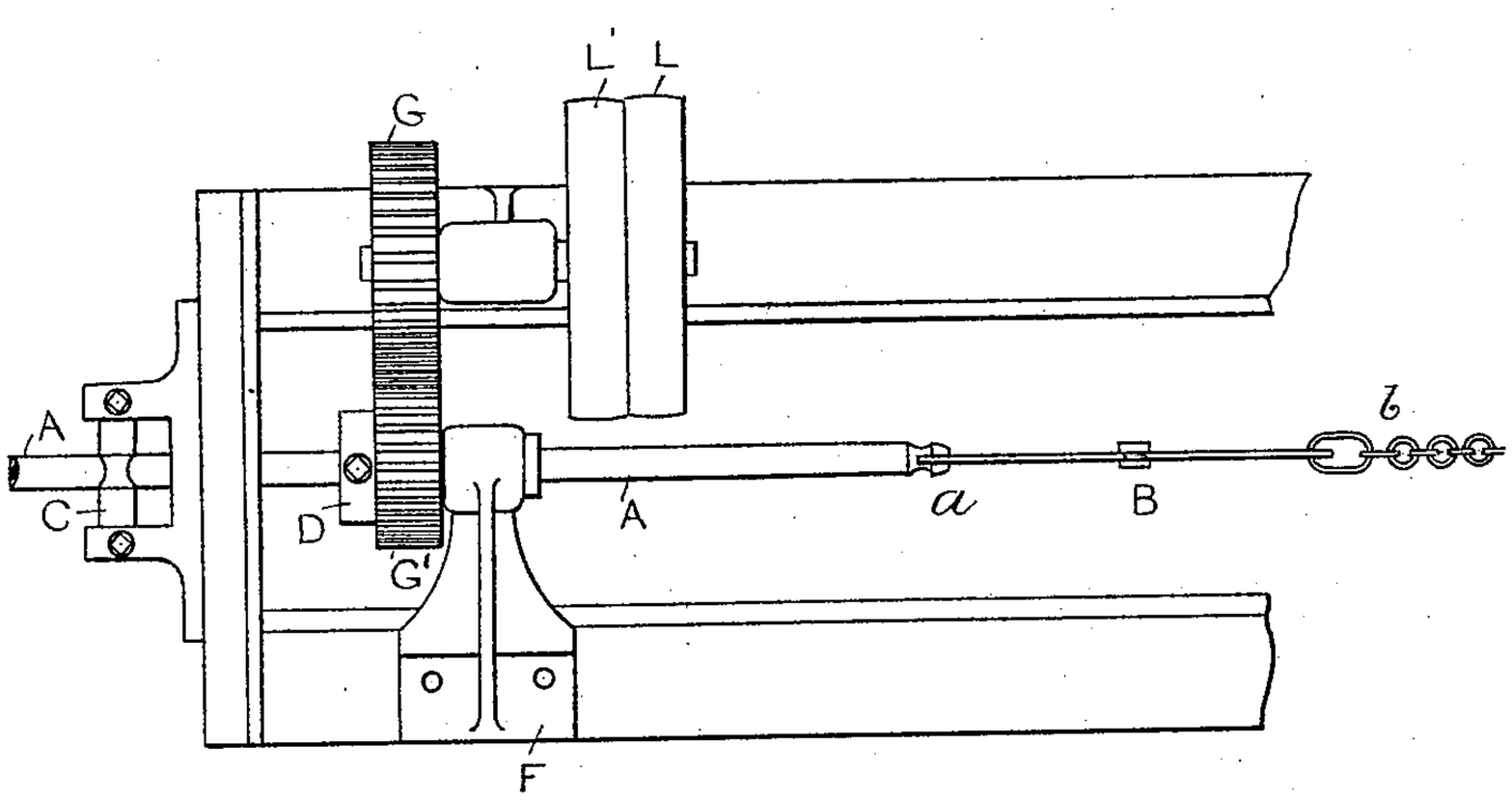

FIG. 1

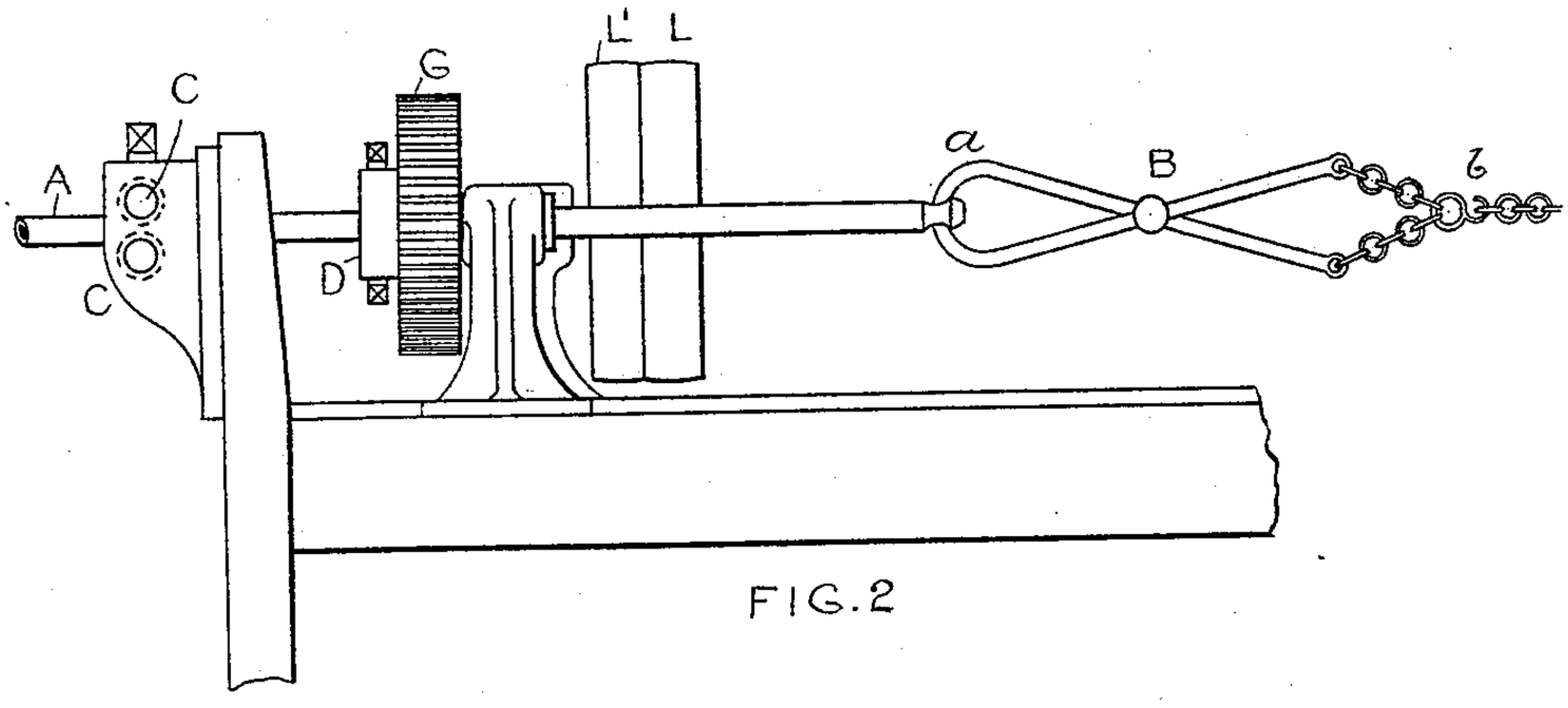

FIG. 2

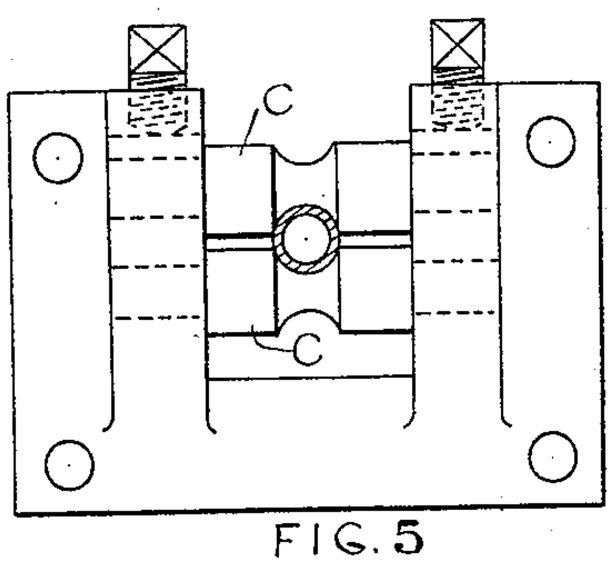

FIG. 5

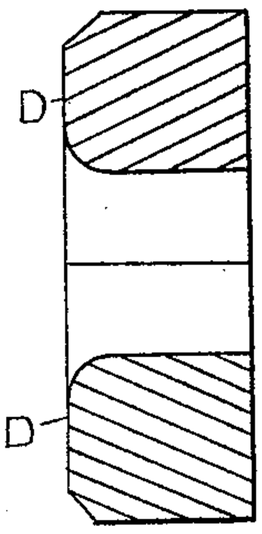

FIG. 6

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(No Model.) 2 Sheets—Sheet 2.

F. A. ELLIS.

MEANS FOR DRAWING AND PLANISHING TUBES OF ALUMINIUM ALLOY.

No. 582,191. Patented May 11, 1897.

