The Lido Theater

The neon sign on this HO scale movie theater blinks on and off and the chase lights on the marquee flow around the announcement of the current attraction

BY D. DEREK VERNER

BEFORE television began to dominate the mass entertainment scene, most cities and towns in America had at least one movie theater. Whether it was called the Bijou, the Strand, or the Lido, it often formed the hub of the town's social life. It was the place to go on a Friday night date; the place where, on a Saturday morning, hordes of small children, the price of admission tightly clutched in their sweaty palms, would line up to see a double-feature western, a newsreel, three cartoons, the latest chapter of a serial, and previews of coming attractions.

If you are a typical model railroader, you probably have provided your layout with innumerable freight stations and industries but have sorely neglected the social needs of your lilliputian residents. Here is an excellent opportunity to offer an alternative for the train crewmen who formerly had to spend the layover in Grogan's Bar or hanging around the Triangle Cafe.

At night, the Lido Theater also provides a touch of lifelike animation as its neon sign blinks on and off and the chase lights on its brightly lit marquee flow around the announcement of the current attraction.

Although the Lido is a free-lanced design, it is typical of literally thousands of theaters that blossomed across the country during the past half century. If you have never worked in styrene or Plexiglas before, this is a good chance to learn some of the advantages of these easy-to-work materials. Construction is not simple, but with patience a very rewarding model can be built—one that is sure to catch the eye of every visitor as it touches some hidden wellspring of nostalgia.

The marquee

Begin construction by preparing the artwork for the theater marquee. If you are a careful worker you may be able to work directly on the white Plexiglas faces of the marquee, using transfer

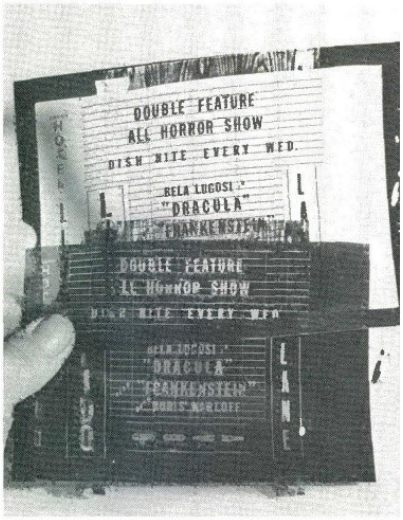


Fig. 1. A neater job of lettering the theater marquee is possible when you use oversized transfer lettering. Here, letters three times the actual size are laid out to fit 5"x7" film. →Fig. 2. The artwork is photographed onto high-contrast film in the correct scale. The negative this produces is then contact-printed onto another sheet of film, so as to make a finished film positive.

lettering and drafting tape. A much neater job is possible, however, if the lettering is done oversized as shown in fig. 1. The artwork is then photographed onto Kodalith high-contrast film in the correct scale. This produces a negative which is contact-printed onto another sheet of Kodalith film, making the finished film positive as shown in fig. 2. Note that the artwork for the left and right sides of the marquee is identical and requires that two positives be made from the negative. If you do your own photography, this is a simple procedure. If you send it out to a photocopy firm (see the Yellow Pages), the additional charge is quite small, since most of the cost is a setup charge. Additional information on photographic linework is available at your library and in the article "Scratchparts by photoetching" in the September 1970 issue of MR.

The next step, after you have obtained the film positive, is to cut apart the individual sides and cement them to pieces of thin (1/16" or .1") white Plexiglas. For the best results use a spray type of adhesive to adhere the film to the plastic. Scotchment and Adheez are two brands available at many stationers' and art supply stores. Spray a thin, even coat on the back of the film and on the plastic surface. Allow it to dry for about a minute and, working from the center out, carefully secure the film to the plastic. Cut the plastic slightly oversized and, after the adhesive has had time to dry thoroughly, sand to the exact final size.

The "neon" lights surrounding the faces of the marquee are simulated by the use of a special transparent colored Plexiglas that is manufactured with fluorescent pigments. This material has the remarkable property of producing an "edge glow" when light strikes its surface. Ordinary plastics can be lit only when the light is fed between its surfaces, such as at one edge. This plastic contains a fluorescent material that glows in bright "Day-Glo" colors when the ultraviolet component of ordinary light strikes it. Since the pigment is distributed throughout the plastic, it creates a light source between the surfaces of the plastic and produces an "edge glow" effect which, in the popular red-orange color, quite effectively simulates the glow of a neon sign.

Cut the material to form a top and bottom of the five-sided box that makes the marquee. When lights are put in the box to illuminate the lettering, the polished edges of the fluorescent plastic will glow brightly. Miter the edges of the white Plexiglas as shown in fig. 3 and insert a small strip of the fluorescent plastic at each corner. The bottom piece can be drilled with ventilation holes as shown, but these are not really necessary.

Next, cut the 1/8"-thick clear Plexiglas supports for the terminating panel. Note the large holes needed to allow the fiber-optic filaments to pass through from the inboard ends of the marquee. These supports serve a threefold purpose: they provide a mounting area for the marquee illumination lamps; they support the mounting blocks that secure the marquee to the building; and they hold the terminating panel in place. The terminating panel, of 1/16" black Plexiglas, is cemented to the supports as shown. This piece must be made carefully, because the success of the chase light effect is determined by the accuracy of the holes.

Chase lighting

On a real movie marquee, the bulbs are divided into four circuits electromechanically broken in sequential order, which produces the appearance of motion. This effect is reproduced on the model in a similar fashion, except that the "bulbs" are 20-mil fiber-optic filaments and the four circuits are represented by grouping the fibers into four bundles. A rotating disk blocks the

light from each bundle, in turn producing the chase-light effect. The disk could also contain various color gels or acetates, creating a moving, color-changing display. I didn't do this, however, because I feel it is unrealistic. After all, individual light bulbs do not change color, however pretty that may look.

The light channels containing the individual "bulbs" are lengths of Plastruct ⅛" channel, drilled at 1/16" intervals with a no. 75 bit. A quick way to space the holes is to build the jig shown in fig. 4. Cement two scraps of styrene to a Plexiglas base to provide a guide for the Plastruct strip. Secure a small pin 1/16" from the drill center in the center of the guide. To use the jig, drill the first hole in the end of the strip; then place the hole over the locating pin and drill the second hole. Place this hole over the pin, in turn, and drill the third hole. By continuing this way, the whole strip can be drilled quickly with accurately spaced holes.

