

THE VERANT: A NEW DEVICE FOR VIEWING PHOTOGRAPHS.

BY EMILE GUARINI.

The verant is an instrument designed for the monocular examination of photographs obtained with ob-



THE "VERANT" IN USE.

jectives of short focus. When a view has been taken with an objective of which the focal distance is appreciably less than the distance of distinct vision, that is to say, 10 inches, a long-sighted observer cannot place his eye near enough to the photograph to see the images that it represents, at the same angle at which his eye would have seen the objects themselves had it occupied the place of the objective at the moment at which the exposure was made. A uniformity of such angles might be obtained, it is true, by enlarging the first photograph; but this process, which is quite a long and troublesome one, would have the inconvenience of bringing the eye too close to the images of very distant objects (such as landscapes and buildings). The verant obviates these difficulties by furnishing a very distant visual image of the photograph, the various parts of which are shown to the eye at the same angles as those at which the objects photographed appeared to the lens of the camera. This result is obtained by means of the new achromatic lens mentioned above, which possesses the two following advantages: its focus is, with sufficient approximation, equal to that of the objective with which the view was taken, and it produces no distortion at a point situated at about an inch from the nearest lens, so that the center of rotation of the eye can be brought to this point.

The apparatus is mounted upon a special frame that permits of bringing the photograph into position at the desired distance. The base plate is provided with a handle formed of two stirrup irons that can also be used as a support when the apparatus is employed in an elevated position. Such a position is to be recommended when it is desired to examine a large number of photographs. Upon the upper part of the plate there is a slide for focusing the image, and two bent rods for the reception of the screen that carries the lens, and which can be folded up. The screen is wide, and its two sides are curved toward the observer in order to protect the unused eye from the light as far as possible. Its surface is dark and unpolished. The screen engages with the two rods by means of two spring sockets. The axis of the lens is at right angles with the center of the image when the screen is pushed back upon the rods, so that the latter touch the upper edge of the screen. The lenses are constructed in two sizes, one of them having a focus of 4.25 and the other of 5.8 inches. When the eye is well placed, these two lenses furnish an anastigmatic, achromatic image free from distortion. According to experiments, a deviation of about 15 per cent between the focus of the objective with which the view was taken and the focus of the lens of the verant is nearly imperceptible to the eye. The lens of 4.25-inch focus can consequently be used for all views taken with objectives whose foci are comprised between 3.5 and 5

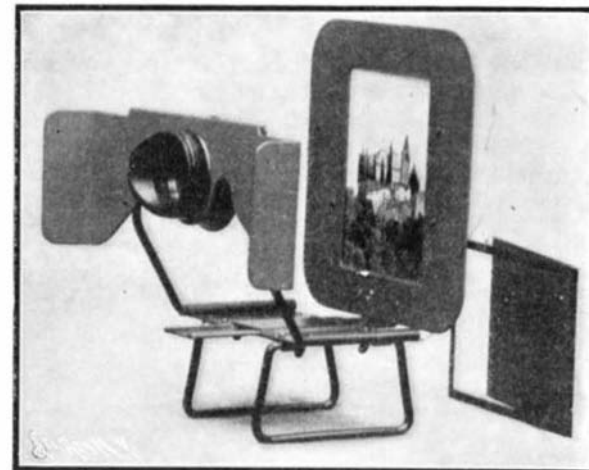
inches, and that of 5.8-inch focus for views taken with objectives having a focus comprised between 5 and 6.5 inches. It is sometimes of interest, however, to use a lens of shorter focus than that required by the rule just mentioned. Although less correct, the image furnished by such a lens may prove more agreeable to the eye. The verant diminishes the importance of the foreground, and, in certain cases, an exaggerated diminution of this part of the view gives more harmonious effects.

