

Dental Digest

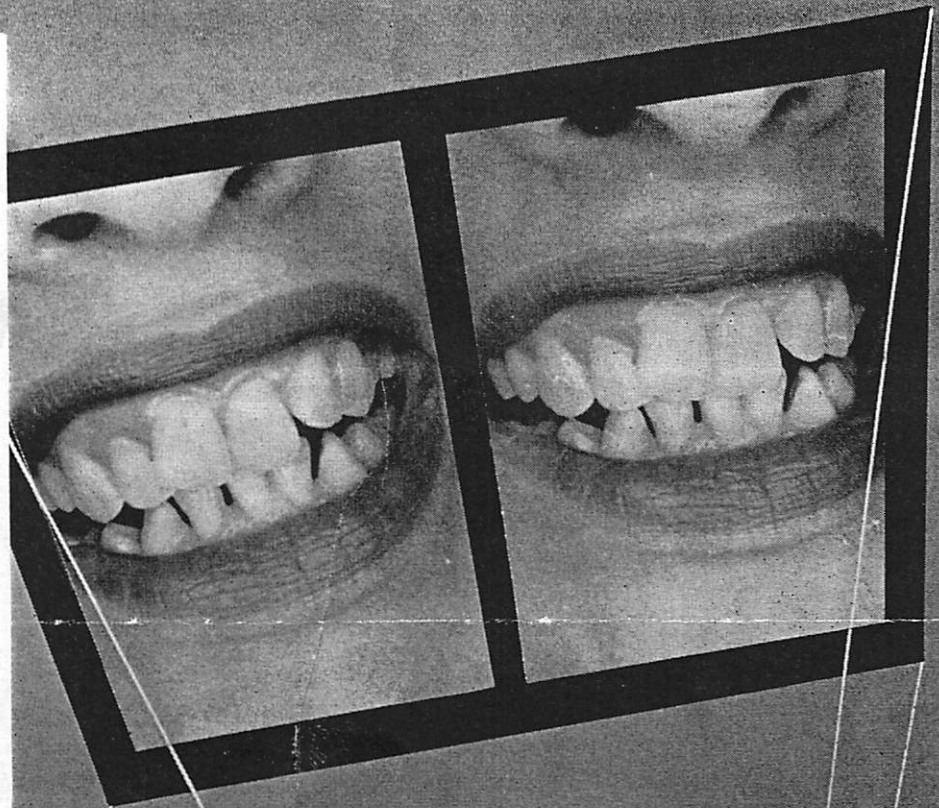
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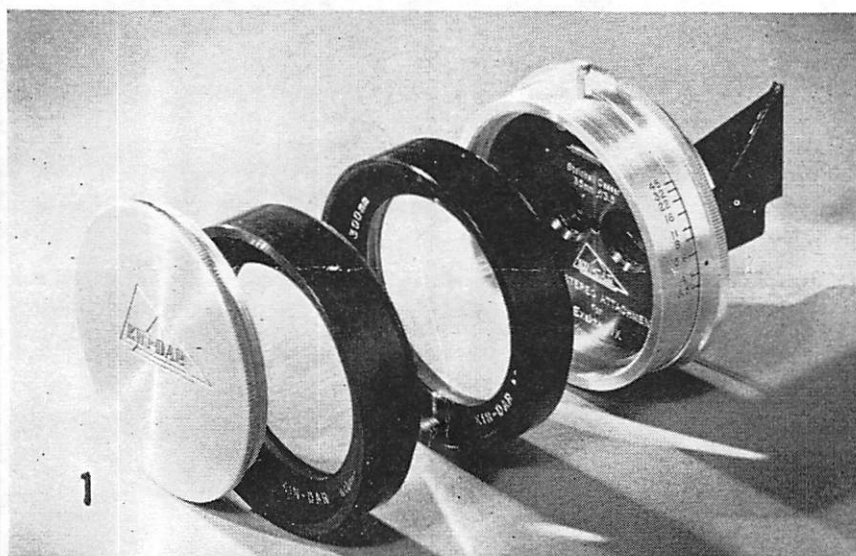


