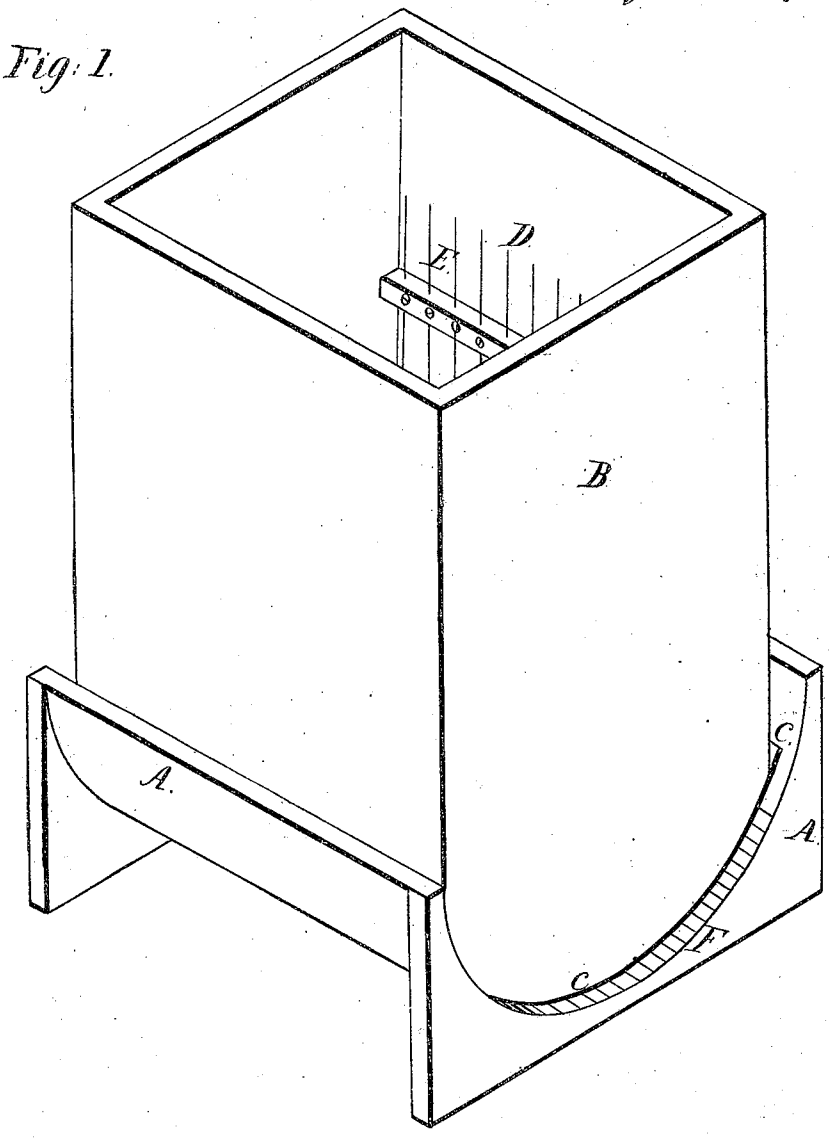
W. H. Elliot. Sheet 1. 2 Sheets

Making Electrotype Plates.

No. 23836. Patented May 3. 1859.

Fig. 1.



W. H. Elliot. Sheet 2. 2 Sheets.

Making Electrotype Plates.

No. 23830. Patented May 3. 1859.

Fig: 2.

