

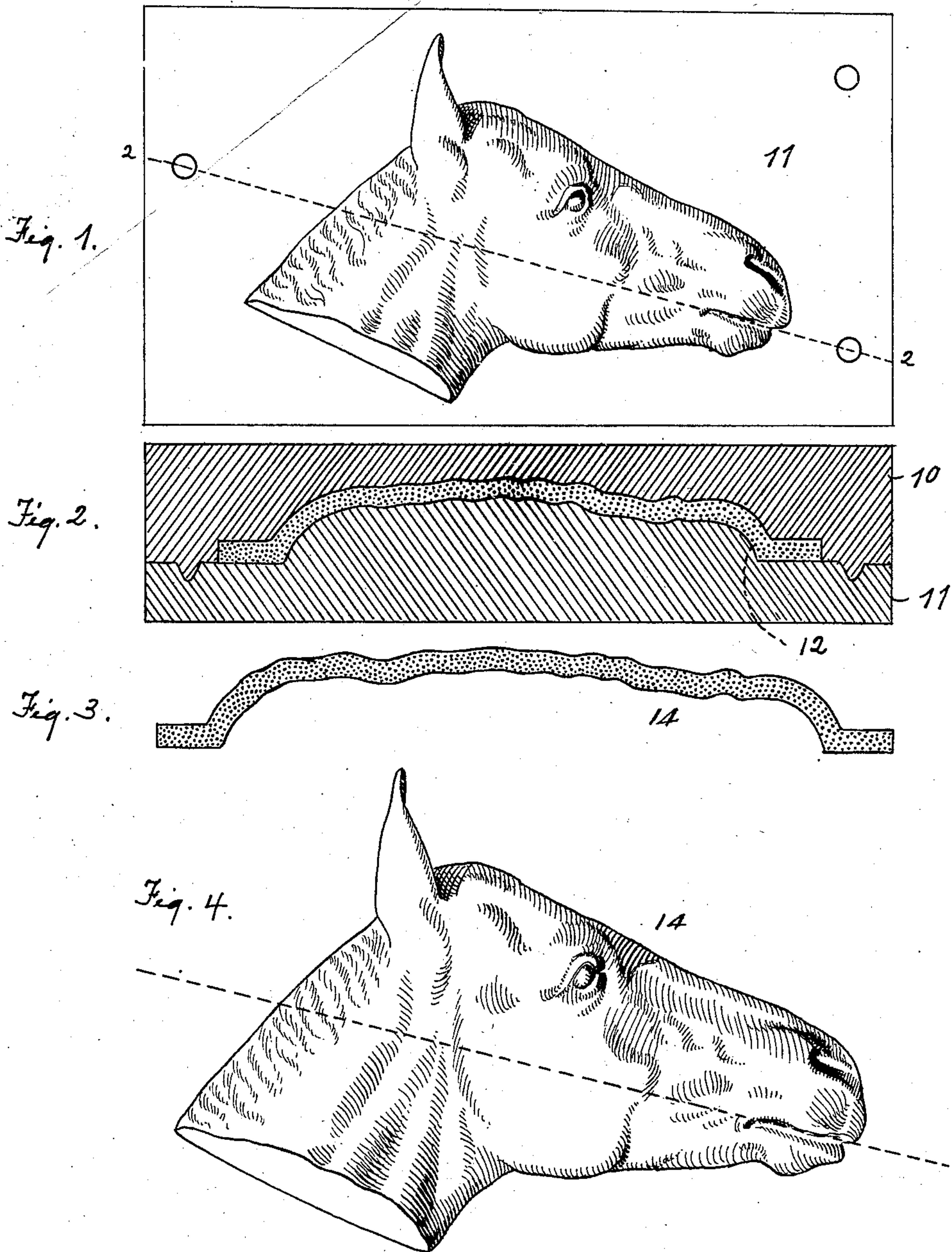
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A. LEUCHTER.

PROCESS OF PRODUCING GELATIN FORMS OR MOLDS.

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WITNESSES:

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AUGUST LEUCHTER, OF BROOKLYN, NEW YORK.

## PROCESS OF PRODUCING GELATIN FORMS OR MOLDS.

No. 869,312.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed February 23, 1905. Serial No. 246,901.

*To all whom it may concern:*

Be it known that I, AUGUST LEUCHTER, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented  
5 certain new and useful Improvements in Processes of Producing Gelatin Forms or Molds, of which the following is a specification.

The invention relates to the art of producing forms or molds in reproduction of original models or patterns,  
10 for use in making molds in plaster or other soft mold material which are utilized, in customary ways, in the final production of the articles represented by the said forms.