STEREOPHOTOGRAPHY

in Dental Practice

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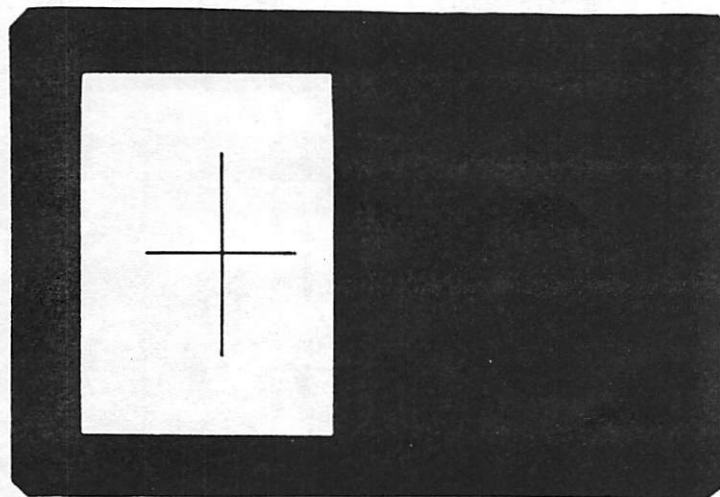
1. Close-up attachment showing septum and two lens openings and accessory 300-millimeter lenses for taking stereo pictures at 9 inches and less.

Working Distances and Sizes of Field at f/3.5

Lenses	Approximate Working Distance at f/3.5	Approximate Field Size
No supplementary Lens	9"	3 $\frac{3}{4}$ " x 5"
One 12" supplementary	5 $\frac{1}{2}$ "	2 $\frac{1}{8}$ " x 2 $\frac{3}{4}$ "
Two 12" supplementaries	4"	1 $\frac{1}{2}$ " x 2"
Three 12" supplementaries	3 $\frac{5}{8}$ "	1 $\frac{1}{4}$ " x 1 $\frac{1}{8}$ "

Note: Working distance above is measured from the front edge of the attachment.

2. Chart of working distances from 9 inches to 3 $\frac{5}{8}$ inches.



3. Celluloid mask used in precise framing of object through camera view finder.

DIGEST

Three-dimensional dental photography has in many instances notable advantages over planar or flat photography. Many dentists owning stereocameras have attempted to use them in their practice because they realized the possibilities of the stereo system. Close-up dental pictures, however, were unsuccessful with the average stereocamera.

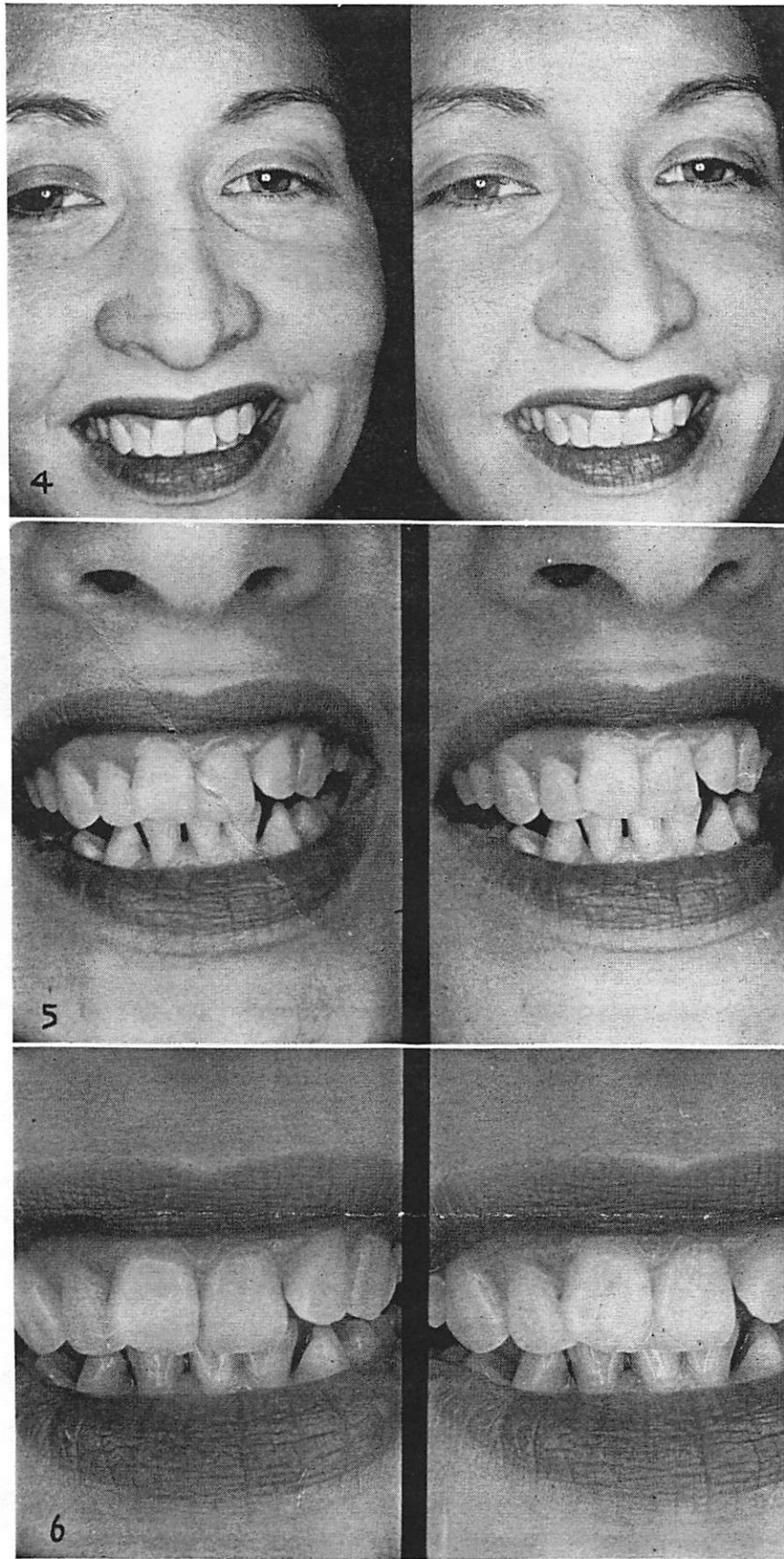
The author of this article has for several years experimented with portra lenses, slide bars, and stereo angle lenses with only partly satisfactory results. With the technique described herein, however, which utilizes a popular 35-millimeter single lens reflex camera, any dentist with a little knowledge of photography can obtain three-dimensional pictures in his own office with a minimum of effort.

