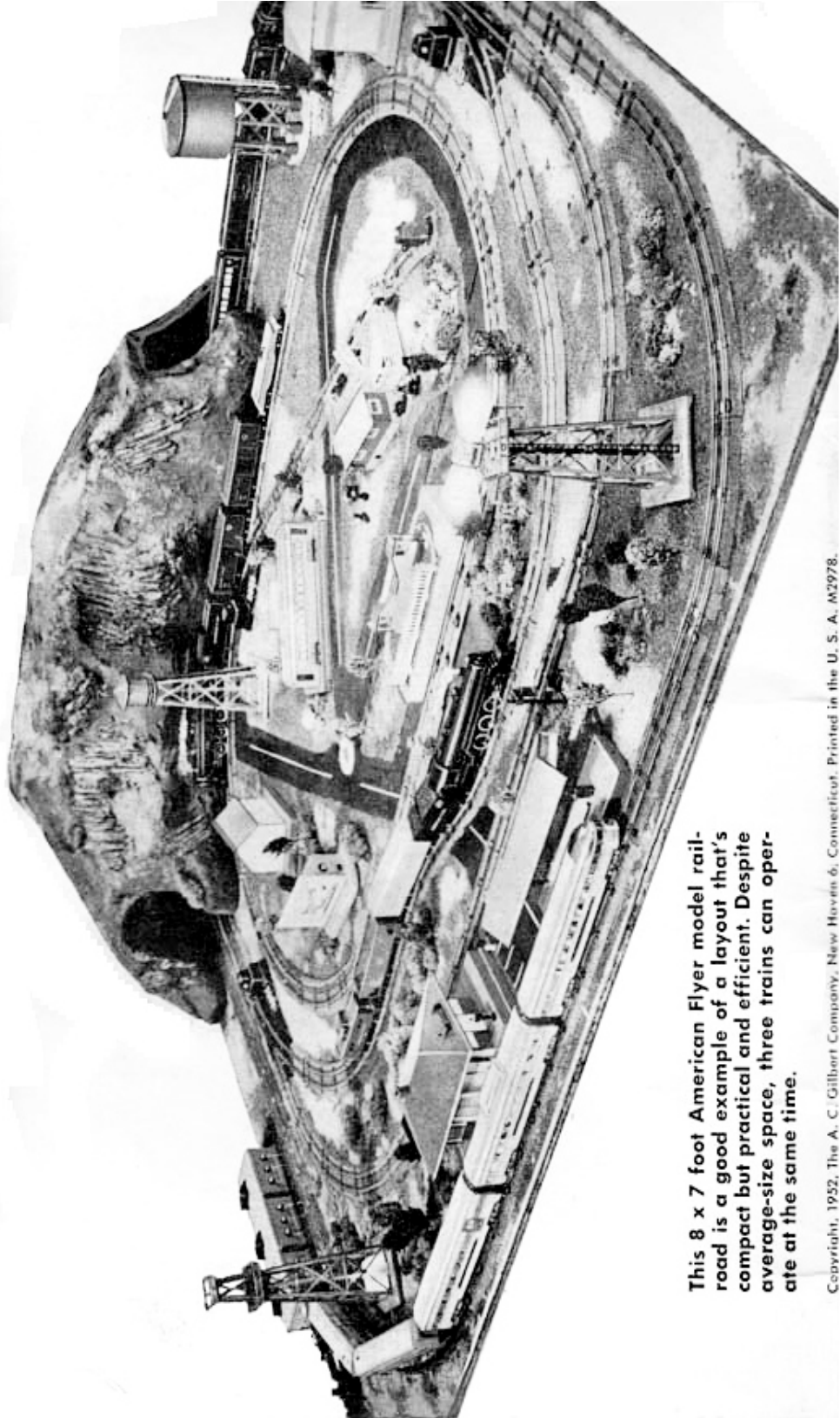


*American  
Flyer*

**MODEL  
RAILROAD  
HANDBOOK**





**This 8 x 7 foot American Flyer model railroad is a good example of a layout that's compact but practical and efficient. Despite average-size space, three trains can operate at the same time.**

## Planning and Building Your

# American Flyer

## Model Railroad

### LET'S BUILD A MODEL RAILROAD!

There's nothing quite as much fun as building a model railroad in your own home — constructing the table, laying the great track system, landscaping the terrain and, eventually, ending up with a complete world in miniature.

Our real world of railroading, with its miles and miles of winding track, its tunnels and bridges, its semaphores and switches and its bustling terminals is undoubtedly the most fascinating form of transportation ever created. With American Flyer trains and equipment, with the tips and hints presented in this booklet and with the willingness to devote a few hours of your own time, there's no reason why you can't make a model "pike" that will be the envy of your friends and neighbors.

### AMERICAN FLYER SCALE AND GAUGE

Many people have asked us what prompted our decision to change American Flyer trains from "O" Gauge to  $3/16"$ , or "S" Gauge, after World War II. The answer is simple. Only with "S" and smaller gauges is it possible to make scale model trains and accessories in a size practical for the average home. Today, the trend is toward things which take up less space. Houses are smaller. Rooms are smaller. Cellars are smaller. That means less room for such hobbies as electric trains. Thus, if we are to have trains which are made to scale — an important American Flyer feature — the scale must be smaller than bulky, oversize "O" Gauge. For, in truth, if the old American Flyer "O" Gauge trains (or ANY "O" Gauge trains) were made to proper scale, a layout would consume a ridiculous amount of room. That's why American Flyer developed "S" Gauge, ( $7/8"$  between rails) fast becoming more popular than all others combined.

### AMERICAN FLYER TRACK

The foremost feature of American Flyer track is that it is made like REAL railroad track: 2-rail "T" construction. When American Flyer switched from "O" to "S" Gauge, it dropped the old-fashioned third rail. No REAL railroad has this strange-looking rail running down the center, reasoned American Flyer engineers. Why, then, should model electric trains have it? The obvious answer is: no reason. Thus was born

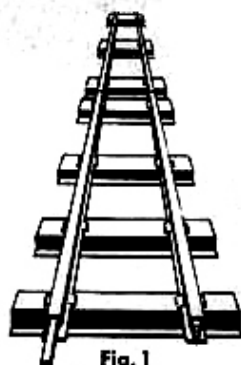


Fig. 1

an idea and after years of research American Flyer 2-rail "T" track (Fig. 1) was developed. Why the flat-topped "T"? Real railroadmen will tell you that the flat "T" surface provides better traction because there is more rail surface in contact with the wheel. The same principle holds true for American Flyer track and is another reason why American Flyer locomotives can haul more, travel faster and climb steeper grades than other makes. Each section of American Flyer track is 10 inches in length and it requires 12 curved sections to make a minimum layout -- a perfectly round circle.

## SECTION ONE

## PLANNING YOUR LAYOUT

**WHERE TO PUT IT?** Before you can plan your layout on paper you must of course know what size it will be. And the size will usually depend on the location. That is, will it be in the attic, the basement, den, guest room, garage or (if you are lucky enough to have one) in the barn? If space is really a problem, you might wind up with a portable layout, discussed in detail on pages 6 and 7. In any case, only you can decide where to build your American Flyer model railroad. However, you should observe a few basic rules. First, it should be dry and free from dampness of any kind which might warp wood and rust equipment. Second, it should be well lighted -- either natural or artificial -- and have a readily accessible power outlet. And third you should, if at all possible, have enough "elbow room" to operate your trains and service the equipment.

**WHAT KIND OF LAYOUT?** Probably 99% of all model railroads "just grow", like Topsy, without any plan or organization. A model pike is or should be a real pike in miniature and a real pike performs a function and service. It may carry freight and passengers between two major cities. It may service a rural area from a big city. It may connect a seaport with a farm belt region. It may be a commuter line or carry people to a resort area, either winter or summer or both. Your model railroad should have a reason for existence, too. Don't let it be haphazard and disorganized. Don't let it be simply a series of connected track sections. Plan it out.

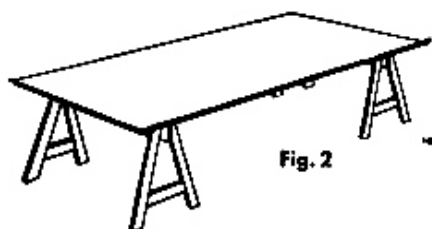


Fig. 2

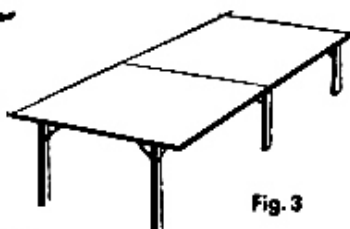


Fig. 3

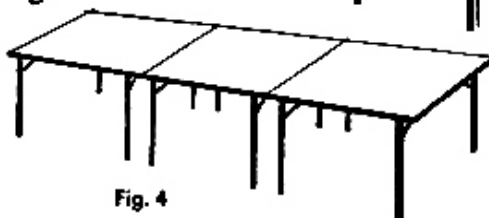


Fig. 4

## BUILDING THE TABLE

This is one of the most important steps — and certainly the biggest — in creating a model pike. The table can be just as elaborate or just as simple as you want to make it. For instance, if you think you may have to put away your layout occasionally, a sheet of plywood resting on two sawhorses (Fig. 2) will do nicely. A few yards of monk's cloth tacked or stapled along the edge as a skirt will dress it up. A ping-pong table (Fig. 3) or three or four card tables butted together (Fig. 4) provide ready-made layouts.

However, you will probably want to build a table more permanent than any of these. For the framework (legs, braces, etc.) use 2 x 3's (best) or 2 x 2's (next best). Second hand lumber is perfectly acceptable provided it is unwarped and in good condition. Fig. 5 illustrates some construction details of a table like this. For the top you can use plywood, which is easy to handle, won't warp and is strong. Less expensive and also very good are tongue-and-groove fir "roofers" or No. 3 (knotty) white pine. Consult your local lumber yard for prices.

