

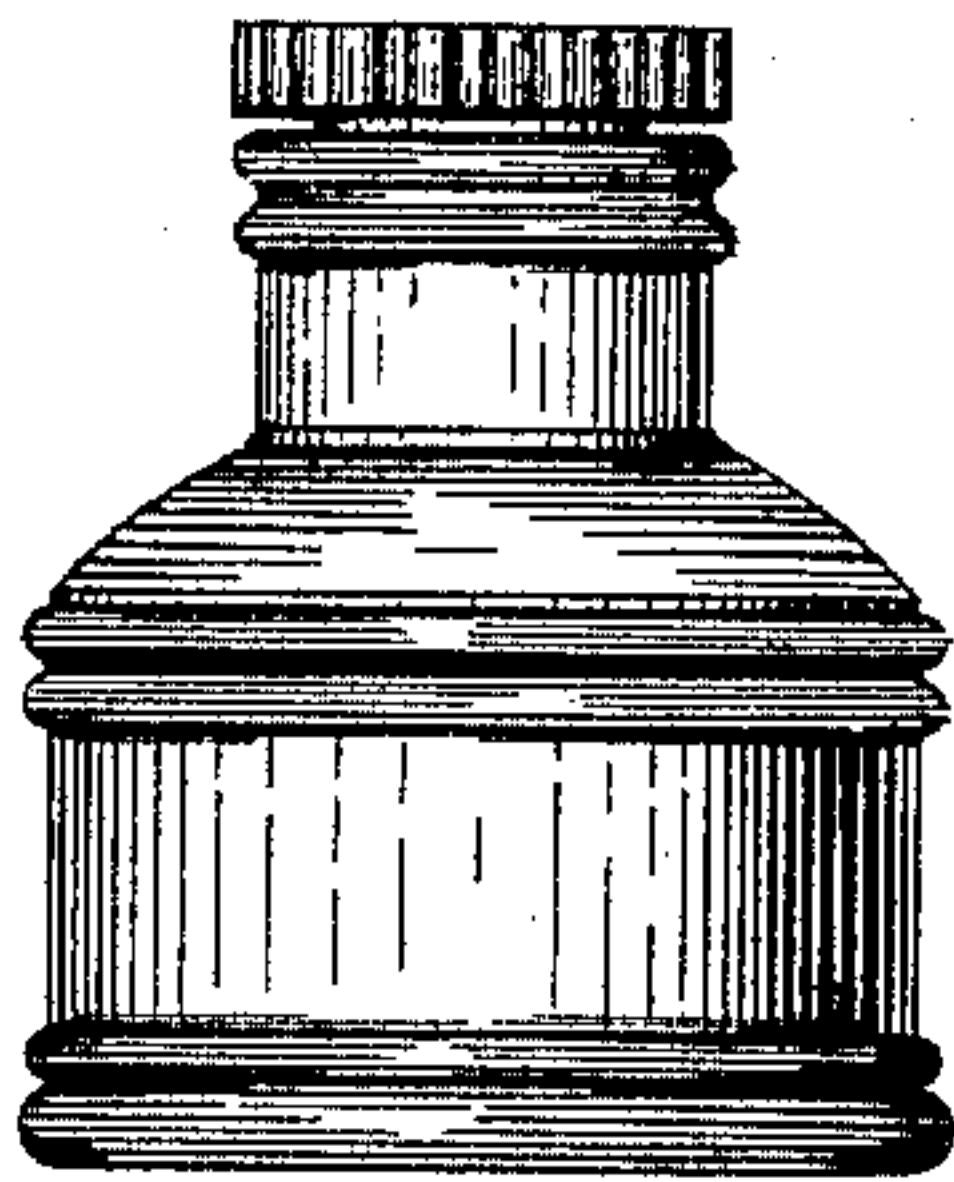
(Specimens.)

