WITH LARGE FREE SUPPLEMENT DESIGN SHEET

Hobbies WEEKLY

CONTENTS

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A Simple Modern

MARBLE BOARD

MOST readers have had, at one time or the other, one of those glass-topped puzzles in which tiny steel balls have to be rolled into specified holes. Here, however, is a man-size modern version, guaranteed to give hours of fun and amusement, and offering scope for the maker's individual ideas.

Fig. 1 shows the completed model, whilst Fig. 2 shows, in a cutaway view, the "works". There are two "floors", A and B, the first forming a sort of false bottom and the second, the bottom proper of the tray. The upper floor has several holes in it. We have to try to get a marble or *large* steel ball-bearing into the end hole, which is ringed with, say, white paint.

The Game

If the ball goes into any other hole, however, it falls through into the bottom part of the tray. It can be guided by means of the slanting strips, F, through a hole in the lower part of a partition, E, then up either of the ramps, G, through one of the upper holes in partition, E, and so into play.

Scattered about the board are other hazards: pins, etc., of which more later.

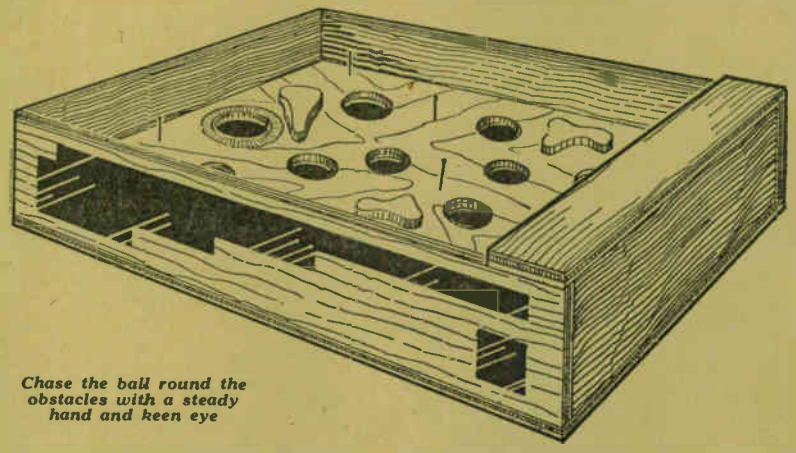
Plywood is ideal for making this model, but if unobtainable, such cardboard as leatherboard or composition board is quite suitable. A piece of plywood with a twist or warp can be used with good effect for the upper floor, A. A piece with a bad knot can also be used. The knot is filled with plastic wood, and when set, smoothed off. The filling will not be perfectly flat and if the ball passes that way it will be deflected, forming another hazard.

No definite dimensions will be given since the size of the model will depend on the wood available. A completed tray measuring about 14ins. by 10ins. would do very well, but it can be smaller. It should not, however, be unduly large and heavy, as it has to be held between the hands when manipulating the ball.

The Floor Piece

The clear space between the two floors, A and B, will be about 1in. and the space between partition, E and end C_1, will also be about the same. Start by cutting floor, A. Drill some holes in it as shown. These need not necessarily be all the same diameter. The smallest of them will be just a little larger than the diameter of the ball used.

No holes should come over the



Chase the ball round the obstacles with a steady hand and keen eye

triangular pockets caused by the strips, F. Floor, B, will be about 2ins. longer than, A, and about ½in. wider. The two floors are separated at one end by strip, D, which can be about ½in. wide.

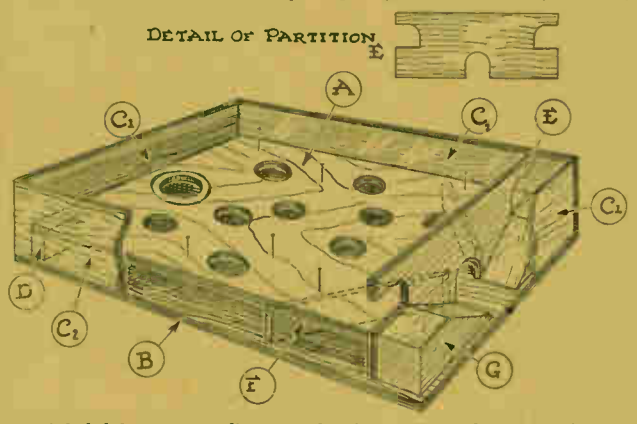
Careful Cutting

Partition, E, is the only part which calls for much care in cutting. In the centre at the bottom, is an opening about 1in. square. (The top of the arch reaches to the underside of floor, A).

There are, as will be seen by reference to the diagram, two openings at the upper sides. These are also about 1in. square, and the lower edge of the opening comes level with the upper surface of floor, A. The size and shape of the ramps, G, can easily be found.

By the way, in a small model there is no need to have two ramps. Move the lower opening to one corner and the upper opening to the corner diagonally opposite. Make a ramp to carry the ball from one floor to the other.

The sides, C_1 and C_2, are easily added. They will be, roughly, 2½ins. high. As already mentioned, if a ball falls through a hole, it can be brought into play again by a tilt and a twist of the board.



A helpful cut-away diagram showing parts and construction

The drawings show hazards formed of nails and of small pieces of fretsaw waste, whilst we have already mentioned the fact that the floor, A, need not be flat and smooth, but twisted, with slight bumps and depressions. Students of local pin tables will get ideas for extra hazards, e.g., little spring buffers. A compromise should be struck between making the game too easy and too difficult.

For this reason, do not overdo the number of holes. Drive in the pins (or nails) lightly, and attach the "bunkers" lightly, too, so that a trial can be made. They can afterwards be made permanent if satisfactory.

Suitable Colouring

As regards finish, the top floor, A, will probably look best in natural wood, varnished. The sides can be painted, and if desired, an ornament painted on. The ornament can also take the form of an overlay. Transfers or stencils are other possibilities. A glass top could be added, but there is always the danger that it will be broken.

The inside of the tray (between the two floors) is painted black. Strips F are, of course, fitted to one floor before the other is added. In the smaller models, solid triangular blocks of wood can be used.

There is no need to number the holes, as only one hole is the winning one. As hinted in the introductory paragraph to this article, however, other arrangements can be made.

For example, the board, painted green (and by means of plastic wood, etc., given an uneven surface) can have nine holes, numbered consecutively 1—9 to represent a 9-hole golf course. The idea is to get the ball through each of the holes in succession. Each time it goes down the wrong hole, one "stroke" is counted. Players can endeavour to reduce their handicap in which care and judgment will help.

A Patchy Mirror

I HAVE a mirror which has gone dull in patches. Can you explain the cause of these patches and how I may remedy them? (E.H.—Birmingham).

THE blemishes on the mirror are probably due to either old age, dampness, or to mechanical friction, resulting in air reaching the film of silver which forms the actual mirror surface, and causing it to oxidise or turn dull and black.

There is no remedy for this except to have the mirror re-silvered, which would have to be done by a firm who make mirrors or specialise in mirror silvering.

Non-porous Balsa

IS there any preparation marketed for treating balsa wood to render it non-porous, or whether first painting with size and then emulsion would serve this purpose? (W.R.S.—Ipswich).

ASSUMING that the filling is only required to enable a smooth finish on the surface, it would be best to use any good wood grain filler, or a paste made of whitening and gold size. Apply a coat, let it dry, then rub down with fine glasspaper. Repeat the treatment if necessary, then use an undercoat paint and when dry, apply the enamel finishing coat.

Doll's House Lighting

WITH reference to my modern doll's house, could you give me information regarding the most economic lighting system? Is a transformer necessary, and if so, explain type? (G.M.—Coatbridge).

QUITE economical running should be possible if .06 amp. bulbs are used. Ordinary flash-lamp bulbs are not very economical. A small transformer could be used for operating the bulbs from the mains (if the latter are A.C.). This transformer should have a primary suitable for the mains (usually 230 volts, 50 cycles). The secondary should give about 2 to 6 volts at 1 to 4 amps., and bulbs of suitable voltage used.

Crystal Set Loud Speaker

PLEASE tell me if I could fix a loudspeaker on to a crystal set—if so how? (E.C.—Islington).

A HIGH impedance speaker (by which is meant a moving-coil speaker with transformer, or moving-iron speaker) may be connected directly to the crystal set. But volume will be small and insufficient for most normal purposes. The only way to overcome this is to use an amplifier, which must be driven from mains or batteries. Such an amplifier was described in Hobbies Weekly, dated April 14th, 1948.

Riveting China

I AM in need of materials and instructions for riveting china. (S.H.—Dominica).

THE only materials needed for riveting china are an archimedian drill, some small diamond pointed drills, and some soft copper wire about No. 20 and No. 18 gauge.

Holes are drilled through the china with the drills in the usual way, but preferably using turpentine as the lubricant.

The holes are located opposite each other and about ¼in. from the broken edges. The parts are then placed in position and can if desired, be cemented with "Durafix" or other good china cement. The copper wire is then laced through an opposite pair of holes, and drawn tight, and the surplus trimmed off and the ends turned down flat, thus forming a "stitch" or rivet to hold the two parts.

Full size patterns on page 59 for making these two

SMALL WORKING MODELS

A FEW weeks ago (on Sept. 29th) we included in these pages some little working wooden models which could be worked off an electric motor. This week we add another two, to operate the same way, as shown in Fig. 1. In the machine on the left we see a power hammer operated by pulley and cam, while that on the right is a simple stamping machine worked direct from a wheel or pulley connected up to a crank rod and vertical spindle.

Both models are easy to construct, and make an interesting addition to a number of such-like models to be driven off a common pulley shafting. The latter is linked up with an electric motor or model steam engine. Wood ¼in. thick is used for all parts of the two models here shown, and the cutting can be done with the fretsaw direct from the patterns printed full-size on page 59 in this issue.

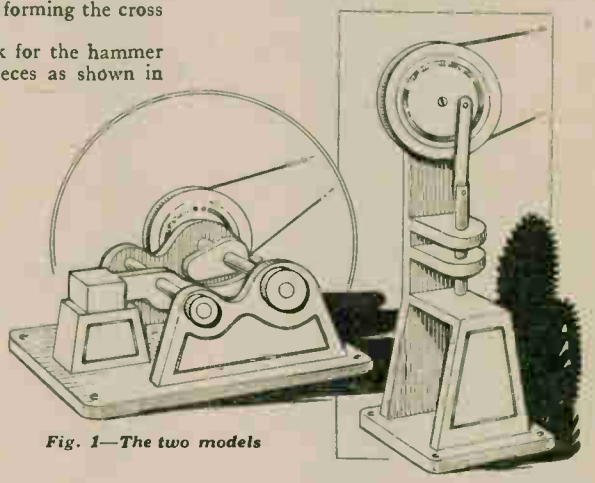


Fig. 1—The two models

The Hammer Model

In making up the hammer model, we have the base, A, which is given full-size on the pattern sheet. This outline, including the three mortises, can be either drawn direct on to the wood or the pattern stuck down to it. When cutting the mortises, keep the saw inside the lines to ensure a tight fit for the ¼in. thick uprights.

The two uprights, B, will next be made, and here again the full-size pattern provided may be stuck down to the wood. When it is cut, the edges should be cleaned and the piece then used as a template for marking round to form the second upright. See the two holes are exactly opposite and accurately cut. They should be a full ¼in. diameter so that clearance is allowed for the ¼in. round rod forming the cross spindles.

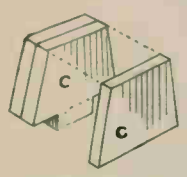


Fig. 2—The block

The striking block for the hammer is made of three pieces as shown in Fig. 2. The middle member only has the tenon which will fit into the mortise in the base. The outline of the middle piece is given at C on the pattern sheet. The two side members can be outlined on the wood from this cut-out piece. Glue the three together and rub their three edges flush and even before gluing in place.

The hammer is made from the piece, D, on the pattern sheet, with two small blocks of ¼in. wood glued on each side as Fig. 3. Cut off a length of ¼in. diameter rod 2½ins. long and thread this through one upright. Then put on the lever, D, and continue to push the rod through the second side.

See the lever, D, is central on the rod before adding and gluing on the washers which might be ¼in. or ⅜in. diameter. The rod for the pulley and cam is 2½ins. long and its two washers and cam and pulley wheel are shown assembled in Fig. 4.

Fig. 3—The hammer

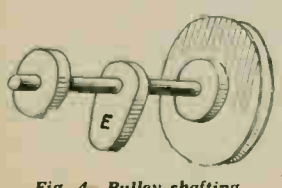


Fig. 4—Pulley shafting

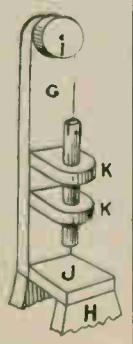


Fig. 5—Pillar and crank

Pulleys and Washers

First make the pulley, 2ins. in diameter, with a groove made in its edge by means of a rat-tail file, or again a triangular file would form an efficient groove. Next cut two washers about ⅞in. in diameter with ¼in. holes in the centre. The cam is shown at E on the pattern sheet and the hole in this should make a tight fit on the rod. First glue one of the washers to the ready-prepared pulley wheels, and then glue one end of the rod into them.

Thread the rod through one of the uprights, B, and put on the cam. After again threading the rod through the further upright, B, glue on the second washer. Let the cam, E, be central between the uprights, B, so it forms contact with the lever, D, which rises and falls as the cam revolves. Make all edges smooth and clean surfaces of working parts before assembling them.

Our second model is somewhat simpler in construction and make-up than the first one. The illustration on the right, Fig. 1, clearly shows this. The square base is shown on the pattern sheet at F, and the outline and two mortises are again cut with the fretsaw. The two uprights, G and H, are now cut, noting that the two mortises, K, K, are on the scant side, so a firm fixing is made when the two parts, K, are glued in.

The top of the pedestal is formed by piece J, an oblong of wood as shown on the sheet. A plain disc, I, is next cut and glued at the top of upright, G, this forms a substantial base to which to screw on the pulley wheel.

The pulley wheel is 2ins. diameter and has a groove made in it in a similar manner to our previous model. It is attached to the upright by a countersunk screw, the head of this keeping flush with the surface of the wheel so that the crank bar may travel round uninterrupted. At a distance of ¼in. from the centre of the pulley wheel, bore another hole. This is to receive the small round-head screw which fastens the crank bar.

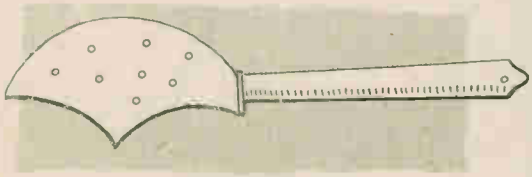
Crank and Plunger

This crank bar is made from a piece of strip brass or tin about 2ins. long and ¼in. wide. Round off the ends of this and either drill or punch holes near the ends, file down and make smooth. The plunger is shown at L on the pattern sheet, and it consists of a piece of ¼in. diameter rod with a slot cut at one end. A hole is drilled through at right angles to it to receive one end of the crank rod. The plunger, L, should fit loosely into the two parts, K, so it can rise and fall with the movement of the crank and pulley wheel. A small brass pin or small nail is passed through the plunger and the metal crank.

The models at completion may be painted up in bright colours and panelled in line in places to give an added effect.

Followers of our metal-work articles can make

A FISH SLICE



THIS useful slice — curved to fit into the edges of the frying pan, will be very handy when cooking eggs or fish and it can be made without much difficulty. The actual drawing out is rather more ambitious than required in your previous jobs, but with strict attention to the accompanying diagrams you should be able to develop the pattern quite easily.

The slice must be constructed in two separate sections, the flat—or actual slicing part—and the handle. It will be much easier if you completely finish each part separately before the final assembly.

