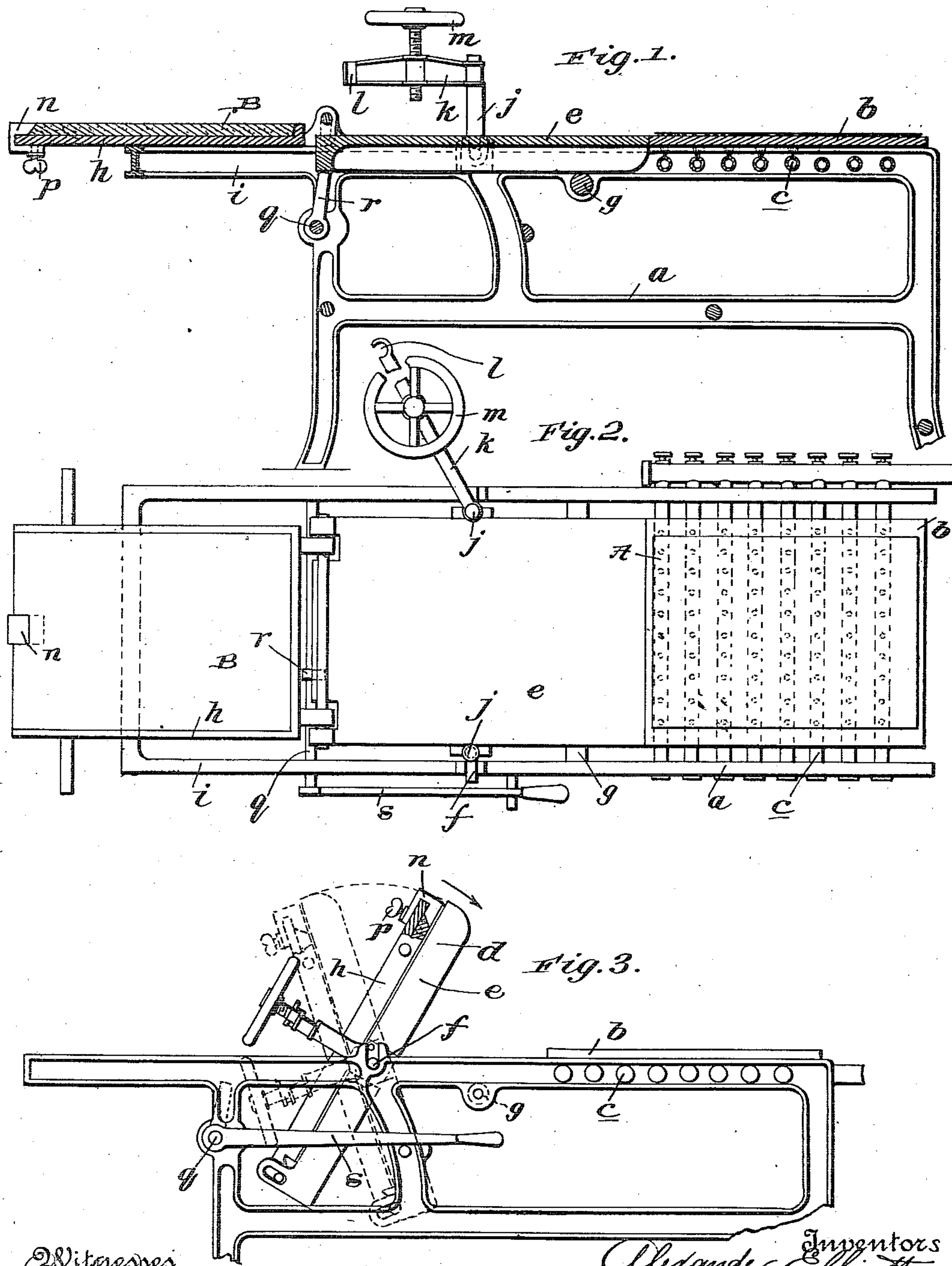


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M. L. ELLIOTT, EXECUTRIX OF A. ELLIOTT, DEC'D.
ELECTROTYPE AND PROCESS OF MAKING SAME.
APPLICATION FILED MAR. 8, 1901.

994,705.

Patented June 6, 1911.

2 SHEETS—SHEET 1.



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Fig. 6.