Equipment Required

A new type Hypo-Stereo attachment (Fig. 1) is designed for taking stereo pictures at a distance of 9 inches and closer.

Basic Unit—This has two coated 35-millimeter Steinheil Cassar f 3.5 lenses and has a bayonet lens mount. The lenses are centered with an interocular separation of .625 inches and are preset to be in focus on objects about nine inches away; f stops are f 3.5 to f 45.

Supplementary Lenses Available—The addition of one 300-millimeter supplementary lens allows close-ups at 5 $\frac{1}{2}$ inches. The lenses have a diameter of 42 millimeters and are thread mounted to each other and to the basic unit. The working distances and sizes of field are shown in Figure 2.



4, 5, and 6. Stereo pictures taken on panchromatic film showing size of field using no supplementary lens, one supplementary lens, and two supplementary lenses.

Aid in Centering and Framing—A thin celluloid mask is supplied which is designed to prevent the operator from seeing a double image and to aid him in precise centering and framing of one of the pictures of the stereo pair (Fig. 3). Either the waist-level or penta-prism finder is removed and the mask easily inserted before replacement.

Procedure

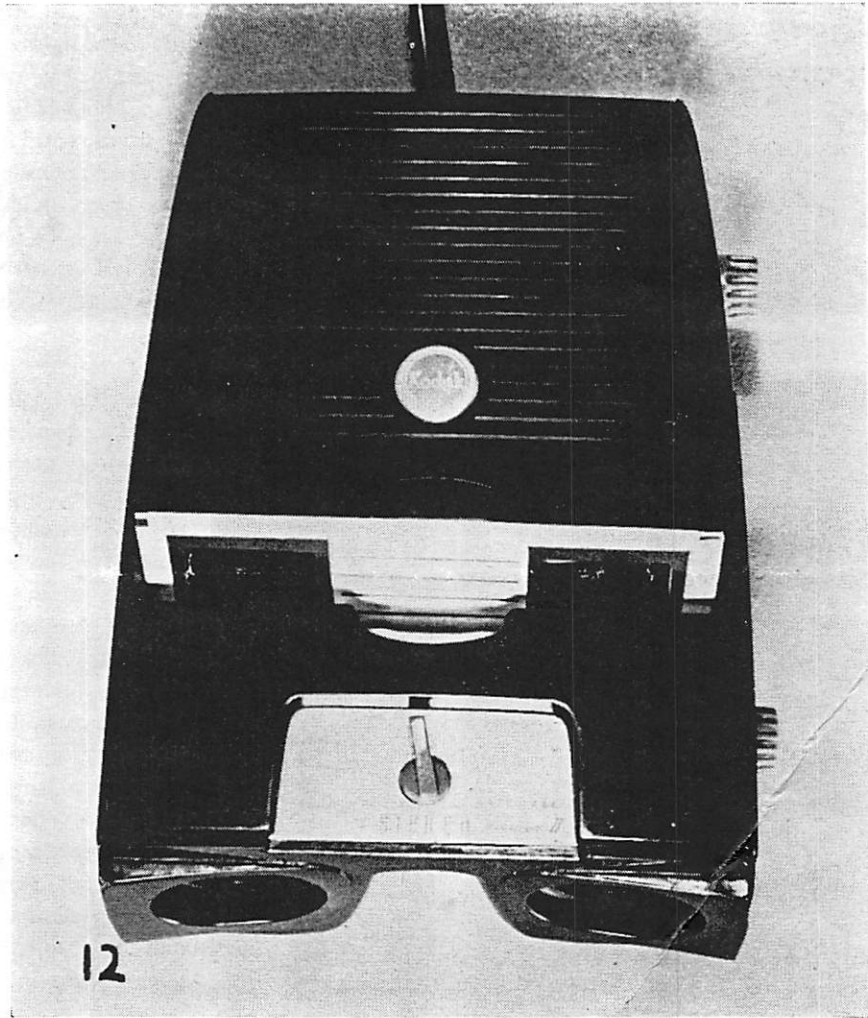
(1) The basic attachment can be used alone or with various supplementary lenses depending upon the working distance necessary to cover the subject field. (2) Pictures taken at 9, 5½, and 4 inches are shown in Figures 4, 5, and 6. (3) The desired f stop is preset and as long as the reflex mirror is down for viewing the apertures remain fully open until the shutter is released. (4) The camera is moved slightly closer or farther away from the object until the image is sharp. (5) When the picture is taken the shutter release button releases the reflex mirror; this swings up and permits the blade trip lever of the attachment to unlatch the diaphragm blades; these in turn close down to the preset f stop. (6) The mirror reaching the end of its swing trips the shutter, making the whole operation automatic.

Change

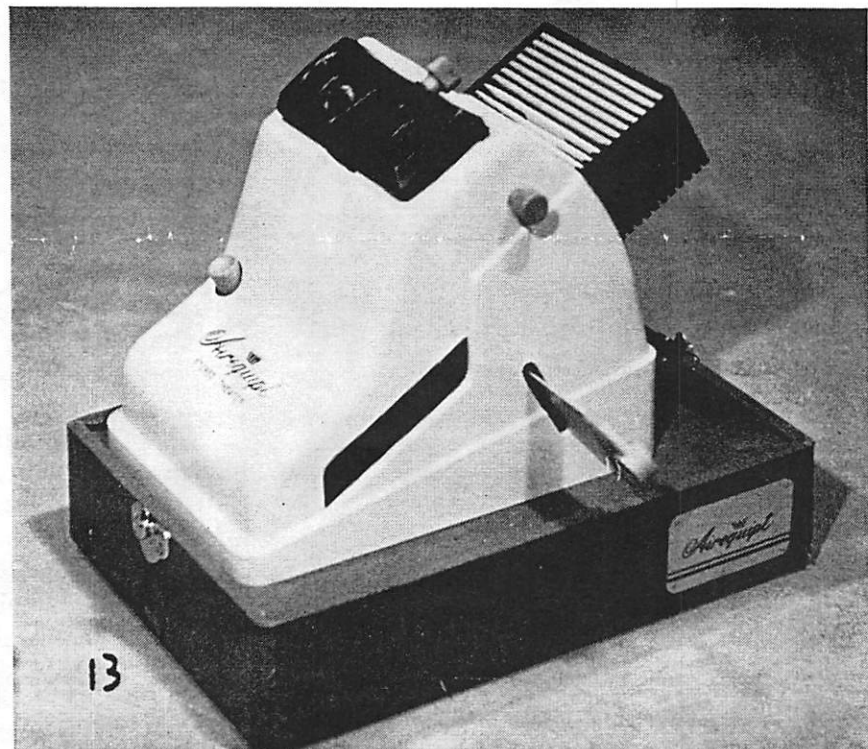
To use the attachment the lens flange must have an outside lock (Fig. 7). If the camera used is several years old it will not have the proper lens flange and it will be necessary to obtain a new one from the camera manufacturer. Lenses used with the old flange will fit the new flange equally well.

