EDMUND SCIENCE · MATH · OPTICS

Information and Instructions

HOMEMADE CAMERA LUCIDA

There are many people who would like to draw a scene or an object in its correct perspective. just as it is seen with the unaided eyes or as it would look when taken with a camera. Unfortunately, since it requires years of training and practice to be able to do this, only a few possess the ability.

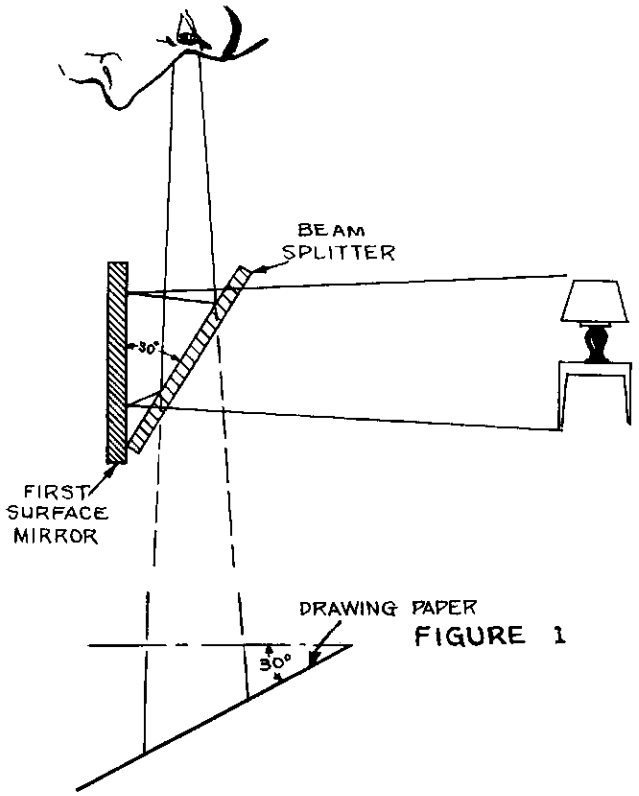

FIGURE 1

Figure 1 illustrates an arrangement of a beam splitter and a first-surface mirror with which perspective drawing is made easy. When these two components are arranged as shown, at an angle of 30° apart, the eye sees the picture of an object in front of the first-surface mirror as if it were projected upon the sheet of drawing paper. The use of a beam splitter alone as an aid in perspective drawing is a well known practice, and such a device is generally known as a "Camera Lucida." However, with the addition of the first-surface mirror, the image seen with the beam splitter is right side up and corrected from left to right. Actually, the "Mirror Lucida," as we shall call it, does not project the picture but enables the eye to see two erect images at the same time: one of the object to be drawn, and one of the drawing paper. The combination of the two images takes place in the brain giving the appearance of a projected image.

CONSTRUCTION NOTES - In Figure 2 is illustrated a pattern for making a triangular box, which is suitable to hold the components that make up the "Mirror Lucida" in their correct positions. Heavy cardboard or sheet metal may be used for constructing such a box. Since accuracy is not of prime importance in constructing

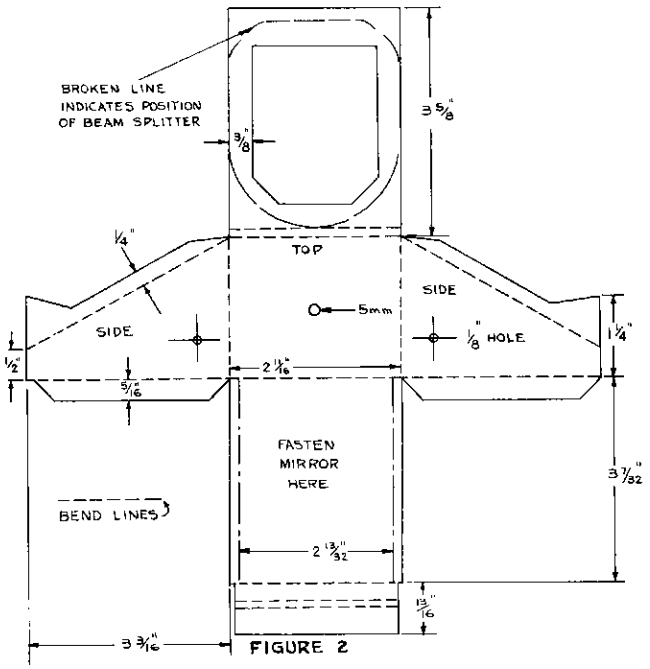

FIGURE 2

the "Mirror Lucida," cardboard construction is preferable because of its ease of cutting and bending. If cardboard construction is used, the mirror may be fastened on the pattern beforehand, in the position indicated, by using regular household cement for the purpose. (If sheet metal construction is used, all the bending should be done first to prevent any damage to the glass components. Here too, a thicker cement, such as linoleum cement, should be used to fasten the components to the metal.) When the cement has firmly set, the pattern, sides and top, may be bent upward and fastened with the tabs provided to the back of the pattern face supporting the first surface mirror. Next, the beam splitter is cemented onto the front pattern face in the position indicated and, after the cement has dried, bent upward to form contact at the lower end, with the first-surface mirror. A firm contact is necessary between the first-surface mirror and the beam splitter to prevent any accidental chipping. A large diameter soda straw approximately 2-5/8 inches in length may be used to

form a pressure spring between the glass components and the bottom tab of the pattern. The straw is fastened directly beneath the beam splitter as illustrated in Figure 3.