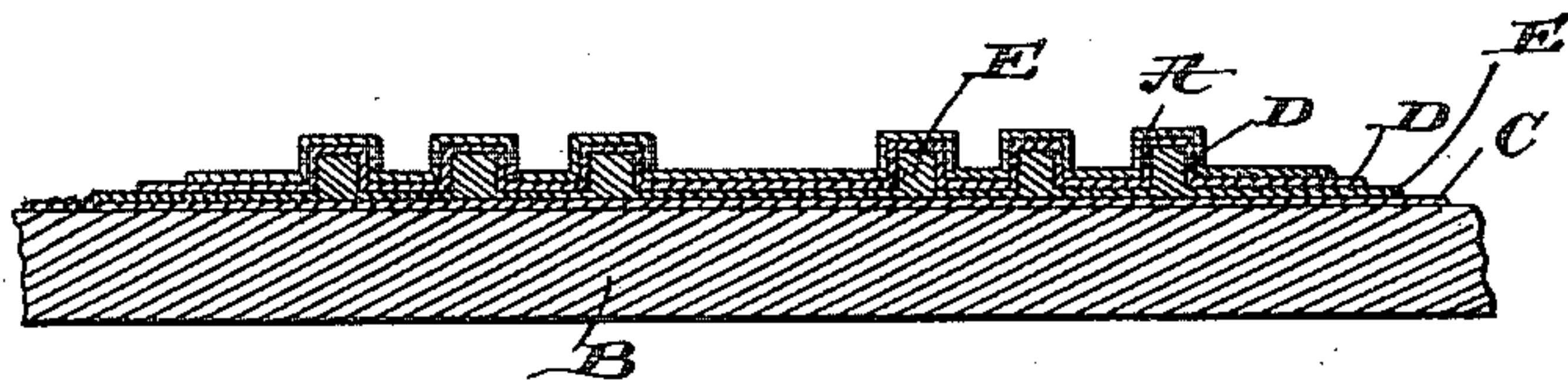


Fig. 4.

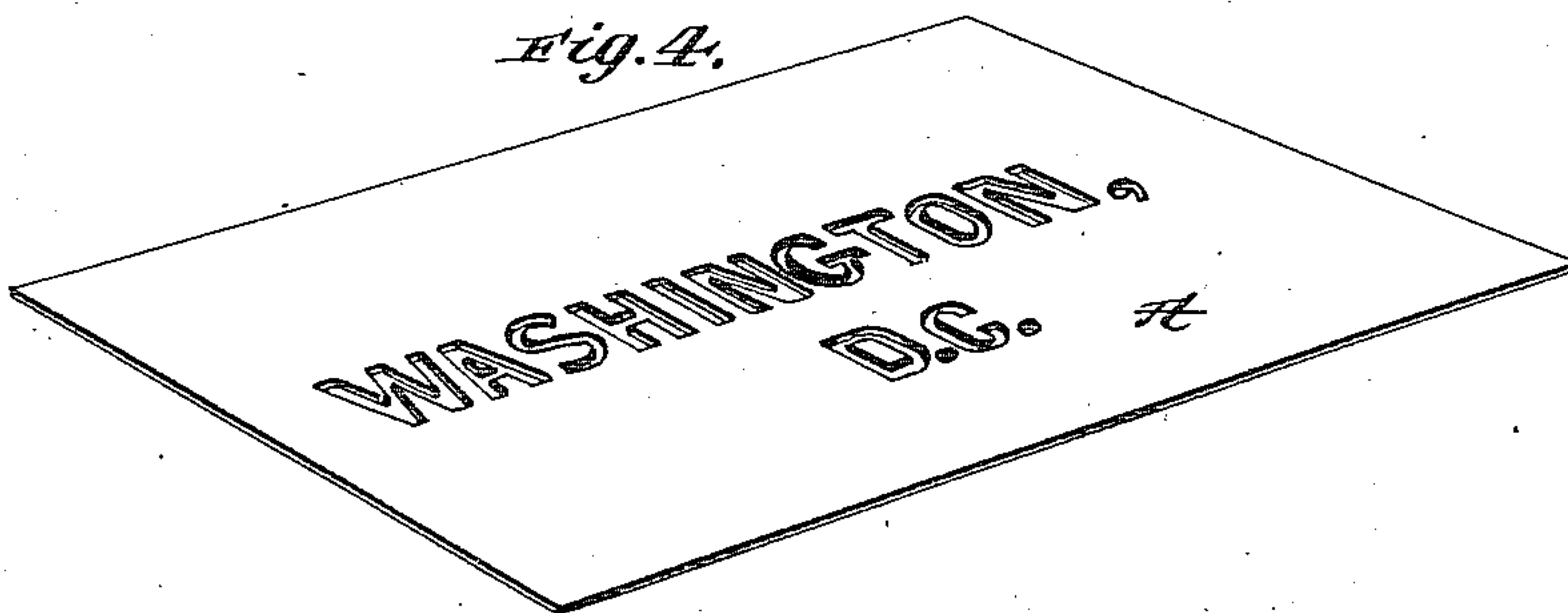


Fig. 5.

