

No. 874,354.

PATENTED DEC. 17, 1907.

W. H. WELSH.  
PROCESS OF PRODUCING MATRICES.  
APPLICATION FILED MAY 20, 1907.

Fig. 1.

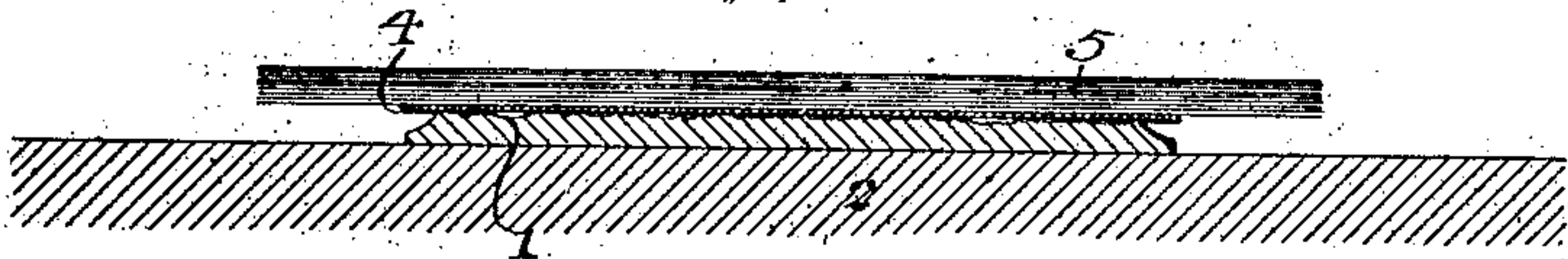


Fig. 2.

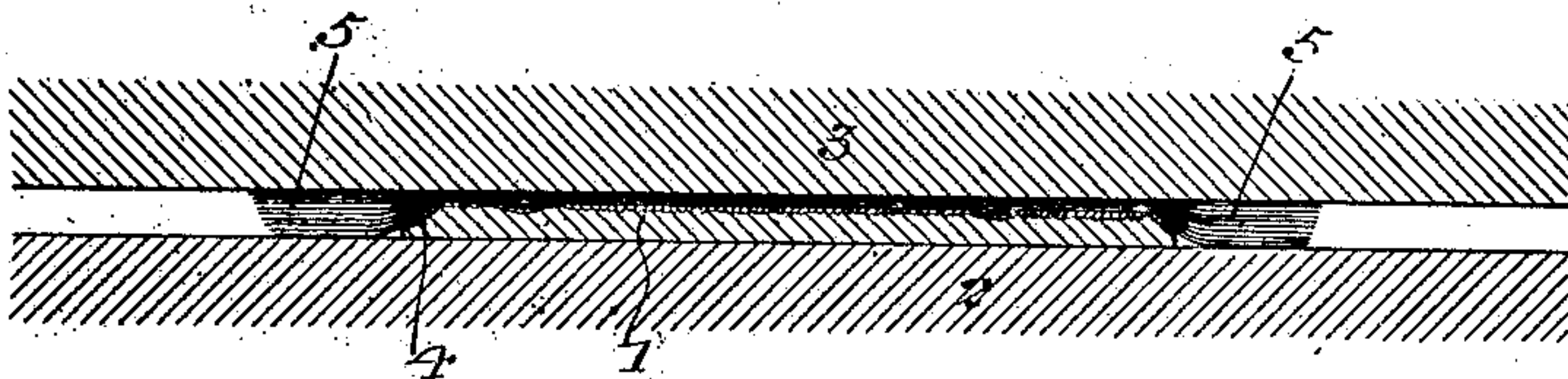


Fig. 3.

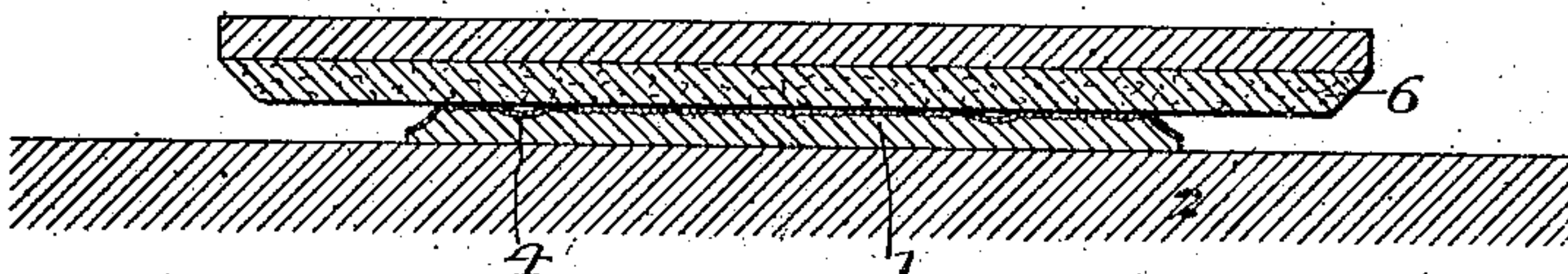


Fig. 4.