Cut individual lengths of the drilled strips and solvent-cement them in place around the periphery of the marquee as in fig. 6. Make the termination panel from thin black Plexiglas. Locate the four holes on the circumference of a 2" semicircle as in fig. 3. The diameter of the holes depends on the number of fibers used. Count the total number of holes in the light-channel strips, divide by four, and gather that many fibers into a bundle. Using a drill gauge, measure the diameter of the bundle and choose a drill of the appropriate size. Drill a small hole to locate the center of the semicircle.

The fiber optics are installed next. Mushroom the end of a fiber by holding the end of a lighted cigaret about ⅛" from it. This will cause the fiber tip to swell and form a rounded bead at the end. (Additional information on fiber optics can be found in my previous article on the subject in the April 1973 issue of MR.) Feed the other end of the fiber through the corner hole on the marquee and back to hole no. 1 in the termination panel. Let it extend out of the larger hole about an inch. Clip off the excess and save it for later use. Insert the next fiber in the fourth hole, and repeat as before. Continue in this manner until you have worked your way completely around the marquee, placing a fiber in every fourth hole. Try to swell the tops of the fibers the same amount each time, so that the "bulbs" will all be the same size. Don't be concerned if the number of bulbs is not an even multiple of four. If you start in one corner as described it will make no difference.

At this point the marquee should resemble fig. 5. Repeat the procedure with the next batch of holes, inserting the first fiber into the second hole in the light channel and back to the no. 2 hole in the termination panel. Continue as before, inserting a fiber into every fourth hole. Repeat again with the third and fourth holes.

Place strips of masking tape over the bulbs to hold them tightly in place, and use a toothpick to apply 5-minute epoxy to the back of the light channel to secure the fibers in position. Do not use solvent-type cements for this purpose; they will attack the optical coating of the fibers and destroy their light-transmitting properties. The other ends of the fibers, where they protrude from the termination panel, should be bonded together with optical cement. Wrap each bundle together with a small rubber band and apply a few drops of the optical cement. Capillary action will draw the cement into the bundle. When the cement has thoroughly dried (at least overnight), trim the bundles off flush with the panel, using a razor saw. Heat-polish the cut ends by holding a lighted cigaret close to them.

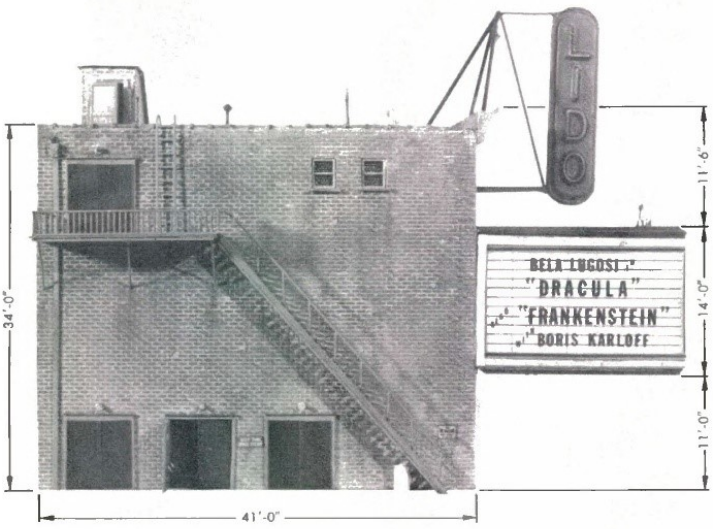
Make the top and bottom covers from 1/16" black Plexiglas. Before cementing them in place, paint the inside surfaces white to help even the interior lighting. Keep the paint away from the edges where the cement will be applied. If desired, the bottom cover can be drilled with a series of holes matching those in the fluorescent plastic as shown in fig. 6. When cementing the covers on, be very careful not to allow cement to touch any of the fibers. Clamp the covers in place and apply the solvent cement very sparingly to the crack of the joint.

Since the 1/16" fluorescent plastic is much too thick to represent neon tubing, it is masked with a strip of black drafting tape to resemble a double row of tubing. A length of 1/32" tape applied along the middle of the plastic will do this effectively.

Fiber optics, as explained in the April 1973 article, are extremely directional, and some means must be employed to make them visible over a wide angle. In this model this is most easily done by cutting strips from translucent yellow tape and applying them over the light channels. The tape used is sold by art stores for use on overhead transparencies. If you have difficulty locating it, you can use magnetic recording splicing tape, which has exactly the translucency required. If you can't obtain this in yellow, use the more common white type and obtain the characteristic yellow color of theater lights by using gels, acetate, or color dyes on the input ends of the fiber-optic filaments.

The building

Cut four pieces of Vollmer plastic brick sheeting (no. 6028) that are to form the building walls. The dimensions of the structure (in HO) are such that the front and back walls can be cut from a single sheet. To cut the material, use a straightedge and a no. 11 X-acto blade on the face side of the sheet. The blade should be used backwards: that is, it should be used to scrape rather than slice. Line up the straightedge with the edges of individual bricks and



draw the back of the blade tip across the desired cut several times. Done properly, this scraping action will produce strings of fine shavings. After scoring the line, place the sheet over the edge of the workbench and snap it off along the line. When cutting plastic near one edge of a sheet, use a vise or other clamping device to grasp the thin strip being snapped off.

When the sides are cut, miter the mating edges to 45 degrees. Use a sandpaper block or the edge of a knife blade as a scraper. Temporarily tape the four sides together, and cut a floor and a roof from a sheet of .060" styrene. These pieces should be a snug fit inside the four walls.

Window and door openings on the alley side of the structure are cut next. In my version, this is the only wall that is detailed, because the other side wall butts against another building and the back cannot be seen. If your intended location requires a different arrangement, you may wish to detail other walls as well.

Cutting neat openings in styrene sheet is quite simple. However, if you are used to working in Strathmore or wood, you may find the procedure a little strange at first. After marking the exact-size opening required, make a large hole in the center of the marked area. This need not be done with a drill. A hot knife, a motor tool and cutting bit, or even an X-acto knife twirled between the thumb and forefinger will work as well. After the hole is pierced, the remaining waste is carved away with a modeling knife. Styrene carves beautifully, and this technique is simpler than it sounds. Merely insert the knife into the hole and make a slicing cut toward one corner, then another cut at right angles to the first, removing a small triangle of material. Repeat in this manner until the opening is the required size. If you wish, you can use a file, a hand nibbling tool, a razor saw, or a hot knife, but the simple technique described seems to work better than any of these methods.