The Slice

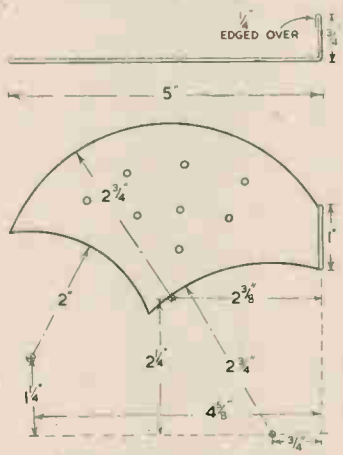
For this part you need fairly stiff material. It is no use if the weight of an egg or piece of fish causes it to bend, although you don't have to go around testing various pieces with an egg—just use your discretion!

Having chosen a suitable piece, the next job is to get the pattern transferred from the drawing to the actual metal.

Start with a central line and remember that the centre of the handle and the extreme tip of the slice must both lie directly on it.

Using a pair of compasses, (dividers, if you have a pair), mark off the shape with the aid of the various radii as shown in the diagram. Remember to mark out the pattern for the holes while you are on the job, using the same radial point as for the large back curve of the slice. It is better to punch your holes at this stage, before cutting out, as the extra body of metal will help to prevent the distortion caused by the punching operation.

Rest the material on a piece of lead or hard wood, and punch holes, filing off burrs afterwards and lightly tapping flat with the hammer. See the holes are of equal size and equally spaced out or the finished job will not have a workmanlike appearance.



Elevation and plan of blade

Having finished the hole pattern, cut out shape with shears and edge over the ¼in. piece in the bending blocks, flattening down on bench iron afterwards with a mallet. Having done this, the ¾in. part must be bent at right angles, again with the aid of the bending blocks. This will form the base or supporting piece for the handle.

The Handle

The next job is to make the handle itself. For this portion you must use very thin material, for reasons which will be obvious later on. The handle is of tubular design and tapering from ⅜in. down to ⅛in., where it joins the slice. Mark out the pattern as per figure, and cut out.

The actual bending, providing your material is thin enough, can be done with the fingers, and in order to form the tube it can be wrapped round a poker, or curtain rod. You will find, however, that when bent, it will not form a smooth tube owing to the presence of "bending lines" and to counteract these the material has to be "broken in".

You do this by straightening out after the initial bending, and wrapping round your poker in the reverse direction. Straighten again and bend as the first time. You will find that, the metal now having been "broken in", it will bend into a fairly smooth tube. There will be a slight lap along the joint and this must be well soldered right along its length.

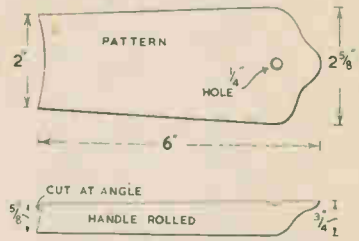
Strengthening

If the material is springy and has a tendency to open out, you will have to grip it with a pair of pliers and tack at both ends with the soldering iron. In this case, when you start soldering, do the rest of the joint first before going over the tacked part, or it will simply spring open again. Smooth the joint with a file and emery paper.

At the large end you have a protruding portion and this must be punched so the slicer may be hung up when not actually in use.

The bottom, or narrow end, must be cut at an angle to ensure that the handle, when in position, will be slightly elevated. This is very necessary so the hand may be clear of the edge of the pan when using. File straight so that the end lies flush on the supporting piece and with the necessary elevation.

To assemble hold the slice in a vertical position and tack the handle in position. You can manage this job quite easily if you hold the slice between your knees and the handle in position with your left hand. Before the final soldering, view the slice from



Pattern of handle and side view

various angles to see you have got the two parts squarely together. Then solder the handle firmly to the supporting piece, leaving a good body of solder on for support. This can be filed neat and smooth afterwards.

Finally, go over the whole job carefully to make quite sure that no rough edges have been overlooked, and your slice is ready for its try-out at breakfast time in the morning.

A MINIATURE TOY GARAGE

Design free with this issue. Complete kit of materials including metal doors and windows, brick, paper, etc., (No. 2766) from Hobbies Branches, 10/6. Or post free 11/3 from Hobbies Ltd., Dereham, Norfolk.

Any housewife would welcome the gift of a

FOLDING IRONING BOARD

JUDGING from the illustration, the little girl is wondering, somewhat doubtfully, how she is going to do all her "smoothing" on the ironing board that somebody made for mum. It is, of course, a standard size model, standing 30ins. high by 42ins. long by 8ins. wide, with a bottom leg splay of 12ins.

It could be made to a three-quarter size, thereby suiting most little girls; it is merely a matter of removing a quarter from all sizes. For instance, the height divided into four gives you the four quarters, each of which is 7½ins. Take off the 7½ins. which, from 30ins., leaves 22½ins., this being the height of the "three-quarter" model.

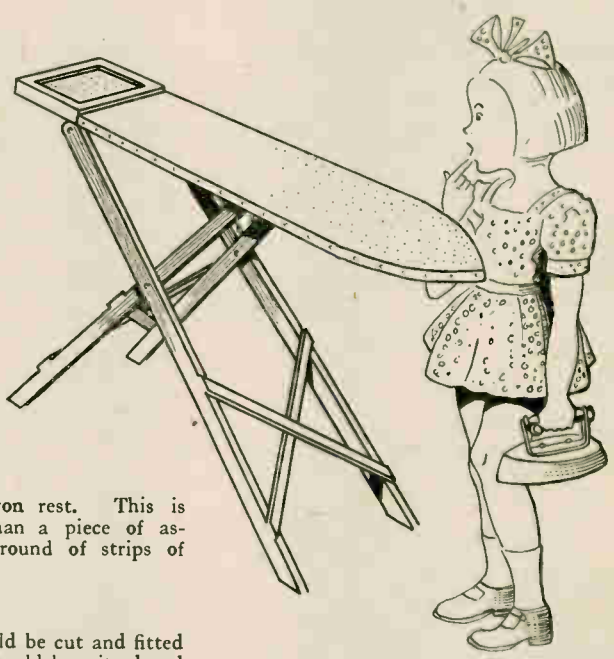
General Sizes

The width of the ironing board is 8ins. Therefore, reduce it to 6ins. wide. The legs are 1½ins. wide. Take off ⅜in. The thickness of the legs is about 1in. Take off ¼in. Quite simple, really, without too much puzzling. Divide all dimensions into four, then remove one of the quarters.

The standard size board is light, yet strong and rigid, folding quite flat after use. Deal can be used throughout the construction. If you have difficulty in obtaining a bit of solid wood for the board, it can be made up as a frame, for covering with stout card, or thin wood, saved from an onion box, perhaps. In the ordinary way, a length of 8in. shelving board would be recommended, either ¾in. or ⅞in. thick.

The drawings at Fig. 1 show how the solid or framed board is made. In the first case, it is only a matter of cutting the board to shape. If the wood is exactly 8ins. wide, set your compasses to scribe an 8in. radius. The point, however, must be placed near the edges, about 7ins. from the end—not 8ins.

Having lightly smoothed the surface of the board and spokeshaved the shaped edges, fit the smoothing iron rest. This is nothing more than a piece of asbestos and a surround of strips of wood, ⅞in. by ½in.



Iron Holder

The latter should be cut and fitted first. The ends should be mitred and the strips affixed with flathead screws, following which the asbestos sheeting is cut to be a force fit. Alternatively, get a piece of asbestos sheeting 8ins. by 6ins. and screw it to the board, then add the strips, putting them on top. If new, the asbestos will cut easily, but all holes will have to be drilled. Thick tinplate is an alternative.

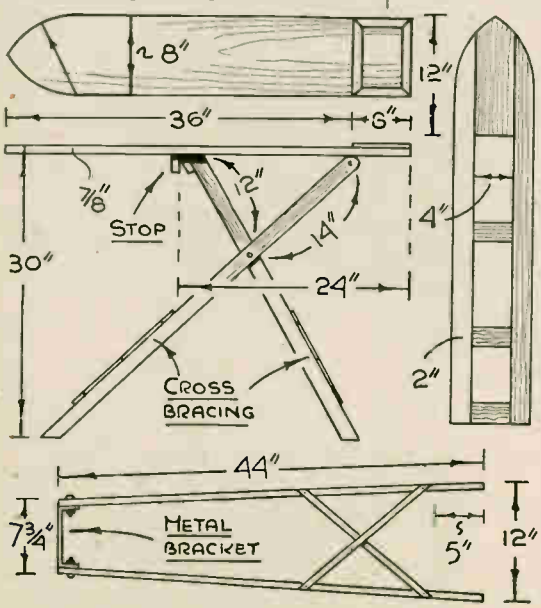


Fig. 1—Top and side view, with details of board and leg framing

Frame Building

If you have to build up a frame, this can be done mainly with 2in. by ⅞in. material. The cross pieces, including the larger top piece, are dowelled between the side pieces. Make allowance in the length for cutting to shape, and when assembling the parts, see that the frame is not in twist. If all joining ends and edges are cut true and the dowel holes bored straight, the framing should cramp together without any tendency to twist.

Main Leg Frame

A top plan of the main leg frame, with necessary sizes, is provided. The legs are 44ins. by 1½ins. by ⅞in. Round the top ends, and bore a ¼in. pivot hole 14ins. inwards (see side elevation).

You then require a metal bracket. This is made from mild steel bar 1in. by ⅛in. or anything similar. The ends are, of course, bent at right angles to form lugs for the pivots. It should be noted that the outside width of the legs, at the top end, is 7¾ins. As a result, the bracket must be made shorter to fit between with about an ⅛in. clearance on each side.

Fitting Legs

If the wood used in making the legs is ⅞in. thick, make the legs 5¾ins. long. Bore ¼in. holes in the lugs and 3/16in. holes in the legs. The pivots are 3/16in. carriage bolts, about 1½ins. long. The bolts need to be a tight fit in the legs, with freedom in the lug holes.

When fitting the bracket between the legs, have a stout metal washer between the lugs and the sides of the legs. This is to allow for movement, when opening and closing. Extra holes are bored in the bracket for fixing to the board with screws. The position of the bracket is exactly 6ins. inwards from the rear end of the ironing board, as can be seen in the side view.

The inner frame has legs approximately 34ins. long. Bore the pivot holes 12ins. inwards from the top ends. Now, assuming you have fitted the bracing to the main legs so there is a 12in. wide splay, the shorter legs are set aside, and held in position

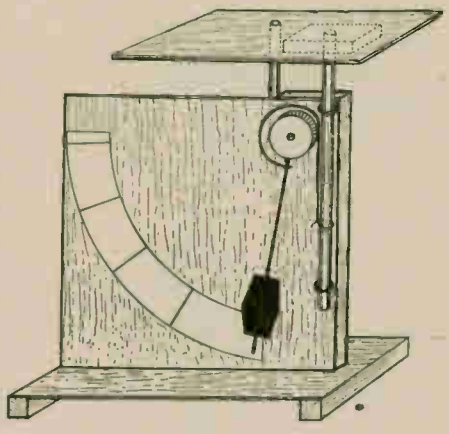
(*Continued foot of page* 56)

Odd scraps of material can be made into useful

POSTAL SCALES

MADE entirely from scrap this device for weighing letters and small packets for the post forms a most useful adjunct to any house or office. The one made by the author has been in use a considerable time and is functioning satisfactorily.

Based on the principle of the lever, it consists essentially of a "table" which, on being forced down by an article placed on it, causes a thread or wire to exert a pull on a small wheel. The slight rotation which ensues causes an indicator arm to move over a graduated scale, thus showing the amount of postage required.



Size Immaterial

Sizes are of no real importance and will be controlled only by the materials available, and the bulk of the articles to be weighed. Where sizes are mentioned they are merely intended as a guidance and need not be strictly adhered to.

Start with the base, which is a piece of wood about 8ins. by 3ins., mounted on two ½in. strips. These strips serve to raise base sufficiently to clear heads of screws which hold the "pillar" in position. This pillar is about 1½ins. by ½in. and 6ins. long.

Mount on this a 6in. square of wood, the function of which is simply to support the graduated paper scale. Fix this square to the pillar before erecting; two screws through the base will be sufficient to hold it in place.

Suitable Wheel

Next obtain the wheel, which, in the example shown, was a 1in. control knob from the radio junk-box. Select one with "square", not tapering rim, and drill through the Bakelite to permit passage of pivot-screw. Remove the grub-screw, and force into the hole a 6-inch length of stout wire to which is attached a lead fishing sinker. The sinker should weigh about one ounce.

If these sizes are adopted the end of indicator will move twelve times as far as the rim of wheel is turned by thread. Stiff brass wire is best and the sinker is readily fixed in position by gently tapping the lead with a hammer. Such sinkers are already pierced with a hole, which tightens round the wire when hammered.

The Platform

Next the "table". For this a piece of wood is required cut to any desired size. On the underside is attached a 9 or 10-inch length of dowelling, about ¼in. diameter. This dowelling is fixed to the table by means of a small glued block as shewn by the dotted lines, though the dowel does not need to pass through table itself. Since there is no strain on this part of the apparatus ordinary tube glue is strong enough for securing both dowel to block and block to table.

With a screw that exactly fits hole in wheel, fix indicator to pillar as indicated in diagram. The wheel should move freely to and fro without "wobble". The sliding length of dowel is kept in position by means of two suitable screw-eyes, the position of which must be such that the moving leg of the table is as close as possible to the wheel without actually touching. As little as ⅛in. clearance is ample.

Slide the dowel into position, and fasten a piece of thread, double thickness sewing thread will serve, to the brass wire where it enters rim of wheel. Fasten the other end to the leg of the table. A spot of glue will prevent it from slipping.

It is well, in doing this, to place a weight at right angles to the dowel, and fasten thread while the table is at its lowest position. This will be the position of indicator when maximum weight is applied. In practice thread will, of course, lie closely in contact with rim of wheel—in diagram it has been shown away for the sake of clarity.

When released the indicator will come to rest approximately in the position shown. It will not hang straight down, for it is now supporting weight of table and dowel. Obviously, therefore, it is advisable to use the lightest material possible in the construction of these components.

Calibration

Cut out a piece of stout paper as shown, in a true quadrant, having a diameter equal to the length from centre of wheel to limit of indicator. Temporarily fix in place with drawing pins ready for graduating.

This is achieved by placing a two-ounce weight on the table and marking point at which indicator comes to rest. Add another two-ounce weight and again mark where indicator points. Repeat until the whole scale is covered. These sections will, of course, decrease in size as the indicator rises up the scale, so do not attempt to calculate or guess them. They can only be found by actual experiment.

Two-ounce divisions are suggested as these conform to Inland Postage Rates, which are 2½d. for first two ounces and ½d. for each extra two ounces. The writer used two ounce bars of chocolate for calibration. They are ideal since if one-ounce, or smaller divisions are required, one merely breaks the chocolate into the requisite portions.

For Small Postages

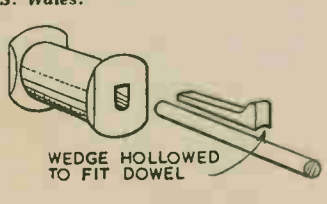
Remove the scale, ink in the divisions and mark with appropriate figures. If intended solely for postal purposes mark sections 2½d., 3d., 3½d. and so on. Finally fix the scale in position with paste, taking care to check its accuracy as you proceed. The scale is now finished and ready for use.

Should the table display a tendency to "swing", owing to twisting of the sliding leg, then it can be overcome by adding a second "leg" as indicated. This can be fixed with glue into a hole in the table and should ride smoothly in the angle formed by pillar and graduation board.

Such a scale will weigh up to about 8ozs., though the actual amount will be controlled by the weights employed, length of indicator arm, etc.

FOR SHAPING DOWELLING

A helpful holder for wood when shaping round to a dowel rod, is shown here. The cotton reel has two edges removed so it can be held securely in a vice. The dowel for shaping is fitted into the hole, a wedge holding it in place as shown in the drawing—R. W. — Rhondda, S. Wales.



GABLE BOARDS.
GLUE TO FRONT OF GARAGE
ON THE PAPER OVERLAY.

THERE WILL BE SUFFICIENT BOARD IN THE PANEL FOR A BASE TO THE GARAGE. SIZE OF BASE 14ins. BY 8ins.