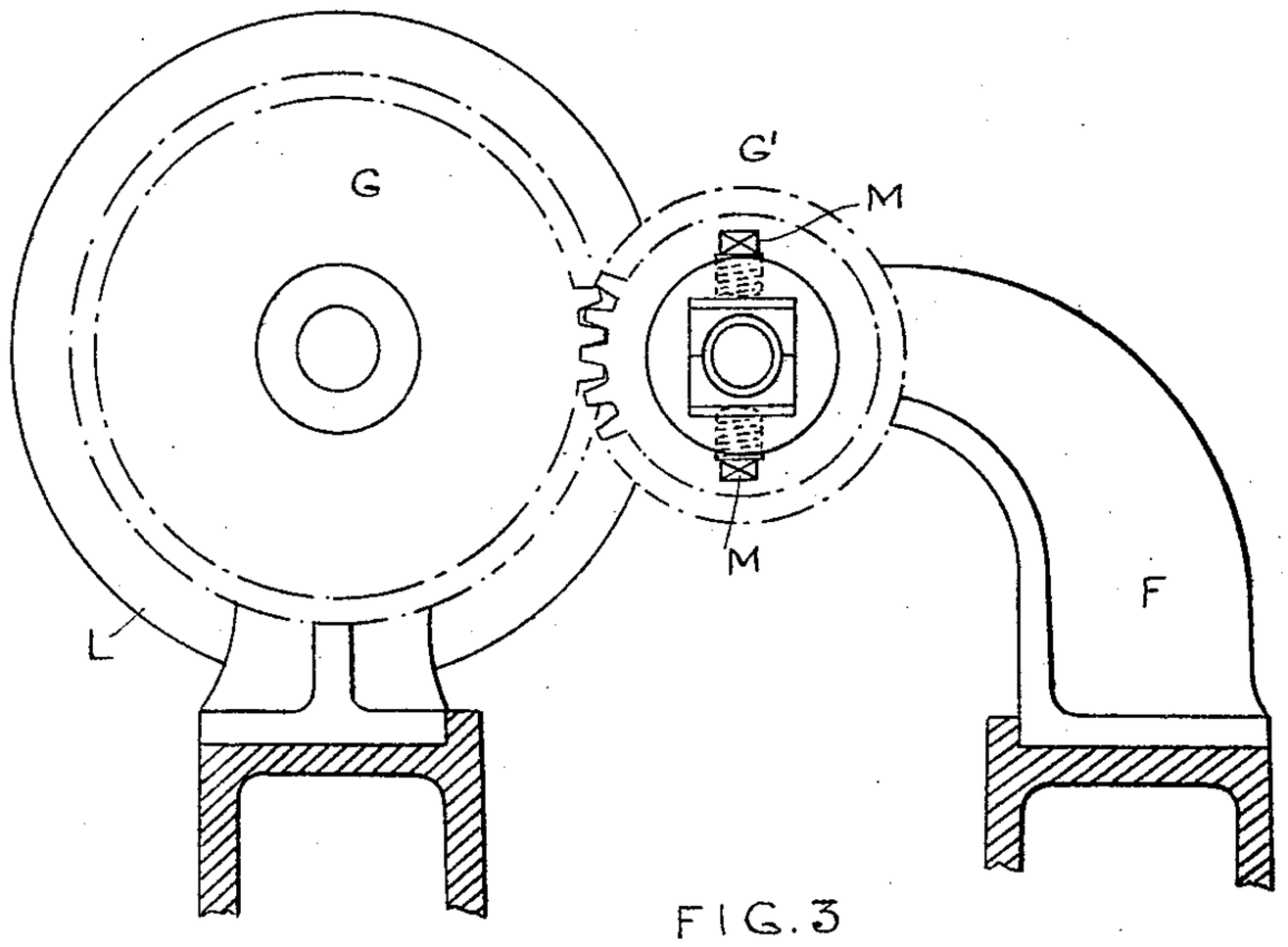

FIG. 3