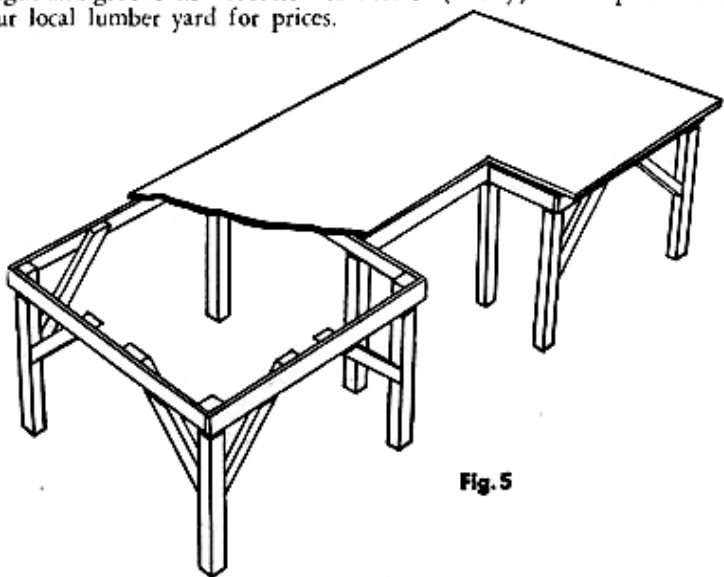


Fig. 5

If you plan a lot of scenery such as mountains, lakes, farmlands, meadows, etc., an open-type layout (Fig. 6) will be cheaper to make and just as effective. It also has the advantage of enabling you to create ravines, cuts, gullies and other topographical features which add to the realism.

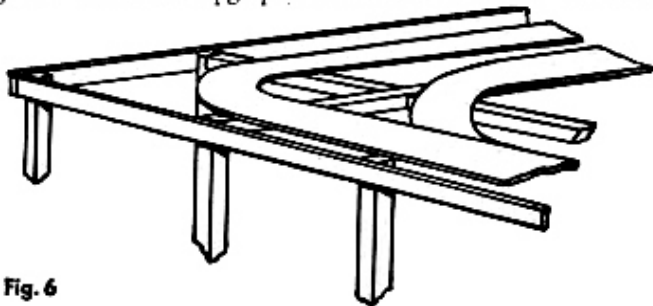


Fig. 6

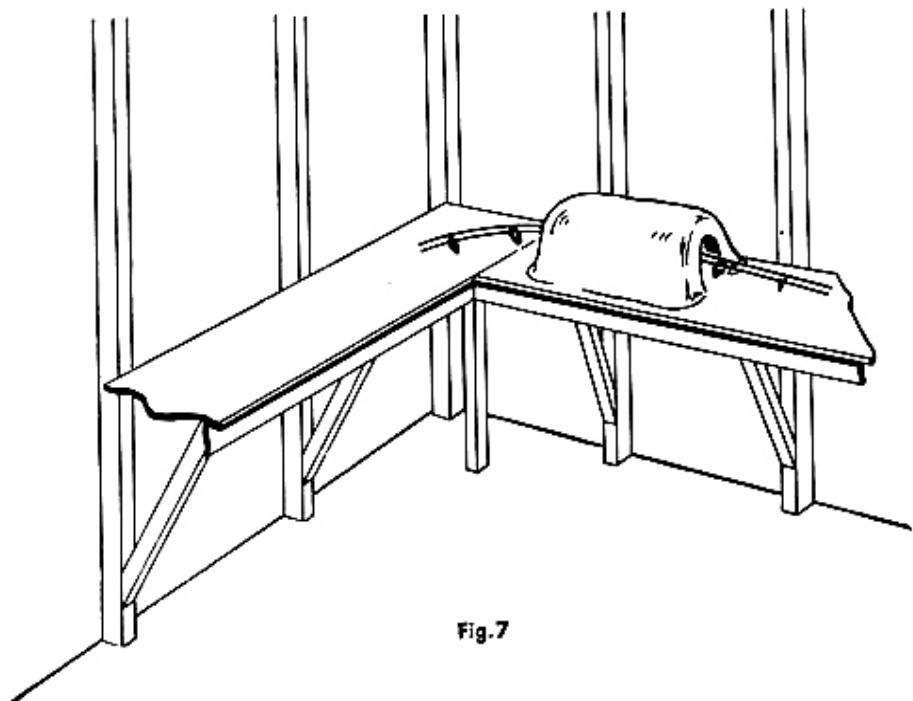


Fig. 7

It may be that you will want, for reasons of space, a "run around" layout (Fig 7) which is in reality a long shelf. If you can build this in the attic, where studs and rafters may be used as supports, construction will be simpler.

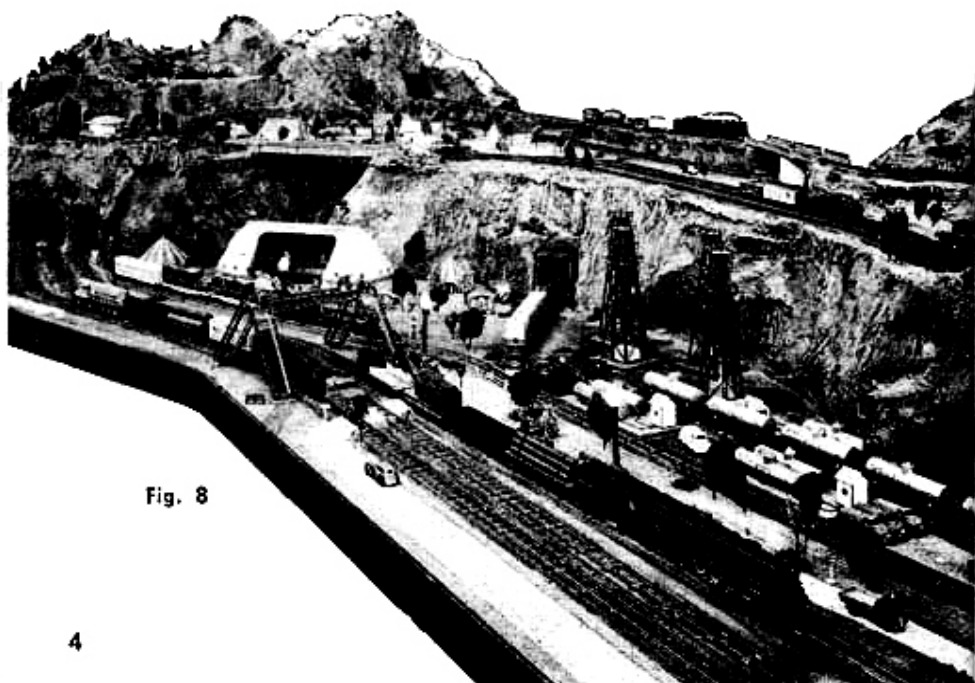


Fig. 8

## DO'S AND DON'TS IN BUILDING

The best layout in the world — from the standpoint of texturing and landscaping, is only as good as the foundation upon which it rests. Thus, it is vital to build your permanent layout strong and true and do right those all-important "little things" which often spell the difference between a good job and a poor one.

**BRACING.** There must be no sway or wobble in your completed table and the way to prevent this is through proper bracing. Figure 9 illustrates some proven methods.

**MORTISING.** This is not mandatory, but a mortised joint is tighter and stronger than a butt or lap. Fig. 10 shows close-up detail. Only tools needed for this are saw, hammer and chisel.

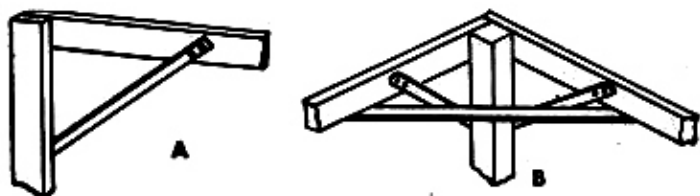


Fig. 9

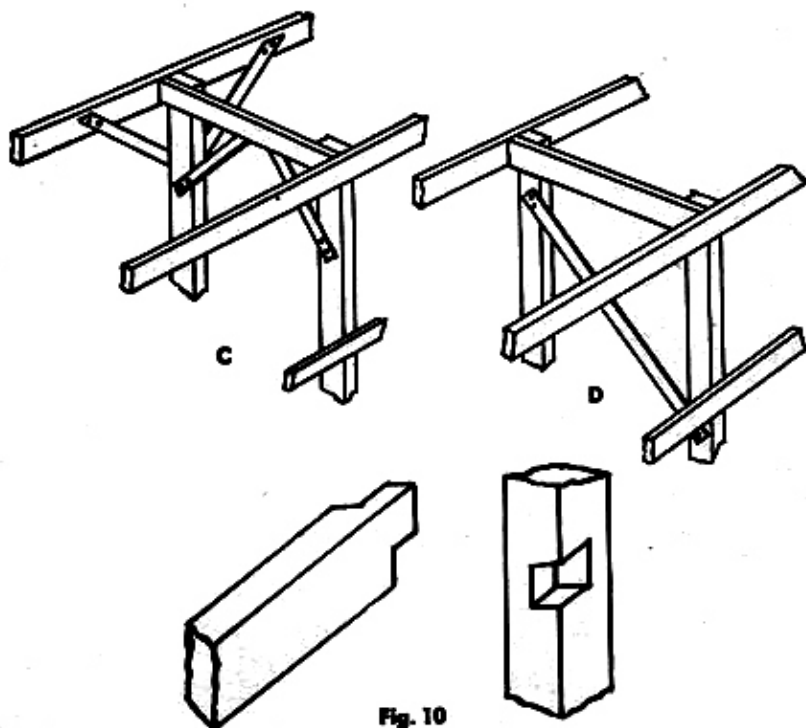


Fig. 10

**GLUE, NAIL, BOLT OR SCREW?** If there's a chance you may some day have to disassemble your table completely, **DO NOT** nail it together. Use long wood screws, instead, or nuts and bolts. Then take-apart is easy. If the layout will be there for keeps, however, use finishing nails, countersink and putty over. Where joints lap or mortise, use prepared or mix-it-yourself glue. Best construction of all is to glue all joints and then screw. Screws have tendency to pull joints together, thus making a strong bond.

**ANCHORING.** If the location you select calls for anchoring into a concrete wall, best system is to put up 2 x 4's against the concrete and then anchor to the 2 x 4's. To secure 2 x 4's to wall drill into concrete (with star drill or carbide tip power drill) and then plug hole with a wooden dowel (which will hold a screw) or use an expansion shield.

## PORTABLE AND UNUSUAL LAYOUTS

If you live in an apartment or a small house, the chances are you don't have an inch of space to devote to model railroading. That is, you think you don't. But how about the dead space underneath a double bed? Or up near the ceiling in the cellar? Or six inches of storage depth in a closet? If you can spare this you may yet be a genuine 14 karat gold plated model railroader.