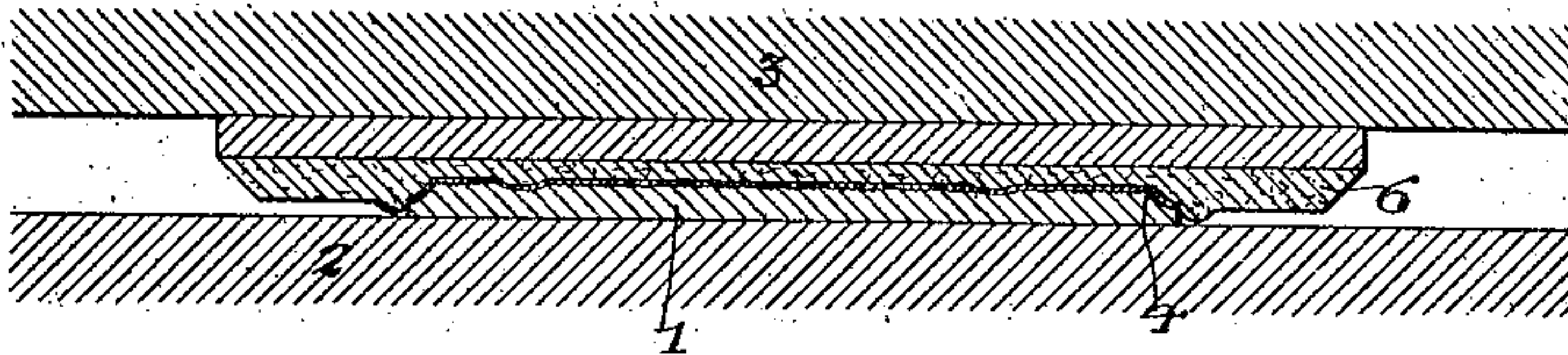
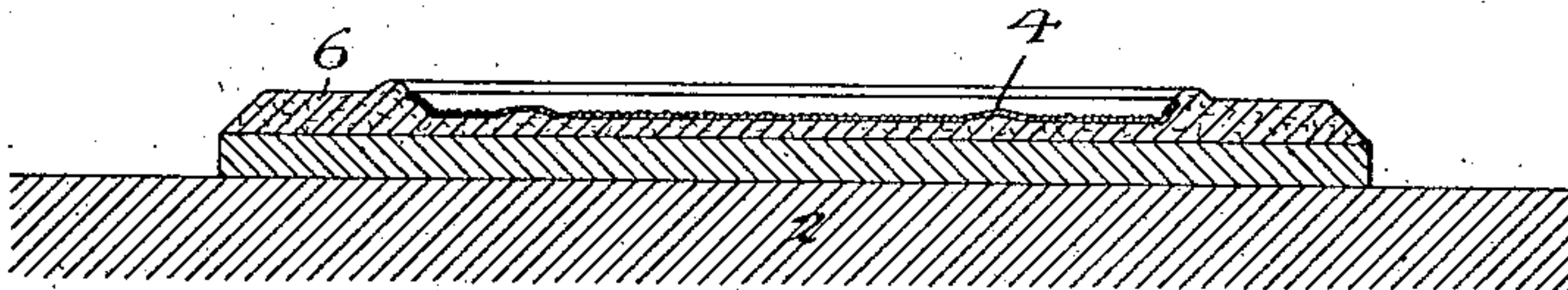


Fig. 5.



Witnesses:  
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William H. Welsh  
by His Attorneys  
Howson & Howson



# UNITED STATES PATENT OFFICE.

WILLIAM H. WELSH, OF COLLINGSWOOD, NEW JERSEY, ASSIGNOR OF ONE-THIRD  
TO CHARLTON H. ROYAL AND ONE-THIRD TO JAMES F. GOUNLEY, OF PHILA  
DELPHIA, PENNSYLVANIA.

## PROCESS OF PRODUCING MATRICES.

No. 874,354.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed May 20, 1907. Serial No. 374,637.

*To all whom it may concern:*

Be it known that I, WILLIAM H. WELSH, a citizen of the United States, and a resident of Collingswood, Camden county, New Jersey, have invented certain Processes of Producing Matrices, of which the following is a specification.

My invention relates to the production of matrices and the subsequent electrotypes made therefrom for use in the reproduction of half-tones, zinc etchings and the like, for books, magazines, and other matter of a similar nature, by the art of printing, and it consists of an improved process of producing such matrices.

My invention may be best described by reference to the accompanying drawings, in which:

Figure 1, is a sectional elevation showing a half-tone, zinc etching or the like mounted on the platen of a press, and illustrating the first step in the process forming the subject of my invention; Fig. 2, is a similar sectional view, showing the next step in the process; Figs. 3 and 4, are similar sectional views, showing further steps in the process, and Fig. 5, is a sectional view, illustrating the impression taken from the half-tone, zinc etching or the like, embedded in a body of wax or other suitable plastic material, which impression is to be subsequently treated in the ordinary manner of making an electrotypes.