In addition to the views, it is possible to fix in the frame a ground glass for use in examining transparencies, or a small sheet iron frame designed for unmounted views. This frame is arranged like film supports. It is constructed for 3.5 x 4.6-inch sizes, and can, at will, be shoved up or down upon the bent extremity of the rods. It is provided upon the back with a slide for the reception of the views.

In making use of the apparatus, an observer having normal eyesight sees, not the small photograph introduced into the instrument, but its distant image, and, owing to the fulfillment of the conditions enumerated above, this image is seen free from distortion, and, except for color, with exactly the aspect that the scene photographed had at the place at which the view was taken. The apparent size, the shadows, and the sharpness are faithfully rendered. The result is an impression of reality that leads the observer to a correct appreciation of the distances. He sees the photograph with its natural relief. It is necessary, however, to select the eye with which it is desired to observe, and to carefully manipulate the screen. This latter is so constructed as to assure the eye the desired position at about an inch from the surface of the lens. It must be applied closely against the eye, so that its higher part shall cover the external angle of the latter. Internally, it carries a holder, designed to receive the correcting glasses for far or near sighted persons.

After the eye has been selected, it is necessary to turn the elevated part of the screen toward the left if it be desired to make use of the left eye, and toward the right if it is the right eye that is to observe. After this, the four fingers of the left hand are inserted in the handle. Then the apparatus is placed as near as possible

to the eye that is to observe, and the focusing is effected by pressing the extremity of the slide with the thumb of the hand that holds the apparatus. The operator stops when the view appears with sharpness throughout its entire extent. If one angle or one side of the view is not sharp, the center of rotation of the eye is not upon the axis of the lens, and the head must there-



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fore be slightly moved, and, if that does not suffice, the direction of the screen must be changed.

Long and short sighted persons should, before using the apparatus, remove the screen and introduce a correcting glass into the holder intended for it. It is unnecessary to say that, under such circumstances, the lens of the verant will present the usual distortion of spectacle glasses which, however, the majority of those who wear glasses will not notice. Individuals having abnormal eyesight can also remove the screen and bring the verant as close as possible to the glasses that they use for seeing at a distance. But this method of operating has the inconvenience of not fixing the position of the eye, even approximately, and often furnishes defective images to observers who are not familiar with optical instruments. During the observation, it is necessary to give the axis of the apparatus, as nearly as possible, the same inclination upon the horizon as the objective had during the exposure. The apparatus should therefore, as a general thing, be held horizontally. This method of operating contributes toward producing an impression of reality. Upon properly inclining the apparatus, it is sometimes possible to correct the convergence of the lines of a building photographed with a camera which was not held level, but was pointed upward.