Hobbies DESIGN

No. 2766
3.11.48

THE SUPPLEMENT TO HOBBIES No. 2766.

DOLL'S HOUSE GARAGE

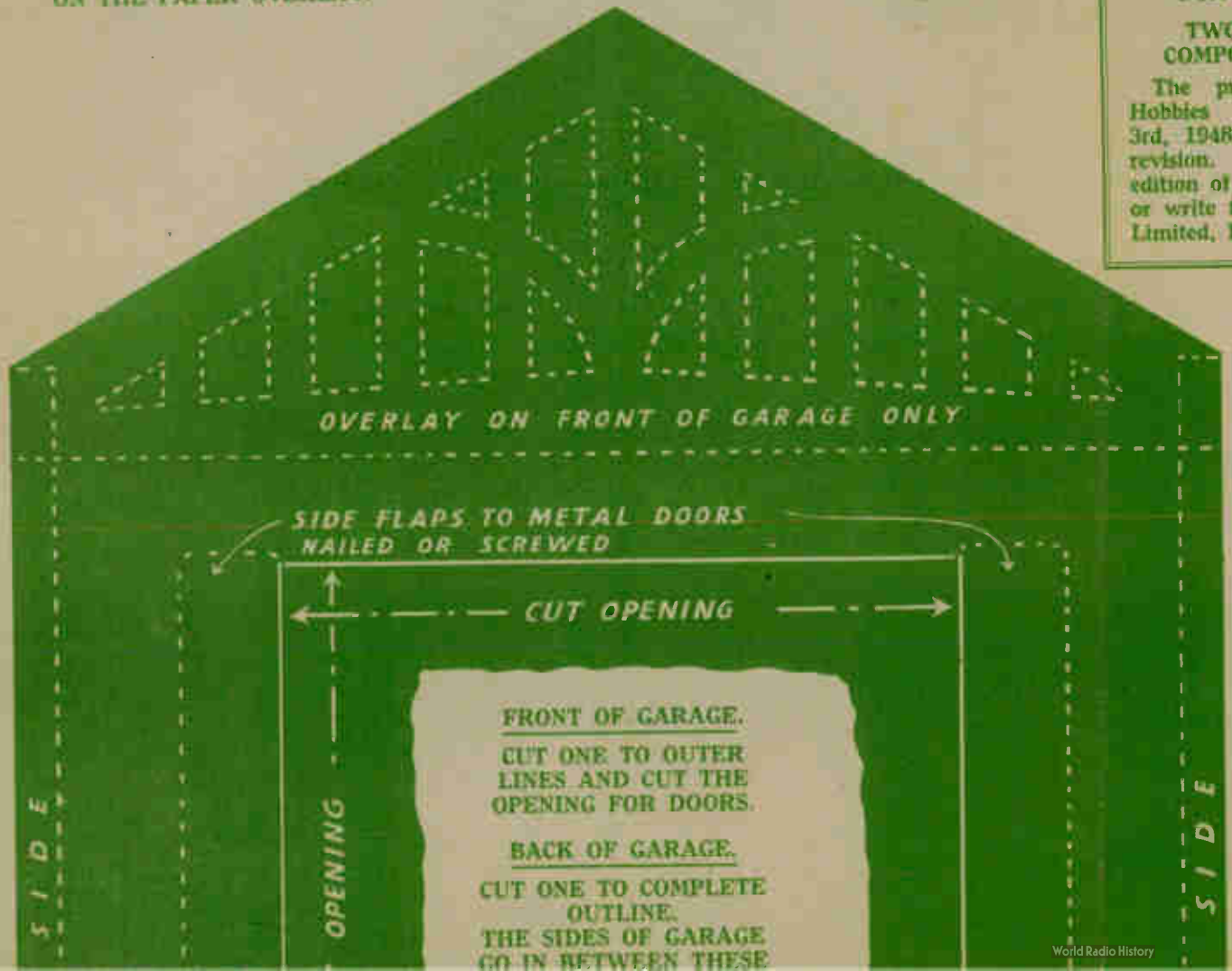
COMPANION DESIGN TO No. 237 SPECIAL.

MATERIAL REQUIRED FOR THIS DESIGN

TWO PANELS OF COMPO BOARD, ETC.

The price is shown in Hobbies Weekly, November 3rd, 1948, but is subject to revision. See the current edition of Hobbies Handbook, or write for price to Hobbies Limited, Dereham, Norfolk.

SIZE OF GARAGE :—10ins. LONG BY 7¼ins. WIDE BY 7¼ins. HIGH.



FRONT OF GARAGE.

CUT ONE TO OUTER LINES AND CUT THE OPENING FOR DOORS.

BACK OF GARAGE.

CUT ONE TO COMPLETE OUTLINE.
THE SIDES OF GARAGE GO IN BETWEEN THESE

GABLE BOARDS.
GLUE TO BACK OF GARAGE.

WINDOW SILLS. CUT AND GLUE BENEATH METAL WINDOWS.

DOLL'S HOUSE GARAGE

ALTHOUGH this small garage model is designed to the same proportion as the doll's house (237 Special), published by Hobbies, to form a companion to that house, it can be built as an independent piece of work suitable for any small cars or motor vehicles. It is 10ins. long and its doors open to a width of 4ins. to allow a good sized model inside.

The kit of wood supplied by Hobbies Ltd., includes composition board from which the walls, base, etc., can be made, and a piece of substantial cardboard large enough to bend and form the roof.

It also includes the two side windows and the double-opening front doors. These doors and windows are in metal nicely painted in cream and green, and fitted with holes ready to fix with small fretnails. There is no need to paste the patterns down, but they can be marked out direct on to the material by pin holes at suitable points linked up with pencil lines.

Construction

Construction is straightforward. The front and back are the same outline shape, but the front has an opening cut into it to provide the space for the double doors later. The sides are alike, with an opening 3½ins. square to take the window fitting. They fit between the back and front and in addition to being glued and screwed, should have blocking strips glued on the inside angle to stiffen them up. Sufficient material is provided in the parcel for a base-board 14ins. by 8ins., and the whole frame can be fixed to that to make rigid.

You should now add the imitation brick paper round all walls, trimming it level with the top. Paste completely over each side, and then cut away the window opening with a

drawing. It can be painted on a strip and then pasted on.

The representation of the half-timbered top under the roof is marked out in stiff brown paper to the shape shown by the pattern. Glue to the front wall above the garage doors and mark imitation roughcast work between the "wood". Now you can glue on the gable boards at the back and front in line with the slope of the roof. Glue them to the face of the wood but projecting about ⅛in. above the part itself as you see in the detail on the other side of the sheet. This provides a rebate against which the card roof can be set as shown.

Roof

This roof piece is 10ins. long and 8¾ins. wide. Cut the edges clean with a sharp knife, and then with the point of the knife scribe a centre line along from end to end. Do not cut into the board far, but just enough to allow it to bend straight. The piece is then glued to the front and back walls between the gable boards as shown in the cut-away detail.

A suitable slate paper—provided—is pasted on to come close to the gable boards themselves. The metal window frames are put in place with short nails, and then a sill glued to the wall immediately beneath the metal-work. These sills are 3½ins. long and ¼in. wide. They can afterwards be painted the same colour as the window frame.

Doors

The two doors are added with their step along the base. In fitting, stand them in position and prick a hole through the metal into the "wall" behind. Add the two doors temporarily to see they hang properly and will close without binding. Then

sharp knife by laying the part flat on the bench. The brick paper on the front wall can be carried round inside slightly, and an imitation upright brickwork can be painted over the top of the doors as indicated in the

over the points if necessary behind. The long metal step is nailed under the doors, at each end. The projecting portion of the baseboard can be painted to represent ground-work or concrete flooring.

4 3/8 INS.

ROOF. CUT A PIECE OF CARD TO OUTLINE ABOVE, AND BEND IN HALF TO FORM THE TWO SLOPES.

DETAIL OF CONSTRUCTION. (PORTION OF ROOF CUT AWAY)

LINE OF METAL WINDOW TO BE FIXED ON OUTSIDE

NOTE.—This design sheet is only presented free with the current issue of Hobbies and not with back numbers. Further copies may be obtained.

WINDOW SILL

SIDE OF GARAGE. CUT TWO AND GLUE BETWEEN FRONT AND BACK.

OVERLAY TO REPRESENT TIMBERING. TRACE THE PATTERN ON TO STOUT DARK BROWN PAPER AND CUT OUT AND GLUE TO FRONT.

PRINTED IN ENGLAND.

An ordinary battery can replace accumulators to provide

AN ALL-DRY RECEIVER

IT is possible to replace the 2 volt accumulator used with ordinary battery receivers by dry cells. This saves expense, and also reduces size and weight in portables. It is a very useful method to employ with small receivers because a dry battery costs a few pence, whereas accumulators cost several shillings.

It can be employed with large receivers, but here it becomes more economical in the long run to use an accumulator because the current consumption is heavier.

1.4 Volt Valves

Manufacturers are now producing valves with 1.4 volt filaments. These have been very popular in all-dry portables, as they are worked from a single 1.5 volt dry cell.

They use very little current and can replace the 2 volt valves which require an accumulator. Any home-made receiver can use one or more of these valves, provided the valve-holders are changed accordingly. (Holders of different shape are used). It is then only necessary to discard the accumulator, instead using a single dry cell.

With 2 Volt Valves

If the ordinary 2 volt valves are retained, either an accumulator or a dry battery can be used as convenient. But as a two-cell dry battery gives 3 volts, the unnecessary 1 volt must be dropped. A resistor connected in one lead, as shown in Fig. 1, accomplishes this.

The voltage drop in any resistor depends on the current flowing. It is, therefore, necessary to add up the current taken by all the valves. The consumption is usually marked on the valve. If not, it can be found from valve lists. Ordinary detector and low frequency valves take .1 amp.; output valves and output pentodes usually take .2 amp. High frequency valves usually take .1 amp. A 1-valver would, therefore, take .1 amp. A detector-l.f. 2-valver takes .2 amp., and a detector-pentode .3 amp., and so on.

Voltage Drop

With .1 amp. flowing, a 10 ohm resistor will drop 1 volt. With .2 amp. flowing, the resistor should be only 5 ohms. If the receiver uses .3 amp., then the value should be approximately 3.3 ohms. The exact value is not particularly critical. The resistor must be a wire-wound type suitable for the current.

Resistance wire can be bought which is so many "ohms per yard". If that obtained was 10 ohms per yard, then one yard should be used for the 1-valver; 1ft. 6in. for the 2-valver, and so on. The wire is wound on a strip of wood or similar material.

If thin iron wire of unknown resistance is to be used, there are two methods of determining the amount to use. For the first, connect a 2 volt accumulator as usual.

Now set tuning and reaction controls so that the set is *just* oscillating.

Then connect the 3 volt dry battery with an ample length of resistance wire in series in place of the accumulator. Now reduce the length of resistance wire bit by bit until the set just begins to oscillate. 2 volts will then be reaching the valves, and the correct length of wire can be cut off and wound as mentioned.

For the second method, connect a good, accurate voltmeter across the valve filaments and adjust the length of resistance wire until the required reading of 2 volts is obtained.

The ordinary 1.5 volt dry cell drops to 1.4 volts on discharge. A so-called 4.5 volt dry battery is thus only 4.2 volts under these conditions. As a 2 volt accumulator is slightly over 2 volts when fully charged, it is, therefore, quite in order to connect two 2 volt valves in series and operate them from a 4.5 volt dry battery. Fig. 2 shows the connections.

No resistor is used, but one or two points must be noted. One is that the detector grid leak should be left connected so that only 2 volts are applied through it to the grid. That is, it should not go to the 4.5 volt connection, which would make results poor.

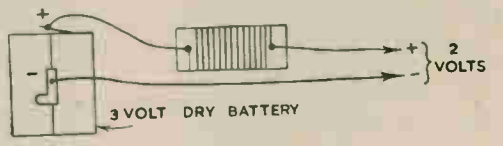


Fig. 1—How the dropping resistor is used

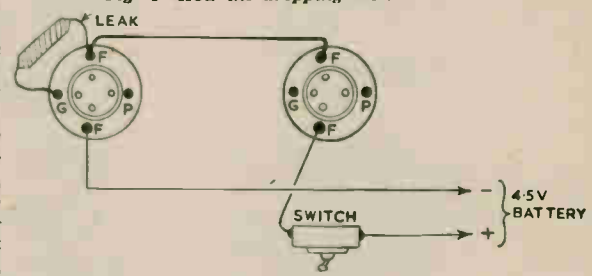


Fig. 2—Filaments in series

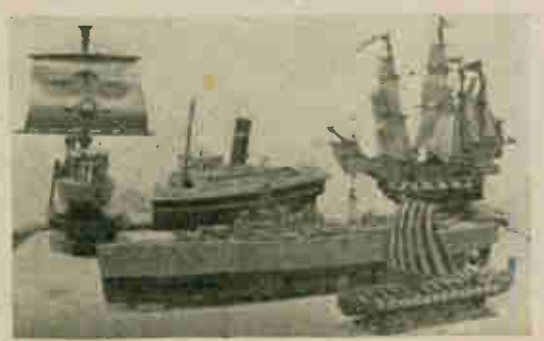
Usually it will only be necessary to change a filament lead or two, leaving all other wiring unchanged. After the change the grid bias may need altering by 1.5 volts because the second valve filament is not directly earthed.

The second point to note with this method is that the filament consumption of both valves should be the same, so that the total voltage coming from the dry battery will be equally divided. Because of this it is most suitable for small detector-l.f. sets.

Current Consumption

The 1.4 volt valves use about 1/6th the current taken by a small torch bulb, and the 2 volt valves about ¼ to 1/3rd. So with a fairly large dry battery quite a long period of operation is possible.

But it must not be expected a dry battery will last as long as an accumulator at many times the price. It will not. Because of this the dry batteries are particularly suitable for the smaller sets.



A READER'S COLLECTION

A range of ship models from Hobbies designs made by 50 year old reader H. Edmonds of Billericay, Essex. The pre-war Egyptian Galley and Viking ship now out of print. The Tug and Battleship shown are driven by small electric motors. A collection of interest and craftsmanship.

The concluding article on how to make your own

STENCIL XMAS CARDS

WE are concluding our articles on novel Christmas card manufacture by showing another very attractive suggestion at Fig. 4. It is based on a fretwork design. Notice the wordless margin, which simplifies the preparation of the stencil plate considerably, yet adds a new colour to the front of the card, assuming the greetings matter inside

Fig. 4—Another attractive design

is done a different colour. You will find that red and green are very universal and most pleasing colours to use.

The stencil design shown at Fig. 5 are smaller in length to suit the inside front section of the folded card paper. A simple greetings arrangement is shown, with an original verse, if wanted.

Either of the "additions" can be worked into the style of card shown at Fig. 4. In regard to that illustrated at Fig. 1, however, the verse is wanted — not a second greeting section. These little things must be considered. Avoid giving extra work by "repeating" yourself, or virtually doing so.

Extremely small lettering, perhaps only $\frac{1}{8}$in. high, should not be attempted. Apart from the difficulty of cutting out the tiny spaces and leaving tinier tie pieces, the bristles of the stencil brush cannot readily work themselves into the spaces and thus ensure sharp neat impressions.

Two styles of lettering are used in the various examples illustrated, particularly at Fig. 4. The easiest form is shown by the words "KIND THOUGHTS". A modern form of "shadow" lettering appears on the

Fig. 5—A simple greeting and verse

pattern page and again at Fig. 7. This, while arresting to the eye, is intricate and difficult to cut out accurately, unless on a fairly large scale.

When designing your own cards, aim at simplicity. The less put on a card, the more impressive and specialized it seems. Cramped lettering is bad, including too much fancy work or decoration.

All the examples shown are actual "prints" from stencils made by the writer, and experience shows that care and patience is wanted. Why begrudge extra time on making neat stencil designs? Any faults in the completed stencil will always repeat themselves. One can, however, often correct mistakes by cutting away the faulty portion and inserting a fresh piece of film, the latter being held with strips of gummed paper tape at the reverse side of the stencil. Repairs in this fashion mean extra labour, so the need for care cannot be over emphasized.