Actually, three of the four exit doors on the alley side of the structure are dummies, simulated with rectangles of Plastruct sheet cemented over the walls. The center exit door is modeled in an open position, and the cutout is framed with Plastruct angle. The two small restroom windows were cut to fit window frames from some forgotten plastic kit. At this point it is not necessary to apply any detail to the wall, but it is easier to cut the openings before the walls are assembled. Cut the upper portion of the front wall to size and make the openings for its windows. The windows in this wall are manufactured by Vollmer and are included in kits 5610 and 5614. They are also available separately in many hobby shops.

Solvent-cement the four wall sections together, making certain that the mortar grooves line up at the corners. After this is thoroughly dry, begin assembling the front facade. The first piece to be installed is the ceiling strip, which is made of 1/8" black Plexiglas. This piece serves as a support for the marquee and should be cemented firmly between the side walls. Three small pieces of clear Plexiglas rod, turned to appropriate shapes, are cemented in drilled holes in this piece. These pick up light from the interior of the building and serve to illuminate the coming-attraction posters mounted over the entrance doors. The remainder of the facade is constructed of clear Plexiglas and Plastruct ABS sheet and shapes. The entrance doors are a single sheet of 1/16" clear Plexiglas, with Plastruct channel dividers. Kickplates and backing plates for the door pulls are small strips of silver mylar tape, available at art supply stores. The door pulls are bits of wire bent into the proper shape and inserted into drilled holes.

Since it would be difficult to front-light the posters in the showcases, they are actually lit from behind. To simulate the depth of the cases, use 1/8" Plexiglas rather than a thinner material, which seems called for. Later, when the posters

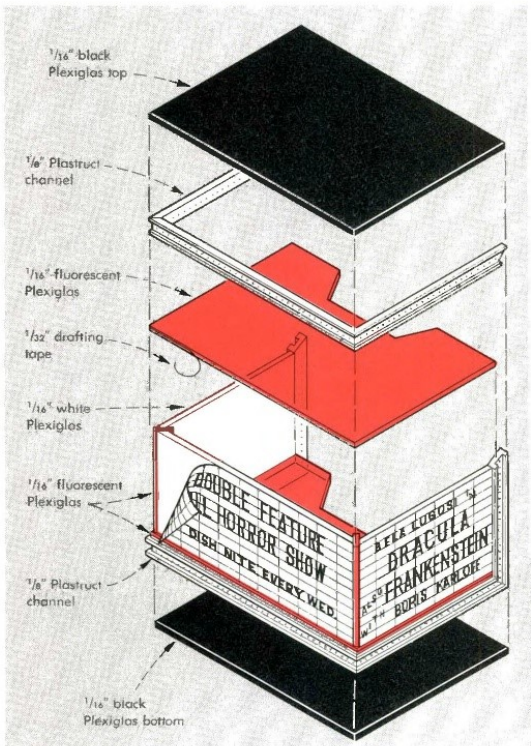


Fig. 3 CONSTRUCTION DETAILS FOR MARQUEE AND FIBER OPTICS TERMINATING PANEL

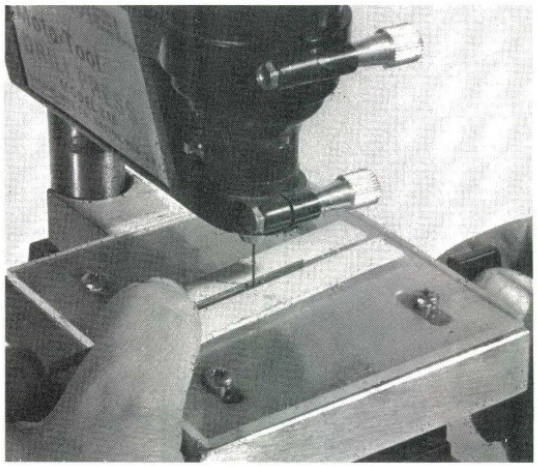
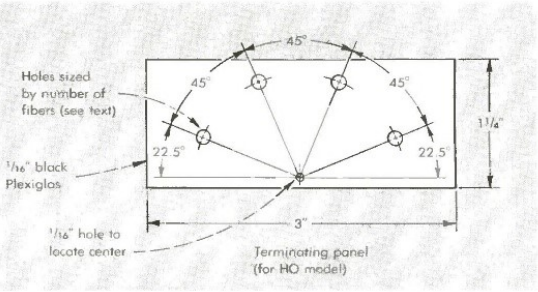


Fig. 4. This jig can be adapted to a drill press and used to simplify drilling of the light channel strip for fiber-optic "bulbs."



are affixed to the back faces of the Plexiglas, the thickness will create the effect of a glass-fronted case about 10″ deep

The remainder of the facade construction can be seen in fig. 7. Place the marquee in position and drill through the black ceiling piece into the support blocks on the marquee assembly with a no. 43 bit. Tap the holes in the blocks with a 4-40 tap, and enlarge the holes in the black Plexiglas with a no. 33 drill bit.

Temporarily assemble the marquee on the building with short 4-40 screws and check for fit. If necessary, enlarge the clearance holes slightly to obtain a snug fit between the marquee and the building.

Posters and signs

Part of the impact of this structure is due to the authentic movie posters. These are miniature color photographs of prototype posters. The recent movie nostalgia craze has resulted in a proliferation of books and poster reproductions from every period of movie history, so you should have no trouble locating some for use on your model. Check the local newsstand for a periodical called *Movie Classics*. This magazine generally carries a full-page color ad for old movie posters.

After you've located suitable posters, the next step is to photograph them. Use a color reversal film (such as Kodacolor), and remember that the smallest color print generally available is a 2× enlargement. Therefore, you must shoot the poster reproductions so that they are half the finished size. With a 35-mm. camera, the easiest way to judge the size is to remember that the negative measures 24x36 mm. Anything that just fills the viewfinder will therefore be reproduced on the negative in that size. This represents (in HO) an area of 7x10 feet. Since you want to obtain a negative that is half the final print size, you simply double these measurements. Now, anything that fills the viewfinder exactly will produce a final print size (assuming a 2× enlargement by the print processor) of 14x20 feet. Adjust the camera to copy distance until the copy appears the correct size in the viewfinder. If you are copying miniature reproductions such as the O scale posters sold by Scale Structures Ltd., you will need some sort of supplementary lens, extension tubes, or other closeup attachment so your camera can focus down to the required distance.

Make up a few signs such as "Coming Attractions," "Starts Wednesday," in the same proportion as the posters, using transfer lettering. These are photographed along with the posters and later cut out and positioned as shown. The posters mounted in the illuminated showcases are backlighted, however, and therefore should consist of a single print only, with no pasteups. Lay out the "Now Playing" sign, the poster, and a few "8x10 stills" on some sort of colored background to represent the interior of the showcase.