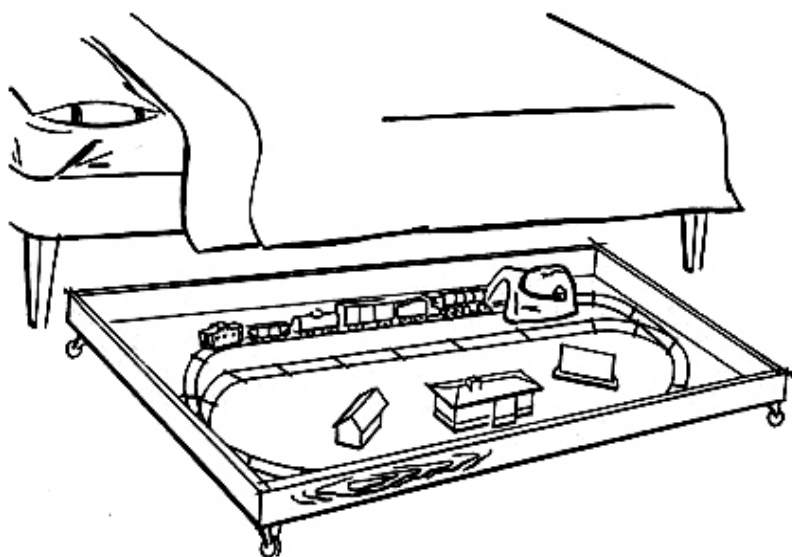


Fig. 11

Fig. 11 shows the construction of a "roll-away" or "hide-away" layout that pushes out of sight and out of the way when it isn't in use. Make framework of 2 x 2's or 2 x 3's, attach pine or plywood top and screw on a set of four ball bearing casters for mobility. Don't attach any permanent accessories which are higher than bed frame (water tower, oil derrick, semaphores, etc.) These can be placed on layout and quickly wired when trains are in use. Smaller accessories can be screwed and wired permanently.



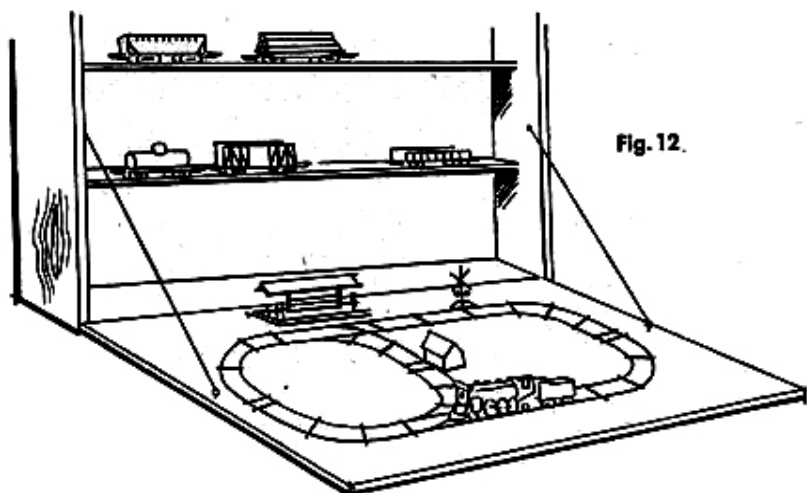


Fig. 12.

The "fold-away" type, patterned after the famous Murphy bed is illustrated in Fig. 12. Box type frame has hinged bottom which swings down when layout is to be used. Again, tall accessories and, of course, all rolling stock must be put on shelf when layout folds into housing.

Another "fold-up" type is shown in Fig. 13. Hinged in the middle, this pike can fold to half its open size for easy storage in the garage or a closet.

A totally different kind is the layout which elevates to an out-of-the-way position near the ceiling when not in use. (Fig. 14). Stout rope running through two pulleys enables you to raise and lower this pike with comparative ease.

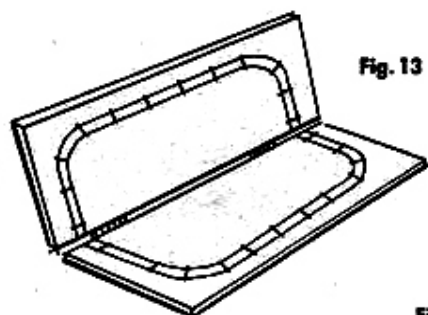


Fig. 13

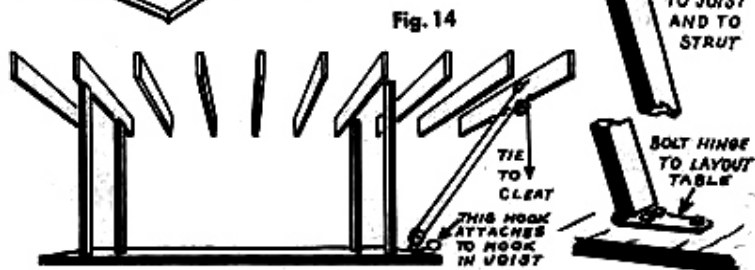


Fig. 14

## TRACK DIAGRAMS

On this and the following page are a number of American Flyer track systems. Some are simple and some are elaborate but all of them have been tested and proven. In building any model railroad you should allow for expansion and future development. You may commence with a modest 4 x 6 ft. layout that only allows for a loop of track and a siding. But someday you'll want a busy train yard, several spur lines, lots of accessories and "all the fixin's" of a complete pike. Try to plan ahead and visualize how your rail line will look not only tomorrow but ten years from tomorrow. Then lay out your track scheme accordingly.



Space 40" x 90"  
Track: 20 Curve, 6 Straight  
2 pair of Switches



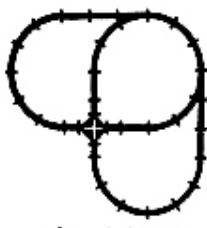
Space 40" x 96"  
Track: 18 Curve, 4 Straight,  
4 - 1/2 Straight, 1 Crossover



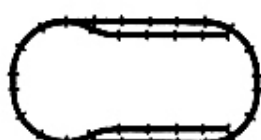
Space 50" x 80"  
Track: 16 Curve, 12 Straight,  
1 pair of Switches



Space 48" x 96"  
Track: 7 Straight, 22 Curve  
4 - 1/2 Straight, 1 pair of Switches



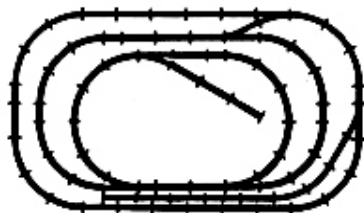
Space 70" x 70"  
Track: 19 Curve, 6 Straight,  
4 - 1/2 Straight,  
1 pair of Switches,  
1 Crossover



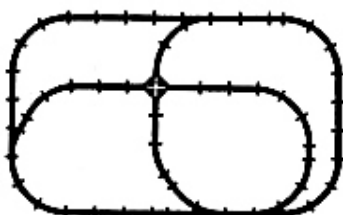
Space 48" x 96"  
Track: 16 Straight, 14 Curve,  
2 - 1/2 Straight, 1 pair of Switches



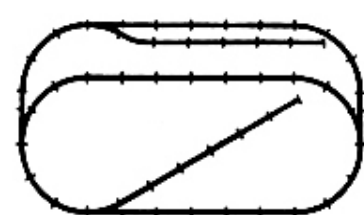
Space 48" x 96"  
Track: 18 Straight, 21 Curve,  
2 - 1/2 Straight, 1 pair of Switches



Space 60" x 108"  
Track: 26 Straight, 36 Curve,  
7 - 1/2 Straight, 3 pair of Switches



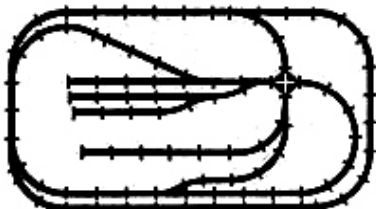
Space 70" x 115"  
Track: 23 Curve, 22 Straight, 7 - 1/2 Straight  
2 pair of Switches, 1 Crossover



Space 60" x 108"  
Track: 27 Straight, 17 Curve,  
2 - 1/2 Straight, 2 pair of Switches



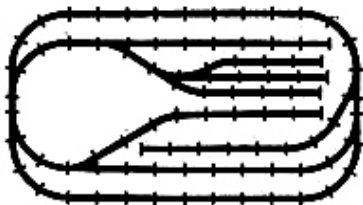
Space 52" x 108"  
Tracks: 21 Curve, 18 Straight,  
4 - 1/2 Straight, 2 - 1/2 Curve,  
1 pair Switches, 1 Crossover



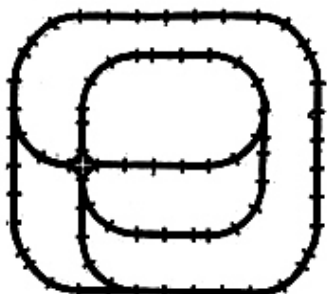
Space 72" x 128"  
Tracks: 30 Curve, 48 Straight, 3 - 1/2 Straight  
3 - 1/2 Curve, 4 pair of Switches, 1 Crossover



Space 60" x 108"  
Tracks: 31 Straight, 25 Curve,  
6 - 1/2 Straight, 2 pair of Switches



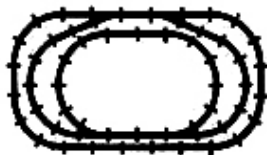
Space 68" x 120"  
Tracks: 23 Curve, 58 Straight, 2 - 1/2 Straight  
4 pair of Switches



Space 100" x 106"  
Tracks: 31 Straight, 29 Curve, 8 - 1/2 Straight  
2 pair of Switches, 1 Crossover



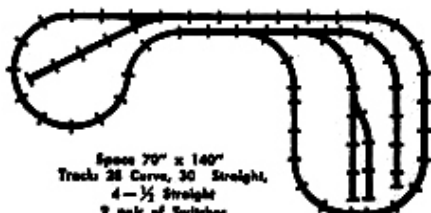
Space 68" x 90"  
Tracks: 23 Straight, 18 Curve,  
4 - 1/2 Straight  
3 pair of Switches



Space 50" x 90"  
Tracks: 32 Curve, 18 Straight,  
2 pair of Switches



Space 70" x 110"  
Tracks: 28 Curve, 41 Straight,  
3 - 1/2 Straight, 3 pair of Switches



Space 70" x 140"  
Tracks: 28 Curve, 30 Straight,  
4 - 1/2 Straight  
2 pair of Switches

### LAYING THE TRACK

You have planned your layout and decided where it will go. You have built the table, making sure it is strong and sturdy. Naturally, you are anxious to get started — to give those American Flyer trains of yours the railroading "highball" signal and have them rolling. So the next step is laying the track.