While it is possible to make suitable envelopes, it is not worth while attempting to do so, unless they are difficult to obtain. The bought envelopes save a lot of bother.

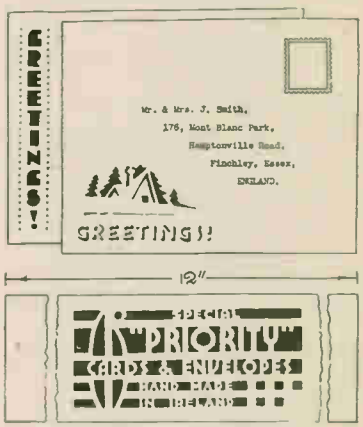


Fig. 6—Envelope and wrapper

You should make a point of making your envelopes up-to-date and distinctive by printing "GREETINGS!" on the face side, as shown at Fig. 6. A tiny snowy picture helps to introduce novelty and the right atmosphere. A fictitious address has been typed on one of the example envelopes to show the effect better; the postage stamp position could be a coloured oblong measuring $\frac{3}{8}$in. by 1in.

A very professional appearance is given to the cards and envelopes when done up with a special printed wrapper, as depicted at Fig. 6. There is no need to adopt the particular design of wrapper shown or use the name of "PRIORITY" which might clash with "rival" card manufacturers like yourself.

Ironing Board—(*Continued from page* 53)

temporarily with bolts and nuts, with washers between.

The washers ensure some amount of necessary clearance. A top cross piece is fitted to the top ends of the inner legs. This cross piece should be screwed on, being 2ins. wide by $\frac{7}{8}$in. thick. It should be cut about 3/16in. shorter than its required length so it is free to move between the main leg framing.

Add the bracing. This bracing is either strips of wood or metal $\frac{7}{8}$in. by 3/16in. Fit with nails or fine screws. So as to keep the inner leg frame in place, a bar of wood is screwed to the underside of the board 24ins. inwards from the rear end; this acts as a stop.

When the metal bracket is screwed to the board and the inner frame brought up to the stop (have the work turned upside down on the bench or table, by the way), it will be seen that the top ends of the inner frame legs need to be cut to an angle, with the cross piece planed to a similar angle.

This can be all done beforehand by assembling the parts together temporarily. The bottom ends of the legs are marked off on a level, using a straight piece of wood, and the angle cut.

To complete the work, cover the board with old blanket or flannel, then put on linen, finishing off the edges with leatherette strapping and studs. The woodwork could be given a coat of varnish stain or left in the white, natural state. Be sure to see that the work stands perfectly rigid on its legs. There must be no "rocking" from side to side.

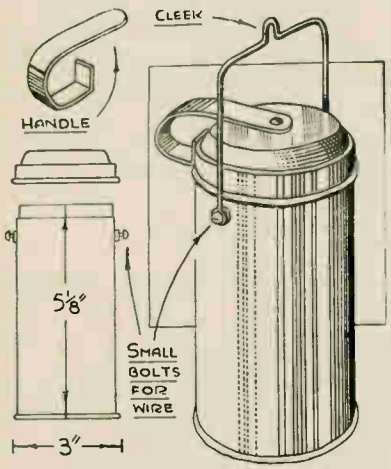
The handyman will find it worth while to make these

TWO THINGS FROM TINS

MOST manual workers, who cannot get home for lunch because of distance, usually take sandwiches with them to work, including tea, sugar and milk. At a gas-jet in the workshop, they prepare tea in a special billy-can, this having a lid which can be used as a cup for drinking the hot tea.

A TEA CAN

These special tea cans do not last for ever, of course, and any reader wanting a new can, with drinking cup, will be interested in the idea shown in the diagram herewith. Here you see a home-made type, made from a cocoa tin, some wire and a few other odds and ends. Its capacity is two large



teacupfuls, costs nothing to make and should serve its purpose for a long time.

The Tin Used

A tin specially ideal for conversion is a ½lb. circular cocoa container, made with the type of lid shown. Of course, anything similar can be used. Ordinary lids, however, do not make suitable drinking cups. If difficulty is experienced in the matter of a suitable lid, it is always possible to use tin cups, or a china cup—probably an old, odd cup which can be kept, together with the tea-and-sugar box, at work. Many men prefer this arrangement, as the lid cup, filled with hot tea, is often too warm for the lips.

Assuming you have managed to obtain an empty cocoa tin of the type recommended, it is only a matter of fitting a tin handle to the lid, then a wire handle to the container.

For the lid, a strip of tin, folded at the edges, can be used. It is bent to the shape shown, then soldered to the lid. It could be affixed with rivets, but soldering makes a better fixture, and the lid will not be liable to leak.

Regarding the wire handle, the best way to attach this is to provide bolt lugs. Two ⅜in. long by ⅛in. bolts are affixed with nuts, one at each side, in alignment, just below the lid neck. Space is left for the thickness of the wire. Any stout wire, about 15 s.w.g., which is often found around boxes, can be used.

The wire is first bent to form the cleek. The ends are then partly looped for anchoring to the lugs. You could, with the use of round-nosed pliers, form "eyes" at the ends of the wire. To fit the handle, the eyes are partly opened, then closed when on the lugs, using pliers.

Note that a nut is at the outside of the tin. A second nut screws on at the inside and both nuts are tightened against each other to lock them. A spot of solder could be applied to the nuts to secure them and prevent leakage. The outside nuts, of course, give clearance to the movement of the handle. If not provided, the handle will foul the "bead" on the lid. There is no need to finish the tea can in any way.

FLOUR BIN

EXCELLENT containers for flour, sugar, etc., can be made from large empty sweet tins. A tin measuring 9ins. long by 7ins. in diameter holds about ½ stone of flour. Most of these tins are well made and ideal for the purpose. All you have to do is to obtain such a tin—try to buy one, in fact, from a store or sweet shop. Most shopkeepers have a number of these empty tins, and you should be able to get one for a few pence. You are not, incidentally, confined to one particular size.

The idea about to be outlined can be applied to all sorts of tins. You can have containers for tea, hard peas, cloves, pepper and similar dry items. Salt, of course, cannot be kept in bare tins, even though it may be the dry powdery salt. After a time, the salt becomes damp, and dampness, of course, creates rust in the tin, and the rust contaminates the salt. Glass or wood makes the best container for salt.

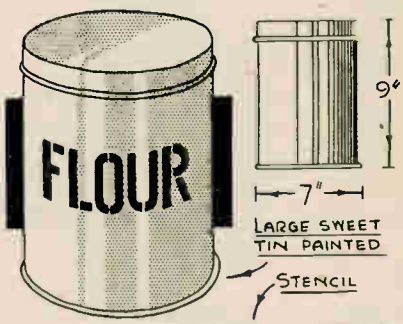
The First Operation

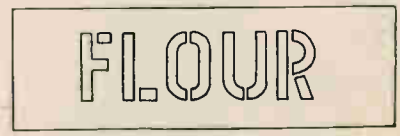
The first operation in converting the empty sweet tin into a useful household necessity is to wash it, and its lid, in hot water, then rinse out and dry it. A coat of bright coloured enamel paint is then brushed on the outside of the tin, including the lid. Do the sides and bottom, all on the outside. Do not paint the top rim of the tin where the lid fits. Keep the "bead" free from paint, too.

The outside of the lid is done all over. When the enamel dries, and the lid is fitted on top, a form of "silver" bead separates the lid from the tin and makes the whole thing quite professional in appearance.

Once the enamel has thoroughly dried, the container must be classified in some way to indicate its particular use. If intended for holding flour, then the word should be printed on it in large letters, as shown.

Now, printing letters on a semi-





circular surface can be very tedious, so to simplify matters, you should prepare a paper or thin card template, with the letters cut in it stencil fashion, as shown. The strip of paper or card is then held firmly around the tin and, using an almost "dry" paint brush, dab the letters with its tip.

You must, of course, use a contrasting colour of paint for the lettering. If the tin is coloured bright green, then the letters may be black, white or crimson. If painted crimson, the letters can be white, yellow, orange, etc. Yet another plan is to print the letters on gummed paper, thus making a label which can be adhered to the tin.

The painted lettering, however, is the best, and more lasting. Stencils are easily made on thin stiff paper, the spaces being cut out carefully with a sharp-tipped penknife. Stencilling is easy if you possess a small paint spray, but the stencil paper will have to be much larger than shown in order to give a complete "mask" to the paintwork on the tin.

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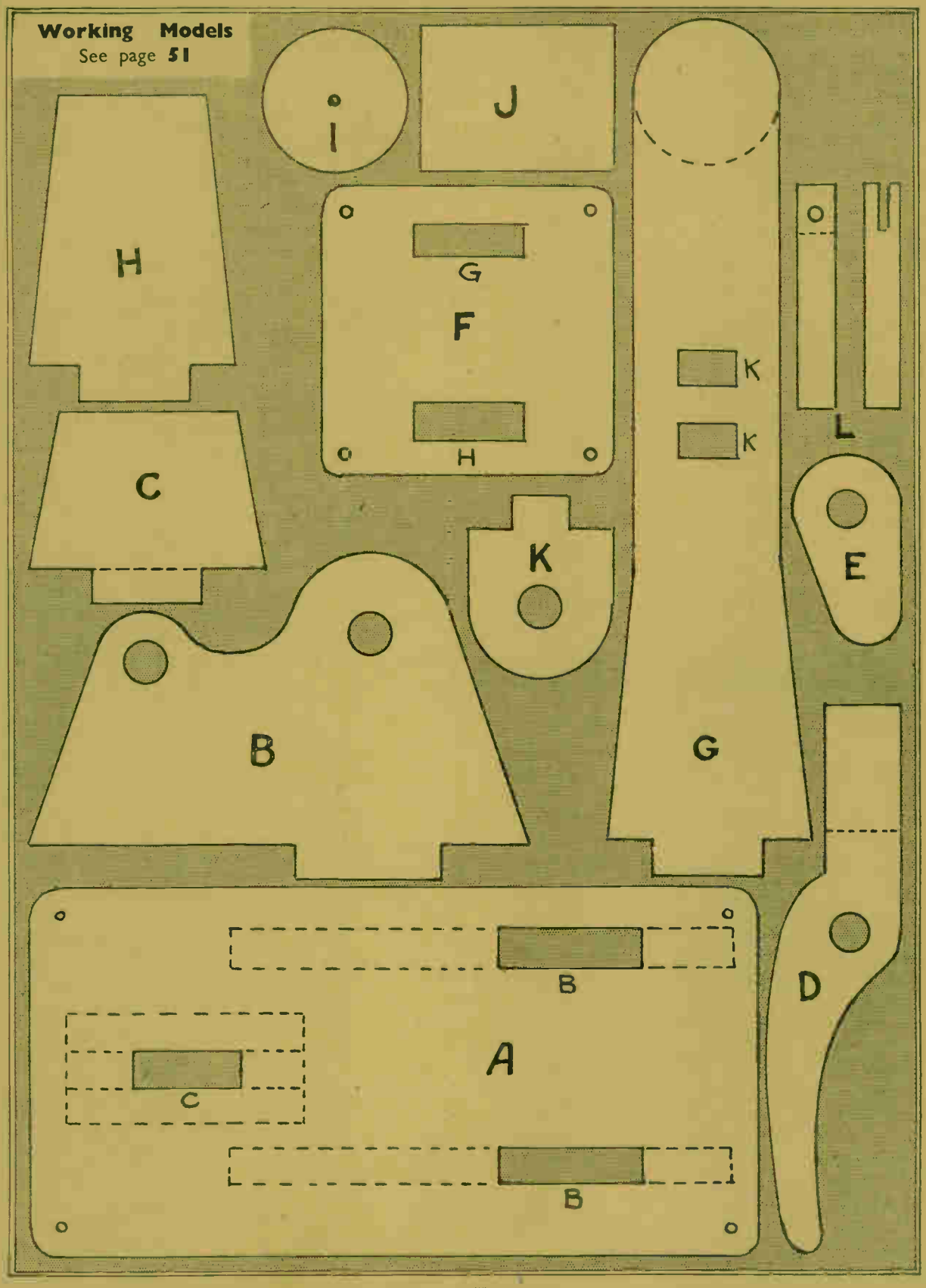

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Hobbies WEEKLY

CONTENTS

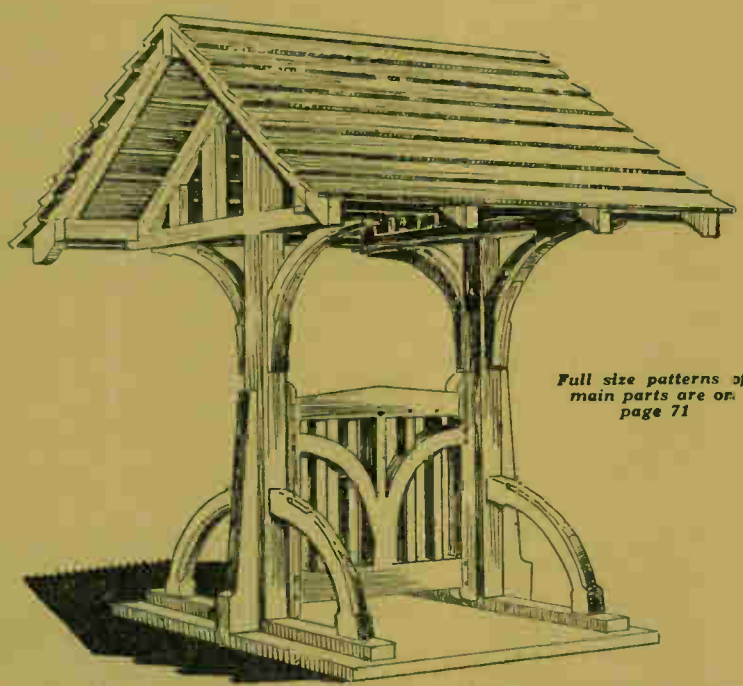
November 10th, 1948 Price Threepence Vol. 107 No. 2767

A MODEL LYCH GATE

WE wonder if any of our readers have ever thought what a charming little model a Lych Gate would make. These old-time entrances to the Church existed centuries ago, and indeed many can still be seen around the countryside.

We have heard of craftsmen and other enthusiasts making a study of, and measuring drawings and details of old windmills, and we wonder if the same thought and idea have ever been given to our picturesque old lych gates. Here then is perhaps the birth of a new hobby, the collecting of pictures, photographs and sketches with written data included of these picturesque oaken structures.

Consider taking this interesting pastime a step further, and building a miniature lych gate in wood. Ordinary deal or pine answers splendidly for this type of model making if treated with oak stain. The simple nature of the shaping and cutting should not deter the craftsman.



Full size patterns of main parts are on page 71

The type shown, however, may be said to be based upon the general construction of many such gates round our countryside. Here, the two main uprights are given with sill pieces and front curved struts and braces. Above we have the gables filled with simple uprights to support ridge and rafters. The roof itself may represent weatherboarding or tiles.

In an actual gateway of course there would be generally side walls of stone or a post and rail fencing covered perhaps with featheredge boarding. In our model, however, we do not show these for obvious reasons, and the sloping buttress-like tapered supports running up to the main posts make a very suitable side finish.

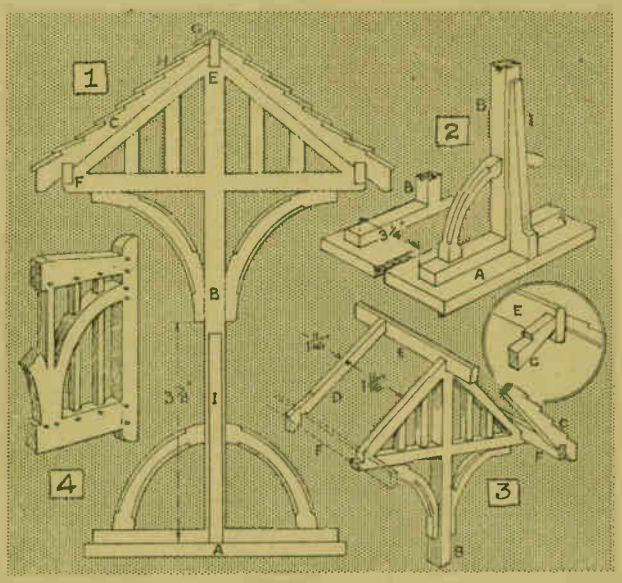
Hinged Gate

The actual gate could be hinged to one side post if desired to open realistically, but we do not think this need be followed in the case of the model. To help workers, we have included all shaped parts as simple outline patterns on a whole page of this issue.