When the prints are returned from the processor, spray them with Testors Dullcote to deaden the gloss. Cut out the individual signs and posters and mount them where desired. You may want to increase the translucency of the showcase prints. To do this, use a knife and carefully split the print in half. Mount the showcase prints against the back of the ⅛″ Plexiglas case fronts and hold them in place by backing them with other pieces of Plexiglas.

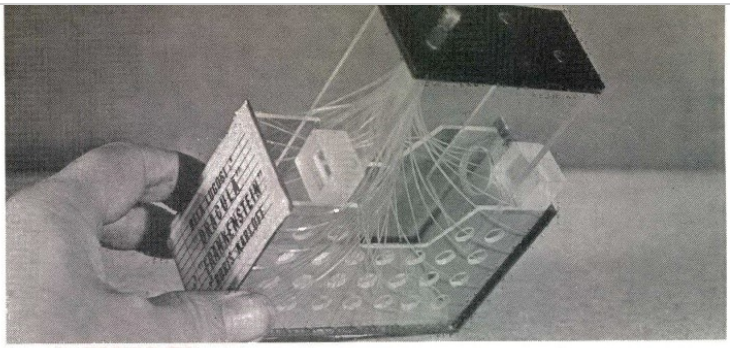


Fig. 5. The theater marquee should look like this after one-fourth of the fiber optics have been installed. Repeat the weaving procedure into the remainder of the termination panel holes.

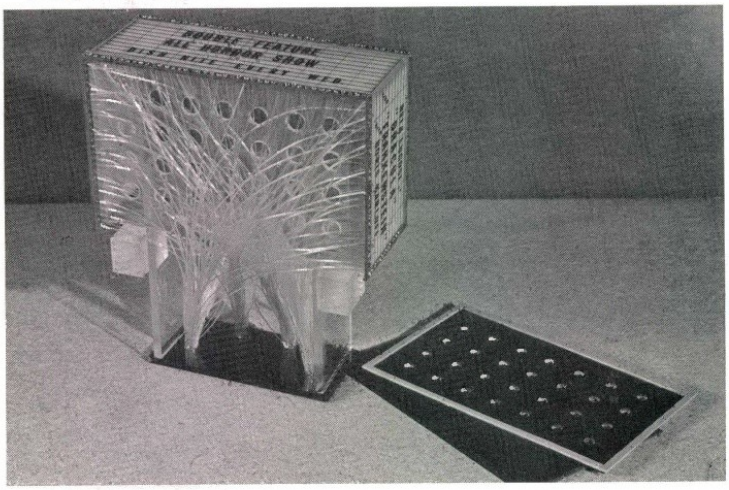


Fig. 6. The finished marquee awaits installation of its covers. The inside surfaces of the black Plexiglas are painted white. The bottom cover can be drilled to let light through.

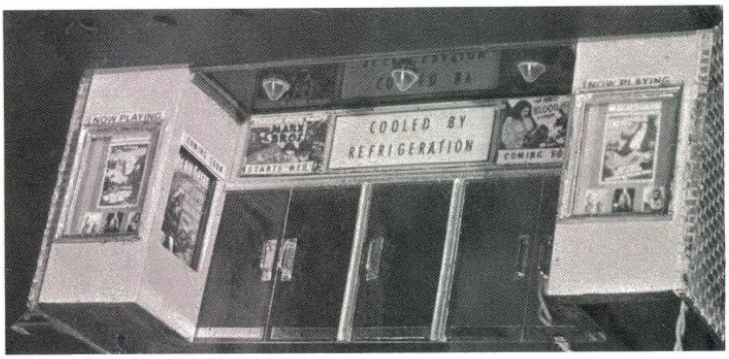


Fig. 7. The various movie posters in the Lido's glass showcases are lighted from behind. The ones over the theater entrance are front-lighted by the three Plexiglas "ceiling fixtures."

Programing mechanism

The heart of any device employing, as the Lido does, programed fiber optics, is the programing mechanism itself. This usually consists of a motor-driven disk interposed between the light source and the input ends of the fiber-optic filaments. The disk contains a pattern

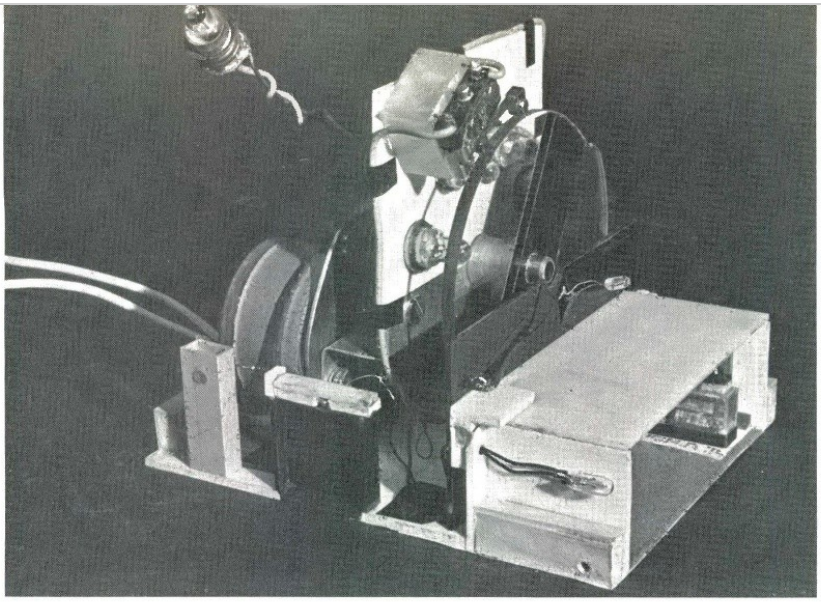


Fig. 8. A penlight bulb soldered to stiff brass rod is wired in series with the four bulbs on the light panel. This bulb is used to illuminate the fiber-optic light over the balcony exit.

Fig. 9 (right). This view of the programing mechanism shows the general location of the various parts. Fig. 10 (far right). A vacuum-tube socket serves as a convenient device to allow quick disconnection of wires that must be removed when the building requires disassembly. These include wires from the marquee assembly and those from the vertical neon sign.

of holes, transparent areas, or color gels that sequence and color the light in the manner desired. It is possible, using this technique, to illuminate the chase lights with a single lamp, but for brightness and compact size, four individual penlight-type bulbs were used instead. In my version, no. 222's were wired in series, with a fifth no. 222 lamp used to illuminate the exterior light over the balcony emergency exit. These lamps operate on 2.2 volts each. The series string was designed to match the 10-volt transformer I use for structure illumination. If you employ some other voltage, use a different wiring method or dropping resistors to match the lamps to the power supply.