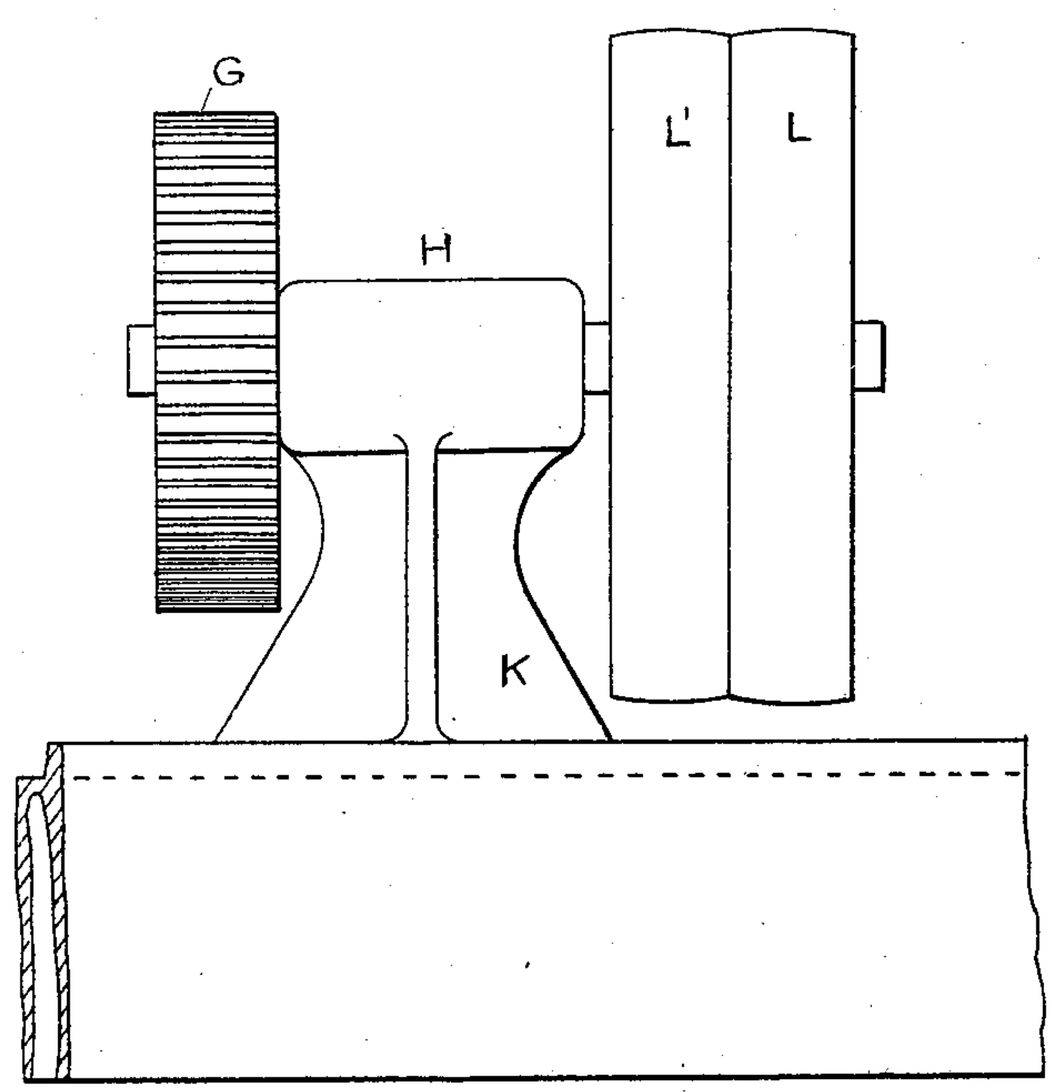

FIG. 4.

