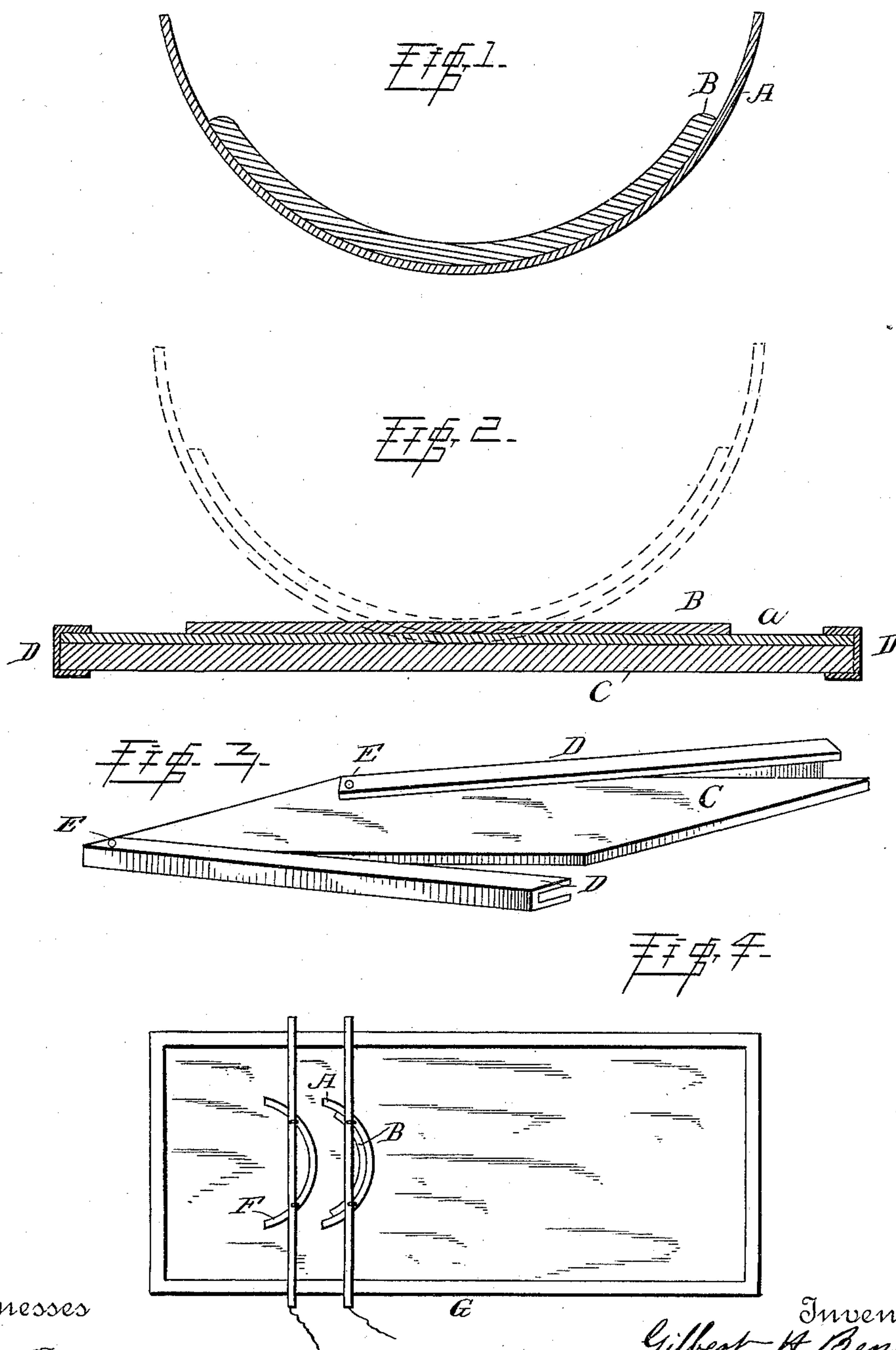


(No Model.)

G. H. BENEDICT & P. M. FURLONG.
FORMING CURVED ELECTROTYPES.

No. 401,631.

Patented Apr. 16, 1889.



Witnesses

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UNITED STATES PATENT OFFICE.

GILBERT H. BENEDICT, OF ELLENVILLE, AND PATRICK M. FURLONG, OF TROY, NEW YORK.

FORMING CURVED ELECTROTYPES.

SPECIFICATION forming part of Letters Patent No. 401,631, dated April 16, 1889.

Application filed February 15, 1887. Serial No. 227,676. (No model.)