The four lamps are mounted in four sockets spaced in the same pattern as the fiber-optic ends on the termination panel. The sockets were taken from an old-fashioned Christmas tree string by breaking off the composition material surrounding the brass shells. Small sockets of this type are also available from electronic supply houses. Cut a piece of .060" styrene to suitable size and secure the sockets in drilled holes with 5-minute epoxy.

The fiber bundles are laid out in such a way that each bundle is blocked out twice for every revolution of the motor shaft. This means that for a realistic chase-light effect, a motor speed of about 48 r.p.m. is required. You could use a small permanent-magnet motor and gearbox, but d.c. motors tend to be rather noisy. The best choice of motor is an a.c. synchronous timer motor, available from most electronic supply houses. For safety's sake, to avoid 110-volt wiring, you might want to power the motor with a small filament transformer located within the structure and connected backwards. In this way, only low-voltage a.c. need be routed to the structure to power both motor and lamps. Since the motor draws only about 3 watts, a very small transformer can be used.

With the marquee in place, slip the building shell over the styrene floor. Working through the open roof, measure the exact distance from the floor to the center hole in the termination panel. Bend brackets from sheet metal to hold the motor and lamp panel at the correct height so that the motor shaft passes through the lamp panel center hole and lines up with the termination panel center hole. Rough-cut a 3½" disk from ⅛" Plexiglas. From Plexiglas rod or tubing, fabricate a collar to fit over the motor shaft. Drill and tap for a setscrew. Install the assembled unit inside the building and connect the lamps to a suitable voltage. Make sure that the spot of light projected from each bulb covers the corresponding fiber-optic bundle. Move the assembly around on the styrene floor until it is positioned properly. Mark the floor, remove the building shell, and attach the assembly to the floor with flathead machine screws set into countersunk holes in the styrene.

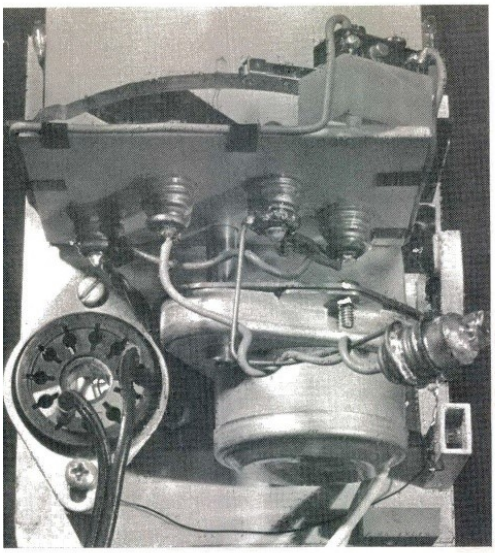
Since you have probably been dying to try the chase lights, now is the time. Place a strip of opaque electrical tape across the diameter of the disk. Reassemble the building and apply power to the motor and lamps. If you have worked carefully up to this point, you will be rewarded by having the lights appear to move around the marquee in a very convincing manner. Okay—back to work.

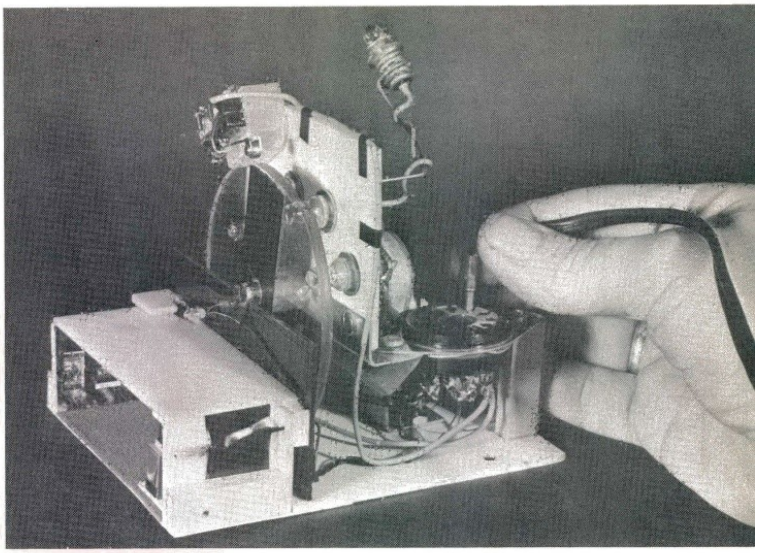
Remove the building shell and the programing disk. The disk is also used to actuate a switch to turn the vertical "neon" sign on and off. The switch shown in the photographs is a subminiature roller-actuated microswitch, but you can easily rig up a suitable switch from an old set of contacts from a relay or switch machine. Flashing lights used in commercial signs are on longer than they are off, so the cam profile should provide for this effect. Remove the electrical tape from the disk and, using a pair of dividers, scribe two concentric circles on the disk to indicate the open and closed positions of the switch or switch contacts. Mark off about 270 degrees for the "on" diameter and 90 degrees for the "off." Saw or file the disk to this profile. Try to make the edges as smooth as possible to reduce friction on the switch. Mount the switch on the lamp panel and, after reinstalling the disk on the motor shaft, test for proper operation.

The lights over the exit doors on the alley side are short pieces of fiber-optic material. Since the building shell is removable from the base, the usual technique of running a number of fibers to one light source is not possible. Accordingly, each of these lights is lit by its own bulb. The illumination for the balcony door has already been described. The other three lights are illuminated by individual miniature bulbs mounted as shown in figs. 8 and 9. The center exit door, modeled in an open position, is backed by a small plastic box painted flat black. If more room is available, you may want to put in a row of seated Preiser figures that will be visible through the open door.

A 10-pin radio tube socket is shown mounted on the base: fig. 10. This serves as a convenient electrical connector so that the wires from the marquee assembly and from the vertical neon sign can be disconnected when disassembly is required. An old octal radio tube supplies pins that are soldered onto the ends of the various wires that are plugged into the socket. Colored paint is used to indicate which wires are plugged into which holes.

The front of the base contains the theater lobby. Cut back the .060" styrene forming the floor and substitute a piece of .010" styrene in its place. Build a box of styrene with a white Plexiglas top. Add a doorman, a candy counter, posters of coming attractions, and any other details you feel will enhance the model. The candy counter, fig. 11, was made from the corner of the box that Preiser figures come packed





in. Strips of styrene, a cash register, and a popcorn machine made of scrap Plexiglas complete the scene.