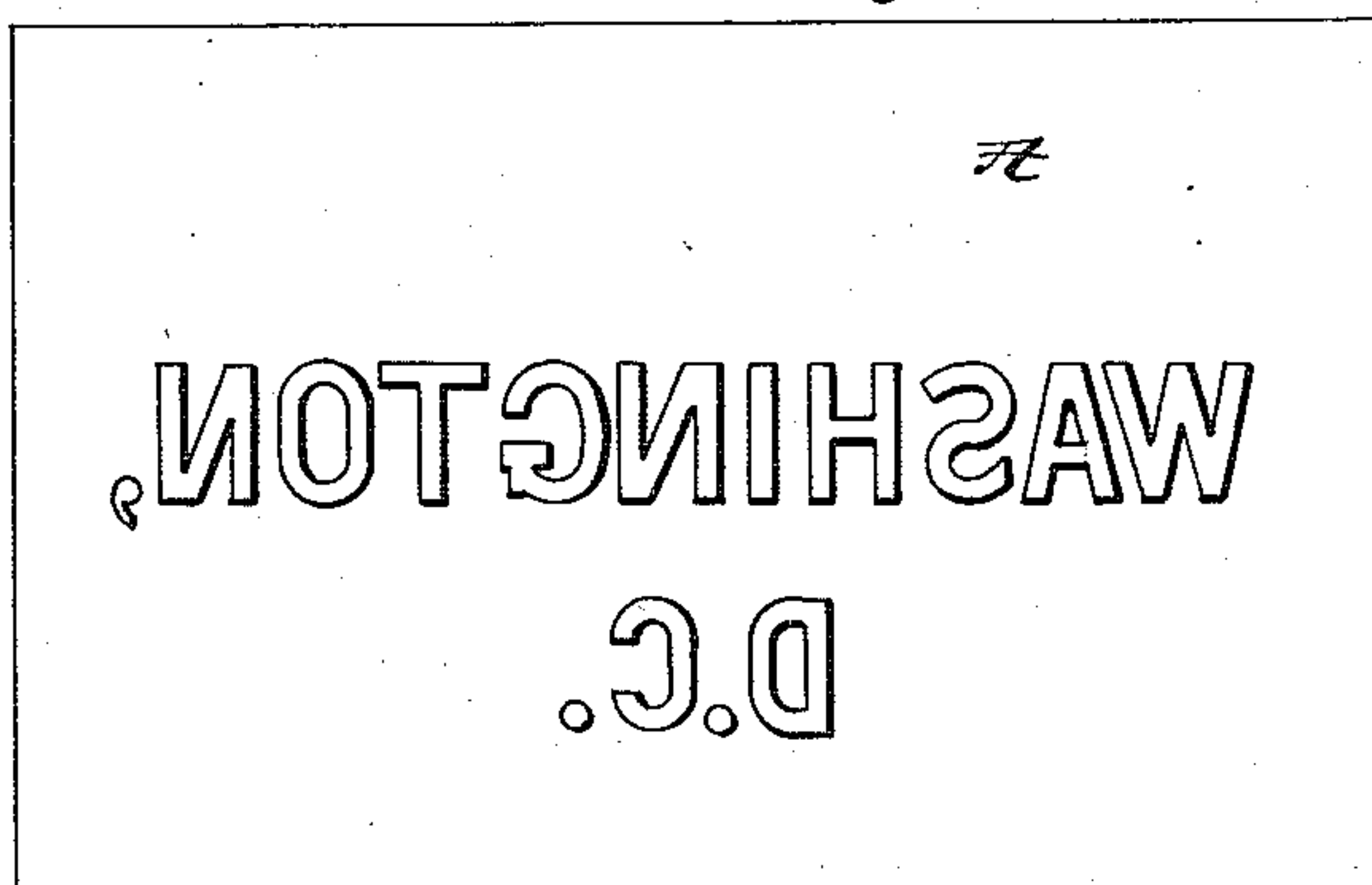
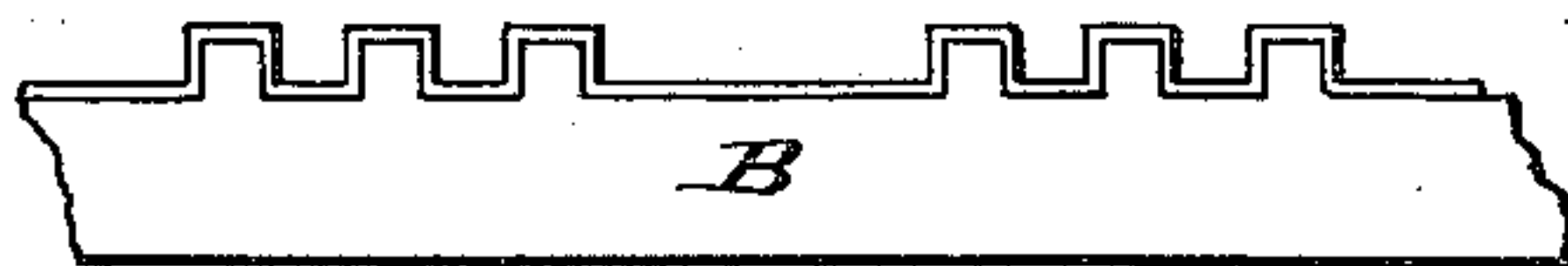