Lighting

As it is necessary to have the light where it will do the most good an electronic flash ring light is recommended (Figs. 8 and 9). Most electronic flash units give a light equivalent to daylight, (5600.K) and therefore daylight color film is used. Without flash the existing light will seldom be great enough to permit the use of small enough stops to obtain the desired depth of field.



12. *Electric stereo hand viewer.*



13. *Table top stereo viewer with magazine holding two dozen slides.*

Film

The author prefers to use Kodachrome Daylight Color Film (ASA10). Good results have been obtained, however, by using Ektachrome Daylight Type (ASA32) and Anscochrome Daylight Type (ASA32). The last two types can be processed locally or by the dentist.

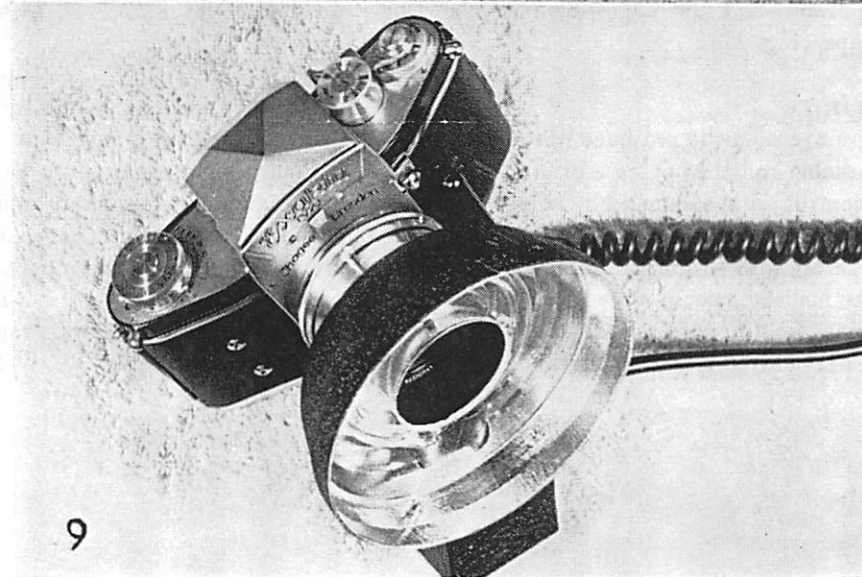
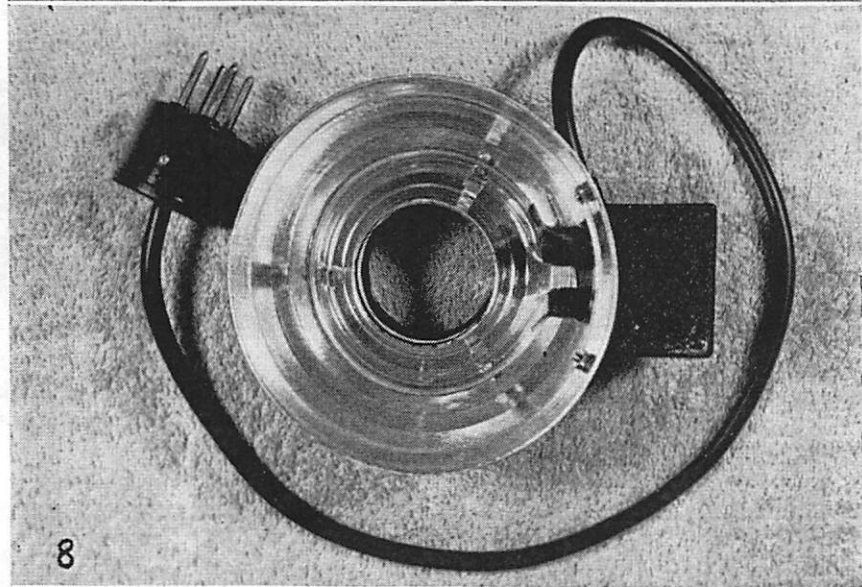
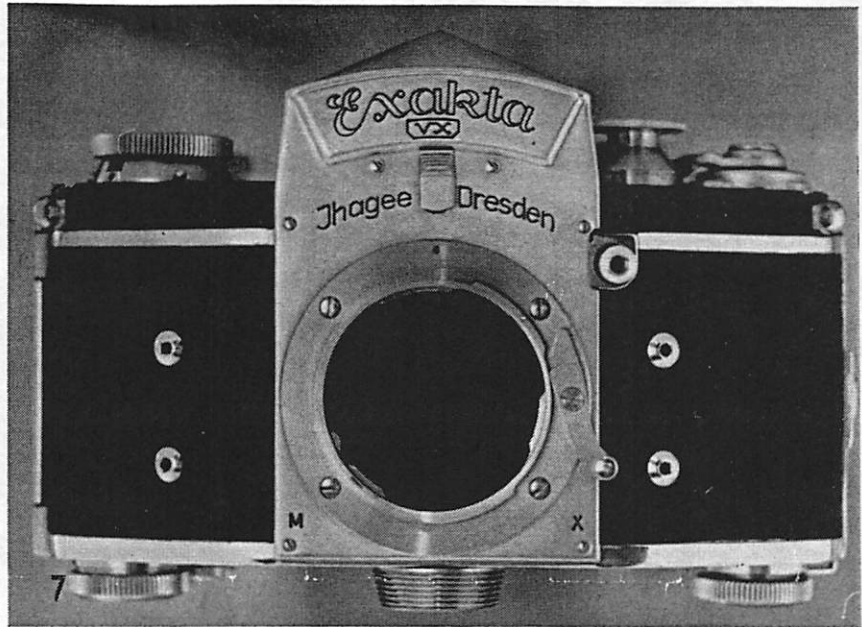
Mounting