To all whom it may concern:

Be it known that we, GILBERT H. BENEDICT and PATRICK M. FURLONG, citizens of the United States, residing at Ellenville and Troy, in the counties of Ulster and Rensselaer, respectively, and State of New York, have invented certain new and useful Improvements in the Art of Forming Curved Electrotypes; and we do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

The object of our invention is to secure in the process of electrotyping a curved metallic shell of uniform thickness. We attain this object by the use in the electrolyte bath of a curved matrix formed upon a curved elastic plate while firmly clamped in a flat position in the manner hereinafter described, and a curved soluble anode suspended at a uniform distance therefrom, the curvature of the anode conforming to that of the matrix, so that when placed in position for the electro-deposition of metal an equal space can be maintained between all parts of the concave surface of the matrix and the convex face of the anode-plate. The curved matrix is formed by the use of a curved elastic plate, preferably of thin sheet metal, held in a flat position by a suitable clamping device. While so held the face of the plate is covered with a layer of molding-wax or other molding composition. The face of the wax is properly blacklead, after which an impression of the type-form is taken thereon and the matrix withdrawn from the form, blacklead, trimmed, built up, &c. When these operations have been performed and the matrix perfected in every detail, the elastic plate upon which the matrix has been formed is released from its clamping-bed and at once returns, through its elasticity, to its original curvature. The result is a curved matrix, which, after the usual treatment, is ready for the bath.

In printing an electrotypes-plate is superior to a stereotype, the copper forming its face being harder and more durable than type metal.

Its use, however, on cylinder-presses has been regarded as objectionable, because of the difficulty attending the formation of a true curvature of the copper shell. The practice hitherto has been to first secure a copper shell from a flat matrix and then bend the shell to the required curvature. The bending requires great skill in the handling and manipulation of the shell, the sharp angles and varying faces of the type rendering it liable to crack or bend irregularly, either of which would make it worthless.

By our invention we do away with the necessity, and consequently the danger, of bending the shell, as it comes from the bath curved as required for the press-cylinder and in condition for immediately undergoing the usual process of tinning, backing, shaving, and trimming.

In the drawings, Figure 1 is a transverse section of the curved elastic plate and the matrix-bed thereon. Fig. 2 is a transverse section of the clamping-bed and the plate and matrix-bed thereon. Fig. 3 is a perspective view of the clamping-bed and clamps connected therewith. Fig. 4 is a plan view of the bath, showing the curved anode and matrix suspended therein.

Like letters indicate like parts.

A is the elastic plate, having sufficient elasticity to allow of its being bent to a flat position, and when released therefrom to spring back to its original curved form.

B is the layer of molding-wax or other suitable composition covering the face of the elastic plate, and upon which the matrix is formed.

C is the clamping-bed, which holds the plate in a flat position by means of clamps D D, hinged at E E. After the impression has been taken upon the molding-wax and a perfect matrix secured and blacklead the elastic plate is released from the bed and resumes its original form, as indicated by dotted lines in Fig. 2.

F is the curved metallic plate or soluble anode, its convex surface conforming to the concave face of the matrix B.

It is essential to the formation of a perfect shell of uniform density and thickness to preserve as nearly as possible an equal distance between the face of the anode and all parts of

the matrix-surface. This uniformity in the intervening space is secured by a curved anode, the metallic deposit being as regular and perfect both as to time and quality as
5 could be effected between two flat surfaces.

We do not claim the distinct and separate use of a curved elastic plate or of a curved anode, these forms having been heretofore described, but we fully believe never having
10 been used in the manner proposed by us for producing a curved electrotype-plate. Our claim relates specifically to the use of a curved elastic plate with the means for clamping the same in a flat position and its retention in
15 that position until an electrotype-matrix has been formed thereon and fully perfected for being subjected to the electro-deposition of metal in the electrotype-vat before being allowed to resume the natural curved form of
20 the elastic plate.

What we claim as new and of our invention, and for which we ask Letters Patent of the United States, is—

The combination of a curved elastic plate and a flat bed provided with hinged and movable clamps for holding said elastic plate in a flat position upon said bed while a matrix-bed is being formed thereon, an impression taken, the form removed from the matrix, and the same fully perfected for its use in the electro-
type-vat before being allowed to resume its curved form, substantially as set forth and described.

In testimony whereof we affix our signatures in presence of two witnesses.

GILBERT H. BENEDICT.
PATRICK M. FURLONG.

Witnesses:

JAMES TEALE,
JOHN B. LIGHTON.