Study the patterns and the details given so a good knowledge of the several parts may be gained and their method of construction and assembly. A base board measuring 5ins. by 4½ins. should first be made from a piece of ¼in. wood, and upon this the side uprights B may be erected. On account of shape of the uprights, and the limited size sheet, we show one

only of the uprights and this again in two parts.

It will be necessary therefore in sticking down the two parts B to the ¾in. wood, to follow the diagram, Fig. 1, which gives the measurement of 3⅞ins. from the bottom of the curved struts to the extreme lower edge of the sole-plate. When one complete end B has been cut out, clean up the wood, and any rough edges, and use it as a template for producing the second end upright.



To get the correct idea of the widths and thicknesses of the braces and supports and also of the filling uprights in the gables, a certain amount of paring and cutting away of these parts must be undertaken. The meaning of this will be apparent from the details, Figs. 2 and 3. The dotted lines on Fig. 1 give a guide to what edges must be cut down before the other flat surfaces are pared away into it. A ¼in. chisel or just an ordinary sharp pocket-knife will do the trimming away cleanly and easily.

The upright rails of the gate, shown in detail on the pattern sheet, will be carried out in the same way, the sectional detail, Fig. 4, showing the uprights cut in, while the curved braces stand flush with the outside frame.

The Gate

The projecting dowel-pin heads may be represented by driving in stout wire nails for a depth of about ¼in. and then cutting off the heads and filing a clean top. Shallow holes must be bored before the nails are gently tapped in to avoid splitting the wood.

The gate is cut from ¼in. wood. It will be noted in Fig. 1, 2, etc. that the curved members of the end uprights have chamfers worked on their edges. These again are cut down with the chisel or knife, the "stopped" ends being first cut down and the chamfers finally brought up to them to avoid any splitting. The two ends are glued to the base, and spaced as shown in Fig. 2, with perhaps one or two countersunk screws put in from below to make a firm job while the roof and its members are being assembled.

The ridge board, E, and the two plates, F, will next be made in 3/16in. wood, and glued to the uprights in the positions shown in Fig. 1 and 3. Lengths and widths are given on the pattern sheet. The plates and ridge are next connected up by the sloping rafters C and D (Fig. 3), the actual outline of these being given on the pattern sheet. Four each of both C and D must be cut, the serrated top edges of pieces C being carefully and accurately cut in to receive the boarding H.

Note the four rafters, D, will have their top edges plain, so the boarding here merely rests upon them and is thus held in place. The enlarged diagram in Fig. 3 shows how the end rafters C come flush against the ridge board at the extreme end.

All the main structure should now be firmly glued together, and it only remains to add the two roof slopes. Their length of 6½ins. allows for an overlap of ¼in. beyond the ends of rafters C at each side. Each slope of the roof is made of eight pieces of thin wood, as H on the pattern sheet, and one piece G. The method of their arrangement is shown clearly in Fig. 1.

Assembly

Start laying and gluing the lowermost piece, that at the eaves of the roof slope, and then keep adding the remainder.

All are fixed in their respective recesses as it were, until the ridge is reached. Here a narrower board, G, will be laid and glued to the top back edge of the topmost member H.

Finally a ridge may be represented by bending at an angle a stout piece of card and gluing this to the boarding to cover the top joint of same and to make a neat finish at the ridge. In gluing on the members H to the rafters lay the model on its side at completion and put a bead of glue behind each board H so that point of contact to the rafters D is well made. Again, little gluing blocks of wood may be added at inconspicuous places within the roof to make all rigid and strong.

The underside of the roof slopes should be stained or otherwise finished just the same as the outside surfaces. A piece of green baize should be glued to the underside of the base.

WHAT on earth are cycling shoes? Does one ride a bike any better through wearing these shoes? Quite frankly, I have never heard of these shoes before in my life, and I have been a cyclist for many years.

THE shoes appear to be of recent invention, and, to judge from the appearance, an idea which doubtless originated in America. The shoes are like ordinary brown, light-weight shoes, with black coverings on the uppers, at the heel, toes and sides, white eyelets and large, turn-over tongue flaps which cover the lacing. These flaps prevent rain entering through the eyelets, and so far as we know, the shoes make no difference to one's cycling, unless they speed up the dash homewards to get them off—after all the people staring!

CHROMIUM-PLATING is supposed to be rust-proof, so when I stored away my machine, with its new handle-bars, in its shed last year, I merely gave the bars a light smearing of Vaseline. To my disgust, I found that the metal had become corroded with a greenish encrustation which I removed with fine emery cloth; this spoiled the high finish, and I find that the bars are apt to rust easily. I don't think much of chromium-plating; it is not much better than nickel-plating.

CHROMIUM-PLATING is rust-proof, but liable to corrode, like brass, copper and similar metal, but only under severe conditions. You must have a rather damp shed. Corroding does not imply rusting. Corrosion is simply a "patina" which is produced by oxidisation through dampness. The domes of buildings in cities are greenish; copper always turns this colour. The greenish encrustation on chromium is simply a patina. There was no need to remove it with emery cloth. It comes off easily enough with a metal polish and a soft cloth. The use of emery cloth, although effective, was a drastic measure. It scratched the high finish and removed some of the plating, and we fear you have spoiled your handle-bars which can, however, be re-plated by a local specialist in such matters. We must warn you, however, that chromium does not last forever. It will, in time, become pitted, so that rust gets beneath the thin coating. A rubbing of Vaseline will help to prevent this to some extent.

How to make a start if you think of building
A MODEL RAILWAY

THERE are few other hobbies than that of Model Railways which offer such unlimited scope for ingenuity and individuality, as well as for educative amusement. It does not call for any exceptional skill on the part of its followers, and yet is absorbing in its versatility. Mechanics, electricity, woodwork, metalwork and a whole host of other crafts are pressed into its service and get their share of the model railwayman's thought and skill.

A model railway may start as a "toy", but if we are really interested in what we are doing, it will gradually develop into a real hobby; in which the railway is always complete, yet never really finished. So let us see

The construction of indoor model railways is again becoming popular as the necessary material becomes available. This is the first of a series of articles by an expert who combines knowledge with reasonable expense.

exactly what is needed to build a model railway without going into any technicalities or discussions as to the superiority of any particular scale or gauge.

In the early stages it will not be possible for the reader to attempt to build his own locomotives, coaches or track, and in point of fact, these items are best bought. It is best to "get something moving" as soon as possible, because the writer has seen so many beginners whose enthusiasm has waned through the time taken making these things.

If track, and at least, an engine are purchased, there is then the urge to lay the former and run the latter, which state of affairs constitutes an embryo railway—after all.

Some readers may already be in the possession of a loco and maybe a few wagons or coaches, together with several yards of either steel or tinplate track which can well make a nucleus of a larger system.

If it is desired to reconstitute a "toy" railway into a thorough-going "model" railway, of course, the first thing to be done is to arrange matters so the railway has a settled location. A model railway which has to be continually laid and dismantled is unthinkable. No model line worthy of the name was ever really portable — with the exception of the extremely small exhibition models which have been built just to show how small a model railway *can* be made. So try to find a place where you can lay the tracks once and for all, if continued successful running is desired.

Typical small station building suitable for modelling

Prepare a Lay-out First

Before actually laying any rails, many hours of planning work with a yard stick and pencil-and-paper should be spent. Never think that this time is wasted, for a model railway put down in a "hit-and-miss" manner can never be really successful. Remember it is easier to re-draw a design than to relay a model line.

As to the ideal situation for a model layout, there is much diversity of opinion. Cellars are generally damp, particularly in summertime; and dampness is the deadly enemy of all models—especially electrically-driven ones. Attics and lofts are tropical in the summer and arctic in the winter. Violent temperature changes are also bad for both the track and the main-springs of clockwork-driven engines.

If the loft is boarded, this state of affairs will be largely mitigated, whilst the condition of the main-springs will be looked after if the locomotives are brought down into the house after running is at an end. In the writer's opinion there is no place to beat the spare bedroom (!) or a box-room; though, of course, the former is all too rare in these exciting times.

Toy Set Differences

If your existing "train set" is of one of the well-known makes, you will possibly have noticed many differences between certain items of equipment in the model and their full-sized counterparts. These differences are very frequently due to the fact that a "toy" railway has to be designed to run in a very limited area; but there is no excuse for using violently out-of-scale lineside accessories.

It is just as easy to make these things to proper scale (i.e., 7 millimetres equalling one foot on the real thing) as to make them either vastly too big or ridiculously small. In these matters, the construction of correctly scaled buildings and accessories for "O" gauge models at the true scale of 7 mms. to one foot, can be undertaken with confidence.

Tool Kit

Only the simplest of tools are needed; in fact, the normal Model-maker's Kit as sold by Messrs. Hobbies Ltd., contains almost all the tools necessary for such work; particularly if the kit is boosted up with a few extra tools from the household tool-box.

If a constructional start is made by laying the track—even a simple "oval"—properly, and ensuring that all the rail-joints—if "tinplate" is being used—are perfectly matched, a great deal of running experience can be gained.

After perfect running has been achieved, the situation of the proposed station or stations, goods-sheds, signal-boxes and other buildings can be plotted in on the base-board of the line itself. All this should be done before any actual building construction is started.

Realism

The ideal of every model railway enthusiast is to make his railway as near like the real thing as possible with the material, tools and means at his disposal. So let this ideal be yours and in its working out you will find that running model railways is one of the most fascinating of all the hobbies, and one which will never die out all the time the full-sized railways are with us.

The next article will deal with the dimensions and constructional methods used in building simple model railway accessories with which you can improve the appearance of your layout. Until then, keep experimenting so you have produced the best possible layout plan you can in the space available.

PREVENTING DAMAGE

WHEN extracting a nail with a pair of pincers on a nicely polished surface it is a little difficult without doing damage. Here is a hint to prevent such an occurrence. Lay a piece of thin wood on the surface so the pincers rest on that when extracting. Any mark will then be made on this piece, taken away again after use.

Another interesting article on radio, explaining

HOW RECEIVERS WORK

THE simpler types of radio receiver are not difficult to understand and it is interesting and useful to know just how anything works. It is not necessary to go too deeply into the theory, because a practical amount of knowledge can be gained without this.

Tuned Circuits

A coil of insulated wire resonates to a particular wireless frequency. The more capacity in parallel with the coil, or the greater the number of turns used, the lower is this frequency. (Just as a long pendulum swings more slowly than a shorter one.)

Crystal sets sometimes tune by having a slide-coil to adjust the number of turns, but a more accurate method is to make the capacity variable instead, using a variable condenser, as shown in Fig. 1. With a Medium Wave coil of about 80 turns and a ·0005 microfarad condenser the set can tune from about 200 to 550 metres. To get up to Long Waves, a switch is opened, thus adding into circuit about 200 turns—the Long-Wave winding.

A circuit like this allows all signals to pass through to Earth except that to which it is tuned. This particular signal is therefore made to pass through the detector, and is heard in the phones.

A crystal detector is used in Fig. 1. This gives good phone volume on local stations, but cannot amplify. So for distant reception and speaker reproduction, valves are used.

A triode (three-electrode) valve is shown in Fig. 4. The filament is heated from a battery; it then emits electrons which are free to travel about in the vacuum inside the glass bulb. A metal plate (or plates) forms the anode, and this anode attracts the electrons because it is given a positive charge from a second battery—the high tension battery.

To reach the anode, the electrons must pass through the grid, which is a fine wire mesh. When slightly charged positively, it helps to make the electrons shoot across to the anode. But if charged negatively, they cannot pass it to reach the anode at all.

The signal picked up is applied to the grid. It makes the very much stronger electron stream fluctuate. As this stream is really an electric current, and is taken away by a wire from the anode, the weak signal going in comes out much stronger. This is how all valves amplify.

A Valve Circuit

By connecting the coil and condenser to A and B in Fig. 2, a two-valve receiver is made. As the grid condenser will not let direct current pass, a slight voltage builds up across the grid leak. This is helped by connecting the latter to L.T. Plus, and aids the electron stream as described.

As the signal is amplified, part can be fed back through the reaction coil and reaction condenser. This coil is coupled to the tuning coil and so increases the signal in the latter, again causing additional amplification.

The choke prevents these radio-frequency signals passing, but allows the audible portion of the signal to go through the primary of the transformer.

Because the secondary has three or four times as many turns as the primary, the signal is amplified three or four times by the transformer. It then reaches the grid of the output valve, where it is amplified as before.

The output valve shown feeds the speaker. It might feed another transformer and a third valve, if more volume were needed.

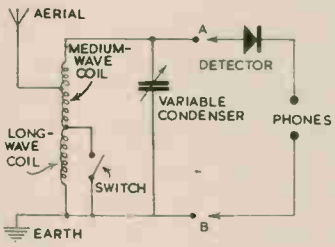


Fig. 1—The tuned circuit

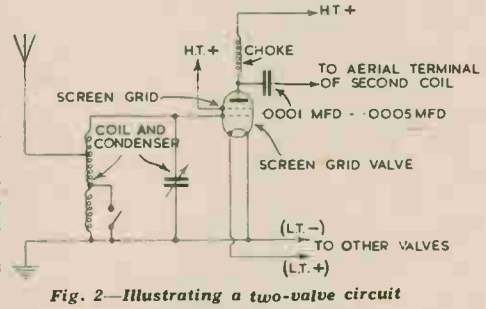


Fig. 2—Illustrating a two-valve circuit

By putting other grids in the valves it is possible to prevent any capacity existing between the first grid and the anode. This makes a Screen Grid valve better able to deal with radio signals. Sometimes a third grid is added to prevent electrons bouncing back from the anode (secondary emission). This is a Suppressor Grid, and the valve is called a Pentode. It amplifies much more than a triode.

In a two valve set, a pentode is often used for the output valve. Though they amplify less, triodes are still used because pentodes amplify high-pitched notes more than the lower tones. The triode gives less volume, but slightly better quality.

Connecting a condenser across the speaker, as in Fig. 2, will reduce the high notes. One of about ·005 mfd. is generally used with a pentode.

When the L.T. Plus switch is opened, the filaments cool, and no current passes inside the valve. The H.T. battery does not need to be switched off because the valves cannot pass current unless their filaments are heated.

H.F. Stage

Many 3-valvers use one of these, shown in Fig. 3. They amplify the radio signal, passing it on to the detector just as received, but much strengthened.

The choke allows high tension to reach the anode, but makes the radio signals pass through the condenser (which will not pass H.T. current) to the next valve.

Two tuning coils and condensers are now used, one with the High Frequency stage, and one with the detector. This makes tuning much more selective, cutting out unwanted stations. To simplify tuning, both tuning condensers are built on a single operating spindle.

Triodes are not now used in H.F. stages. This is because there is no screen grid to prevent the signal passing back across the condenser formed by the anode and grid electrodes, which would be just the reverse of what is required.