An interocular separation of 2.456 is acceptable in mounting. This measurement is in reference to the openings in the mask and denotes the distance between such openings from the left hand side of one opening to the left hand side of the other opening. The stereo "window" is properly adjusted by placement of the film in the mask, moving them closer together or farther apart.

Metal masks of correct size are now available from the EMDE company.

Matching Transparencies Produced—A 35-millimeter frame has 8 perforations and hence this attachment produces 2 matching transparencies, each 4 perforations wide. Regular stereo pictures have 5 perforations and if a regular stereo mask is to be used the outside edges of the pictures will need to be masked off. The author has found Realist Masks and stainless steel matrix ribbon .003 inch to be suitable.

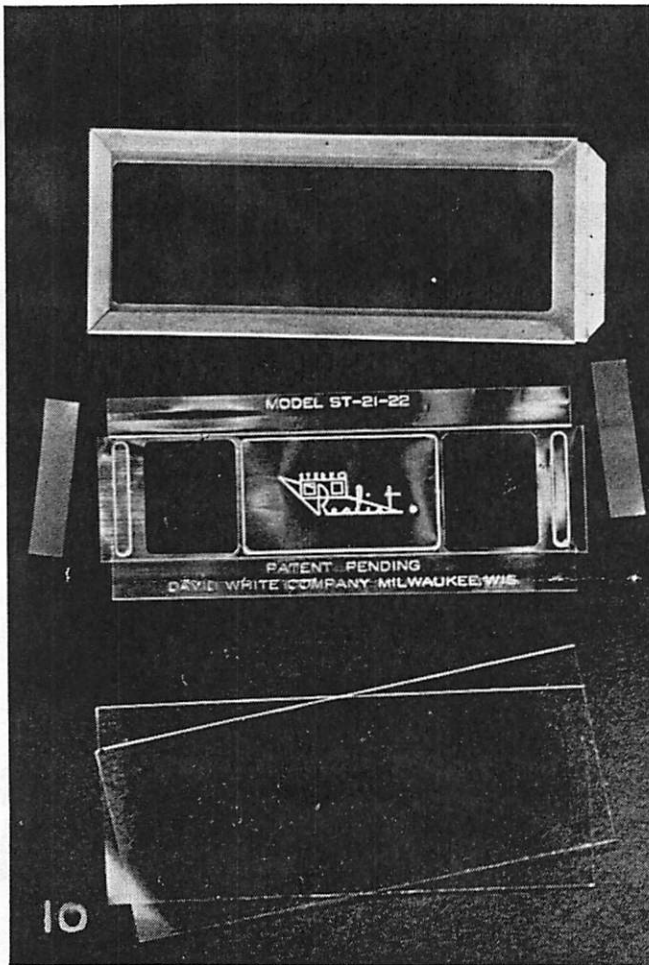
Glass Used in Mounting—Mounting the mask between two pieces of glass is to be recommended, and is necessary if the slides are to be projected (Fig. 10). Despite the blower on the projector, films will buckle and even be damaged from the intense heat of the light from the condensing lens confined to a small area unless glass is used in mounting. If the slides are to be used in a hand stereo viewer, glass or plastic is advised to protect the slide from fingerprints and scratches. If the slide is to be placed in a magazine and left there for viewing, the mask can be placed in a card-