Make the entrance doors by covering the back wall with plastic tape and cutting out the individual panels with a sharp knife. Install a carpet of flocked contact paper, sold in most hardware stores. Scribe the piece of plastic forming the lobby ceiling on its underside with 2-foot squares. Apply Polly S black paint and rub it off so that the paint remains in the scribe marks. Lighted by a small lamp from above, this treatment supplies sufficient light to illuminate the lobby and gives a good representation of a grid-type ceiling.

Place a lamp on either side of the lobby box as shown, to illuminate the front showcases. The remaining lamps are mounted on small blocks of plastic and serve to feed the short lengths of fiber optics over the exit doors. Mount two more lamps inside the marquee on the 1/8" support pieces. Connect them to wires long enough to reach the tube socket, and solder tube pins to the ends of the wires.

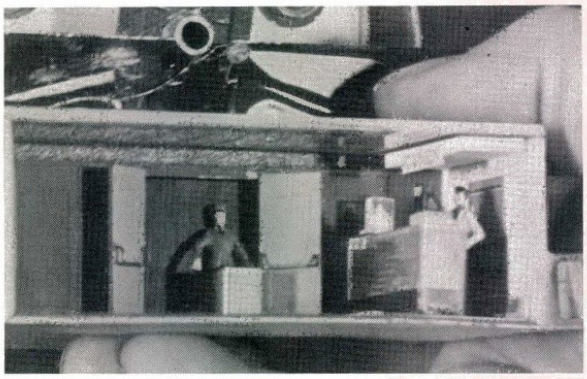
Before the roof of the structure is installed, experiment with masking the rotating disk for the best chase-lighting effect. The width of the tape placed across the diameter of the disk determines the time interval each of the marquee "bulbs" is "off." The most effective width seems to be slightly greater than the center-to-center lamp spacing.

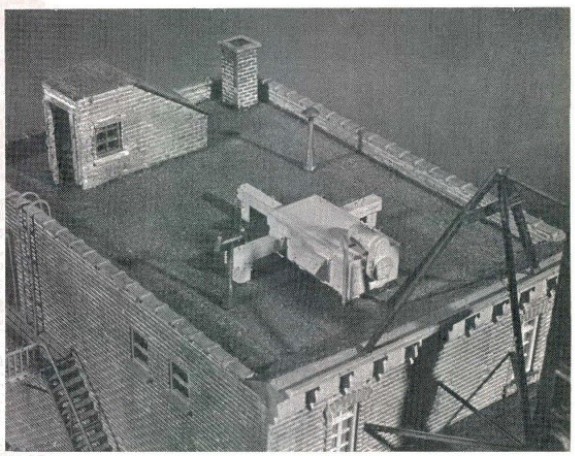
Painting and detailing

Cut strips about 3 scale feet high from the Vollmer brick sheeting and cement them inside the top edge of the building. Install the roof piece from inside and solvent-cement it in place against the bottom of the strips. Form the elaborate cornice on the front of the building from styrene strips and Timberline corbels. See fig. 12. Cut the decorative stonework behind the corbels from an embossed foil strip, sold in many hobby shops for use in decoupage. Cement the cornice in place and build up the slope from the roof with sheet styrene.

Give the entire roof a thick coat of flat black latex wall paint, artist's acrylic, or Polly S. While the paint is still wet, press a single layer of facial tissue in place and smooth it out as much as possible. Dip a brush into a cup of water containing a few drops of Kodak's Photo-Flo or other wetting agent, and work the tissue well into the corners. When the paint has dried, remove the excess tissue and give the roof another coat of flat black. The tiny wrinkles produced when the tissue expands from the water will effectively simulate a tarred roof.

Cut narrow strips of .030" styrene for the tile coping. With the edge of a sharp knife, scrape the top edges of the strips so that they assume a D-shaped cross section. Measure and mark the strips at 3-scale-foot intervals. At each mark apply a strip of 1/32" drafting tape to represent the overlapping tile joints. Trim off the tape on the underside of the strips and cement them in place on





↗Fig. 11. Snacks are a must for hungry theater patrons. The candy-popcorn counter was made from the corner of a box the Preiser figures came in. →Fig. 12. Those viewing the Lido from above will notice its well-detailed roof.

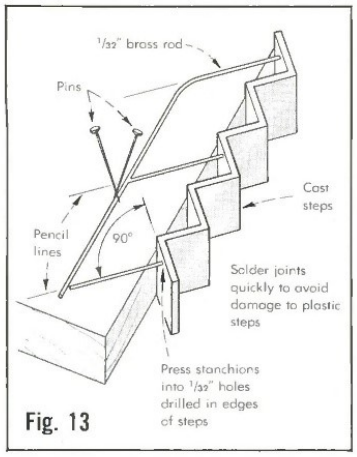


Fig. 13

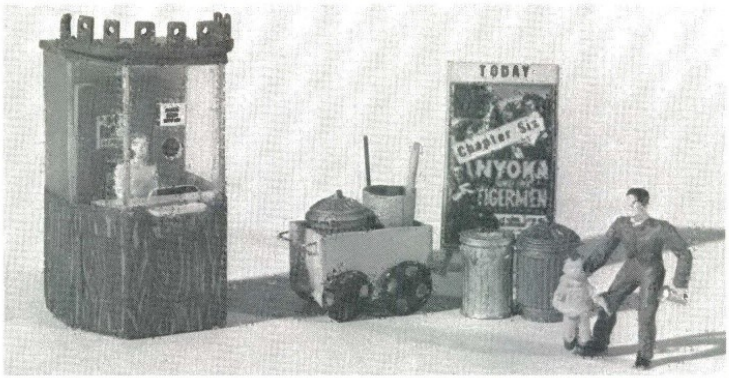


Fig. 14. It's those little "added touches" that lend life to any model, and the Lido certainly makes good use of these detail parts. The small boy being held by the scruff of the neck by an usher will be leaving the matinee performance a little earlier than he had anticipated.

top of the back and side walls. Paint the strips a dark tile red; brush in one direction so that the paint builds up more on one side of the tape than the other. Construct the stairwell housing from Vollmer brick sheeting and styrene covered with tissue for the sloping roof. The stairwell housing door and window are from an old plastic kit. Mark the position of the housing on the roof and scrape off the tissue where it will be cemented. Cut an opening in the roof for ventilation, and cement the housing in place.

Give all of the brickwork a generous coat of latex flat white and immediately begin to wipe it off with clean rags. Use cotton swabs to get into the corners. The paint remaining in the grooves will produce realistic mortar joints.