Fig. 7.



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ELECTROTYPE AND PROCESS OF MAKING SAME.

994,705.

Specification of Letters Patent.

Patented June 6, 1911.

Application filed March 8, 1901. Serial No. 50,347.

To all whom it may concern:

Be it known that we, ALEXANDER ELLIOTT and MICHAEL SHAEN, citizens of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Electrotypes and Processes of Making the Same, of which the following is a specification.

Our invention relates to electrotypes, and consists, first—in a process of backing copper or electrotype shells whereby a perfect electrotype is produced much more expeditiously and at considerably less expense than by the processes now in vogue, and second—in the electrotype the product of the process.

The invention will be fully understood from the following description and claims, when taken in conjunction with the accompanying drawings, in which:

Figure 1 is a longitudinal-vertical section of the apparatus, which we prefer to employ in carrying out our process; the same being shown with a copper shell on its heating plate, and with its casting box open and holding a cast plate in its top section. Fig. 2 is a plan view of the same. Fig. 3 is a detail side elevation, partly in section, illustrating by full lines the manner in which the casting box is swung on the supporting frame, and, by broken or dotted lines, the position which the said box is caused to assume to receive the molten metal for forming the plate. Fig. 4 is a perspective view illustrating the copper shell in an inverted position. Fig. 5 is a plan view of the copper shell. Fig. 6 is a sectional view illustrating in their proper relative positions the several layers of metal which enter into an electrotype made in accordance with the preferred embodiment of our invention. Fig. 7 is a detail edge elevation of a completed electrotype made according to our invention, by reference to which it will be seen that the backing of the copper shell is a homogeneous mass.

Similar letters of reference, designate corresponding parts in all of the several views of the drawings.

In carrying out our improved process, the type, cut or other subject of the electrotype to be produced is first molded in wax, after the usual manner, and the mold is then shaved, preferably through the medium of a power shaver, this with a view of remov-

ing the splurge of wax caused by the pressing of the type, cut or other subject into the wax, and leaving the plane surface of the mold smooth and level and eliminating all building up of the mold. The wax mold or impression is then coated with powdered graphite, and immersed in an electroplating bath when a copper shell A will be deposited thereon.

We prefer to shave the mold with a power shaver as stated, because the shaving knife thereof, when properly set or adjusted, is enabled to make a perfectly true cut and leave the plane surface of the mold smooth and level, but it is obvious that any other kind of shaver or means calculated to render the plane surface of the mold smooth and level—i. e., free from depressed portions, protuberances or unevennesses, may be employed.

In backing the copper shell a plate of the required thickness and composed of what is known as electrotype metal or other suitable metal is cast or otherwise produced, and the back side of the copper shell is soldered to the face thereof.