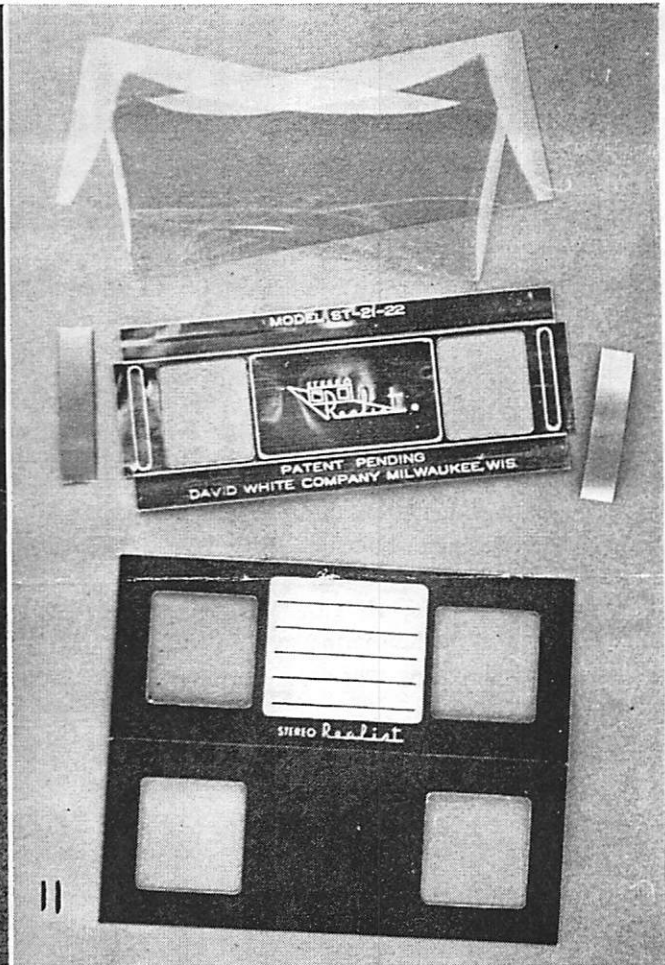
7. Camera with new type lens flange having both inside and outside locks.

8. Electronic ring light fits around lens confining light to area being photographed.

9. Assembled outfit showing camera, attachment and ring light ready for use.



10. Glass mounting of transparencies. Left to right: aluminum frame for binding edges, regular size stereo aluminum mask for holding transparencies with ribbon matrix for masking outside edges and thin glass covers.



11. Cardboard mounting of transparencies. Left to right: two thin sheets of plastic, aluminum mask as used in previous method, cardboard folder. Binding tape seals the edges.

board frame and the edges bound with tape (Fig. 11).

Viewing

There are many stereo hand viewers available and one having a brightness control is recommended (Fig. 12).

There are also several stereo table viewers made. Some of these accept magazines holding 24 or more slides (Fig. 13) and eliminate the task of

changing individual slides.

Projection

The advantage of projection is in showing the slide to a greater number of people. Polaroid glasses are, of course, necessary and an aluminum screen is required. The viewer should sit fairly well in front of the screen and not at a severe angle.

A wide variety of stereo projectors is offered the photographer today.

Comment

A practical method of taking and showing three-dimensional dental pictures has been presented in which ease of operation is an important feature. Various uses for stereo color pictures might well be used for records, study, clinics, teaching, and visual education. The three-dimensional picture creates a realism important in dental photography.

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