J. JACOBSON.  
MATRIX.

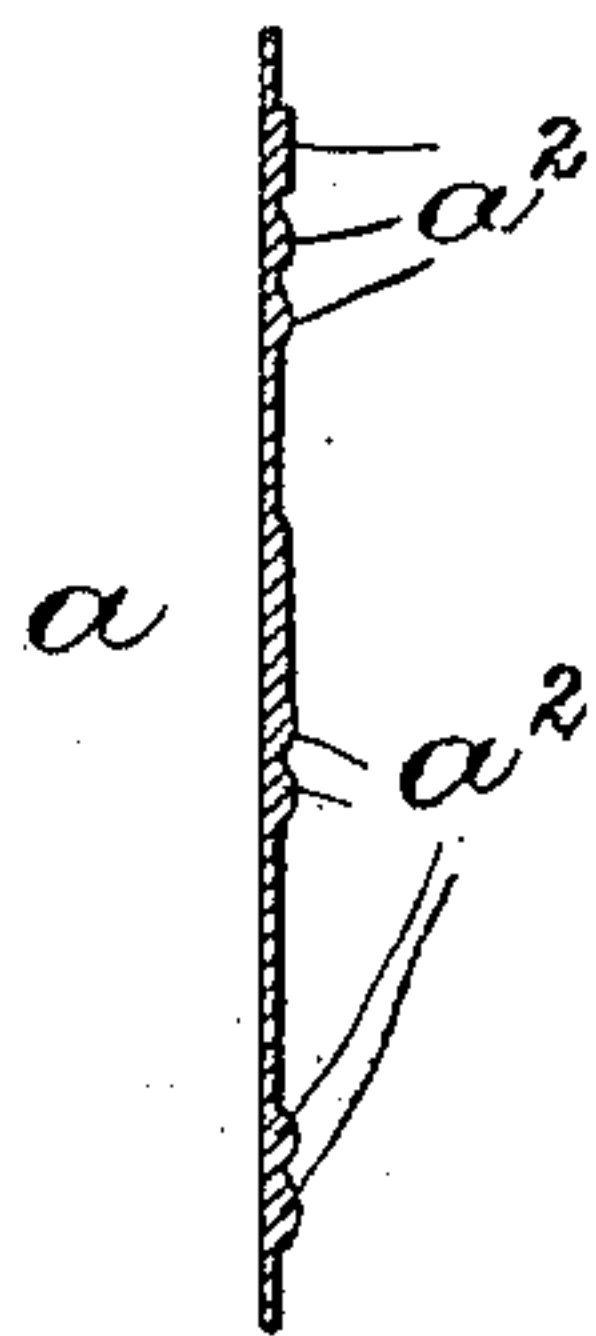
No. 584,553.

Patented June 15, 1897.