The fire escape stairs are made from the steps marketed by Model Die Casting as part of the Roundhouse "Old-Timer" line. Join two lengths of the steps together, trim off the overhang on each side, and cement narrow strips along the edges to simulate the stringers. Build the upper landing by constructing a frame of H-shaped Plastruct strips, and "plank" it with narrow strips of thin styrene. The railing around the landing is Grandt Line's Gay Nineties rail. Fig. 13 shows how to solder up the stair rail from brass wire. For invisible solder joints, tin the wires in the area to be soldered, place them in contact, and apply a small amount of flux, but no more solder. Capillary action will draw the solder from the tinned surfaces into the joints when heat is applied. Clean off all traces of flux, and paint the entire fire escape with dark green Polly S paint.

The air-conditioning unit on the roof is constructed of blocks of Plexiglas and styrene. Vents, chimney, a length of brass ladderstock, and a drain pipe complete the roof details. Simulate seams in the roofing by painting narrow lines with thick black gloss paint. When this has thoroughly dried, take a piece of silver chalk pastel and rub a little on the roof. With the tip of your finger, rub this all over the surface of the roof. The effect will be a soft weathering, with darker areas in the corners where dirt would normally collect. If the graying effect is too strong in any area, simply remove it with a damp rag. A few strokes of dark red pastel on vents will give the appearance of rust. When using pastels, always soften the effect by rubbing the chalk into the painted surface. In a similar fashion, using black chalk, weather the sides of the building under the window ledges and fire escape. Use red, yellow, orange, and brown felt-tip marking pens to touch up individual bricks in a random pattern.

Fig. 14 shows the ticket booth and other accessory details.

Make the ticket booth of thin Plexiglas and styrene. It is occupied by another member of the ubiquitous Preiser family. The billboard announcing the latest chapter of the thrilling serial was photographed along with the other posters and mounted as shown. A styrene trash cart with dress-snap wheels completes the details. You might want to add a line of people at the box office if there is a particularly good picture playing.

As explained earlier, one side of the Lido butts up against the next building, while the other side opens into an alley. The cast iron fence shown in fig. 15 is therefore necessary to prevent the smaller members of the community from performing clandestine infiltration operations. Make the fence by cutting apart pieces of the Gay Nineties railing and reassembling them as shown. Use a tiny square of styrene as a latch for the gate which will be placed across the front of the alley.

Assemble the building and apply power. Turn off the room lights and check for light leaks. Any glow through translucent walls or roof can be stopped with a coat of black paint on the inside. Thin strips of foam weather stripping applied where the marquee butts against the building will prevent light leaks in that area.

The theater name atop the front of the marquee is made from ¼" plastic sign letters painted a bright "Day-Glo" orange. I use ultraviolet lights on my layout, but even if you don't, the "Day-Glo" fluorescent paint will make the sign appear to be lit.

Vertical sign

The blinking neon sign uses a type of lighting known as "duo-panel," which is often employed on military instrument panels. Basically, this system of lighting is a combination of edge lighting and masking which results in very even illumination. Fig. 16 illustrates the principle: a clear Plexiglas panel is edge-lit by means of two lamps as shown. The lamps are positioned so that their filaments are located between the surfaces of the plastic. Light from the lamps bounces back and forth between these surfaces and would exit at the edges

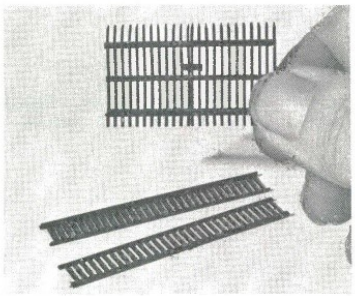


Fig. 15. A fence of Grandt Line castings, cut and reassembled, keeps boys out of the alley.

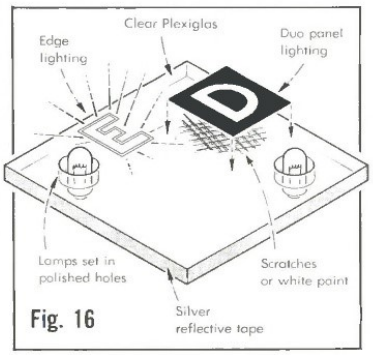


Fig. 16

were it not for the silver reflective tape preventing this. If any area on the surface of the plastic is scratched or painted, it will cause the light to exit the plastic and illuminate the area.

So far we have described edge lighting. This is the type of lighting used on many radio dials and stereo sets. Its greatest drawbacks are lack of contrast and a sensitivity to dust and scratches which cause the light to leak out where it is not wanted. If, however, you place a mask containing clear letters on an opaque background over a scratched area of the panel, the result is a high-contrast, evenly illuminated legend.

My version of the sign uses three-dimensional letters, produced as indicated in fig. 17. If you don't want to bother with the complex casting process, simply include the theater name on your marquee artwork as shown in figs. 1 and 2. Cut this from the negative and use it in place of the three-dimensional cast mask. The effect produced by the three-dimensional letters improves the sign considerably because, as the observer's point of view shifts, the letters seem to be suspended in front of the background in the same manner as in a real neon sign.

The first step in producing the cast sign is making the original master. Small plastic letters from an art supply store are solvent-cemented to a piece of .060" styrene cut in the shape of the sign. You can avoid a mistake I made at this point by cutting the styrene backing piece larger. Make it the same size as the edge-lit Plexiglas. The reasons for this will be explained later. Mount the master in a casting box made up of scrap styrene as shown in fig. 17. Allow escape channels in the corners as shown. Make the sides of the box about 1/16" higher than the letters. Fill the box with RTV (room-temperature vulcanizing) casting compound and cover it with a piece of glass. Weights on top of the glass will force the material into every crevice, and the excess material will exit through the escape channels. Allow the mold to cure overnight.

Remove the completed mold and fill it with polyester clear casting resin. Use a toothpick and carefully chase out any bubbles that become entrapped in the resin. When the casting has cured, remove it and make a few more in case of breakage. If the surface of the resin seems tacky to the touch, place the castings in a 175-degree oven for about half an hour. Sand the backs of the pieces so that they are perfectly flat. At this point your sign faces should look like the middle piece of fig. 17.

The high gloss of the plastic makes painting difficult, so the next step is to remove the surface gloss. Use a toothbrush and an abrasive kitchen cleanser to scrub the entire surface of the plastic. This produces a "tooth" for the paint to adhere to. Spray-paint the front of the sign faces with several coats of black until no light shows through when they are held up against a table lamp. After the paint has dried thoroughly, use the edge of a modeling knife to carefully scrape the paint from the faces of the letters.