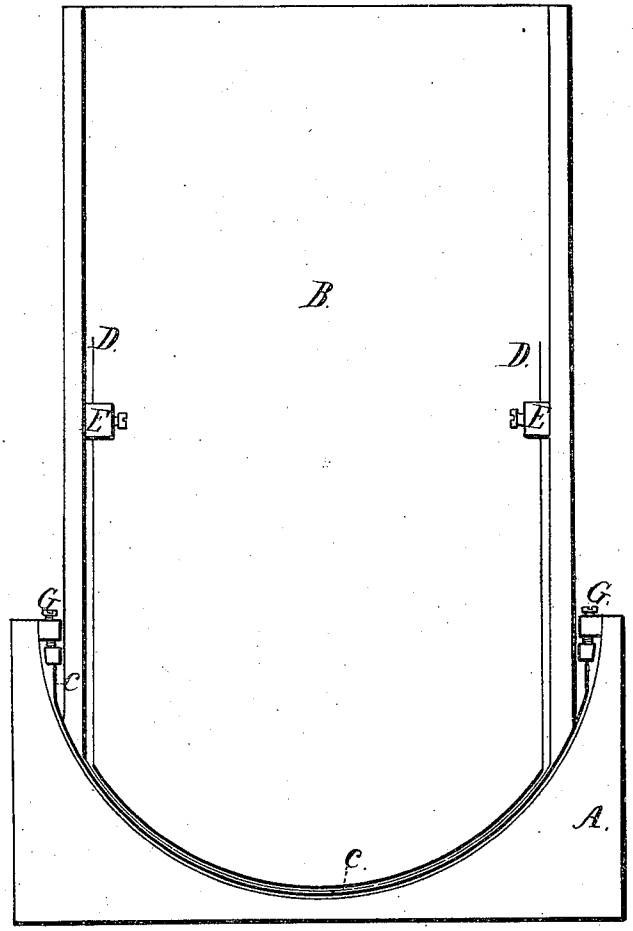
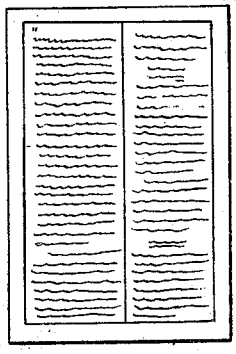


Fig: 3.



UNITED STATES PATENT OFFICE.

WM. H. ELLIOT, OF PLATTSBURG, NEW YORK.

MODE OF FORMING CURVED ELECTROTYPE-PLATES.

Specification forming part of Letters Patent No. **23,836**, dated May 3, 1859.

To all whom it may concern:

Be it known that I, W. H. ELLIOT, of Plattsburg, county of Clinton, and State of New York, have invented a new and useful Improvement in the Mode of Making Curved or Cylindrical Electrotype-Plates or Printing-Surfaces; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Similar letters of reference indicate the same parts in each figure.

The nature of my invention consists in the employment of a peculiar compound flexible impression-sheet for the purpose of making curved electrotypes, and in the use of certain devices for holding impression-sheets in the required form while the metal is being deposited.

To enable others skilled in the art to make and use my invention, I will proceed to describe it.

Figure 1 is an isometrical view of the apparatus for giving form to the impression-sheet. Fig. 2 is a perpendicular section of the same through the center. Fig. 3 is a plan of the impression previous to its being placed in the apparatus.

A is a concave cylindrical form, of a radius equal to that of the printing-press when the type are upon it.

B is a box without top or bottom. Its lower edges are curved at B′ to correspond with the form A.

C is the compound impression-sheet laid into the curved form.

D are metallic wires, which pass through projections E upon the inside of the box and down over the face of the impression. These wires serve the double purpose of holding the impression-sheet down to its place, and of distributing the electrical current over the face of the impression.

F are fine grooves or air-escapes in the form A to provide an escape for any air that may be under the impression-sheet, or between it and the form A.

G are screws, which are used as a mechanical power for bringing the impression-sheet to the required form and holding it there.

i are projections or ledges, cast upon or attached to the form A, for the purpose of resisting any tendency the flexible sheet may have to spring up and displace itself from form A; and they serve the same purpose whether screws G are used with them or not. It is better, however, to use at least one screw, as the sheet requires tightening after it is forced under the ledges.

The compound impression-sheet may be composed of a sheet of paper or any other non-elastic pliable material covered with a coating of wax or other impressible substance; or it may be composed of a thin sheet of metal, paper, and wax, the paper being placed between the metal and wax. A sheet thus composed is almost indispensable for large electrotypes, but for small ones paper and wax alone will do. These impression-sheets must be flexible and easily bent to the required form.