By virtue of the wax mold being provided as stated with a smooth and level plane surface, the copper shell deposited thereon has a smooth and level back side which rests in a plane parallel to that of the face of its type or other subject. This is materially advantageous because when the backing plate is applied in the manner described, the shell is uniformly joined to and supported throughout its area by the backing plate, and is not liable to buckle, incident to the setting of the two kinds of metal, and form sinks or depressions in the face of the electrotype which would have to be hammered out by repeated blows applied to the back of the backing plate before the electrotype could be used. When the subject of the electrotype produced in accordance with our invention embodies no blank spaces of large size into which the paper would be liable to sag in printing, the improved electrotype is ready for use as soon as produced without further treatment, except the usual shaving of the back of the backing plate. When, however, the subject of the improved electrotype embodies blank spaces of such size that the paper would be liable to sag into same and be blackened in printing, depressions can be provided by routing out the

blank spaces in the manner ordinarily practiced by electrotypers.

In the preferred embodiment of our invention the soldering of the copper shell to the plate of electrotpe or other metal is accomplished as follows, viz.; the plate which is lettered B, in Figs. 1, 6 and 7, is taken while in a heated state, and its face is brushed with muriate of zinc or any other suitable flux, after which a sheet of tin foil lettered C in Fig. 6 is applied to its face. By reason of the plate B being heated as stated, the tin foil will spread over its face and by virtue of the flux employed will adhere thereto. The inner or back side of the copper shell is brushed with muriate of zinc or any other suitable flux, and a sheet of tin foil is applied to the same, after which the shell is heated, when the tin foil will be melted and caused to adhere thereto. Such sheet of tin foil is lettered D in Fig. 6, and after its application to the shell in the manner described, the cups of the letters or other matter on the shell are filled by pouring molten electrotpe or other suitable metal therein; such metal being indicated by E in Fig. 6. The tinned face of the cast plate B, and the back side of the copper shell to which the tin foil D and electrotpe metal E are applied, are then brought together while all are still in a heated state, and are subjected to sufficient pressure to hold the shell firmly on the plate until the solder employed to effect the union of plate and shell is set, when a perfectly straight and true electrotpe will be the result.

It will be appreciated from the foregoing that our process of backing a copper shell and producing an electrotpe is very simple and expeditious, and is much cheaper than the process now commonly practiced, because it obviates the necessity of building up the mold to produce depressions in the shell and in fact could not be practiced if the shell were produced on a built up mold on account of the protuberances which such a shell would present to the backing plate, because it removes the necessity of hammering the electrotpe to clear it of imperfections caused by pouring molten electrotpe metal on the thin copper shell to back the same which is the practice extant, and because the electrotpe produced is ready for use without further treatment except the usual shaving of the back of plate and, when the subject of the electrotpe embraces large blank spaces, the routing out of said blank spaces usually resorted to. It will also be appreciated that in the electrotpe the product of our process, the plate B, sheets of tin foil C, D, and electrotpe metal E, are fused or blended into oneness, and form a solid backing for the copper shell which will enable all parts of the same to withstand greater pressure.

Although we prefer to cast the plate B employed in our improved electrotpe, it is obvious that the said plate may be formed in any other manner suitable to the purposes of our invention without departing from the spirit thereof.

The apparatus which we prefer to employ in carrying out our improved process comprises a main frame *a*, a heating plate *b* arranged thereon over hydrocarbon burners *c*, or any other suitable heater, and a casting box *d*. The casting box comprises, in turn, a bottom section *e* having trunnions *f* journaled in the frame, and adapted to rest, when in its horizontal position, on a cross bar *g* of the frame and flush with the heating plate *b*, a top section *h* loosely connected to the bottom section and adapted when the box is opened as shown in Fig. 1, to rest on a bracket *i* projecting from the frame, posts *j* rising from the bottom section, a cross bar *k* pivotally connected to one of the posts *j* and having a hook *l* adapted to be swung into engagement with the other post *j*, and a hand screw *m* bearing in a threaded aperture in the cross bar *k* and adapted to be turned down on the top section *h* of the box when the same is closed, as shown in Fig. 3, so as to press and hold said top section against the bottom section. The top section *h* of the box carries a clip *n* which straddles its outer end, and is provided with a thumb screw *p* through the medium of which it is adjustably fixed in position. Said clip has its end which engages the plate cast in the box undercut as shown, whereby it is enabled to hold the said plate in the section *h*.

