

**CARVING STATUES BY MEANS OF PHOTOGRAPHY.**

BY J. HAMMOND SMITH.

The device illustrated is intended for use in the production of all kinds of statuary, where it is possible to use the original as a model, or where it is possible to arrange a model after the original idea. Its principal use is in copying from life and existing statuary. It is especially useful where a likeness may be desired, and where variation of relative sizes of the statue from the model may be necessary. For instance, a man may be used as a model, and his exact likeness produced, in a statue of any reasonable size, smaller or larger than the man himself.

The device is composed of combined cameras and projecting lanterns, which I call camera-projectors. These camera-projectors are located in suitable positions about and at variable distances from a common center, where the model is located. In the illustration the camera-projectors are located in a horizontal plane about the central bust. These instruments are adjustable along radial lines. Other adjustable camera-projectors, with their optical axes passing through center, may be located at any desirable points.

The plates on which the contours and dimensions are recorded, as well as the plates for the illumination of the finished statue, are obtained, photographically as follows: Screens, like the one shown in positive at the top of the engraving, are placed in a number of the camera-projectors. Then all extraneous light is shut out, and these used as lanterns to project images of the screen on the model, which is located at the center. The other camera-projectors are then used as cameras, in which photographic plates are exposed. Thus photographs of the model while illuminated with the screens are obtained. The screens are then removed from the lanterns, and the model illuminated by the lanterns or from some outside source, as flash light or daylight, and other photographs of the model, still in the same position, are taken, to be used in the illumination of the finished statue. These plates may be stored away in small space for any length of time, and then brought out for the production of the statue of the model and its illumination.

The method of producing the statue, after the photographs have been taken, is as follows: After the plates have been developed and dried, they are returned to their respective positions in the camera-projectors. Then the instruments are used only as pro-

jecting lanterns, and generally only two at a time. If the statue is to be smaller than the model, the instruments must be moved nearer the center; but if it is to be larger than the model, the instruments must be moved farther away from the center; the distance depending on the size of the statue desired.

The statue is built up or carved out by locating points, by the intersection of light beams from the lantern, with corresponding beams of the same marks or symbols of the screen, coming from the camera, which is now being used as a lantern. When the photographs were taken, certain marks on the screen were projected on the model by the lantern. These marks were photographed on the plates of the cameras. When these plates are developed, and replaced in the camera,