Before you sawed the first board or drove home the first nail of your layout table you knew what your track system would be. Thus, all you do now when you actually attach the track to the table is follow the diagram you have put on paper.

Remember that nothing in a model railroad is more important than the track upon which the train runs. It must be absolutely level and the rails must be in proper alignment if the train is to operate smoothly. Laying the track is an easy task, but don't let the simplicity cause you to do the job quickly. Take your time and do each step with patience and care. Your efforts will be repaid later.

### KEEP IT QUIET!

Barely 10 per cent of the model railroads are equipped to deaden sound with insulation, but all of the better ones do just that. Those that do have sound insulation repay their builders with a realistic "clickety-click" sound, just as with real trains, when the wheel passes over the rail joints.

Model railroads have experimented with sound deadeners for years, trying all manner of cork, felt and composition materials, but by far the most satisfactory has been rubber. Normally, this is cut in strips and placed between the track and the table top. However it has two chief disadvantages: the application is tedious and the result is unrealistic.

By far the best sound deadener, and one which actually contributes to the pike's appearance, is American Flyer Rubber Roadbed. Developed by American Flyer Research Laboratory engineers, this Rubber Roadbed has been enthusiastically received by model railroaders who want to eliminate the "drum-head" effect of trains running on track-on-plywood yet do not want to sacrifice appearance.



Fig. 15

One of the greatest boons is that the Rubber Roadbed can be installed actually faster than the time it takes to attach the track sections in the regular way. Fig. 15, illustrating both the straight and curved Roadbed sections, shows the recesses into which the track ties fit.

It takes only a few seconds to equip each American Flyer track section with Rubber Roadbed and installation time is saved because the Roadbed, being of non-slip design, need be held in place only with a couple of staples for each side of each section. If you have an automatic staple gun or can borrow one, your Rubber Roadbed track system can be laid with ease and care in a short time.

However, it may be that your budget won't allow the purchase of Rubber Roadbed right away, although you'll undoubtedly want to plan for it later on. If such is the case, your tracks can be mounted directly to the table top, fastening each track section with small nails or brads through the holes provided in each tie, or "sleeper". Make certain you don't tighten the nails so much that the rail sections are twisted out of line.

To complete the realism, if you attach the tracks in this manner, you can use American Flyer Track Ballast. Your American Flyer dealer stocks this item and it is very inexpensive.

### APPLYING THE BALLAST

Putting on the ballast can be done in a variety of ways, but probably the best is as follows. (Fig 16). Before your track sections are nailed to the table, lay the track sections, joined and connected, in the same position where they will be permanently fastened. Then, using a pencil, locate the ends of your ties. Now remove the track and connect the pencil marks you have made. This is your model railroad "right-of-way" and the area which will be ballasted.

This right-of-way is next coated with a sticky adhesive like glue or "water glass" (purchased in paint or hardware stores as sodium silicate). Paint, preferably gray, can also be used but the ballast should be applied before the paint starts to "set".

The next step is to attach the track sections, after which the American Flyer ballast is carefully sprinkled on the wet adhesive portion. You now have a real railroad pike, made doubly realistic by your American Flyer 2-rail track.

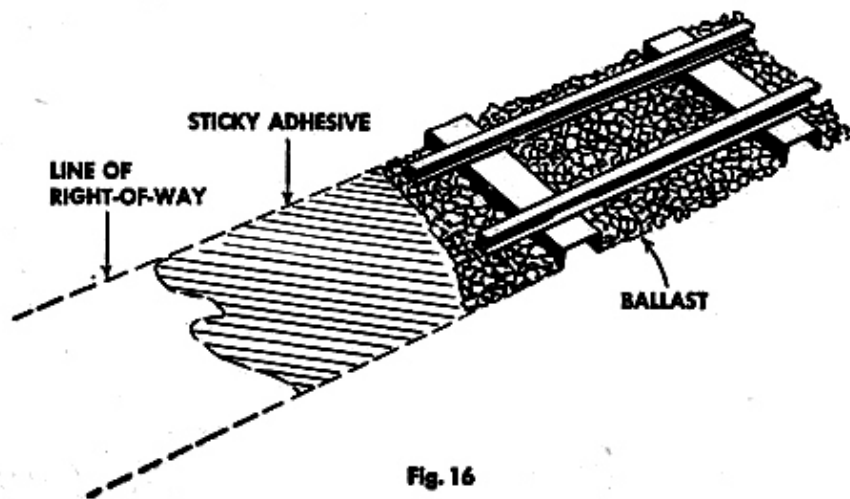


Fig. 16



## ACCESSORIES

Half the fun of running your trains lies in using the various accessories that make your model railroad just like a miniature of the real thing. Bridges, stations, towers, cranes, semaphores, signals and tunnels are all pieces of equipment that, someday, you'll want for your layout.

Recognizing the importance of accessories and train equipment, American Flyer engineers have built up a larger line of each than any other manufacturer. Thus you know that when you "go American Flyer" you have more cars, accessories and rail equipment from which to select.

If you're like most model railroaders you won't buy all of your accessories at once. Most pike fans plan which piece of equipment they'll add next to their layout and then save for it. In this way, building your layout into a model railroad empire is not only painless to your pocketbook but is actually more fun because part of the enjoyment is anticipating what you'll get next and where it will go.

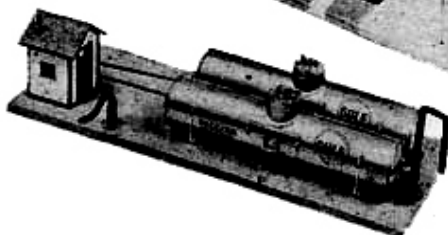
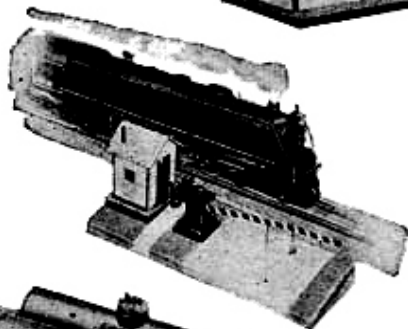
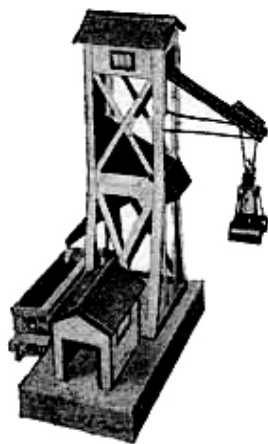
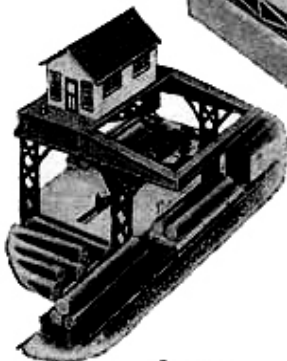
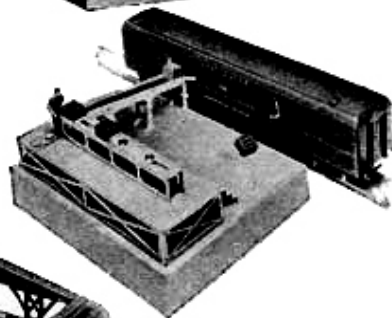
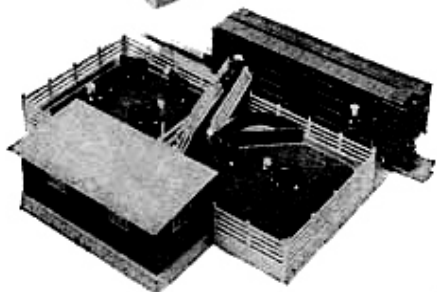
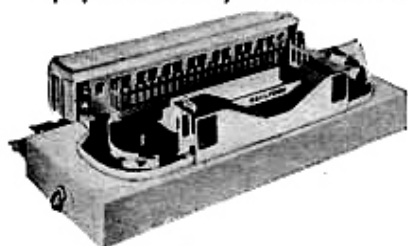
Planning ahead involves your accessories just as much as the rest of your layout. You may not be able to get your Trestle Bridge now but you'll want one later, so in landscaping your layout be sure you have a river or ravine which it can span.

Eventually you'll want an Operating Coal Loader or Seaboard Coaler for your railroad terminal, so be sure to allow enough room. Nothing in model railroading is more frustrating than to have no space for that one accessory you need to make your pike complete.

Best plan is to get the smaller, more necessary accessories at the beginning and let the larger remote control equipment wait. For example, an American Flyer semaphore, crossing gate, switchman's tower, wayside station, freight station, etc., are all typical of the fairly inexpensive "musts" for your pike.

The accessories shown on these pages are among the most popular in the American Flyer line. There are, however, dozens more in the American Flyer catalog, with complete descriptions and price. Your dealer will be able to guide you and make suggestions for accessories suitable to your own particular layout.

Accessories like the American Flyer selection on these pages will help to make your model railroad a complete world in miniature. Some of them are completely automatic in action; many others operate by remote control. All of them are patterned after real railroad equipment. See your American Flyer catalog for complete details.







One of the strongest appeals of model railroading is the unlimited opportunity it offers for improvement and refinement of operation. This is usually done after the pike is in operating condition and the trains are running; there is no need to delay getting your trains in action, although you may have temporary halts of service when you re-wire a section.

### PLANNING YOUR CONTROL PANEL

This is the most important single part of your model railroad, since it is the heart of your electrical system. Here is located the transformer which reduces ordinary house current to low voltage. Here are the switches and panel buttons which control your various accessories and track equipment. It is the control board which enables you, by remote operation, to route that long freight onto a spur line while the all-Pullman express roars by, to dump a scoopful of coal into the waiting hopper car, to shoot the crates down the Baggage Unloader ramp into the Box Car.

Think ahead and try to anticipate future needs when you plan your control panel. As with the rest of your layout, allow room for expansion. Keep your controls grouped as closely together as possible so that all switches and buttons will be literally at your fingertips.

### STYLE, DESIGN, TYPE

There are hundreds of ways in which a control panel can be planned and built, depending on the number of controls which will go on it, the space you have available for it and other factors. One particularly efficient and useful type is shown in Fig. 18, where the transformer and controls are mounted together, making a very business-like arrangement.