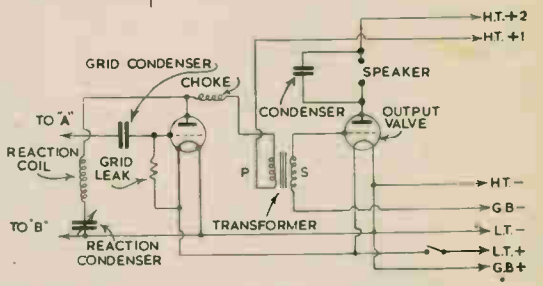


Fig. 3—Diagram of the high frequency stage

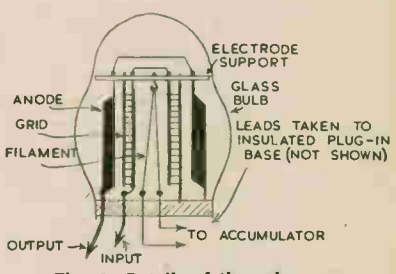


Fig. 4—Details of the valve

A popular type of hanging line can be made for a

KITCHEN CLOTHES AIRER

A CLOTHES airer, of the ceiling type, usually consists of two airer rail ends, made from light metal, four 7ft. wooden rails, a single pulley block and a double pulley block with a hank of braided cord and a cleek. Now, while you can buy the complete set of accessories, it is possible to make up a substitute which is just as good.

Readers who buy a set will still find this article useful. It is, if one has never fitted up a ceiling clothes airer before, a bit of a puzzle to know what to do with the pulleys and the cord. Two pulleys and one length of cord which must raise the airer horizontally, or lower it, without trouble. One has two ends to the cord and, after a lot of thinking, it seems that a third pulley is really necessary.

That double pulley is the answer to the whole problem, and we show, in outline, just how everything is arranged. It will be noticed that we have a double cord to work the airer. Our two cord ends go to the rail holders. Quite simple, you see—after you know! Ask somebody who doesn't know what to do, and he will probably give it up as a bad job.

The Ends and Rails

If you wish to make up the airer, prepare two ends as shown, cutting same from ⅞in. wood, or ½in. stuff, if nothing else is available. A hardwood is preferable, but deal or cedar would serve. You need two pieces 3ins. wide. When slotted and shaped, ⅞in. wide by ½in. thick strips are screwed below the slotted edge.

Now, there is a reason for this—several reasons, in fact. One is that the slots are easily cut. The second is that by having your rails slightly wider, the strips, pressing against them by pressure of the fixing screws, holds them firmly in position. In the case of commercial sets, the rails are very loose, and easily pushed out of the holders, unless nails, or dowel pegs, are pushed through the rails, near the ends.

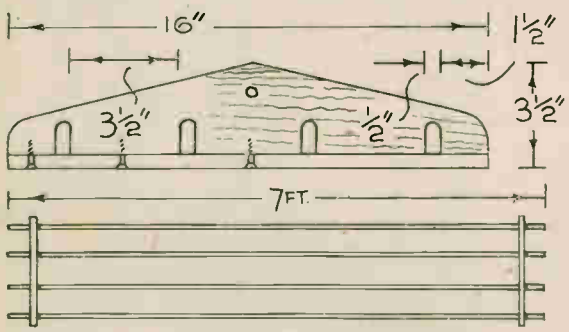
The rails are cut from ½in. wood to be 1¼in. wide, with one edge rounded. This edge is kept uppermost so the clothes are not frayed or sharply creased while hanging up to dry. Once the rails (these could be cut from a 7ft. length of ½in. deal flooring or shelving) have been prepared, they are affixed to the ends as already described. Be sure to bore ⅜in. holes for the ends of the cord in the airer ends.

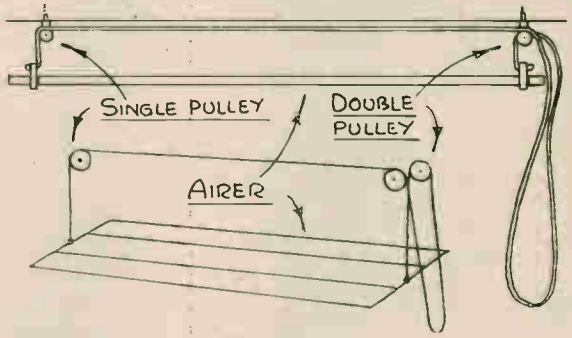
Pulleys and Cord

You will need to purchase a single pulley, with screw, and a double pulley, with screw. The screws, of course, are part of the pulley wheel mounting. The double pulley consists of a double-grooved wheel in its mounting. The wheel is thicker than the single pulley wheel. Although the thicker wheel is really a single wheel, it serves the purpose of a double wheel.

While buying the pulley blocks, also obtain a hank of ⅜in. braided cord and a metal fastening cleek. The latter screws to the wall to serve as an anchorage for the airer cord.

The next thing is to know where to arrange the airer. In the case of a kitchen or parlour house, the usual place is at the landing, just above the stairs, high up where it is not readily seen. In other words, we make use of the ceiling of the landing, which is next to the roof. The airer, where a parlour house is concerned, is suspended directly over the stairs. It can be lowered to the banister rail, where one can reach over and drape the clothes easily over the rails.





Diagrams of various wooden parts with detail of pulley and lines

As the screws of the pulley blocks require to be screwed into the ceiling, a step-ladder will be needed, including a floor awl or something similar. The awl is used to find the position of the ceiling rafter. You may have to make a few holes in the plaster, but it is worth while to find the rafter, as the airer, draped fully with damp clothes, is quite heavy.

You will probably find nothing better than the plaster laths. The pulley screws have not much of a grip in these laths, which are only 1¼in. with by ¼in. thick. The pulleys do get a firm grip on these, but as the laths are merely tacked to the rafters, or ceiling joists, the chances are that they may pull away, bringing much of the ceiling plaster with them.

Assuming you manage to get the pulleys up strongly, the cord is threaded through them as indicated, the ends being brought through the holes in the airer ends and a single knot tied to prevent the cord pulling through. Be sure to have the cord properly fixed through the pulley wheel mounting. If done incorrectly, the mounting will fray the cord by constant rubbing of the cord against the sharp edges.

Horizontal Lift

By pulling on the double cord, the airer should rise up on a horizontal level. If not level, straighten by pulling on one of the cords. When straight, tie a knot in the double cord. This will ensure that the airer rises and lowers on a level with the ceiling. The knot, if possible, should be made at a point where it can be hooked to the cleek. It should not interfere with the lowering of the airer, i.e., by coming up against the double pulley.

Incidentally, make a point of applying thick oil to the pulleys prior to fixing them to the ceiling. It will be difficult to lubricate them once affixed and the airer suspended.

FRETSAW BLADE HOLDER

A useful holder on the work-table for your fretsaw blades can be made by gluing two or three cotton reels together so their central hole form a cylindrical tube in which the blades will stand. Get the heaviest reel at the bottom for weight.

A Craftsman's Notebook

Keep Bottles Labelled

UNLESS they are labelled there is always a possibility of confusion over the contents of different bottles. Amateur chemists, photographers, and others who include bottles among their equipment ought, therefore, to make sure that each is clearly marked before it takes its place on the workroom shelf.

My paper labels usually have rounded corners. If not, they are trimmed round, as I find that these keep down better than the square corners. In cases where stock solutions are made up at home I find it useful also to include the formula on the label, so there will be no doubt about the exact strength when further supplies have to be made.

A tip when pouring from a bottle is to pour from the side opposite the label, in order that any drips which happen to run down the side will not obliterate the lettering. Many workers preserve the labels with a coat of clear varnish, carried beyond the edges of the paper on to the glass itself.

A Whitewashing Hint

WHEN whitewashing ceilings I have the pleasing knack of keeping the handle of the brush almost dry, and amateurs who always get the whitewash streaming down the handle, and sometimes their arms too, occasionally ask how I manage otherwise.

Being only an amateur decorator I am actually as surprised as they at my success in this direction. What I would suggest, however, is to take up the whitewash on the tips of the bristles only, never dipping the brush so deeply that it reaches the tin where the bristles join the handle.

Another good idea appears to be to get well up on the steps so the arm can be slightly bent to reach the ceiling around one easily. To work from a low level, with the brush straight above one's head, often seems to be a cause of the whitewash running down.

Chiefly about Collecting

EARLIER this year the Cartophilic Society and the Cameric Club—two main organizations of cigarette card collectors—held their first exhibition of cards. One of the rarest sets is said to be a series of 100 ships issued by Wills in 1897.

A particularly valuable autograph is that of William Shakespeare, the two or three remaining letters that bear his signature being valued at something like £200,000 apiece. Nelson's signature is said to have fetched £20, and that of Charles Dickens over £36.

Matchbox labels valued at about £100 were to be seen at a rally of philumenists (the more technical name for the collectors of matchbox covers). Also exhibited were a hundred or so different varieties of match, some a foot in length.

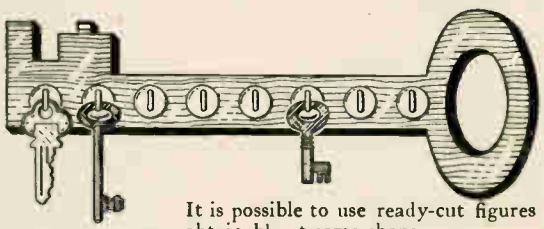
An Oxford collector, specializing in cuttings, pictures, and programmes connected with entertainment, is reported to have got together between one and two million such items.

His collection, started when he was 15, includes almost every film star ever known, and in some cases—Deanna Durbin and Charlie Chaplin, for instance—the pictures number as many as a thousand.

To help in compiling a survey of racial origins, university scientists enlisted the aid of a trichologist to collect, classify, and catalogue samples of hair from all the races of the world.

The Craftsman

NOVELTY KEY RACK



AT coming-of-age parties it is often the custom to present the person now arrived at man's (or woman's) estate with an outsize "key of the door". These, made in silvered cardboard, can be obtained at stationers' shops, but are comparatively expensive. This article shows how to cut one from fretwood, and follows one we had on a variety of types some time ago.

Only a small number of people are, at any given moment, interested in coming-of-age parties. The same "key", however, with only slight adaptation, can be used to form a key rack as illustrated. The reader who makes up novelties for sale will thus find a double use for this giant "key", and those with treadle machines can cut two or more at a time.

The Pattern

A pattern is first prepared. This is done by the usual method of "squaring up". In the diagram, the large squares are 1in. and the smaller ones ½in. If only one key is required, a paper pattern is made and pasted down in the ordinary way, but if it is anticipated that several will be required, a cardboard template can be made and pencilled round.

Though large sheets of plywood are, at the time of writing, not too plentiful and correspondingly expensive, there is any amount of plywood "offcuts" for sale at very cheap prices, and these will do very well for the present job.

By the way, the figures 2 1 are cut out separately and mounted afterwards.

It is possible to use ready-cut figures obtainable at some shops.

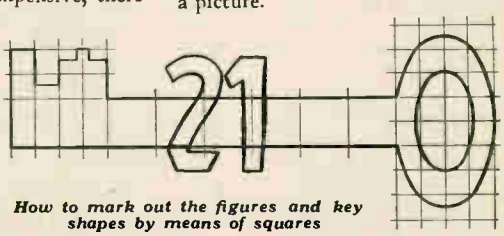
The Numerals

For a "twenty-first" key, comparatively thin wood can be used, but thicker wood is needed for the key rack, to provide some grip for the screws on the hooks. A strip of wood about 1in. by ⅜in. can be glued to the back of the key-rack for this purpose.

For a "twenty-first" key, the figures are, as already mentioned, glued on after the main key has been made and trimmed up. A good finish would be to paint thin glue all over one side and then sprinkle imitation "frost" or "glitter" (such as is sold for Christmas decorations) on it.

When dry, the surplus powder can be dusted off, and the other side treated. A bow of white ribbon completes the job, though, as the recipient will probably be expected to wear the key round his neck, a length of white silk cork (e.g. parachute cord) should be provided.

For the key rack, the wood should be stained and polished and some cup-hooks or key hooks inserted as shown. The rack can either be fixed directly to the wall, or hung up, like a picture.



How to mark out the figures and key shapes by means of squares

The sails revolve when you pull along this

SIMPLE TOY WINDMILL

HERE is another attractive mechanical toy to make, which works as you pull it along. Our illustration gives an idea of how it will look when completed and painted with brilliant paints or enamel.

The length of the toy is 8ins. and it is 5⅞ins. wide and 9½ins. high. It is made up almost entirely from ¼in. wood, but the sails could, if desired, be of ⅛in. wood or even stout card.

The simple mechanism which turns the sails as the toy is pulled along is explained in the diagrams, but it might be said here that from a pulley on the axle of the front pair of wheels a belt extends and is carried round a second pulley on an axle immediately beneath the windmill itself. Then from this axle a belt extends upwards to the axle and pulley bearing the sails.

The Mechanism

It is thus only a matter of cutting a few pulleys and washers, fixing them to the cross axles and finally adding the belts, which might consist of fine string. If elastic bands are substituted for string belts, then they will have to be threaded on the axles during assembling of the parts of the toy.

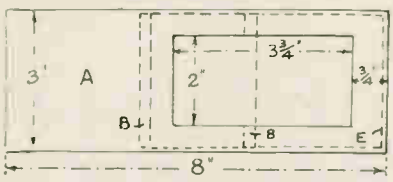


Fig. 1—Outline of floor and opening

The first part to make will be the floor (A) shown in Fig. 1. Mark this out in pencil direct on to wood and cut with the fretsaw. Follow this by setting out and cutting the front and back walls (B) of the mill, see Fig. 2. Having made one piece, lay it on a second and mark round it to get the exact duplicate shapes. See the holes for the axles of the sails are identical on both pieces.

Sides and Roof

Next make the sides (C) of the mill. These are simply two pieces measuring 4½ins. by 2ins. They are glued between the front and back shown in Fig. 3 and by the dotted lines in Fig. 2. This completes the construction of the mill except for the roof which will be added later.

It might, however, be said now that the roof can be formed from tin or stout card bent to the pointed shape of the front and back and pinned on. A detail of part of the roof is shown in Fig. 3.

The two side rails (D) of the floor are next marked and cut. These measure 8ins. by 1½ins., and are glued and pinned to the edges of the floor, see Fig. 4. There are three axle holes in each piece, one hole in the middle of its length and one towards each end at 1½ins. from the end as Fig. 4 shows.

It will be observed from Fig. 1 that the mill itself is glued and nailed or screwed to the top of the floor in the position shown by the cross dotted lines (B). There is an open space left in the floor towards the front of the mill, intended to gain easy access if required to the pulleys and belting. This space is later covered over by a piece of wood measuring 2½ins. by 2¾ins. and it may be seen in the sketch of the finished toy.

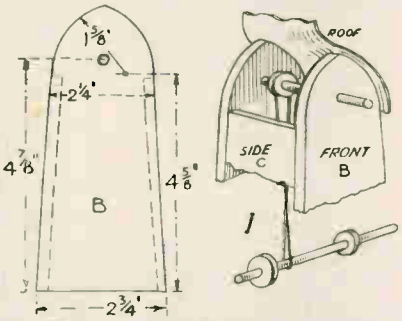


Fig. 2—How to mark out shape of sides

Fig. 3—How the sails are driven from the axles

The wheel axles are 5⅞ins. long, and this length suits the ready-made wheels provided by Hobbies, Ltd. The wheels are 2⅜ins. diameter and ⅝in. thick and make a very substantial bearing for the toy. The outer faces of the wheels come flush with the ends of the axles, but on the latter will be threaded, during the building up, the washers (G), Fig. 4, which will keep the wheels evenly and properly spaced.

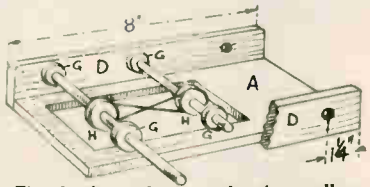


Fig. 4—An underview showing pulley drive

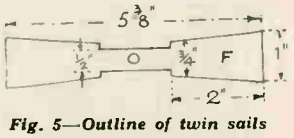


Fig. 5—Outline of twin sails

The centre axle will also have similar washers (G) put over it. The washers, of course, are placed so they come on the inside of the rails (D), see Fig. 4. The pulleys (H) are 1⅛ins. in diameter, are made from the ¼in. wood and grooved deeply with either a rat-tail or three-sided file. The former, it will be found, makes the better and more suitable groove. Glue on the pulleys as shown in position in Fig. 4, and later connect up with the belt shown.