The ordinary method of making electrotypes from half-tones, zinc etchings and the like, is to make a wax impression, black-lead the same, oxidize such black-lead, place the oxidized impression in the electroplating bath, and when a sufficient quantity of metal has been deposited thereon, to strip such shell from the wax impression, back it with metal and then finish the same in the usual manner. Experience has proven, however, that it is practically impossible to make satisfactory impressions and subsequent electrotypes with the aid of wax, from half-tones, zinc etchings and the like, and for this reason it has been recently proposed to prepare metal impressions of such half-tones, which are subsequently treated in the usual manner and then electroplated. This latter practice is to employ a sheet of lead or other suitable metal of a thickness approximately  $\frac{3}{64}$  of an inch or slightly greater, and if the half-tone, zinc etching or the like, is of large size,

to provide means for imparting pressure to the metal sheet step by step so as to prevent damage to the platen or other part of the press.

In a companion application, filed April 23, 1907, Serial No. 369,789, I have described and claimed a method or process of making combined type and half-tone impressions from which subsequent electrotypes are produced, and in which a metal plate, preferably lead, is employed to receive the half-tone impression and be subsequently embedded in the wax, the type impression being made directly in the wax and surrounding or disposed adjacent the half-tone. This method is most satisfactory for the purpose described, except that after removal from the electroplating bath, there is more or less difficulty experienced in removing the lead impression from the deposited copper shell; it being necessary to heat the lead to a greater or less degree before the copper plate can be stripped from the same.

The object of my present invention is to obviate this difficulty by the use of a thin sheet of metal foil, and to cover broadly the picking up, by a suitable supporting body of plastic or similar material, of the metal sheet or foil which has received the impression of the half-tone or zinc etching, and thereby preserve its surface in the desired plane; a condition that would be destroyed if the sheet of foil were unsupported. The advantages of a metal impression of a half-tone or zinc etching are fully pointed out in my application before referred to, and it is not thought necessary to describe them herein.

In carrying out the method or process forming the subject of my invention, I proceed as follows: 1 represents a half-tone or zinc etching, which is shown removed from its block and lying upon the lower platen 2 of a suitable hydraulic press, the upper, movable platen 3 of which serves as the medium for pressing the sheet of metal foil into the indentation of the half-tone or zinc etching. Upon such half-tone or zinc etching, I place a thin sheet of metal foil, preferring to use lead foil, from  $\frac{6}{1000}$  to  $\frac{12}{1000}$  of an inch in thickness, which sheet of foil is indicated at 4, and by preference just covers the half-tone or zinc etching. A layer 5, of relatively soft or yielding material, several sheets of



paper for instance, is placed on top of this sheet of metal foil, and then pressure is applied to the layers so prepared. No specific pressure is employed except that it should be sufficient to cause the necessary displacement of the metal foil to form in the same the lines, indentations and other surfaces of the half-tone or zinc etching. The half-tone or zinc etching with the foil impression covering the same is then withdrawn from the press, and a body of plastic material mounted upon a suitable carrier, preferably a wax plate of the usual character for securing an ordinary type impression and indicated at 6, is put over the same. The impression and the superposed wax or plastic body are then returned to the press and subjected to sufficient pressure to force the body of wax or plastic material towards the face of the lower platen of the press; thereby embedding the foil covered half-tone or zinc etching in said body of wax or plastic material and effecting such a bond between said plastic body or wax and the foil as to firmly secure the latter thereto for all purposes in the subsequent steps of producing an electrotpe. When the body of plastic material or wax is removed from the press, the half-tone or zinc etching may be readily lifted from the impressed sheet of metal foil, leaving the latter firmly embedded in the plastic body or wax, and such impression is black-leaded in the usual manner and placed in the electroplating bath. A number of foil impressions may be embedded in and picked up by a single plate of wax or plastic material if desired, and when transferred to the electroplating bath, a continuous shell of any number of impressions will be produced.

When the copper coating or deposit has been effected in the electroplating bath, the foil impression may be readily stripped from

the copper shell without further attention or treatment, and the latter is then backed and finished in the usual manner.

While I speak of employing metal foil, (lead foil for example), to secure the impression from the half-tone, zinc etching, and the like, and have used such expression in the claims, it will be understood that it is a purely relative term and that it includes any relatively thin sheet of metal capable of performing the function desired in the process forming the subject of my invention as described herein.

I claim:

1. The process of forming matrices for the production of electrotypes from half-tones, zinc etchings and the like, which consists in making a metal foil impression of the half-tone, zinc etching, etc., placing a body of plastic material over the foil impression to serve as a carrier therefor, and applying pressure to said plastic body whereby the impressed foil becomes firmly embedded in and attached thereto and may be stripped from said half-tone and the like.

2. The process of forming matrices for the production of electrotypes from half-tones, zinc etchings and the like, which consists in making a lead foil impression of the half-tone, zinc etching, etc., placing a waxed plate over such impression to serve as a carrier therefor, and applying pressure to said waxed plate whereby the impressed foil becomes firmly embedded in and attached thereto and may be stripped from the half-tone and the like.

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

WILLIAM H. WELSH.

Witnesses:

MURRAY C. BOYER,  
JOS. H. KLEIN.