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UNITED STATES PATENT OFFICE.

FREDERICK ARTHUR ELLIS, OF LONDON, ENGLAND.

MEANS FOR DRAWING AND PLANISHING TUBES OF ALUMINIUM ALLOY.

SPECIFICATION forming part of Letters Patent No. 582,191, dated May 11, 1897.

Application filed July 13, 1896. Serial No. 599,032. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK ARTHUR ELLIS, residing at London, England, have invented Improvements in Means for Drawing and Planishing Tubes of Aluminium Alloy, of which the following is a specification.

This invention relates to the drawing and planishing in one operation and on one draw-bench of tubes of aluminium alloy with the object of rendering the said tubes harder, more elastic, and of greater tenacity than if drawn in a die in the usual manner.

To carry my invention into effect, I place a tube of aluminium alloy upon a mandrel provided with a gripping-head and draw the tube on a draw-bench through a fixed die, which may either be of the ordinary character or of rollers rotating longitudinally to the tube.

Close to the fixed die I provide one or more revolving dies, each of which is so arranged that the parts may be caused to press upon the tube with any desired pressure while revolving upon the part of the drawn tube after it has left the drawing-dies. In this way I produce a rotary or slightly spiral planishing due to the revolution of the die or dies over the whole surface of the tube as it passes longitudinally through the said revolving die or dies and after it has been drawn longitudinally through the fixed die, and thus I develop a special grain throughout the tube and largely increase its hardness, elasticity, and tenacity over that required in the ordinary longitudinal drawing, also giving it a smooth or planished surface. In addition to this drawing and planishing I may finish the tube by an external polishing, removing all tool-marks and giving an excellent finish to the material.

In order that my invention may be the better understood, I now proceed to describe the same with reference to the drawings hereto annexed and to the letters marked thereon.

Figure 1 is a plan of my combined drawing and planishing bench. Fig. 2 is an elevation of the same. Figs. 3 and 4 are enlarged detail elevations of power-driven rotary planishing-dies. Fig. 5 is an end view of the fixed drawing roller-dies. Fig. 6 is a sectional detail of the rotating planishing-dies.

A is the seamless tube or cylinder of aluminium alloy, mounted on a suitable mandrel provided with a usual neck and head *a*, by which the tube and mandrel are gripped for drawing by the ordinary tongs B and chain *b*, hauled in any convenient manner.

The tube A is first drawn through the fixed dies C C, which are roller-dies adapted to be pressed together with any desired amount of force. The tube of aluminium alloy so drawn is deficient in elasticity and tenacity, and to confer these latter qualities upon the drawn tube I provide planishing-dies D D with splayed or bell-mouthed faces toward the entering tube, as shown in Fig. 6, and carried in a geared head E, mounted on a bracket F, rotated by gearing G G′ at a high speed, such as six hundred revolutions per minute, from a counter-shaft H, mounted on a bracket K and driven from any convenient source by a strap on fast and loose pulleys L′ L or by other equivalent means.

The dies D D are adapted to close together forcibly, (preferably by the pressure of set-screws M M,) so as to produce any desired embracing grip and thus a swaging or planishing upon the tube A as it passes longitudinally through the drawing and planishing dies under the drag of the hauling-chain *b*.

The rapid rotary and squeezing action of the swaging or planishing dies D confers great increased hardness, elasticity, and tenacity upon the aluminium tube so treated and produces a planished surface, removing all tool-marks produced by the longitudinal draw through the fixed roller-dies C C.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. In combination, roller-dies, a support therefor affixed to a draw-bench, means for producing mutual pressure of said roller-dies, means for drawing a tube through said dies, swaging or planishing dies embracing the tube, a geared rotating head carrying said dies and means for rapidly rotating said head.

2. In combination, roller-dies, a support

therefor, means for drawing a tube through said dies, split swaging or planishing dies adapted to receive and embrace the tubes after passing the roller-dies, a geared rotating head carrying said swaging-dies, set-screws in said head for forcing the dies upon the tube, a supporting-bracket for the head and means for rotating said head and dies, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK ARTHUR ELLIS.

Witnesses:
RICHARD A. HOFFMANN,
CHARLES H. CARTER.