It is common in the art to produce gelatin forms or  
15 molds from and in the exact size of original models or designs and to utilize these forms or molds in the making, from them, of molds in plaster or other soft mold material.

My invention resides in methods of procedure by  
20 which I am enabled to produce the initial forms or molds in proportionately enlarged size from an original model or article and to vary this enlargement as may be required, whereby with the use of one original model or design to be copied, I am enabled to produce a form  
25 or mold exactly representing such model or article on an enlarged scale, and whereby also if a still further enlargement is required I am enabled to reproduce in the composition this first form or mold and obtain an enlargement of it, and so on.

30 I prepare the composition for the form or mold of special materials and first produce this form in the exact size of the original article or model to be copied, and then I submit this form to a special bath whereby it is proportionately enlarged. If a further enlarge-  
35 ment is desired I make another form or mold from the thus enlarged first form and then subject it to the enlarging bath whereby I obtain a second proportionate enlargement from the original model or article, and I may secure a third and then a fourth enlargement, and  
40 so on, in the same way.

My invention has a wide application, but its utility may be appreciated in connection with the manufacture of ornamental bands or figures for sets of silverware, the different pieces of a set requiring the same design  
45 but on different scales, and also in connection with the manufacture of silver spoons in which the same design must appear on at least three sizes of spoons, to-wit: the table-spoon, dessert-spoon and tea-spoon. In accordance with my invention it is only necessary in the  
50 first instance to provide a model of the tea-spoon, since from this one model I can produce three composition forms or molds of the exact size for the tea, dessert and table spoons, each of the two latter bearing the exact design of the original model proportionately enlarged.  
55 The first composition form or mold I would produce from the model if intended for tea-spoons would be

made in the ordinary way and would not necessarily involve the use of my invention, since my invention comprises the production of the forms or molds on enlarged scales from the original. Hence in carrying out  
60 my invention, aside from preparing the special form or mold to be used for tea-spoons, I produce from said model a form or mold of the size of the tea spoon but intended for dessert spoons, and I subject this form or mold to my enlarging bath whereby it becomes pro-  
65 portionately enlarged and to the requirements for dessert spoons. This enlarged gelatin form may now be utilized in the proper way as an original model from which a further composition form or mold may be prepared, and which when prepared will be subjected to  
70 the bath and enlarged to the proper size for a table-spoon. Thus from the one original model I am enabled to produce forms or molds for tea, dessert and table spoons, whereby the expense of producing a special original model for each of these sizes of spoons is  
75 avoided.

In many instances several of the composition forms or molds, all of the same size, may be produced from the one original model and variously enlarged in accordance with the length of time they are permitted  
80 to remain in the enlarging bath, but there is a limit to which a form or mold may be properly enlarged and hence where excessive enlargements are desired, as from a tea-spoon size to a table-spoon size, I first enlarge the tea-spoon form or mold to the proper size for  
85 a dessert spoon and from this prepare a second form or mold and enlarge it to the table-spoon size.

My process carried out in the natural way will produce exact proportionate enlargements.

I illustrate in the accompanying drawings, as nearly  
90 as may be, my invention, Figure 1 being a top view of the lower section of a casing in plaster or other suitable substance bearing a model prepared in exact size from an original article intended to be copied and enlarged, the article in this instance having been a  
95 representation of the head of a horse; Fig. 2 a vertical section through the two sections of said casing on the dotted line 2—2 of Fig. 1 and showing the gelatin form cast therein; Fig. 3 a like section of the gelatin form after having been removed from the casing of  
100 Fig. 2 and enlarged in and by the enlarging bath, and Fig. 4 a top view of same.

In the drawings 10, 11 respectively denote the upper and lower sections of the casing of plaster or other suitable material prepared from an original article, 12  
105 the gelatin form cast therein in exact size of the said original article, and 14 the same form after having been enlarged in and by the enlarging bath.

In preparing the solution for the forms or molds I make use of gelatin and gum tragacanth solution  
110 (water being the solvent) of a consistency capable of passing through filtering paper, with a trace of acetic



acid, preferably employing one part of gelatin to one and one-half parts of gum tragacanth. The exact proportions above specified of the gelatin and gum tragacanth are not absolutely essential and they may be  
 5 varied in accordance with the degree of enlargement desired and the nature of the form or mold to be produced, but the proportions specified are preferable as a general formula and are those that I have made use of with the best results. The solution produced as  
 10 above described enables the uniform and proportionate enlargement in the bath of the form or mold, and the accomplishment of this result, which is of vital importance, has not heretofore, to my knowledge, been attained in this art. It is evident that a piece of dry  
 15 gelatin submerged in water will first swell up and then frill at its edges, while the more central portions remain firmer and swell less, this being due to the fact that the outer portions of the gelatin absorb more water than the inner ones; and if this piece of  
 20 gelatin represented a form or mold it would be obvious that the form or mold in swelling would present irregularities and distortions unfitting it for practical use.