To prepare the matrix or impression, the sheet is laid upon a printing-press with the wax upward and the necessary impression made in it. It is then removed from the press and laid in the form A with the impression upward. The box B is then placed upon the sheet and pressed down with considerable force, so as to bring the edges of the box into the wax, so that the liquid may not escape from under the edges of the box, and also that the curved edges B′ of the box, may assist in bringing the impression-sheet to the desired curve by pressing it between them and the form A. The box touches the impression-sheet on all sides outside of the impression, and, when secured in its place, the wires D are then placed upon the face of the impression, forced down gently, and secured by small screws in the projections E. The solution is then poured into the box, the weight of which is sufficient to bring an impression-sheet, if composed of paper and wax only, down upon the form A in the most perfect manner. Any air that may have been caught under the sheet may escape by means of the air-escapes F. Instead of fine grooves, a sheet of porous paper may be laid under the impression-sheet to provide for the escape of the air, or fine holes may be made through the form A for the same purpose.

In case the impression-sheet is formed in part of a sheet of metal, it should be so made that when left at liberty it will assume the cylindrical form required, as nearly as possible, and sufficiently elastic that it may be straightened out flat to receive the impression and afterward spring up again to its original form.

There will then be less difficulty in getting it into the form A and in bringing it to the exact curve required.

When impression-sheets are composed in part of a sheet of metal any number of them may be placed in one bath or vessel which contains the solution from which the electroplate is deposited, the bottom of said bath being represented by form A, and when so placed it may be made to conform to the bottom of the bath by pressure against its straight edges by means of ledges *i* and one or more screws, *g*.

The peculiar characteristics of this invention are in the use of the several devices for holding the compound impression-sheet in the exact cylindrical form and in some peculiarities of the impression-sheet itself, all of which appear to be essential to the making of curved printing-surfaces sufficiently true to be used upon cylinder-presses. Among these peculiarities are the employment of ledges *i*, attached to the form A, for resisting the tendency of the impression-sheet to spring up and displace itself from the face of the form A; the employment of curved edges B′, which rest upon the edge of the impression-sheet and hold it along its edge in perfect contact with form A, and thus by being held firmly between the edges B′ and form A it must take—at least at its edges—the true cylindrical form; the employment of air-escapes F for the escape of air from between the impression-sheet and the form A, especially when said sheet is composed of a material sufficiently pliable to be affected by the stiffness of the wax or impressible material, as the thicker portions of the impression-sheet in such cases remain flat and slightly raised up from the form A until the solution is poured upon it, and as the solution cannot be poured upon it until the box B has been forced down, pressing the outer edge of the sheet firmly against form A and completely inclosing the air under the sheets at those points where it may have been flattened, it is necessary that some escape should be provided for the air thus inclosed, otherwise the sheet cannot be brought down to the form A by the weight of the solution; the employment of adjustable wires D for holding down the central portion of the flexible sheet and for distributing over the impression the electrical current; the curved form of the flexible sheet when left at liberty. Such a sheet can be much more easily straightened out for the purpose of receiving the impression than a flat one can be curved after it has received the impression.

I make no claim to the broad principle of forcing the back of a flexible impression-sheet against a cylindrical form for the purpose of giving it the required shape; but

What I do claim, and wish to have secured to me by Letters Patent, is—

1. The employment of ledges *i* in combination with the form A, for the purpose of holding a compound flexible impression-sheet or type-matrix in the required form, with or without screws R, as specified.

2. The employment of curved edges B′ in combination with the form A when said edges are so arranged in relation to said form that the edges of the compound impression-sheet shall be held firmly between them for the purpose of holding said impression-sheet or type-matrix in a cylindrical form, as set forth.

3. The employment of air-escapes F in combination with form A, box B, and the flexible impression-sheet C, so as to provide for the escape of air from between the said impression-sheet and form, as and for the purpose specified.

4. The combination and arrangement of the concave form A with the adjustable wires D, for the purpose of holding the impression-sheet in contact with the concave side of said form, as and for the purpose set forth.

5. The employment of a curved impression-sheet of sufficient elasticity that it may be straightened out while the matrix is being formed by the type and then spring up again by its own power to the form required, in combination with curved form A when used for the construction of a curved type-matrix, as and for the purpose specified.

Plattsburg, New York, April 4, 1859.

W. H. ELLIOT.

Witnesses:

LEONARD COZZINS,

G. P. COZZINS.