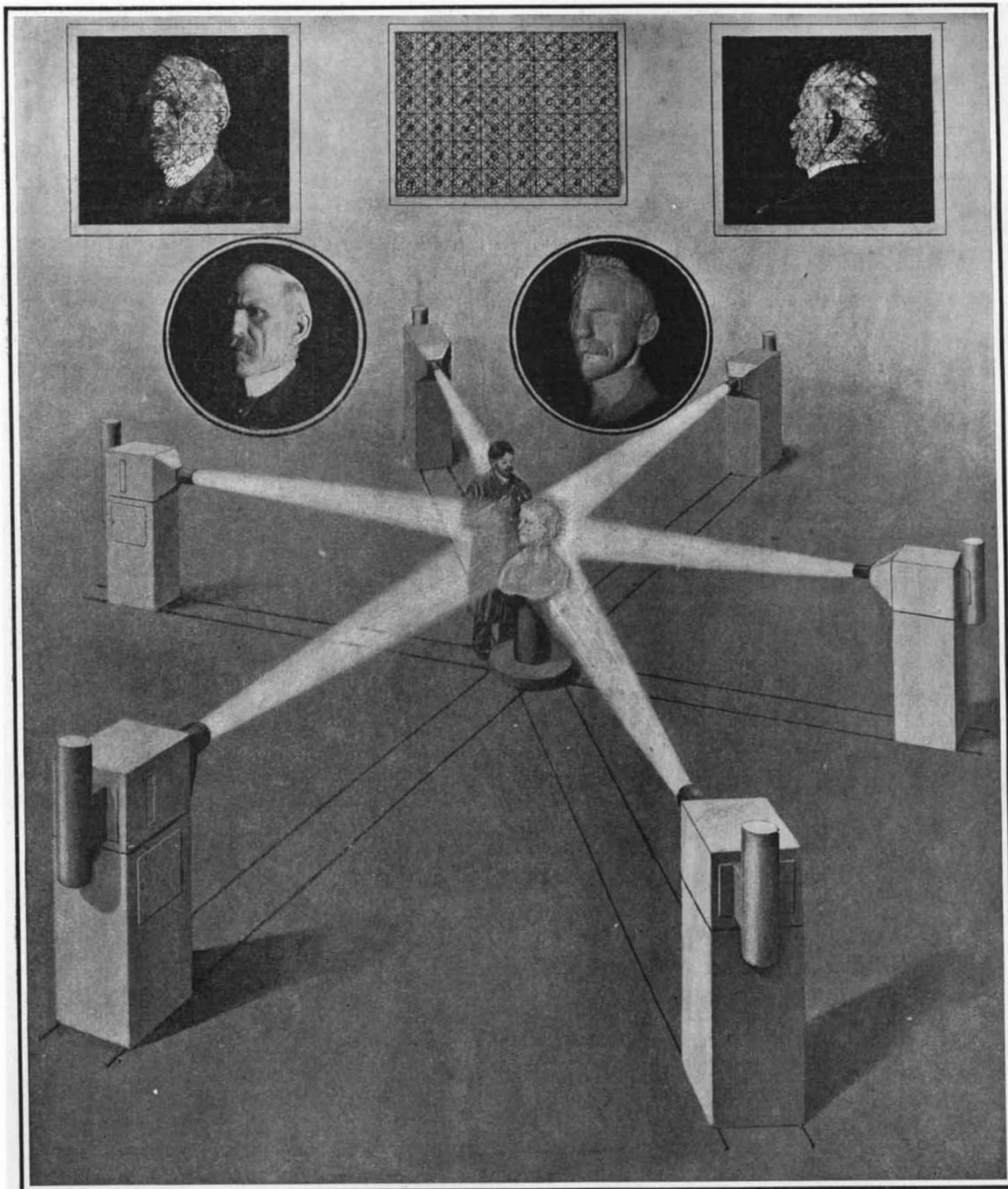
model, or a statue of the model, occupies the same position and space as was formerly occupied by the model when the photographs were taken. If this part of the surface of the statue is too far from the center, the black image of the letter O from 2 will appear to the right of the white image of the letter projected from 3. But if the surface is too near the center, the black image will appear on the left and the white image on the right. Therefore, in making the statue, corresponding images projected from the two instruments must be made to coincide, by building up or carving out the material of the statue. Lights of different colors may be used in the projecting instruments to heighten the contrast of the two images.

A set of negative plates (the original plates) may be used in all instruments in making statuary, or a complete set of positive plates may be used. In either case the black markings from either projection will be superimposed by the white markings from the other projection. The positive plates are found most convenient to use, on account of the positive image of the model thus obtained.

The finished statuary may be illuminated by simply using the camera-projectors as projecting lanterns; using slides made from the second set of negatives exposed while photographing the model. Instead of projecting the image of the model on a flat surface, as is ordinarily done, producing a flat picture, the image is projected on the statue at just the proper angle and distance to enhance the likeness of the statue to the original model. Thus a projected picture and a statue, both of which bear likeness to the original model, are combined, producing a likeness which cannot be attained by pic-

ture or statue alone. When a statue is to be illuminated in this way, a number of small projecting lanterns must be installed in the exhibit place, at the proper angle and distance with respect to the statue, to produce the proper illumination. These projecting lanterns must have the same optical arrangement as the standard camera-projectors used in making the statuary. They may be mounted in ornamental pendants, pedestals, walls, or columns.

With the artificial illumination of the statue, which is a part of the system, a most natural and lifelike appearance is obtained. Thus two distinct effects are produced by the statuary; one effect in daylight as ordinary statuary, and another and entirely different effect when the illumination is produced artificially.



The dimensions of the model are recorded photographically on a plate or screen. The plate or screen is used to project these dimensions on a block of wood or stone. The sculptor carves away enough material so that the images projected from two cameras coincide.

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and the camera, used as a lantern, the same marks will be projected on a surface located in the same position as the model when the photographs were taken. Therefore, if both instruments are used as lanterns, the two projections must coincide on a surface located as the model formerly was. For instance, suppose lantern 2 projects the letter O of its screen on the model. The letter O is reflected to camera 3, and the impression on the photographic plate is the letter O. Now with camera 3 used as a lantern, and with the developed negative in the same place as when the photograph was taken, an image in white, of the letter O, will be projected from 3, and will exactly cover the image in black of the letter O projected from 2. But it will be noticed that these two images will coincide only when the