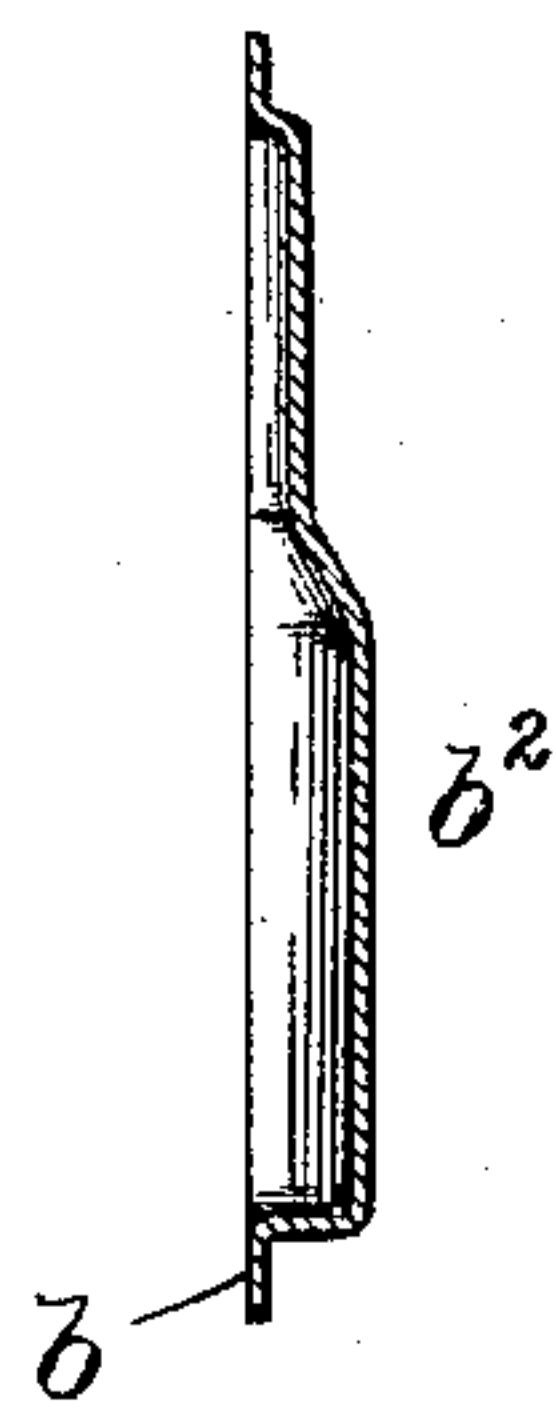
*Fig. 1,*



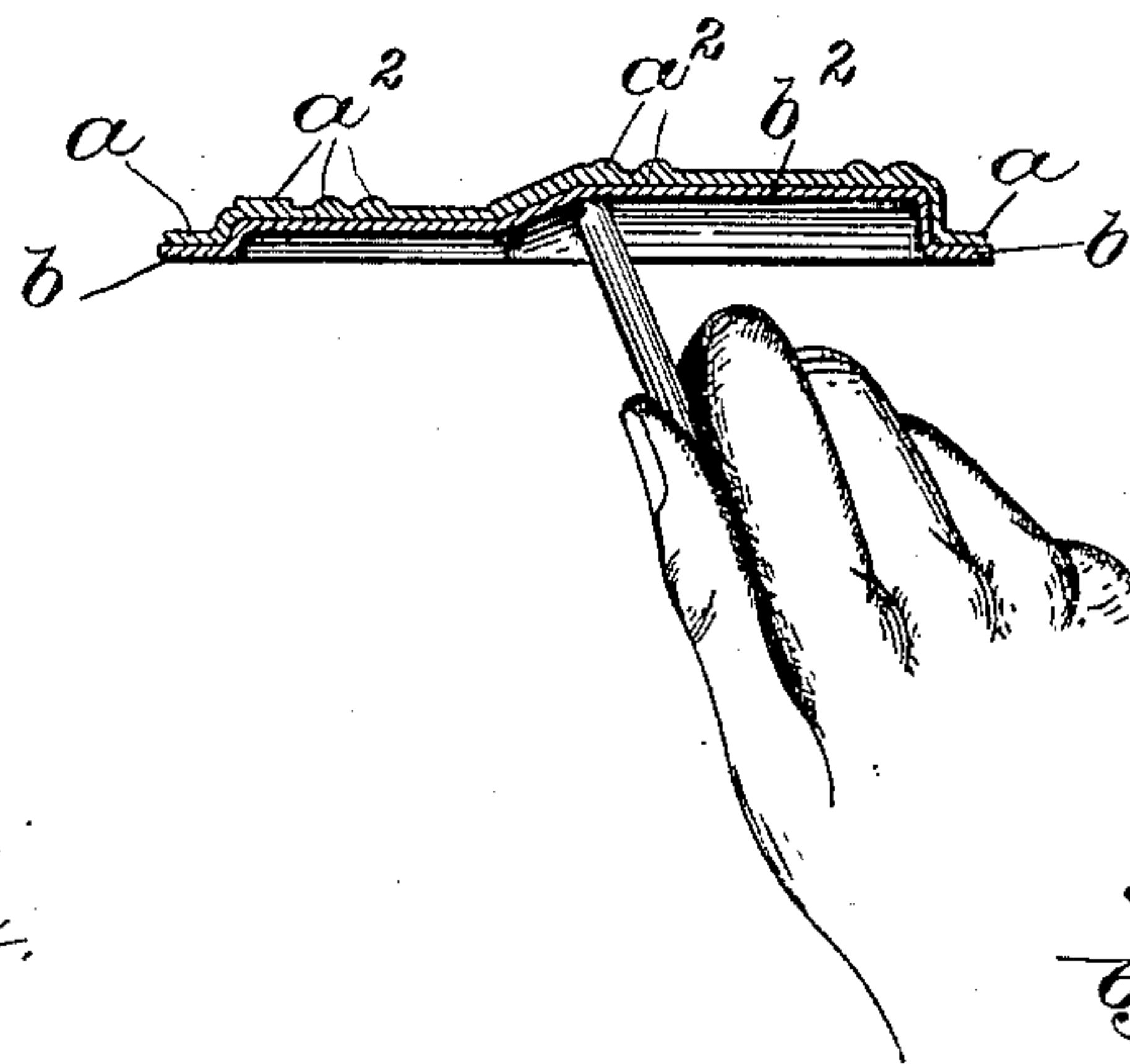
*Fig. 2,*



*Fig. 3,*



*Fig. 4,*



Witnesses:

*Jas. J. Maloney,*  
*J. P. Livmore*

Inventor

*John Jacobson,*  
by *Jos. P. Livmore*  
*Att'y.*

# UNITED STATES PATENT OFFICE.

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## MATRIX.