Cut a piece of 1/8" clear Plexiglas the same size as the sign faces and drill a hole at each end large enough to admit a subminiature lamp. I used no. 7153 lamps for this purpose. These are long-life lamps designed to operate on 5 volts. By wiring them in series, they could be connected directly to my structure power supply. If your supply voltage is different, you may want to use other lamp types. It is recommended, however, that long-life lamps be used, since changing them is difficult.

The holes for the lamps must be located outside the lettering area. This is one reason for making the sign faces larger than shown in the photos. In order for the illumination to be even over the entire sign, it is necessary that the light come from the surface scratches rather than directly from the lamps. To get maximum transfer of light from the

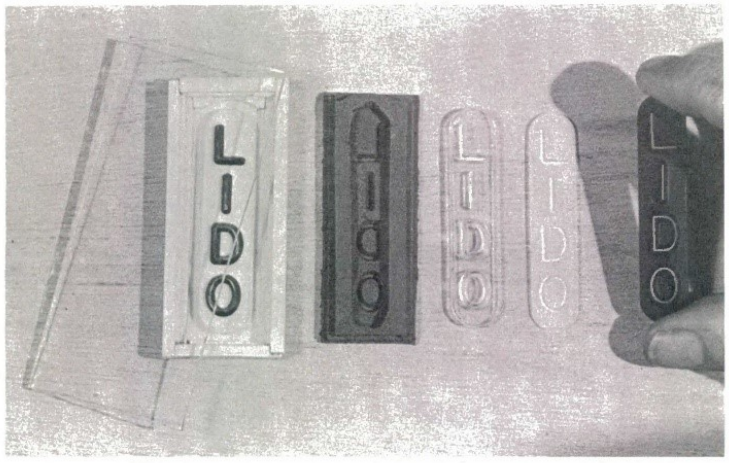


Fig. 17. The Lido's vertical sign starts with a master, shown here mounted in its casting box. Next is the RTV rubber mold made from the master, then a resin casting made from the mold, a casting with its surface gloss removed, and finally a finished, painted vertical sign.

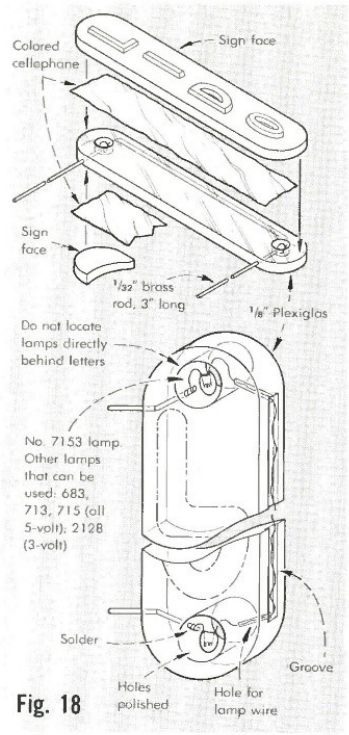


Fig. 18

lamp to the interior of the plastic, you can either polish the sides of the holes or encapsulate the lamps in place with clear epoxy or polyester casting resin.

Insert two 3" lengths of 1/32" brass rod into drilled holes in the edges of the Plexiglas as shown in fig. 18. Solder one wire from each bulb to the rods. The other two wires are joined together and set into a groove cut into the edge of the Plexiglas. With power applied to the two rods, scratch the surface of the Plexiglas with a knife or scriber. Note that the scratch lights up brightly. The idea is to scratch the surface of the plastic in the areas directly behind the letters. The more scratches in one area, the greater the amount of light. Since the brightness falls off the farther you get from the light source, you compensate by making more scratches in the center than at the ends. This is illustrated in fig. 19. Do not place scratches anywhere but directly behind the letters. Light produced in any other area will be wasted. Use the sign face as a guide. Hold it in place and observe where the letters appear dark. Scratch the surface a little more in these areas. When the light appears balanced, turn the Plexiglas over and repeat on the other side.


Fig. 19. The amount of scratching on the Plexiglas center piece controls the brightness of the vertical "neon" sign's letters.

If you want to color the sign, cut two pieces of colored acetate or cellophane and place them between the sign faces and the Plexiglas: fig. 18. Fasten the complete sandwich together with mylar or metal foil reflective tape, applied to the edges only. This is the second reason for making the sign faces as large as the Plexiglas. Any tape or adhesive applied to the surface of the Plexiglas will cause light to leak out and be wasted. In my version, not only is tape applied to the surface but also the faces must be cemented in place. This creates a wasteful light leak where the cement is applied. If you want to duplicate the sign shape shown, apply several turns of narrow strips of masking tape over the reflective edge binding tape. If you use a metallic foil tape on the edges, be sure you don't short out the wiring at the support rods or on the groove along the side.

The rods that supply the power to the sign also serve to support it. Bend them to the shape shown. Mount the sign on the front of the building by drilling small holes, passing the rods through the holes, and applying blobs of epoxy on the inside of the building. Cover the rods with Plastruct channel or H columns. Construct the remainder of the sign-support structure with Plastruct shapes. Solder wires to the rods on the inside of the building, apply power, and check for light leaks. Touch up any areas that show light leaks with black Polly S paint. Paint the remainder of the sign and support structure.

The Lido Theater is now complete and awaits only site installation to begin attracting patrons. It won't be long before word gets around and you can expect long lines waiting to see the latest double feature. Stay away from X-rated films, though. After all, "Nelda the Nudist" is playing over at the Suydam Follies, and we need some wholesome entertainment for the kids in town.

Sources of supply

Olson Electronics, 260 S. Forge St., Akron, Ohio 44327: Timing motor, 48 r.p.m., MO-275J, 89 cents; fiber-optics kit of 175 12" 20-mil fibers, XM-064J, $3.15; optical adhesive, XM-071J, $2.49.

Industrial Plastics Supply Co., 324 Canal St., New York, N. Y. 10013: Plexiglas, 1/16" and 1/8", in white, black, clear, and fluorescent red/orange transparent. Write for prices.

BRIDGES & BUILDINGS FOR MODEL RAILROADS describes how to build truss, covered, cantilever bridges; shanties, stations, enginehouses, and more. $3. EASY-TO-BUILD MODEL RAILROAD STRUCTURES has more great ideas: yard and terminal facilities, wayside and industrial structures. Includes scale rules. $2.

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HO Primer $3.50
Track Planning for Realistic Operation $3.50
764 Helpful Hints for Model Railroaders $3
Bridges & Buildings for Model Railroads $3
Scenery for Model Railroads $4
N Scale Model Railroad Track Plans $2.50
Track Plans for Sectional Track $2
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101 Track Plans for Model Railroaders $3
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