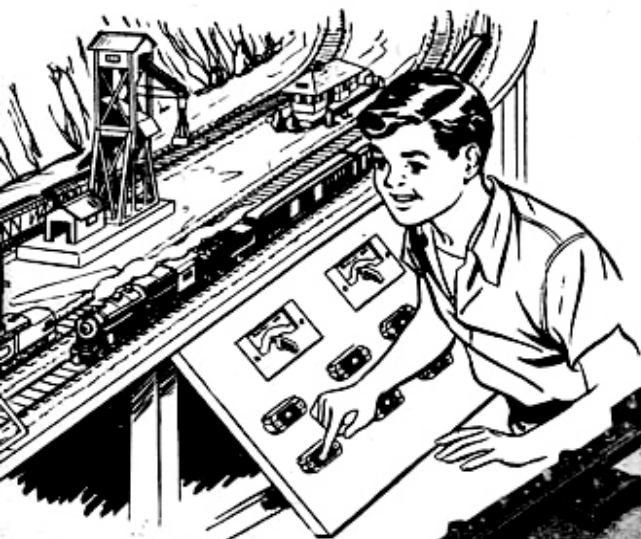


Fig. 17

Fig. 18 (below)  
Controls mounted  
at edge of table



## WIRING THE LAYOUT

When the framework is built and the track laid, it is time to start the electrical wiring. Obviously, this is another very important step in building your model railroad. Just as a train will not run properly on a poorly-laid track, similarly its operation will not be successful with a poor wiring job.

## WHAT KIND OF A TRANSFORMER?

The question most frequently asked by beginner model railroaders is: "How big a transformer should I get?" The answer, of course, depends on how many train sets you have, how many accessories, what *kind* of accessories, (that is, do you have a coal loader which consumes more current but usually operates when the train is standing still, or do you have such automatic accessories as a crossing gate which takes current PLUS what the train uses?) and the size of your layout.

It is impossible to set up hard and fast rules, although the chart below will help in a general way.

EQUIPMENT	CURRENT NEEDED
Steam Locomotive, small	20 watts
Steam Locomotive, large	30 watts
Diesel Switcher	20 watts
Large Diesel ("A" and "B" unit)	40 watts
Each lamp (cars and equipment)	3 watts
Operating accessories	10-40 watts

Another factor which makes rules impossible is that power varies according to locale. In some parts of downtown New York and Chicago, for example, current is direct (D. C.) instead of the usual alternating (A. C.). And in most homes, line voltage is lower at night than it is during the day.

In general, you should never figure on drawing more than three quarters of the rated wattage (you'll find this on the name plate) because, as the transformer warms up in use, its output diminishes.

On large train layouts, where you have two or three trains and a number of accessories, it is advisable to have one transformer for train operation and another for the accessories and equipment. This allows a more constant voltage for your trains and the drain by accessories won't affect the train speed or operation.

## STARTING THE WIRING

The first step in wiring is to make use of a "buss bar" system (see Fig. 19) which consists of two heavy wires from the transformer Base Post and 15-volt Post completely around the underneath side of the table. This wire should be run through holes in the table braces or in wire hangars or, if you prefer, it can be held in place by insulated staples. Using American Flyer "Rainbow Wire" will simplify the job, since you can trace the various colors — red, green, blue, etc., — to their source.

This "buss bar" now provides you with an available source of current everywhere on the layout and, as equipment is located and mounted on the table, the wires can easily be dropped through the table top and connected to this current supply. For Buss Bar wires a number 14 or 16 wire is suggested. The smaller the wire the greater the voltage drop.

## SPLICE IT RIGHT!

Poor splices create more trouble on layouts than any other cause. A loose splice, where one wire is joined to another, is a high resistance joint and the loss of current at such joints is very great.

In splicing, first make sure that all insulation is removed from the wire at the point of joining. If the wire is not already tinned (this is done in the manufacture) this can be done by holding a soldering iron tip to the wire and flowing a small amount of solder onto the exposed wire. Before tinning, it is wise to scrape the wire with a dull knife to remove all dirt and gum left by the insulation (Fig. 20). After tinning the wires, make a good mechanical connection between the two wires by twisting one around the other. (Fig. 21).

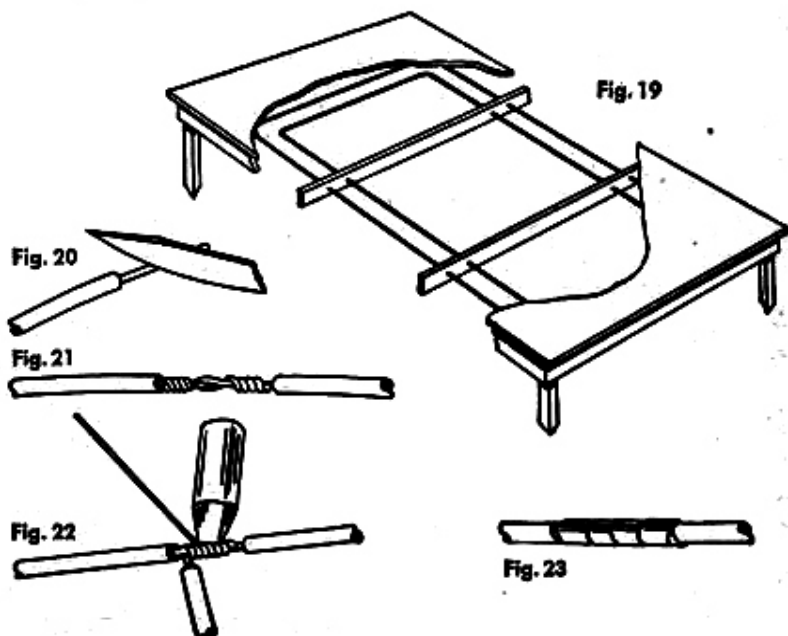
Next, hold the soldering iron to the connection and, using a rosin core solder, run solder into the joint to get a complete coverage of the connection. (Fig. 22). It is not good practice to use an acid core solder or any acid type flux since they are corrosive and hard to clean.

When the soldering is done be sure to insulate the exposed splice (Fig. 23) because bare wire is a potential trouble-maker.

Use friction or gum tape and cover the bare portion completely.

All connections to the track can be made to a regular track terminal, but in building a permanent layout these wires can be soldered directly to the rail. But be sure the connection is *well* soldered and kept on the outside of the rail so that the connection won't interfere with the wheel flanges.

In all layout wiring, observe this rule: **ONE STEP AT A TIME.** First make the track connection, then test the complete track by running a locomotive over it. If everything is operating properly, add one piece of equipment at a time and test after each addition. In this way, any trouble can be quickly found and corrected.



## LANDSCAPING

Here is the greatest challenge to the imagination of the model railroader. The possibilities are literally unlimited and the expense is usually low. It is also the most satisfying and rewarding part of making your model layout, for to see your plain wood-top table with its bare track system grow into a railroad wonderland of mountains, lakes, cities, farmlands, docks, rolling hills, plains and whatever your fancy chooses is a wonderful creative experience. This landscaping and texturing is what gives your pike realism and authenticity.

Landscaping can be as simple or as complete as you wish to make it. You can do a creditable job in an hour with some paint and a few bags of American Flyer imitation Grass. This will serve to cover the bare wood and create the illusion of your train right-of-way running through green fields.

Most of you American Flyer fans will not, however, be content with this minimum landscaping. Not when mountains and other topographical features take only a bit longer to make and, when completed, put you in the "professional" class.

## BUILDING THE MOUNTAIN

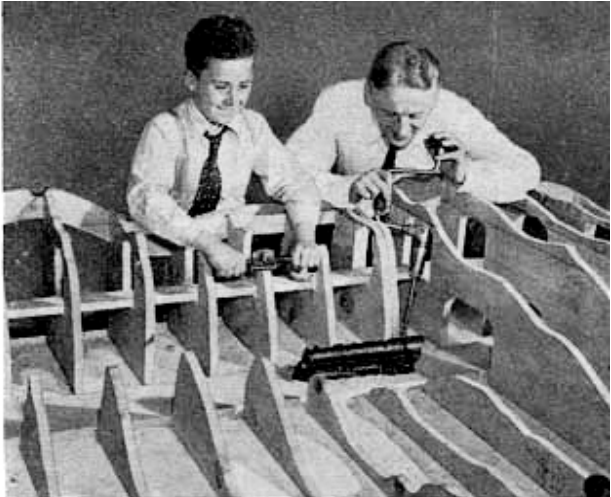
If you have an average home workshop in your cellar, the chances are that the only material you'll have to buy for making mountains are a few feet of ordinary window screen. Most workshops have a few odds and ends of scrap lumber lying around and this is what constitutes the mountain framework. In nailing the framework pieces together you don't have to worry about fancy carpentry, because screening and, later, texturing material will cover your handiwork. Be sure to make it strong, though, because some of the covering substances have considerable weight and must be well supported.

Fig. 24 shows a section of typical framework and, (Fig. 25), the same covered with wire mesh. This forms the outline of the mountain (the more rolling and jagged the better) and provides the surface to which the texturing will adhere. The best material for most model mountains is spackling plaster or brown plaster which can be shaped into such interesting natural features as gullies and rock formations and which has the advantage of durability.

After the plaster is blended to a reasonably mushy consistency (follow manufacturer's directions), soak into the mixture six-inch wide strips of burlap or similar rough-textured cloth. Next, lay these strips into position over the mountain framework and, before the plaster hardens, shape gullies and corrosion features with a penknife. Burlap sections should butt snugly but not overlap. For additional realism slather on the plaster more heavily in some areas and, in these spots, place outcroppings of stones. If you can obtain pictures or photographs of real mountains (check with your local library) make a study of mountainside formations and exposed rock strata so that you can obtain accurate detail. Another excellent material is brown plaster mixed with asbestos and applied as in Figs. 25 and 26.

If you prefer not to use plaster, papier mache makes an excellent material. Mix a batch of wall sizing in a bucket and add to this enough shredded newspaper to make a thick mixture. Let soak overnight and, the following day, apply in handfuls to the screened frame. When this dries thoroughly it is then ready for painting.

**Fig. 24.** First step in building a mountain (in this case a railroad cut and tunnel) is making the rough form. Best material is  $\frac{3}{4}$ " plywood jig-sawed in irregular shapes as shown and nailed to base.



**Fig. 25.** Wire mesh is next tacked or stapled over the form. Do not pull it taut, but allow slack so it can be shaped and bent between the forms to make gullies and ravines. Material troweled on wire is mixture of brown plaster and asbestos.



**Fig. 26.** Here mountain is half completed. Before plaster mixture is dry, gullies and other topographical features are sculptured with penknife. When fully dry, mountain is painted and textured.



If your mountain can be built out from the wall, as in Fig. 27, the trouble of constructing a framework can be eliminated. Heavy cardboard, of the kind normally used in posters and window displays, is cut into strips and bent to make the desired contour. Touch a spot of glue onto each end and tack or staple into place. This is especially important when putting on outcroppings and cross pieces.