SPECIFICATION forming part of Letters Patent No. 584,553, dated June 15, 1897.

Application filed February 17, 1897. Serial No. 623,826. (Specimens.)

*To all whom it may concern:*

Be it known that I, JOHN JACOBSON, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Matrices, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a matrix adapted to be used in producing dies for embossing prints or photographs or molds for making medallions or the like, in any of which cases the figures are to be brought out in relief.

The matrix embodying the present invention consists, essentially, of a base or body the shape of which is such as to produce the necessary prominence to correspond to the general shape of the object or objects to be reproduced, while its surface has thereon in comparatively low relief the details of the object or design to be reproduced. In the case of a portrait, for example, the shape of the matrix would be such as to have a generally oval prominence to correspond to the shape of the head or face and to conform in a general way to the forehead, nose, chin, &c., while the surface of the matrix would have thereon in substantially low relief the finer details of the picture.

The main object of the invention is to provide means whereby a photographic process, such as the swelled-gelatin process, which in itself is capable only of reproducing the design in low relief on a substantially flat surface, may be utilized in producing a matrix having a high relief corresponding to the general form of the design and a surface relief in addition, which gives the minor or superficial details of the design. It is essential, therefore, that the surface portion of the matrix should be of such a nature as to be capable of being molded or otherwise formed with a low relief thereon while it is substantially flat and afterward shaped as a whole to bulge or swell the surface in accordance with the prominent relief required without impairing the configuration already formed therein in low relief. After it has been thus shaped, moreover, it is essential that it should retain the shape while a mold or cast is being taken

from it to be used in producing a die or medallion, and it is necessary, therefore, that the base portion of the matrix should have sufficient rigidity to properly maintain the shape of the surface portion.

It is obvious that certain materials combine in themselves the essential characteristics thus described of both the base and the surface portion, it being possible, for example, to produce on a flat plate of lead or similar material a low relief by pressing or molding such a plate while it is flat, the plate thus molded obviously being capable of being shaped to provide for the main prominence and of retaining such shape. It is desirable, however, to form the surface portion of the plate of one material and the base portion of another, since the material best suited for the production of the low detail relief does not usually possess the characteristics required to maintain the shape to which said surface portion must be reduced in order to afford the high relief.

It has been found that gelatin is especially well adapted to be used for the surface portion of the matrix, since gelatin may be easily molded and is also capable of having the low relief formed directly thereon by sensitizing the gelatin, exposing it, and swelling it in accordance with the well-known swelled-gelatin process. When gelatin is used, therefore, as the surface portion, it is mounted upon a base portion of another material having or adapted to have the shape required to support the gelatin when it is reduced from its flat shape to the shape required to bring out the prominent or main relief, it being obvious that the base portion may be prepared and shaped without special skill, since it is only necessary to follow the more prominent portions of the design.

It is desirable, however, even when the matrix is made of two different materials, that the base portion should be of such a nature that the surface portion may be mounted thereon flat and the entire matrix then brought to the desired shape by manipulating the base portion, it being obvious that the process is more easily carried out in this case, since the person who is preparing the matrix can then observe the reproduction in low re-



lief and bring out the prominent relief accordingly.

Figure 1 represents an object, photograph, or print from which a matrix is to be reproduced with a view to obtaining means for embossing subsequent prints or photographs or of making medallions in which said object is to be shown in relief. Fig. 2 is a section of the matrix or the surface portion thereof upon which the detail relief of the object to be reproduced has been formed, but before the prominent relief has been produced. Fig. 3 is a similar section of a base or support adapted for use with a two-part matrix as above described, and Fig. 4 a section of a two-part matrix complete.