The Sails

The shape for cutting one pair of sails is given in Fig. 5, and they may be cut from thin wood or stout card. Cut an axle for the sails from ¼in. diameter rod about 3ins. long, and glue on a pulley similar to those below. Spacing washers may be added as required, and the sails glued on to a washer on the axle outside to form a stiff fixing.

The method of connecting the lower axle with that on the sails is shown in Fig. 3, the belt passing round the lower axle and over the pulley above. See that the axles turn freely in their bearings, and make quite sure the washers are spaced properly to give adequate clearance for the wheels to have free movement.

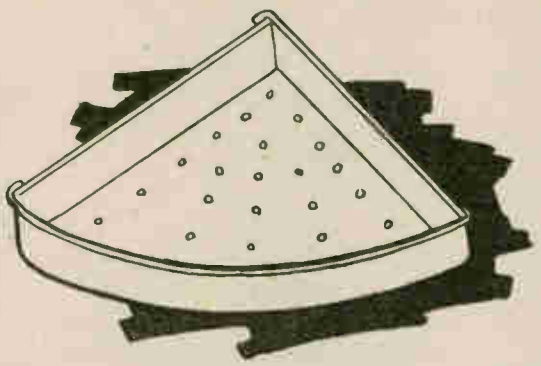
The completed model can be painted in bright colours of brown, red and black lines. Be sure not to get paint to the working parts where it is likely to hinder the smooth running of the model.

The handyman metal worker should try his hand at

A METAL SINK TIDY

THIS useful kitchen utensil is quite easy to make, and will provide a handy receptacle for tea leaves, etc., making the bugbear of washing-up much easier. It fits into one corner of the sink, and having a perforated bottom, lets out all water whilst retaining the leaves.

To construct, you will require three strips of material as follows: One 8½ins. by 2½ins.; one 8¼ins. by 2½ins.; and one 8ins. by 2½ins. In addition you will need a triangular piece for the bottom (Fig. 1).



The Side Pieces

To facilitate reference we will call the three side pieces A, B and C, and the strips must be marked out and cut as per diagram (Fig. 2).

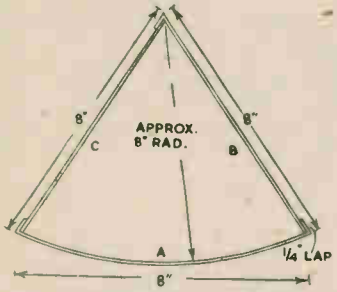


Fig. 1—Plan view and details

With the aid of the bending irons and cramps, fold over the ½in. strip at the top of each piece. As your pieces may be longer than your bending irons, it will be necessary to fold each strip in two halves.

After folding, lay the strips on your bench iron and, using your mallet, knock each fold right down flat. This is known as "edging," and you will achieve a much neater finish if you travel along the whole fold, easing it down equally, rather than trying to knock down flat a bit at a time. If you do the job the latter way the resulting edge will present a rough and uneven appearance. When flat down, the fold may be smoothed over by lightly tapping with the hammer.

Next, fold the bottom edges, again using your bending blocks, but this time do not knock flat. Instead, leave them at right angles to form supports for the bottom when inserted.

The next job is to fold the corner supporting laps. Obviously, you cannot get the strips into your bending blocks, so these folds will have to be bent over on the edge of your bench iron, using the mallet. Ease the folds over equally, a little at a time.

With the bottom looking inwards, lay strip A on the bench iron, holding B side in the correct position and solder together in the corner, allowing the solder to penetrate well into the joint.

You can insert C piece into position, soldering likewise. Now you have A, B, and C soldered together, forming a perfect triangle, and your sink tidy begins to take shape.

Using the thumbs, gently bend A strip outwards, until it is shaped into

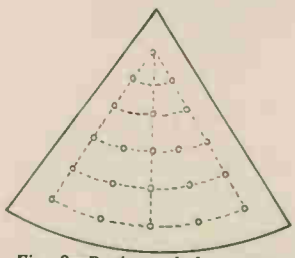


Fig. 3—Draining holes pattern

a gradual arc. You will now appreciate why the notches were cut in the bottom fold of this particular piece, as without them, it would have been impossible to bend into an arc as required. Where the folded top edges join together, fill up the slight gap with solder, filing smooth afterwards. This will give a smooth unbroken top edging to the finished job.

The Bottom

Get a piece of material large enough for the bottom, but before cutting, mark out in a symmetrical pattern the holes for water drainage. These must be punched out on a piece of lead or hard wood, but in this case the resultant countersinking must not be hammered back. All that is necessary is to file off the sharp burrs on the back side with a file.

When the job is finished, these countersinks will elevate the bottom slightly and allow the water to drain away.

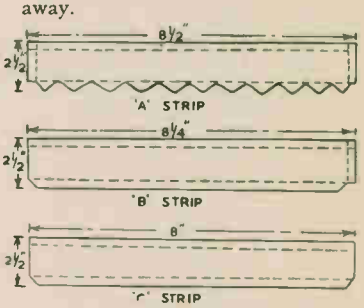


Fig. 2—Outline of strips

Make sure the bottom is a good fit before inserting. You can mark it out to the exact shape and size by laying the completed side portion upside down on your material and marking round the inside, taking care to get your whole pattern central.

After inserting the bottom, turn the whole job upside down, holding the bottom in position with the left hand. Tack in about three places and then solder right round the outside, allowing the solder to run well into the supporting folds.

Clean off flux, dry thoroughly, and finish by giving at least three coats of white enamel. You should now have a sink tidy of which any housewife will be proud, and the satisfying knowledge that you have made it yourself.

Stamp Collecting—(*Continued from page 69*)

Then there are the Gandhi memorial stamps from India and also the Olympic Games issue of Great Britain which has been overprinted and surcharged for use in the areas around the Persian Gulf. Monaco has also issued a very fine set of stamps in commemoration of the Olympic Games with some beautiful pictures of an athletic nature. Athletics, rowing, swimming, skiing and sailing are all depicted.

Lastly the United States of America has not been behind! Very far from it in fact, for it has issued too many for the average collector to keep count. This is a pity as it detracts from the interest of those which are worth having.

Unfortunately, Great Britain has herself issued (or rather the Colonies have) a great number of high value stamps for the Silver Wedding. Now, it is almost impossible for any except the rich to be able to afford all these. The full set costs £47, and many of the stamps are of such high value that their postal use will be very limited indeed. So one wonders if the stamps are issued in order to defray postage of normal nature or are they issued in order to collect money from collectors?

NOTES ON NEW ISSUES

IT is some considerable time since we discussed the stamps that have appeared among the new issues, so there is some leeway to make up.

Once again our thanks are due to Mr. Donaldson, of Wellington, New Zealand for the first item which is illustrated. Readers will recall that he also very kindly sent the New Zealand Life Insurance set which gave a very interesting view of many of the lighthouses of New Zealand, also the Otago Centennial set.

This time he sends the three denominations which comprise the set for the new stamp issuing territory of the Tokelau Islands. Formerly they used the stamps of New Zealand but now with the new administration they have their own.

Nice Views

These islands are situated some 350 miles north-east of Samoa. To appreciate these stamps properly, a good magnifying glass is essential. Look, for instance at the ½d. value which is illustrated. On the left of the central picture is a map showing the situation of the three islands in the Pacific Ocean. Then, on the right of the picture, which is quaintly framed by sloping palm trees, there is a map of the island of Atafu.

The 1d. stamp gives a picture of a

Commemorating Pakistan Independence

native constructed hut and also a map of the island of Nukunono, while the 2d. value has a general view and a map of the island of Fakaofo. So you see that a full set of three stamps not only lets you know the proper position of the group but also gives you a detailed map of each island.

Sierra Leone

This treatment reminds one of the 1½d. value of Sierra Leone. the Wilberforce issue which gives a map of Africa showing the position of Sierra Leone, then a large map of the Colony. As the price of the set is quite low, readers should be able to obtain this interesting addition to the stamp album.

The 12 annas stamp from India which is shown was issued to commemorate the Indian to United Kingdom Air Service and was valued only for postage on the first flight. The aeroplane shown is a four-engined Constellation. Naturally, a specimen used for franking mail on this first flight should become a desirable item and most certainly should be kept on the envelope—on no account be soaked off.

Pakistan has issued four stamps to commemorate her independence.

Tokelau Islands—an attractive view set

One of these, the 2½ annas which shows a picture of the entrance to Karachi Airport, is shown here. The other values are the 1½ annas, with a view of the Assembly Buildings at Karachi; the 3 annas, with the Gateway to Lahore Fort; and the 1 Rupee which has a crescent in the centre and two stars in the top corners. Each stamp bears the date 15th August, 1947—the date of Independence.

India and Gold Coast

India also issued a set of stamps to mark the event. The 1½ annas shows native carving, the 3 annas the Indian National Flag and the 12 annas a modern four-engined aircraft.

One of the most interesting sets which has appeared for some time is that which comes from the Gold Coast. Readers will recall that for some time the stamps which have come from this Colony have all been of the same type of design. There was a picture of Christiansborg Castle at Accra with a small medallion portrait of either King George V or VI.

Now we have a different design for each value, but retaining a small portrait. The ½d. shows a mounted constable in an ancient archway, the 1d. a much-improved picture of the castle, the 1½d. shows some native emblems of the Joint Provisional Council, and on the 2d. there is a picture of a native beating two drums with the inscription "Talking Drums". Everyone has heard of the marvellous way in which news is transmitted by means of the beating of these drums.

A very nice map of West Africa marking in the areas surrounding the Gold Coast appears on the 2½d., while the 3d. informs us that one of the products of the Gold Coast is manganese—that element essential to the making of certain types of steel.

Cocoa Farming

Lake Bosumtwi is shown on the 4d., but the most interesting of the designs come on the 6d. and the 1/-.

India—First flight only

The former is shown here, and as you can see it shows a cocoa farmer in the act of cutting off from the tree one of the cocoa pods. It shows very well indeed how quaintly these pods grow, coming as they do direct from the branch without any leaves near.

The higher value then shows natives splitting open these pods in order to get at the beans. These beans are then fermented and dried and later made into chocolate or else into cocoa powder as we know it. The 2/- value reminds us of the Colonial soldiers, as it is a picture of these soldiers trooping the colour.

Among the other issues that we

Growing Chocolate on the Gold Coast

can do no more than mention are the new Australian stamp, the 2½d. issue, to commemorate W. J. Farrer who did so much to further the growth of wheat and the Egyptian stamp showing the entry of Egyptian troops into Gaza.

(*Continued foot of page 68*)

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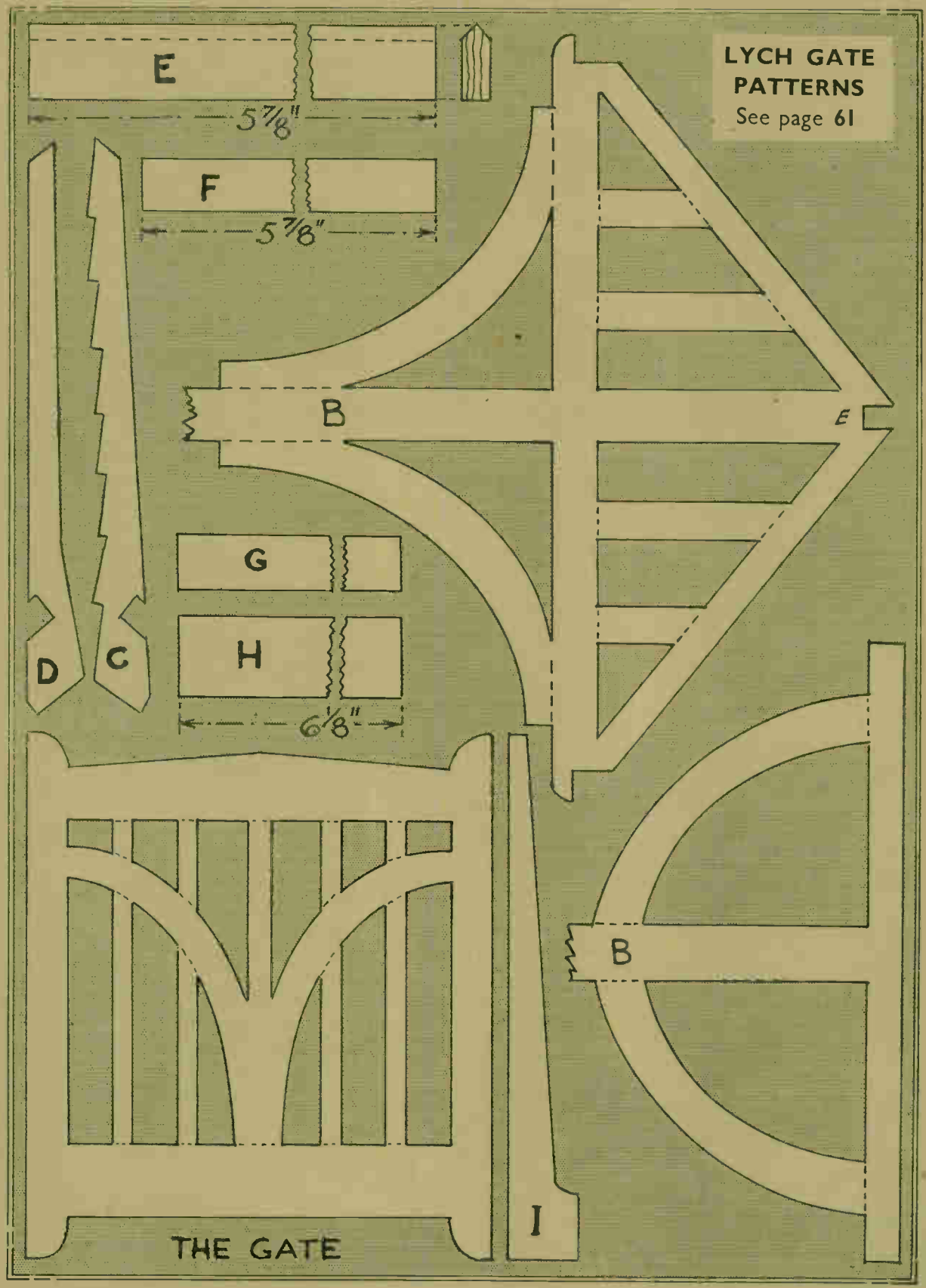
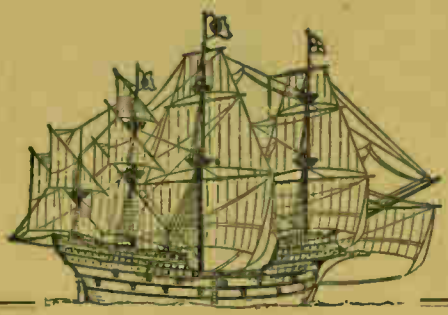
(*Continued on Cover IV*)





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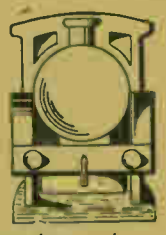

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WITH LARGE DESIGN SHEET FOR MODEL LORRY

Hobbies WEEKLY

CONTENTS

November 17th, 1948 Price Threepence Vol. 107 No. 2768

DOLL'S PRAM STYLES

THE pram illustrated may seem unusual, but it does please the kiddies. Something like a pram is better than nothing. It happens to be the easiest and cheapest model that could be made. The other designs are a bit more elaborate and conventional, and will serve to give you ideas.

It is always about this time of the year that our readers look for suggestions for Christmas gifts. A toy pram is always a welcome present. Instead, however, of confining you to one particular design, you have three models to choose—each of which are very simple to construct.