In addition to the elements named, the apparatus is provided with a transverse shaft *q* which is equipped with stops *r* for engaging the bottom of the box and holding the same in a horizontal position, and a hand lever *s* through the medium of which the stops are thrown out of engagement with the box so as to permit of the latter being swung on the frame after the manner indicated by full and broken lines in Fig. 3.

In operating the apparatus and carrying out our improved process, a suitable flux such as muriate of zinc, and a sheet of tin foil are applied in the order named to the back or inner side of the shell, and said shell is placed on the plate *b*, when the heat imparted to it will melt the tin foil. While the casting box *d* is in the position shown by broken lines in Fig. 3, sufficient molten metal to form a plate such as B in Fig. 1, is poured therein, and then when the cast metal is cooled sufficiently to permit of the box being opened, said box is swung in the direction indicated by arrow in Fig. 3, back on the cross bar *g* of the frame, and is then opened as shown in Fig. 1, the cast plate remaining in the top section *h* by reason of it

being engaged by the clip *n*. Muriate of zinc or any other suitable flux is applied to the face of the plate B, together with a sheet of tin foil, when the latter will be melted by the heat retained in the plate and caused to spread over and adhere to the face of the same. Molten electrotpe metal is poured on the tinned copper shell so as to fill the cups of the letters or other matter thereof, and with this done the copper shell is moved from the heating plate *b* over on the bottom section *e* of the casting box, and the box is then closed, and the section *h* is pressed down on section *e*, through the medium of screw *m* sufficiently to hold the plate *b* firmly down on the copper shell until the tinned surfaces of the shell and plate set, when the electrotpe is removed.

It will be observed from the foregoing that the heat retained in the cast plate B is utilized to melt the tin foil applied to said plate, and that this simplifies the process and renders the same very expeditious since it obviates the necessity of reheating the plate for the purpose stated. It will also be observed that in accordance of our process and with the aid of our apparatus a perfect electrotpe may be expeditiously produced with but a minimum amount of effort on the part of the attendant of the apparatus.

By virtue of the copper or electrotpe shell having a flat back, due to the plane surface of the mold employed, when the backing plate is pressed down on the shell in the manner described, the shell is held perfectly flat, a good union is effected between the flat back side of the shell and the flat face of the plate, and the shell is effectually prevented from buckling.

We have entered into a detail description of the preferred embodiment of our invention, in order to impart a full, clear and exact understanding of the same. We do not desire, however, to be understood as confining ourselves to the specific materials employed or the relative arrangement of the same, as such changes or modifications may be made in practice as fairly fall within the scope of our claims.

Having described our invention, what we claim, and desire to secure by Letters-Patent, is:

1. The process of producing an electrotpe which consists in molding the subject matter of the electrotpe to be produced in

wax, rendering the plane surface of the wax mold smooth and level, forming an electrotpe-shell on the mold having the smooth and level plane surface by electro-deposition, filling the cups of the letters or other matter of the shell with molten metal, and soldering the back side of the shell to the face of a metallic backing plate.

2. The process of producing an electrotpe which consists in molding the subject matter of the electrotpe to be produced in wax, rendering the plane surface of the wax mold smooth and level, forming an electrotpe-shell on the mold having the smooth and level plane surface by electro-deposition, applying tin and a flux to the back side of the shell, heating the shell, filling the cups of the letters or other matter of the shell with molten metal, heating a metallic backing plate, applying tin and a flux to the plate, and bringing the back side of the shell and the face of the plate together and subjecting them to pressure while in a heated state.

3. The process of producing an electrotpe which consists in molding the subject matter of the electrotpe to be produced in wax or other suitable material, rendering the plane surface of the mold perfectly smooth and level, depositing metal on the said mold and thereby producing an electrotpe shell having a smooth and level back side which rests in a plane parallel to that of the face of the subject matter of the shell, and joining the back side of the shell to the face of a metallic backing plate through the medium of metal which is interposed between the shell and the plate at all points throughout the area thereof.

4. The process of producing an electrotpe which consists in producing an electrotpe-shell having a flat back side, casting a metallic backing plate, and joining the flat back side of the shell to the face of the plate by solder while the said plate retains a portion of the heat due to the casting thereof.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

ALEXANDER ELLIOTT.
MICHAEL SHAEN.

Witnesses:

ORA A. BRADY,
GEO. JOHANNES.