The plate or film *a*, which may be of any material capable of being shaped to produce in relief the details of the object or picture, but which is preferably of gelatin, is prepared, as shown in Fig. 2, by molding the same or by sensitizing and exposing it in accordance with the swelled-gelatin process, it being desirable in many cases to produce the mold by a photographic process which will accurately reproduce the detail at slight expense. The said plate or film in its original form, as shown in Fig. 2, is substantially flat and of substantially uniform thickness, except that the general outlines and detail portion of the object shown in Fig. 1 is brought out in slight relief, as indicated at *a*<sup>2</sup>, Fig. 2. It is essential, therefore, if any prominent relief is to be obtained, that the said plate *a* should be shaped to conform to the prominent object or objects or prominent portions of a single object and maintained thus shaped to afford means for producing dies or molds in accordance with the ultimate object of the invention. To this end the said plate *a* is either made of material capable of being molded flat and then shaped and of retaining its shape or, if, as is preferable, it is made of gelatin or similar material, is mounted upon a base portion *b*, which, as shown in Fig. 3, is shaped or capable of being shaped to conform to the general shape of the object shown in Fig. 1, having, as indicated in Fig. 3, the prominent portion *b*<sup>2</sup>, which is adapted to underlie and support that portion of the surface portion *a* upon which is reproduced the detail, as indicated at *a*<sup>2</sup>. In either case it is obvious that the complete matrix is of such shape as to afford the main relief, corresponding to the general form of the design, and also has an additional "surface relief," so to speak, corresponding to the minor or superficial details of the design.

While, therefore, it is not intended to limit the invention, so far as relates to the material of which the matrix is made, I prefer to use a different material for the surface and base portion, respectively, a gelatin film being probably best adapted for the surface portion and a plate of flexible non-elastic material, such as lead, which is capable of being easily shaped and of maintaining its

shape with sufficient rigidity to afford the necessary support for the surface film being probably best adapted for the base portion. 70

It is further desirable to mount the surface film upon the said base portion before the latter is reduced to its final shape, since the shaping may then be accomplished by manual operations with the actual reproduction in low relief of the object upon the surface portion as a guide, the operation being very simple and requiring but slight skill or artistic ability. 75

Where a mold has been obtained, either photographically or otherwise, in reproduction of the surface detail of the object, molten gelatin may be flowed into the said mold and the plate *b* pressed down upon said gelatin and allowed to remain until the gelatin cools and solidifies, after which it may be stripped off with the gelatin film adhering thereto, the combined base and surface portions, however, being substantially flat. The same result may also be obtained by mounting upon the base portion *b* when flat a film of sensitized gelatin, upon which the relief may be obtained in accordance with the usual swelled-gelatin process. The flat plate obtained in accordance with the foregoing methods, or any other suitable method, is then shaped, as shown in Fig. 4, by pressure brought to bear upon the under side thereof, preferably, as indicated, by a manual operation performed while the operator observes the surface of the plate to determine when the proper shape has been obtained. 80 85 90 95 100

It is obvious that the matrix embodying the present invention may be produced at but slight expense and is especially adapted for use in producing dies for embossing photographs, printed cuts, or the like for portraits or for advertising purposes, in which work it has been necessary heretofore to produce the dies by hand, this being an expensive and laborious process, while if a photographic process is used without the aid of the present invention the relief obtained is only that of the surface detail, which does not give the prominence desired for embossed pictures or medallions. 105 110 115

I claim—

1. The herein-described matrix, comprising a plate of substantially uniform thickness having a design in low relief formed on its surface, the body of the said plate having that portion of its surface containing the low-relief design rounded out from the main portion of the plate, thereby to accord with the main configuration of the design, substantially as set forth. 120 125

2. The herein-described matrix, comprising a surface portion of one material having a design formed in low relief, and a base portion having its surface formed in high relief, the high-relief portion of the base conforming to the main configuration of the design in low relief on the surface portion, whereby the said surface portion as a whole is shaped to 130



conform to the said base and so maintained, substantially as set forth.

5 3. A die or matrix having a surface film of gelatin having reproduced thereon a design in low relief, and a base or supporting portion of flexible, non-elastic material, on which said gelatin film is mounted, the combined plate being shaped to conform to the main configuration of the image reproduced in low

relief upon the surface of the gelatin, substantially as described.

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

JOHN JACOBSON.

Witnesses:

H. J. LIVERMORE,  
JAS. J. MALONEY.