One of the main objects accomplished by me is the  
 25 prevention of irregularities in the enlarging of the form or mold and in producing an exact proportionate enlargement of the form or mold, and to attain this result I add in the solution a trace of acetic acid, which is a solvent of gelatin, and therefore when used  
 30 in a sufficiently diluted state will facilitate and hasten the swelling up of the gelatin when the latter is in the bath, which, in the present instance, is a water bath. The necessity for obtaining a uniform swelling up of a form or mold is particularly observable in the case of  
 35 thick forms or molds, and with the use of acetic acid I am enabled to secure a uniform enlarging of even a reasonably thick mold, the attainment of this result being due to the fact that I embody the acetic acid in the mold itself and use for the enlarging bath, by preference, plain cold running water.

Having prepared the solution for the forms or molds and also the bath, the process of creating the forms or molds and then enlarging them may be proceeded with. The first step necessary is in performing the  
 45 usual preliminary work of making the plaster molds or casings to surround the models or patterns to be copied and into which the solution is poured to fill the space between the inner wall of the plaster casing and the surface of the model or design to be reproduced, and I need not specifically describe the method of preparing these plaster molds or casings, since I follow the ordinary methods in use in taking an elastic or glue mold from a model or pattern. I may say, however, that care should be taken in preparing the  
 55 plaster mold or casing with the view of having the space between the inner wall of the casing and the face of the model or pattern of as nearly uniform diameter as may be consistently possible, so that the composition form or mold when removed from the mold  
 60 or pattern may be as nearly as possible of uniform thickness.

Having prepared the plaster casing I proceed at once in the ordinary way of pouring the gelatin solution, as prepared by me, into the said casing, and thereafter, at  
 65 the proper time, remove the casing and strip the gelatin

form or mold from the model or pattern. The gelatin form or mold thus produced is immersed into the bath of cold water and allowed to remain until the desired enlargement in its size has taken place or until all of the enlargement that can well take place in one operation  
 70 has occurred. The action of the bath on the form or mold may be observed and when the form or mold has become enlarged to the desired size it may be removed from the bath. When the form or mold containing the acetic acid is placed in the water, the outside and more  
 75 exposed portions of the same will first gradually release the acid, while the inner portions of the form or mold necessarily retain the acid for a longer period and gradually discharge the acid as the outer portions of the form are relieved of it, and in this way a continuous imparting of the acid into the water bath takes place, with the result that the water penetrating the mold and absorbed by the same becomes more acid the deeper it  
 80 penetrates and thus creates a stronger bath within the mold and is enabled, in this way, to effect the even and  
 85 proportionate enlargement of the mold. In using acetic acid for this purpose it is important that only as little acid as may be enough to attain the result be employed, because the acid being a solvent of gelatin will naturally tend to weaken the elasticity and strength of  
 90 the form or mold and even impair the setting of same if it should be used too freely.

The gum-tragacanth is used to increase the swelling capacity of the mold and also to secure firmness in the enlarged form or mold. 95

In the practice of my invention I have found that a form or mold of the composition above specified will enlarge, at one operation, from a surface area of about eighteen square inches to a surface area of about thirty-two square inches, the enlargement being proportionate and preserving the finest and most delicate modelation, even to the chasing marks present on the original model or pattern, and this is a highly important result, as may be realized, for illustration, in the enlargement of a portrait in bas-relief, in producing which, in accordance with my invention, not the slightest change in the expression of the face is perceptible. I have also, in practicing my invention, successfully enlarged highly undercut work, small pieces of statuary and whole figures. 110

After the gelatin form or mold has remained in the bath a suitable length of time to secure the desired enlargement, I remove it from the bath and subject the same to a hardening or fixing process in order to render it suitable for use in taking the plaster cast from it, this  
 115 hardening or fixing process consisting simply in subjecting the then enlarged form or mold to a bath comprising saturated solution of alum with a trace of acetic acid in it. This bath should be used when it is in a very cold state. The hardening effect of alum on gelatin is well known, but in my process I employ the acetic acid also so that it may counteract the contracting action the alum would otherwise have on the mold. This acid and alum bath also creates such a chemical change in the form or mold, without disturbing or distorting its  
 120 size or form, that after subjecting the form or mold for, say, half an hour, to the bath, the finest casts can be taken from it without any surface preparations, such as are usually employed, being applied to the form or mold for preventing the sticking of the plaster thereto. 130



The taking of a cast from a properly enlarged and hardened form or mold is the last step of one operation or ends one carrying out of the practice of my invention, since the essential feature accomplished by my invention is the production of the proportionately enlarged form or mold in condition for use in preparing therefrom the plaster casts or other soft molds.