Next, tear old newspaper into pieces about four inches square, dip into a thick solution of starch and water, and lay over the cardboard framework in two thicknesses. Paper, which is easy to work when wet, should then be wrinkled and form into natural contours. Allow this to dry completely overnight. It will be strong enough to hold plaster.

The next step is to brush on a thin coating of plaster, which has been mixed to the consistency of heavy oil paint. Dip pieces of wadded paper into the plaster and use them to round out contours. Be careful not to overload with plaster, because too much weight will cause the framework to sag. Let dry overnight.

One more coat is necessary in order to do the finished modeling. This time mix the plaster to the consistency of putty and use to form rocks, retaining walls and cuts. Into this you can also sculpture gullies and rain channels.

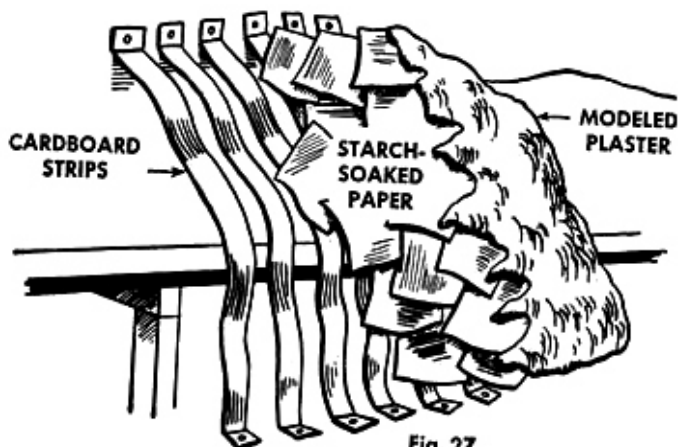


Fig. 27

20

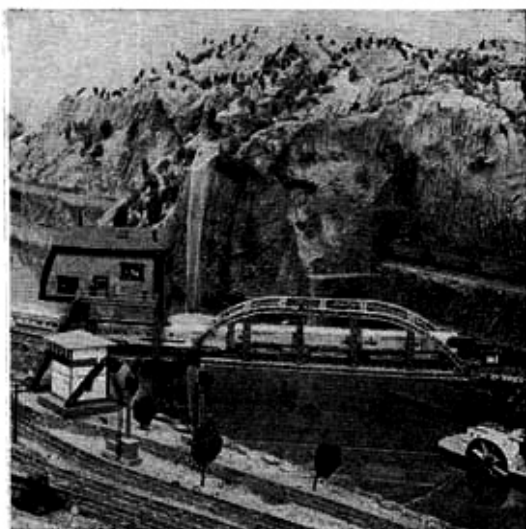


Fig. 28. Mountain constructed as sketched above appears like this when finished. Painting and texturing completes the job.

## PAINTING THE MOUNTAIN

If you've made your mountain properly it will look pretty realistic even before it is painted, but this resemblance to the real thing is nothing compared to what you will see after the application of colors.

Remember that the colors used by Nature are many and varied. There's no such thing as a mountain that's a solid green, or brown, or blue. Rather, it's a blending of all of these colors plus several more: reds and yellows, blacks and violets, etc. You'll also need to use plenty of earth colors: burnt sienna and various hues of brown and sepia.

If you've used plaster as the basic material for your mountain you must prepare the surface by giving the mountain a coat of sizing, which will prevent the plaster from soaking up the paint like a blotter.

Before you apply the colors to the mountain, try them out on a scrap of wood or a piece of cardboard to see how they'll look. The paints, if you use tubes of ochre which can be purchased in most paint stores, must be diluted and mixed. At the bottom of the mountain use browns and greens, blending one into the other, and progress into blues and violets as you near the peak. As you work up the mountain weaken the intensity of the shades so that you switch from browns to blues gradually. If you can find a color picture of a mountain in a magazine, study it first and see how the trees, rocks and bare earth of a mountain are blended skillfully by Nature. If you want to create the illusion of distance use more blues to arrive at a hazy effect.

Almost any kind of soft brush is suitable for putting on the paint, but probably the most satisfactory is a three-inch brush for the large areas and a small artist's brush (you can get one in the 5 & 10) for the recesses and details.

You'll want to have a few patches of "dirt" here and there, because that's what you'd find on most mountains, especially when the timber line is approached. Dried coffee grounds are excellent for this, and they can be held in place if sprinkled over wet or tacky paint. Also, your fields will look more like real fields if you scatter American Flyer imitation green grass over the green paint while it is still wet.

If your mountain is near your tracks you should use plenty of "dirt" and crushed stones (American Flyer track ballast) near the railroad right-of-way.

Above all, don't over-do the job. Don't make the mountain a rainbow. Don't make the surface a kaleidoscope of colors. Don't make your shades too *strong*. Keep the colors *soft* and blend them. That's what Nature does.

## TREES AND SHRUBBERY

No terrain, unless it's a rolling desert, is complete without trees and bushes. They're not hard to make and they'll give your landscape a finished, growing look.

The best material of all is called "Baby's Breath" and you can buy it in most florist shops. In case you're not familiar with it, Baby's Breath is a weed and after you blow or shake the blossoms off (they flick off easily because the material is quite dry) you have what appears to be miniature tree sprigs in wintertime. These sprigs will be the branches of your finished tree, so the next step is to find the main trunk and larger branches.

A twig, of the right scale height, will serve admirably. (Fig. 29). Gluing Baby's Breath to the twig is tricky, because the surface is hard to

work with, but fine wire or even thread will work fine. Arrange the Baby's Breath branches so that they splay out naturally and then paint the entire tree — brown for maples, gray for beech, etc. If you have a spray gun for this job, fine. If not, you can dip the tree, but be sure to thin the paint considerably first so it won't lump up on the tree.

Another good material is Norwegian Lichen Moss, carried by most hobby shops. This is a green sponge-like substance and is usually sold already tinted. You can use it to represent bushes (Fig. 30) or as trees (Fig. 31) and is also fine for hedges.

Sponges also make excellent trees and are inexpensive to buy. Dye them green by soaking them for a few minutes in a Tintex or similar dye solution and then, while the sponge is still wet, tear off pieces about the size you want your tree to be. Don't cut with scissors, because foliage doesn't have a hard, definite line, but tear with your hands for a rough, ragged effect.

If you want to create an Autumn scene you can daub your completed trees with reds, yellows and other Fall hues, without too much trouble, and the finished result will give your layout a good deal of color.



Fig. 29



Fig. 30



Fig. 31

## LAKES AND RIVERS

There is nothing that adds such a finished touch to your model railroad as a river, stream, pond or lake. Making these with real water is not often practical because of the stagnation, dampness, smell, tendency to soften plaster and rusting of metal braces and wood screws.

However, you can easily make a lake that will be almost as real as one of actual water and the cost will be just a few pennies.

Glass is the basic material and the type you should buy is "ripple" or office glass. This kind is very shiny and wavy on one side, while the reverse side has a pebbled surface and deeper waves. You can get this glass from any glass dealer for a few cents, and chances are he may have some odd-shaped broken pieces around you can have for nothing. These will be suitable, because you don't want geometrically square or rectangular bodies of water, anyway. Lakes and ponds are irregular in shape.

The glass should be mounted on the bare table, shiny side up, so that your terrain of plaster or papier mache can cover the edge. Large headed tacks are fine for holding the glass into position, but you only need a few; you just want to prevent shifting of the lake. Tap the tacks into the wood on the outside edge of the glass with the large head holding the glass down.



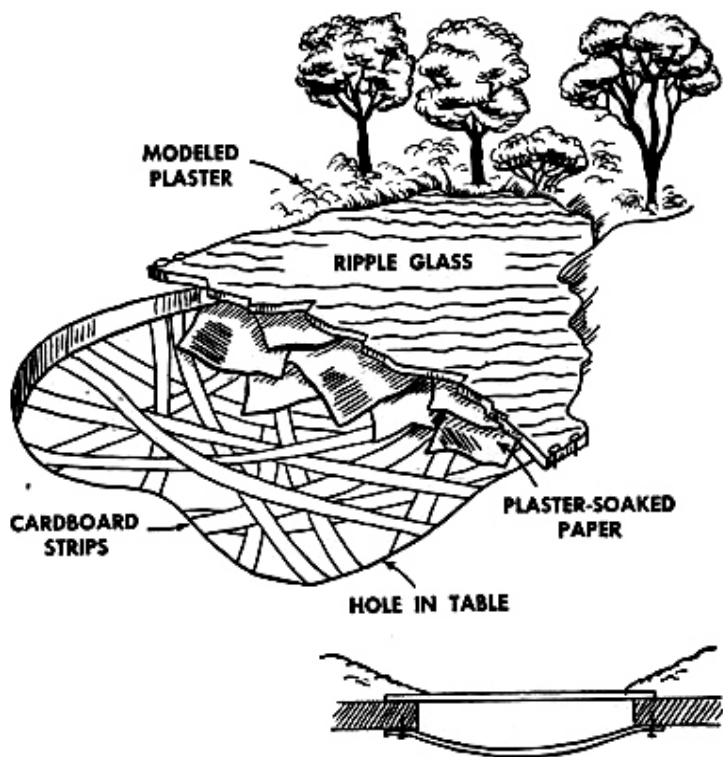


Fig. 32

Before you do this, paint the underside of the ripple glass various shades of blue and green, similar to the hues you'd find in real bodies of water. Near the shoreline the water would be a muddy blue and, out in the deep water area, a clear, lighter blue. If you want to suggest breaking waves, blend in some white streaks along the shore.

When the underside of the glass is dry, install as described above and cover the glass edges with your plaster shoreline.

If you can spend some extra time, you can build an even better glass lake (Fig. 32) realistic enough to fool a granddaddy trout.

To do this requires an open-type layout, so that the lake bed can be lower than the railroad tracks. If your table is a solid top kind, you can make it open by cutting out an area with a keyhole saw. Use a drill first to get started.

This open area can then be criss-crossed with cardboard strips over which squares of paper soaked in spackling plaster are placed. When this hardens your lake bed is ready for painting.

