

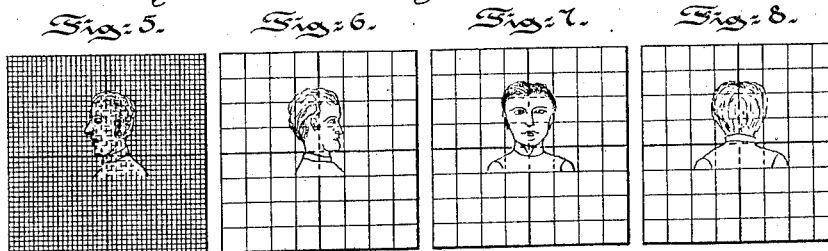
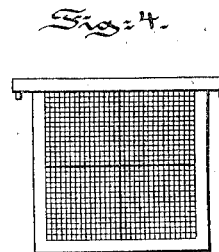
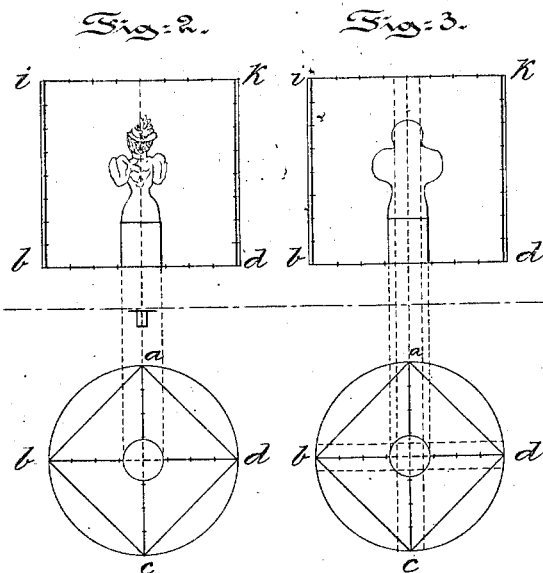
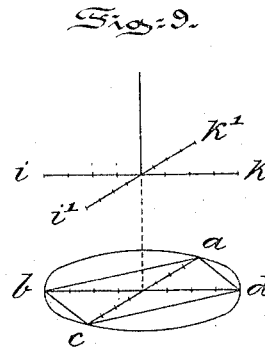
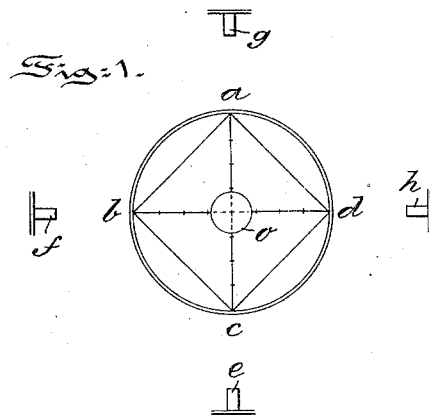
No. 647,608.

Patented Apr. 17, 1900.

C. PIETZNER.
PROCESS OF PHOTOSCULPTURE.

(Application filed Dec. 19, 1899.)

No Model.)



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UNITED STATES PATENT OFFICE.

CARL PIETZNER, OF VIENNA, AUSTRIA-HUNGARY.

PROCESS OF PHOTOSCULPTURE.

SPECIFICATION forming part of Letters Patent No. 847,608, dated April 17, 1900.

Application filed December 19, 1899. Serial No. 740,881. (No specimens.)

To all whom it may concern:

Be it known that I, CARL PIETZNER, a subject of the Emperor of Austria-Hungary, residing at Vienna, Austria-Hungary, have invented certain new and useful Improvements in Processes for the Plastic Imitation of Natural Objects by Means of Photography, of which the following is a specification.

My invention has relation to a method or process whereby plastic imitations or reproductions of natural objects may be secured through the instrumentality of photography, and in such connection it relates more particularly to the steps or operations constituting the process.