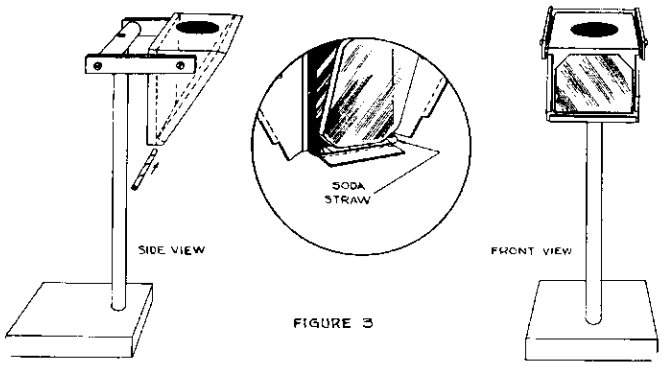

FIGURE 3

The glass parts on the "Mirror Lucida" should be gently cleaned before securing the pattern completely in place. (A word of caution here; the first surface mirror may be damaged easily and extreme care should be taken when cleaning the silvered surface.) After cleaning, the "Mirror Lucida" is fastened together at the bottom with the two side tabs and the long bottom tab. It is best to apply a little pressure to the bottom tab while the cement is drying in order to be certain the glass components are in firm contact with the soda straw. The "Mirror Lucida" may be dressed up by applying a covering of artificial leather in order to give it a professional appearance.

MOUNTING THE MIRROR LUCIDA - The two 1/8 inch holes indicated on the sides of the pattern in Figure 2 are for mounting purposes. They are placed at the center of balance in order that the "Mirror Lucida" may act as its own plumb bob, thus automatically keeping the first-surface mirror vertical at all times. This is necessary to present normal scenes or objects in the correct perspective. However, a provision should be made for tightening the "Mirror Lucida" by means of two wing nuts so it can be used, if necessary, for special effects or close-ups. When the "Mirror Lucida" is used in the vertical position, the drawing board should be tilted an angle of 30° to the horizontal in order to obtain the most accurate perspective.

A type of stand for use with the "Mirror Lucida" is illustrated in Figure 3. This particular stand can be made of plywood and 1/2 inch dowel, although its construction is entirely optional with the user. If desired, the stand may be made adjustable in height in order to vary the size of the object "projected" upon the drawing paper. It will be noticed that the base of the stand is backwards to the "Mirror Lucida." This is done to allow the "Mirror Lucida" to be freely moved about on a large sheet of drawing paper, thus increasing the useful range of the instrument. It is sometimes necessary to weight the base down a bit with a heavy piece of wood or metal to prevent the "Mirror Lucida" from tipping over.

DRAWING WITH THE MIRROR LUCIDA - The correct way to use the "Mirror Lucida" is illustrated in Figure 4. A drawing is made by simply tracing the object which appears to be projected upon the drawing paper. If the drawing paper is kept stationary, the "Mirror Lucida" may be moved sideways on the paper to cover a larger area, although the "Mirror Lucida" and the object being drawn should be the same distance apart at all times. It might be difficult at first to focus the eye upon the end of the drawing pencil and the object to be drawn at the same time. After a little practice it will become extremely easy to draw an object by rapidly focusing the eye back and forth from the pencil point to the object to be drawn. With this method it is possible to draw portraits, architectural studies, animals or other objects in their correct perspective, exactly as seen with the unaided eye.

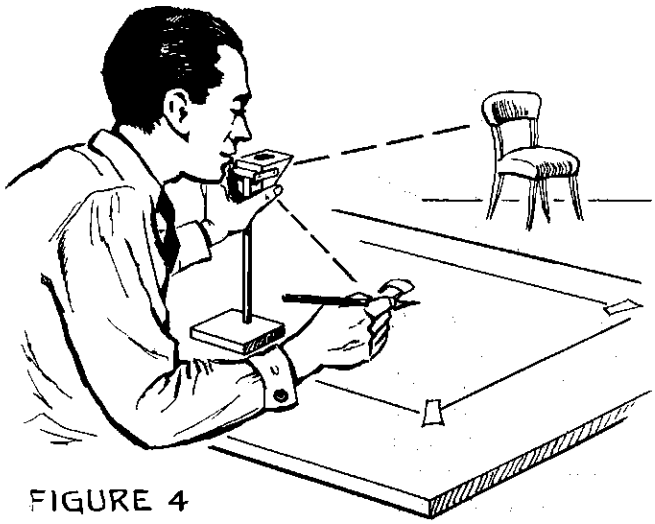
FIGURE 4

A practical hint to follow when using the "Mirror Lucida" is to use plenty of light on the drawing paper, and to have a well-lighted object as a model. This will prevent any possible eye strain, and at the same time give the best results obtainable with such an instrument. There are so many practical uses to which the "Mirror Lucida" may be put that it will be well worth the effort consumed towards its construction.