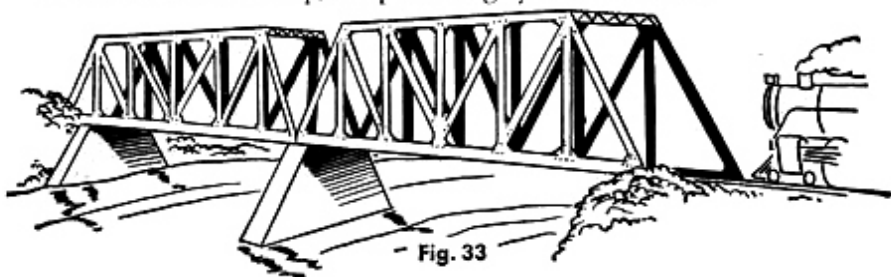
Use either watercolors or oils and paint the deeper middle portion darker than the shoreline area, which should be a lighter greenish-yellow.

The glass can now be laid over the lake bed and secured, after which the plaster shoreline can be molded to hide the broken edges. Shrubs and trees along the water's edge complete the job.

## BRIDGES

In many railroads throughout the United States you can't travel more than a few miles before you cross a bridge. This may be a small trestle-type that spans a glorified culvert, or it may be more elaborate and the span greater.

One of the most common is the all-metal Trestle Bridge, used for overpasses or where the railroad track must span a narrow ravine or stream. These are frequently used in multiple by real railroads, with the center end of each bridge supported by a concrete pier. This arrangement is easily duplicated on your American Flyer railroad (Fig. 33) and is fairly simple to set up. The center support should be a wood block, sawed so that it is wider at the bottom than at the top, and painted a grayish cement color.

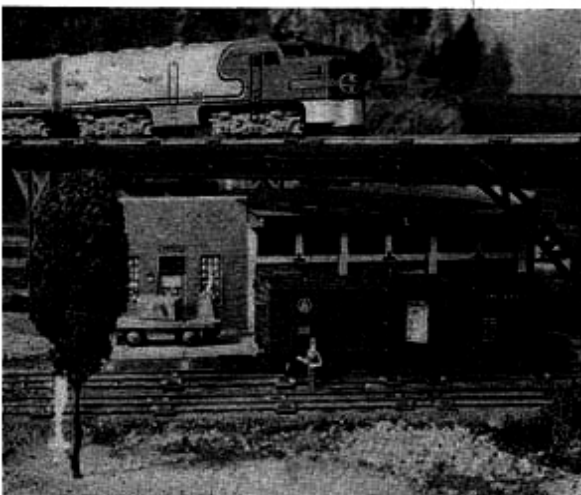


Trestles, either of the double or single variety, are the most spectacular bridges for the average model railroader and your pike can use at least two of them, especially if you have a river which they can cross. You'll find a variety of bridges illustrated in the American Flyer Train catalog and all of them are reasonably priced. Some have extra features like a revolving aircraft beacon light which operates automatically from the heat of the bulb and which alternately swings a red and a green ray.

Bridges don't necessarily have to cross a gorge or a river, although if you have such a topographical feature the realism will be greater. Even a bridge which slips under the track on a flat layout will still be effective and increases the interest of your train trips.

One of the most successful types of bridges are those built with Erector set girders. Fig. 34 shows one of these spanning a busy freight yard. The open-type Erector girders, with their authentic construction, give the scene a "real" look that makes a bridge built with them very effective.

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**Fig. 34. Because of the realistic appearance of their girders, Erector parts make successful bridge. Here elevated section spans a bustling rail center.**

## ROADS AND HIGHWAYS

The kind of landscaping you have will decide the road surface. City and suburban roads are, naturally, different in appearance from the rural variety and yet each are easy to make. The simplest way to create a hard-surfaced macadam or concrete road is to outline the area in pencil, paint between the lines with oil-base paint tinted to a realistic shade (light buff for concrete, black for macadam) and then landscape up to the edges.

Complete the job by painting in white the familiar center line on the road. Some states use a solid single or solid double "no pass" line around curves and on grades and open dotted-lines for the rest. You can duplicate this on your own highways.

Many new roads today have a rough, non-skid surface which can be achieved on your miniature highways by using medium-coarse grit sandpaper, cut in strips, for the road and then painting this surface a flat black. This, too, should be lined in white down the center. (Fig. 35.)

Country or "back" roads (Fig. 36) are best made by sprinkling fine sand or gravel between the boundary areas, smoothing it out and then scribing it with a stick or pencil end to create ruts and wheel marks.



Fig. 35

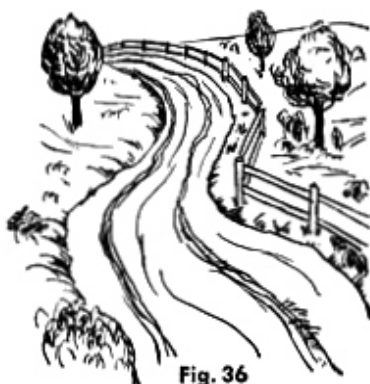
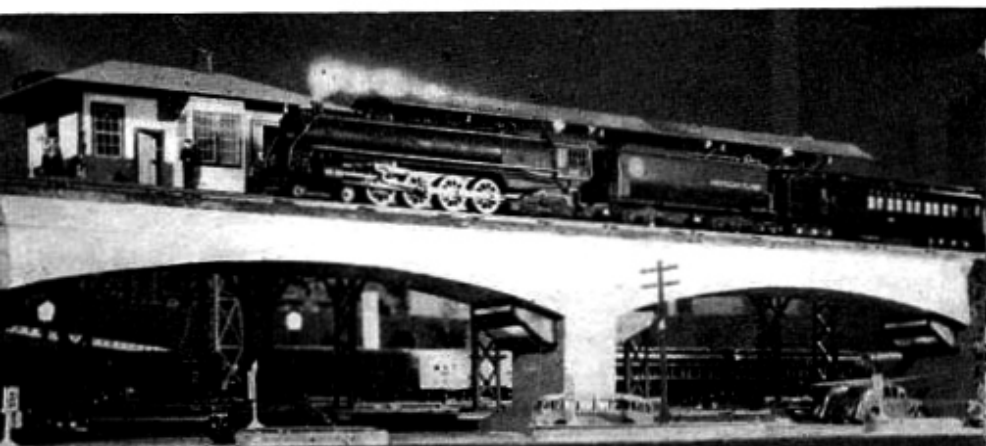


Fig. 36

**Fig. 37. Variety of track levels increases railroad fun. Passenger train pulls up to station on upper level supported by wood piers and Masonite facing, painted gray.**

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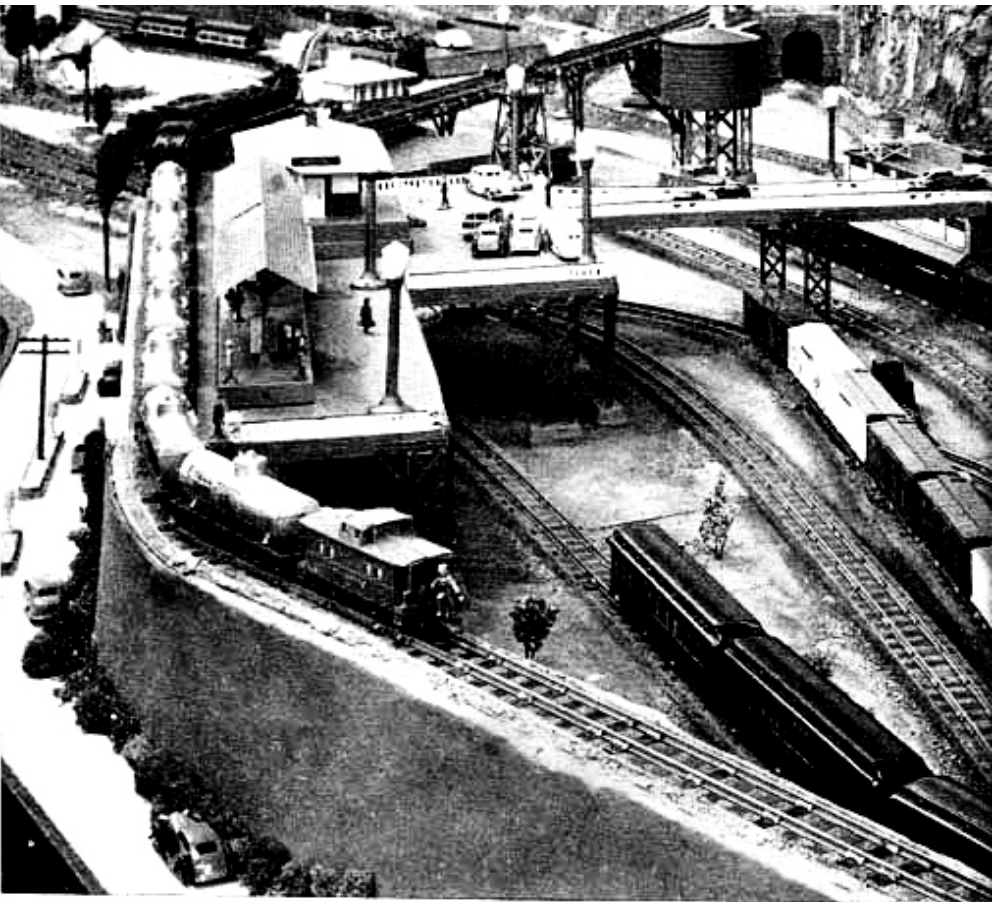


Fig. 38. Here's a birds-eye view of the elevated track level shown in Fig. 37, on the previous page. Note American Flyer Boulevard Lamps, Figures and other accessories which add to realism. Raised track level was made by supporting 1 x 3-inch pine with rough framework. Sides are burlap strips soaked in plaster (page 18) and painted.



Fig. 39. Many a model railroad is spoiled by an unsightly background. If your layout is against a wall you can achieve true-to-life effect by mounting photographic enlargements on wall. Here New York skyscraper scene provides metropolitan atmosphere.