Heretofore it was known that reproductions of natural objects could be secured by transferring the outlines of the object to the reproduction by suitable mechanism of a pantographic nature and in which certain points were found and reproduced one by one. This method of reproduction has the advantage that special skill is not necessary in the production provided a sufficient number of points or dots are selected and set off in the reproduction. This method of reproducing upon plain surfaces is simple, inasmuch as the position of each point or dot can be fixed from two measurements only. When, however, it is sought to adapt this method or system to the reproduction of objects in relief, it is found that three measurements must be taken and transferred to ascertain each point or dot. As a consequence, in the reproductions of objects in relief this pantographic method is not only slow and tedious to the artist, but it is fatiguing to the human sitter, who must attend during repeated and prolonged sittings. The process is also inaccurate, because it is practically impossible to place the sitter or other object in exactly the same position at successive sittings. As a result of the inconveniences of the pantographic method it has been suggested that recourse be had to photography in order that a series of photographs of the object may be produced to form records from which by means of compasses, pantographs, or other suitable mechanism the reproduction may be made on the same or on either enlarged or reduced scales. It has also been suggested that the record of the article be photographed upon the ma-

terial from which the reproduction is to be made. But both of these photographic processes, it has been found, cannot be carried out with that accuracy or exactitude which is necessary, and they also either deprive the artist of his individuality or else give him very little and inferior assistance.

The principal object of my invention is to provide a process or method whereby the plastic reproduction or imitation of objects and living beings may be obtained through the instrumentality of photography; and to this end my invention consists, primarily, in first photographing the model and at the same time photographing the scales of measurements, so as to produce said scales of measurements at an angle of ninety degrees upon the photographs of the model; second, in dividing the photographs of the model by means of parallel lines extending from the divisions on said scales, and, finally, reproducing the model by reproduction of the points ascertained by the ordinates, said measurements being transferred to the model by means of equivalent measurements on a frame similarly located with respect to the model, as are the scales of measurements with respect to the photographic reproduction; secondarily, in first photographing graduated measurement-bars placed in relation to the object or body to be reproduced; second, completing said photographs by forming thereon a network of lines passing through the photographic reproductions of said graduated measurement-bars to thereby ascertain the relative distances of any point from the fixed data-lines represented by said bars, and, finally, setting off said distances on the model or plastic reproduction-blank by means of measurements from equivalent bars equivalently placed with regard to said model or blank, and, lastly, in first taking photographs of the object or body and of graduated measurement-bars placed two in the form of a cross below the object and two parallel thereto in the form of a cross above the object; second, completing said photographs by forming thereon a photographic reproduction of a network of lines passing through the photographic reproductions of the graduated measurement-bars to thereby ascertain the relative distance of any point from the fixed data-

lines represented by said bars, and, finally, setting off said distances on the model or plastic reproduction-blank by means of measurements from equivalent bars equivalently placed with regard to said model or blank.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a top or plan view illustrating in diagram the arrangement of the necessary parts and apparatus for successfully carrying out the process of my invention. Fig. 2 is a view, partly in rear elevation and partly in plan, illustrating in diagram the first step in the process, the portions in rear elevation illustrating the photographic reproduction of the object and the graduated measurement-bars and the portion in plan illustrating the position of the object and of the photographic instrument for taking the reproduction. Fig. 3 is a view similar to Fig. 2, illustrating the means whereby the measurements in Fig. 2 are transferred to the model or plastic reproduction-blank. Fig. 4 is a front elevational view of the network slide to be inserted in the camera. Fig. 5 is a front elevational view of one of the photographic reproductions of the object and of the network. Figs. 6, 7, and 8 are similar views of other photographic reproductions, the meshes of the network being more widely separated or spaced, and Fig. 9 is a perspective view illustrating in perspective a modified form of the apparatus in which the object may be photographed in four positions simultaneously.

Referring to the drawings, *o* represents the object to be reproduced, which is placed on a turn-table arranged within a square *abcd* and having its center at the point where the diagonals *ac* and *bd* cross. The square is surrounded by a ring or circular wall. The cameras *e*, *f*, *g*, and *h* for taking the photographs are arranged at points equidistant from the center of the object on prolongations of the diagonals *ac* and *bd*, as indicated in Fig. 1, and at a height approximately level with the middle of the height of the object. When the photographs are taken singly or the two opposite photographs are taken at the same time by cameras *e* and *g*, a vertical bar is placed on the right and another on the left of the object at *b* and *d*, Fig. 1, these bars being connected at the top by a cross-piece *ik*, Figs. 2 and 3. When the photographs are taken, Figs. 5, 6, 7, and 8, these bars will be reproduced in each of the photo-

and it is therefore advisable to be provided with several bars of different heights. They should be also arranged to be adjustable in height. If, however, all the four photographs are to be taken at the same time, the vertical bars aforesaid cover a part of the object in some of the photographs. Therefore instead of using such bars in the form of a cross are securely fastened above the object and corresponding in situation with the diagonal cross-bars below the object, which latter are also provided with graduated measurements which will be reproduced in the photographs, Fig. 9.