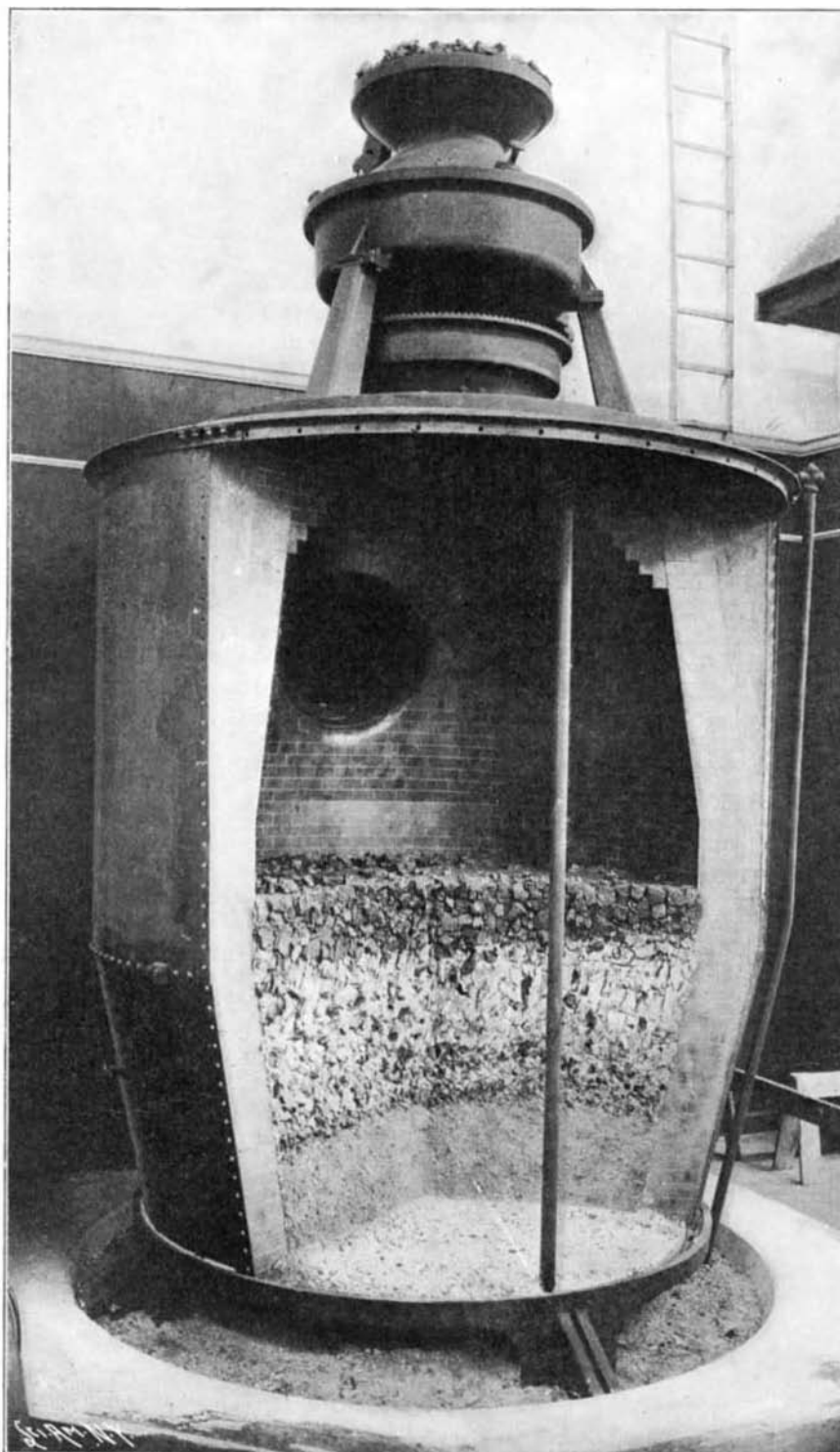
The photographs mounted upon cardboard are introduced into the frame in exactly the same way as lantern slides into a stereopticon. With unmounted views, the small sheet-iron frame is used. When the arrangement is not provided with a ground glass, one is fastened upon the back faces of the frame.

Being free from distortions and astigmatism for an apparent field exceeding 50 per cent, it is unnecessary to say that the new verant lenses are capable of being used with advantage as weak lenses or as lenses for reading. The manufacturers have even mounted some of them in appropriate frames. They are provided with an asymmetrical screen which assures the center of rotation of the eye the desired position at about an inch from the neighboring surface of the lens. Short-sighted persons must naturally here also introduce a correcting glass into the holder at the back of the screen.

MODEL OF A CONTINUOUS-FEED GAS PRODUCER AT THE ST. LOUIS FAIR.

The construction of the Morgan producer herewith illustrated, which is exhibited in the Mines and Metallurgy Building at the St. Louis Fair, is exceedingly simple. It consists essentially of a firebrick-lined shell supported on standards in a basin of water. The lower part of the shell, which is without a bottom, is filled for about two or three feet with ashes, which stand in the water and can be easily dug away from the periphery of the basin. Upon this bed of ashes is supported a layer of coal of about the same thickness, which is maintained in the incandescent state by a blast of air driven by a Korting blower with steam jet to a point just below the

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