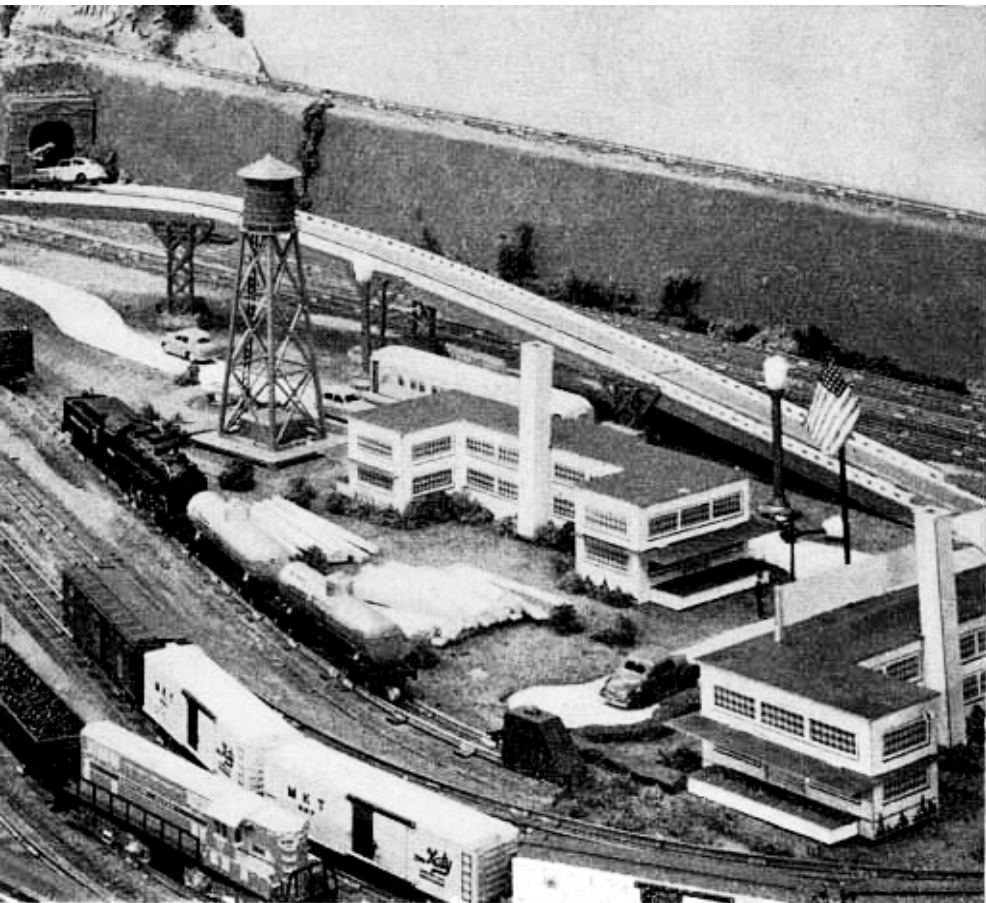
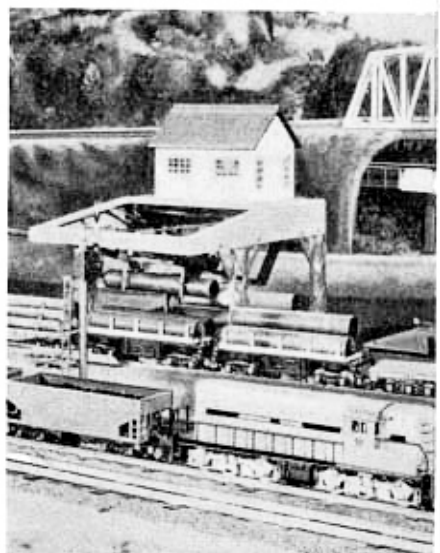
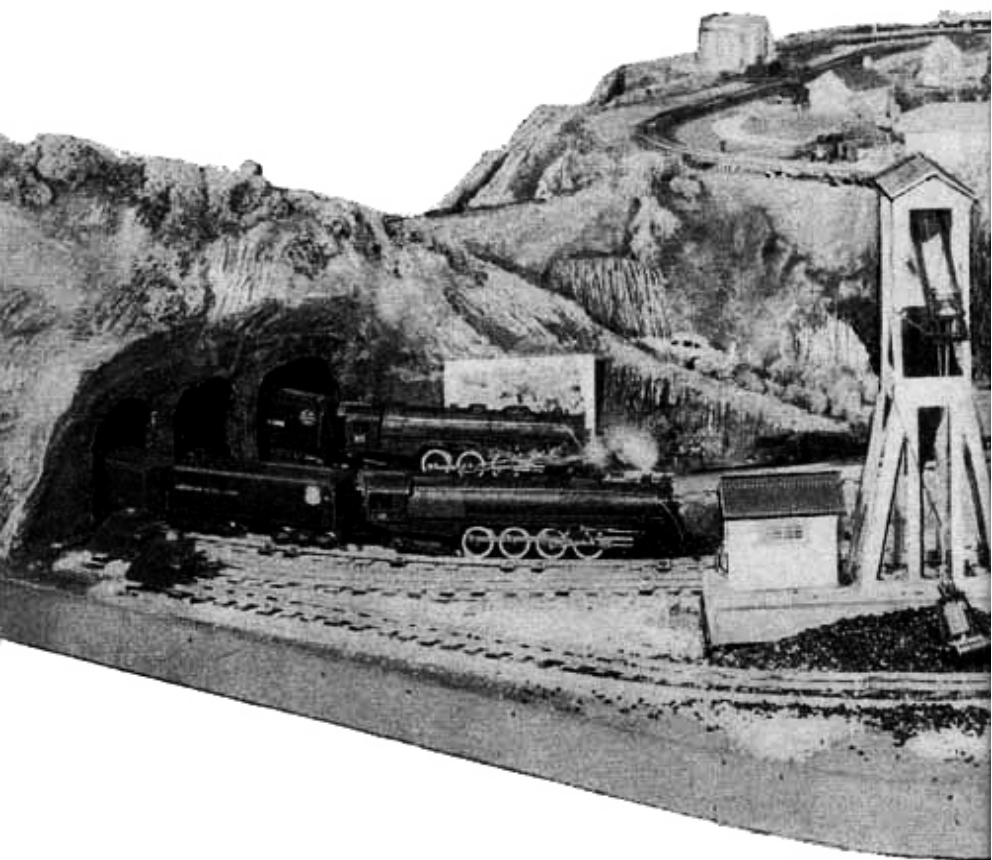


Fig. 40. Factories, farm houses, homes and other buildings make your American Flyer pike "just like real". Cigarette cartons, cracker boxes, etc., are fine for basic construction. Ink-in or paint windows, doors, etc., and glue on such features as roof. Add loading platforms, chimneys (dowels for round type, 1" square for other) and landscape.

Fig. 41. Real railroads have many different types of over-and-under track and a variety of levels. Here, this American Flyer pike has same thing in miniature. In background, trestle bridge passes over girder bridges, while spur to log loader is higher than mainline track.



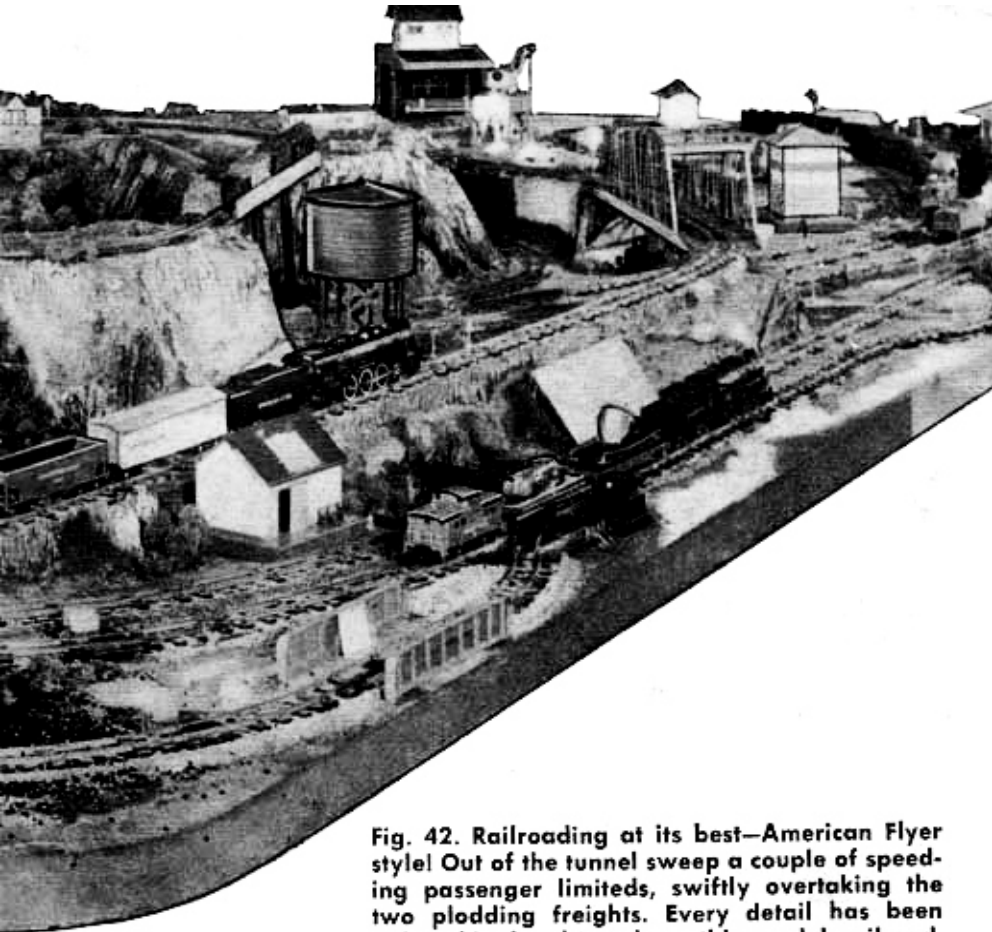


## CONCLUSION

There is much that has been left unsaid in this booklet, because the field of model railroading is so vast and so all-inclusive that to cover it completely in less than several hundred pages is quite impossible.

However, we have tried to present you with some ideas and to launch you in what is one of the world's most fascinating and educational hobbies. Railroading with American Flyer trains and American Flyer equipment is twice the fun because, right from the beginning, everything you buy is realistic and built to scale. From the two-rail track to the intricately-detailed locomotives, you'll find American Flyer is just like real railroad equipment scaled down to  $3/16$  of-an-inch size.

When you're in New York we urge you to visit the wonderful Gilbert Hall of Science at Fifth Avenue and 25th Street and see the magnificent model railroad there. And for now — happy railroading!



**Fig. 42. Railroading at its best—American Flyer style! Out of the tunnel sweep a couple of speeding passenger limiteds, swiftly overtaking the two plodding freights. Every detail has been painstakingly planned on this model railroad, which was several years in the making. As with a real railroad, the track system grew slowly and equipment was added when it was needed and when there was a function to be performed. With its broken terrain and variety of track levels, the train runs are both interesting and realistic. Note that nearly every category discussed in this book is included on the layout: building the table, making hills and mountains, landscaping, texturing, painting, making the roadbed, wiring and many other aspects of creating a miniature railroad.**