When the photographs are taken, prints are made in the desired size in the usual manner; but whereas in the already known processes such photographs have no means in themselves of giving zero-points from which measurements may be taken the copies made by the present process are provided with such means which is afforded by the reproduction of the bars or their measurements. As aforesaid, the photographs may be covered with suitable cross-lines by joining the points of the measurements as reproduced therein in any suitable manner. If all the four photographs are taken at the same time and there are no vertical divisions on the picture, the latter are set out according to the divisions shown upon the cross-bars. This reproduction of network of lines is essential and can be effected by photography, if desired, being done by photographing the network of lines made in suitable proportions or by using besides, as aforesaid, cross-bars also a network of lines with divisions in the form of a screen, Fig. 4, in the dark slide of the camera. The photograph is best made to some exact scale—as, for instance, in the proportions of one to five—as this facilitates the calculation. If at any spot the graduated measurements should be covered in the picture by some portion of the model, they can easily be completed by reference to the next corresponding divisions which are visible in the picture.

For reproducing the object clay, gypsum, or any other suitable material in the form of a block, Fig. 3, which is somewhat larger in each direction than the model to be reproduced, is put in the middle of the turn-table, where the original formerly stood. Then a second cross-bar frame, with measurement divisions, is put above the rough block, so as to divide the model in plan into four equal parts. This frame exactly corresponds with the original frame; but in regard to its size and the dimensions of its divisions of measurement it is either equal or larger or smaller,

the aforesaid method of finding the different points corresponding in the model to the various points in the outlines of the photographs, superfluous material of the block being removed, so that the outlines of the corresponding photographs appear as the outlines of the block. Such outlines being in two planes perpendicular to one another, for the formation of the block between these planes the required points of the model are ascertained from the pictures provided with the network divisions, and the ordinants thus obtained are transferred by the known process of dotting or pointing to the model from two or three sides, respectively, superfluous material being removed in any suitable manner—for example, by use of knives, gravers, routing-out machines, and the like. The ordinates are easily taken from the pictures, since they may be directly read, and are indicated on the divisions of the frame both for height, breadth, and depth, so that they correspond exactly with that of the natural object. After the situation of the more prominent points has been thus fixed the model can be finished by rounding off the material between the points so found.

If in certain situations a point should not be visible from both sides, secondary photographs can be taken at suitable angles, and in working out ordinates to find the position of the relative points on the model the angle at which the photograph is taken must be taken into account.

It facilitates the work to make the first reproduction of the original of the photographs, together with their graduated measurements thereon, in the size in which imitation is to be made. It is then more easy to correct the outline by cutting out the contours in the two other directions. Such means can also be used for more speedily arriving at the formation of the exterior outlines.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An improved process for the plastic imitation or reproduction of objects and living beings on any desired scale of enlargement or reduction, consisting in first taking photographs of the model to be reproduced and

photographs at the same time of the scales of measurement which will be reproduced at an angle of ninety degrees upon such photographs, then dividing the photographs by means of parallel lines from such divisions and finally reproducing the model by the reproduction thereon of the points ascertained by these ordinates, such measurements being transferred to the model by means of equivalent measurements upon a frame similarly located with regard to the model.

2. A process for plastic reproduction of objects and living bodies by means of photography, consisting first in taking photographs of graduated measurement-bars placed in relation to said object or body and completing said photographs, then forming thereon a network of lines passing through the photographic reproductions of the graduated measurement-bars for ascertaining the relative distances of any point from the fixed data-lines represented by said bars and finally setting off said distances on the model or plastic reproduction-blanks by means of measurements from equivalent bars equivalently placed with regard to said model or plastic reproduction-blank.

3. A process for plastic reproduction of objects and living bodies by means of photography, consisting first in taking photographs of said object or body and of graduated measurement-bars placed two in the form of a cross below the object and two parallel thereto in a cross above the object or body, then completing said photographs by forming thereon a network of lines passing through the photographic reproductions of the graduated measurement-bars for ascertaining the relative distance of any point from the fixed data-lines represented by said bars, and finally setting off said distances on the model or reproduced blank by means of measurements from equivalent bars equivalently placed with regard to the plastic reproduction-blank.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CARL PIETZNER.

Witnesses:

ALVESTO S. HOGUE,
AUGUST FUGGER.