It is obvious that the degree of enlargement of the form or mold is under absolute control, since the form or mold may be removed from the bath and subjected to the hardening process as soon as it has enlarged to the desired size.

If it should happen that the gelatin form or mold after remaining in the bath as long as it should stay there, for one operation, has not become enlarged to the extent desired, this being in a case where an excessive enlargement is required, I remove the form or mold from the bath and harden it and then make a new gelatin form or mold, in the same composition, from this enlarged form and subject it to the enlarging bath, whereby I may obtain a form or mold in exact reproduction, on an enlarged scale, of the original model or design, but more greatly enlarged than any enlargement could take place in one operation of the bath. In carrying out this method of procedure I now have one form or mold representing one enlargement and a second form or mold representing a still greater enlargement, and it is obvious that I may repeat the operation until I obtain the several sizes of forms or molds I may desire or the final large size of mold that I may require. This operation of securing the several enlargements involves simply a repetition of the operation of securing one enlargement.

In practicing this enlarging process I often use a negative form or mold instead of a positive form. It is a matter of judgment when to use the positive and when to use the negative form, but in both methods excellent results are secured.

What I claim as my invention and desire to secure by Letters-Patent, is:—

1. The process of producing a gelatin form or mold from a model or pattern and proportionately enlarging the same, which consists in making the form or mold from a gelatin solution containing acetic acid, and then subjecting the same to a liquid bath adapted to enlarge said form or mold; substantially as set forth.

2. The process of producing a gelatin form or mold from a model or pattern and proportionately enlarging the same, which consists in making the form or mold from a gelatin solution containing acetic acid, then subjecting the same to a liquid bath adapted to enlarge said form or mold, and finally hardening the same; substantially as set forth.

3. The process of producing a gelatin form or mold from a model or pattern and proportionately enlarging the same, which consists in making the form or mold from a gelatin solution containing acetic acid, then subjecting the same to a liquid bath adapted to enlarge said form or mold, and

finally hardening the same with an alum solution containing acetic acid; substantially as set forth.

4. The process of producing a gelatin form or mold from a model or pattern and proportionately enlarging the same, which consists in making the form or mold from a solution containing gelatin, gum tragacanth and acetic acid, and then subjecting the same to a liquid bath adapted to enlarge said form or mold; substantially as set forth.

5. The process of producing a gelatin form or mold from a model or pattern and proportionately enlarging the same, which consists in making the form or mold from a solution containing gelatin, gum tragacanth and acetic acid, then subjecting the same to a liquid bath adapted to enlarge said form or mold, and finally hardening the same; substantially as set forth.

6. The process of producing a gelatin form or mold from a model or pattern and proportionately enlarging the same, which consists in making the form or mold from a solution containing gelatin, gum tragacanth and acetic acid, then subjecting the same to a liquid bath adapted to enlarge said form or mold, and finally hardening the same with an alum solution containing acetic acid; substantially as set forth.

7. The process of producing a gelatin form or mold from a model or pattern, which consists in making the form or mold from a gelatin solution, and finally hardening the same with a solution of alum containing acetic acid, whereby a uniform hardening without distorting the form is secured; substantially as set forth.

8. The process of producing a gelatin form or mold from a model or pattern, which consists in making the form or mold from a solution containing gelatin and gum tragacanth, whereby the capacity of the form or mold for enlargement in a water-bath is increased; substantially as set forth.

9. The process of producing a gelatin form or mold from a model or pattern and proportionately enlarging the same, which consists in making the form or mold from a gelatin solution in which is incorporated a limited quantity of an acid which is a solvent of gelatin, then subjecting the form or mold to a water bath, and finally hardening the same; substantially as set forth.

10. The process of producing a gelatin form or mold from a model or pattern and proportionately enlarging the same, which consists in making the form or mold from a gelatin solution in which is incorporated a limited quantity of an acid which is a solvent of gelatin, then subjecting the form or mold to a water bath, and finally hardening the same with a hardening solution containing a solvent of gelatin to counteract any contracting effect of the solution, whereby a uniform hardening without distortion is secured; substantially as set forth.

11. The process of producing a gelatin form or mold from a model or pattern and proportionately enlarging the same, which consists in making the form or mold from a gelatin solution in which is incorporated a limited quantity of an acid which is a solvent of gelatin, then subjecting the form or mold to a water bath, and finally hardening the same with an alum solution containing acetic acid; substantially as set forth.

Signed at New York city, in the county and State of New York this 21st day of February A. D. 1905.

AUGUST LEUCHTER.

Witnesses:

ARTHUR MARION,  
CHAS. C. GILL.