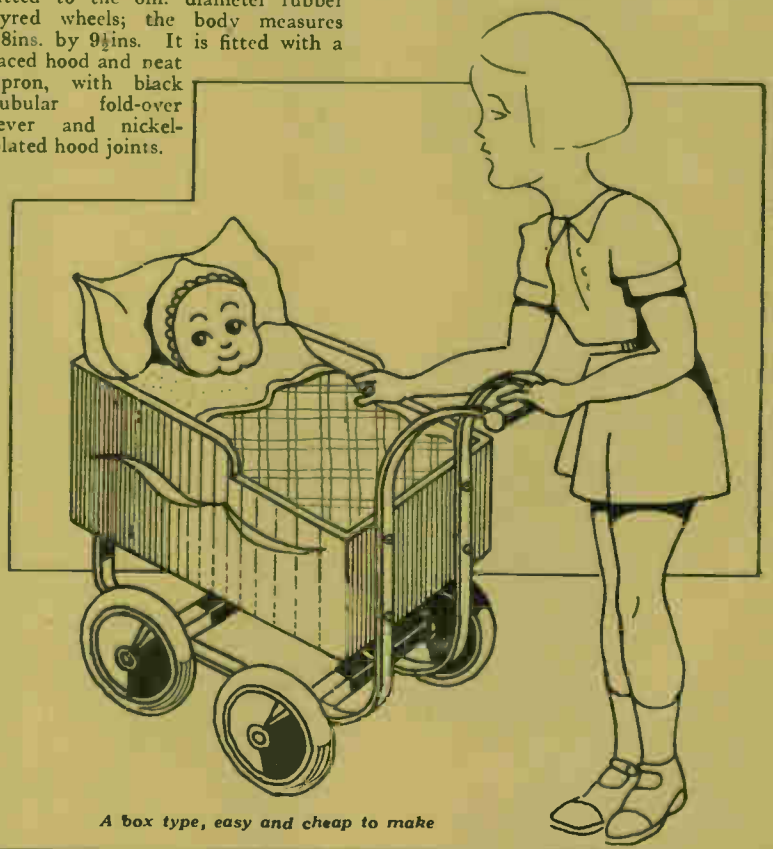
Steel disc wheels with rubber tyres are used, and there should be no difficulty in obtaining a set of these wheels of the diameters mentioned. The wheels really give a professional touch to the finish of the toy. Hardwood wheels, with red-fluted centres, if available, could be used to keep down expense. In the long run, however, you may regret not having invested your money in the metal wheels.

Pram Design "A"

First of all, the specification of a normal "de-luxe" pram is sure to be of interest. This model pram (A) is manufactured on realistic lines, being the type usually bought in the shops. It is a super quality model, with strap springs and steel body having an embossed design. Mudguards are fitted to the 6in. diameter rubber tyred wheels; the body measures 18ins. by 9½ins. It is fitted with a laced hood and neat apron, with black tubular fold-over lever and nickel-plated hood joints.

Now, it is not easy to try and copy such a pram. The body could be shaped from ½in. wood, and the edges covered with stiff cardboard or a strip of lino material. The shaped sides need to be held together with cross pieces at the top ends, with two or three at the bottom. These act as braces and keep the sides the correct distance apart when nailing on the covering material.

The body is supported by suspension springing. You will have to



A box type, easy and cheap to make

All correspondence should be addressed to The Editor, Hobbies Weekly, Dereham, Norfolk.

build a chassis consisting of two metal axles affixed to the springing. The wheels need to be fitted on axle stems, and be held with cotter pins, with a covering grease cap.

The point is that you cannot get the pram wheels, the axles or the springing, nor the fasteners for the springing and the body pivots. You will, to copy such a pram, have to make these parts. It might be possible to pick up second-hand toy pram wheels.

Hood Bracing

Even with these difficulties overcome, the pram hood fittings will cause some bother. Strip metal could be bent into "ribs" for the hood, the latter, like the apron, being black or brown leatherette. After being attached, the hood needs bracing with suitable metal stays. The pushing handles needs to be made out of tubular rod, correctly bent and flattened at the ends for boring and fixing with screws. Nothing but difficulties, obviously. Another plan is to have the wheel axles fitting to flat bar which is bent to screw to the underside of the body. This is much easier, but you will still experience difficulties.

Pram Design "B"

A basinette type of carriage is shown at B. It is fairly small, the body being made up to width with 10in. by ¼in. wood, such as deal shelving. It is possible to obtain the sides and hood pieces from two lengths of board. The hood pieces are butt-jointed on after cutting to shape. The sides are nailed on ½in. stuff which will form the bottom and ends. The width of these could be 10ins. or more.

A 1in. square wooden axle is screwed beneath the body. It is for the 10in. diameter front wheels, such as the steel disc type. The rear wheels are 6ins. in diameter, which means that the axle bar must be cut wider, as seen in the elevation. The pushing handle is flat bar, 1in. wide by ⅛in. thick, affixed with round-head screws.

The handle, which is a length of 1in. dowel rod or piece of broomstick, is slotted at the ends to fit tightly and neatly on the bars. It is advisable to have a screw going through the handle and the bar ends. The wheels are attached with suitable coach screws (not carriage bolts) and washers.

Pram Design "C"

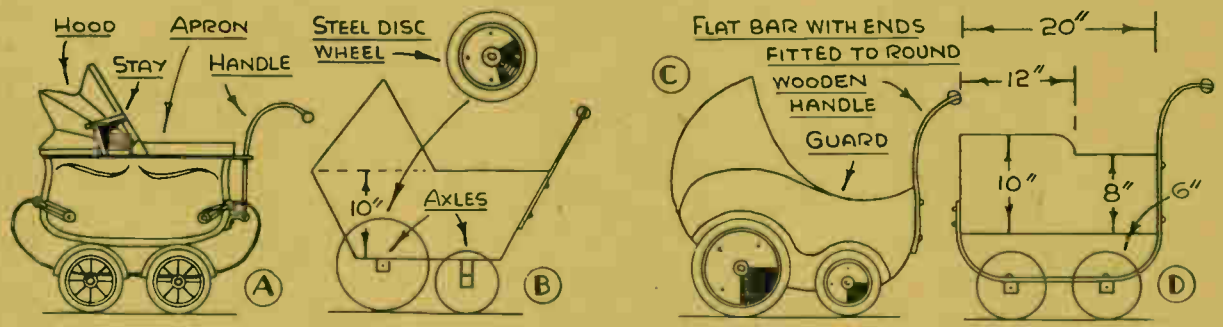
A low-built, streamlined type is at C. This is on modern lines and just as easy to build as the previous model. Cut the sides from ½in. wood, then cover the edges with some thin pliable material, such as cardboard or lino. Be sure to fit the cross pieces between the sides before, of course. You particularly need the cross pieces at the bottom of the body in the approximate position of the wheel centres so that the wheel screws have something solid to drive into. The cross pieces should be cut from ⅞in. wood, and be about 2ins. to 1½ins. wide. Attach them with glue and 1¾in. oval nails.

The approximate position of the 10in. and 6in. wheels is found and the diameter of the wheels scribed with the compasses. A shaped piece of ⅞in. stuff, cut to suit the contour of the wheels, as in the elevation, is prepared for both sides. Note that there is about a 1in. clearance.

When these shaped pieces are attached with glue and nails, they form mudguards to the wheels. The latter, of course, are attached with coach screws of suitable thickness and length, with metal washers added to prevent rubbing and wear at the hubs. A handle is made up similar as the one described for model B. It will be noticed that two screws are required to fix the handle, so it will be necessary to have cross pieces at these points.

Pram Design "D"

Prams, minus a hood, of course, seem to lack something. In the design at D, a simple surround is provided and this dodge saves a lot of constructional bother. The body, prepared from ½in. wood or possibly an old soap box, is rather plain. To make up for some of this plainness, and also raise the body higher so that 6in. wheels (which are considerably cheaper than the 10in. size) can be used, it will be observed that the handle bar and a form of springing are in one piece.



Four distinctive types of toy pram which should give ideas for completion

The bar is 1in. by ⅛in. stuff, either iron or mild steel, the latter being preferred. You need to bend two identical bars—a simple job, really, if you go to the trouble of shaping a wood former. A piece of wood, 20ins. by 6ins., with the ends round to a 6in. radius, will help you in bending the bar where it goes beneath the body for the wooden axles.

When the bars are prepared and drilled and screwed in position, the 1in. square axles are secured with single screws and the wheels attached. Be sure to bore suitable holes for the wheel screws so the latter drive in without splitting the wood. You will need a spanner for driving purposes, as coach screws have a square head, and a threaded shank similar as a wood screw.

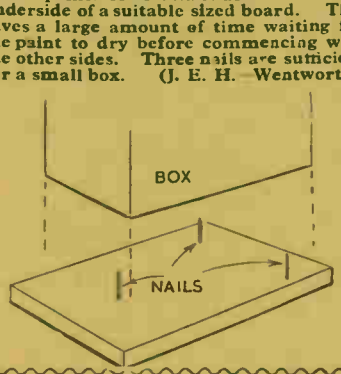
Finish the Prams

The prams should be finished in bright enamels. Some are light brown or deep blue. Providing the wood surfaces are filled up and made quite smooth, you could obtain a good finish by applying the enamel with a spray gun.

Alternatively, assuming you have a small spraying outfit, the prams could be cellulose finished. Even if you do not possess a spraying outfit, you can buy brushing cellulose paint. It is much thicker than the spraying stuff, being flowed on with an enamel brush. However, ordinary enamel will give just as good a finish.

A PAINTING IDEA

When painting the outside of wooden boxes and similar articles, a good idea is first to paint the bottom of the box then stand it on the points of 3in. nails driven from the underside of a suitable sized board. This saves a large amount of time waiting for the paint to dry before commencing with the other sides. Three nails are sufficient for a small box. (J. E. H. Wentworth).



A new and efficient shock-proof type of gramophone

RECORD REPEATER

GRAMOPHONE record repeaters can be very useful, particularly where 7in. or 8in. discs are concerned, these having a playing time of short duration. Therefore, if you possess a number of these small records, or desire, at some time, to keep repeating part of a 10in. record for instrument practice work, dancing, etc., you need the repeater shown. Full-size pattern is given on page 83.

It is an improved, simplified type, easily made, using 1/16in. thick Perspex for the main shape, and 1/32in. stuff for the underside. It is the latter, you see, which is cut to lift the playing needle and "carry" it across the record to the start. All this is automatic, and there is no possibility of spoiling the surfaces of records.

A trouble, perhaps, with previous record repeaters designed by the writer, was the sudden concussion of the adjustment bar against the sound-box, or pick-up, needle. Although the shock was mild, it would, in all probability, have a bad effect on the stylus in time.

Shock-proof

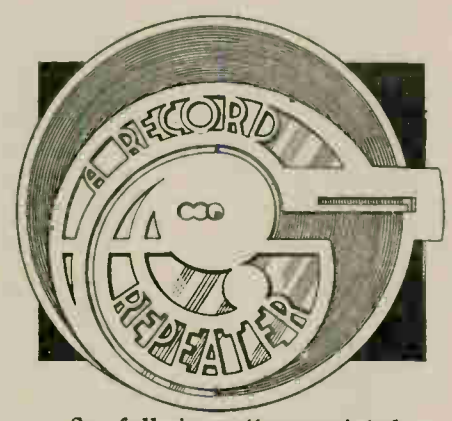
In the new repeater, there is no adjustment bar. There is merely a bar, cut to "cushion" the knock of the repeater against the playing needle. To obtain some adjustment, three pre-set spindle holes are provided. These enable the repeater to be used on records from 7ins. to 8ins. in diameter. The hole in between the other two holes is not for an intermediate size of record, i.e., a disc 7½ins. in diameter, as this is not a standard size, even in the case of direct disc recordings.

The extra hole, as shown at Fig. 1, allows the repeater to be more suitably adjusted on 7in. or 8in. discs which do not terminate properly towards the centre so that the needle is unable to escape into the repeater groove, at which point it is taken up by the thin underside of the repeater and carried, by the action of the turntable, across the record to the beginning of the sound track.

Full-size Patterns

Because of the difficulty of drawing the repeater shapes from a squared-up diagram, and the accuracy required, full-size parts are provided on page 83. There are merely two separate shapes, one fitting within the other.

The pattern page should be adhered to a flat piece of 1/16in. thick plastic material, then carefully cut with a fine fretsaw. Slightly thicker plastic material, such as celluloid or Perspex, plain or coloured, may be used. You could even use thin plywood, such as 1 m/m. stuff. Stiff card is unsuitable,



See full-size patterns printed on page 83

as the edges fray easily. Paxolin could be used, which is a stiff material, rather like card impregnated with shellac. It may be cut with an ordinary fine fretsaw or a metal-cutting blade.

Helpful Waste

Whatever stuff you decide to use for the main shapes, be sure to keep the part which separates the two shapes intact, as this piece of waste helps to keep the parts truly centred when adhering them upon the thinner underside material.

Exercise every care whilst cutting the parts to shape. Do the inner frets first, i.e., the lettering, etc., then the outside shape. When cut satisfactorily, carefully remove the shape holding the two pieces together.

The needle track is only ¼in. wide, until it begins to widen towards the buffer bar. To ensure smooth working, the edges should be neatly smoothed with fine abrasive paper. Roughen the underside of the work by lightly rubbing with coarser paper. This is to form a "key" for the adhesive and also remove trimmings from the frets, if any.

It is being assumed, of course, that you are using a plastic material. If you use 1 m/m. plywood, or even ⅛in. stuff, glue will obtain a better grip if the underside is roughened slightly with M2 glasspaper. If wood is used, have the grain running in the direction indicated by the arrow.

The Underside Shape

Having prepared the main repeater shapes, you can now attach them to a sheet of thin celluloid or other plastic material. A piece of old X-ray film, well cleaned, could be used, or any photographic film, if of a suitable size. The material must be reasonably thin—not more than 1/32in. thick. It may be transparent or coloured, but must be of a plastic nature so that the needle will ride on it smoothly, without damage or deep scoring.

You need a piece 7½ins. by 6½ins. Lay it on a flat board. Apply a thin smearing of cellulose cement on the reverse side of the outer repeater shape and press it down flatly on the piece of film. Hold it down for a few minutes, as the cement dries rather rapidly. Set in the waste shape, for centring purposes only, then apply adhesive to the central repeater shape and fit it down in position. Place another flat piece of wood on top and weight it down with heavy books. A heavy smoothing iron is a good weight to use.

Ordinary glue, obviously, cannot be

(Continued at foot of page 76)

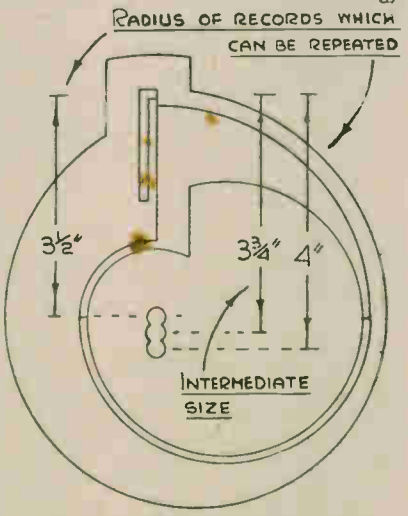


Fig. 1—The main shape, which takes 7in. or 8in. discs.

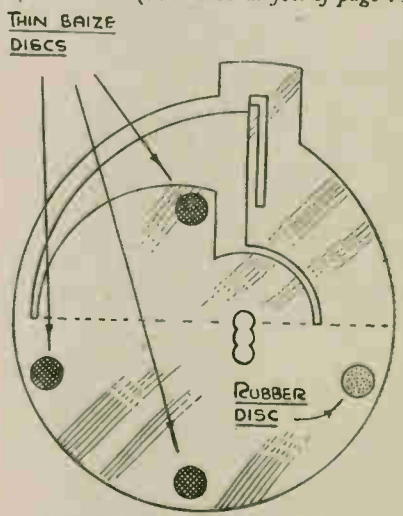


Fig. 2—An underside view, showing position of the pads

What to do and how to get the best out of WINTER CYCLING

DO not store your bicycle during winter. There are many days that are most pleasant for a run out into the countryside—sunny, bright, and exhilarating. In clear frost-bound weather, if the roads are not too icy, it is grand to go wheeling along the byways, for the country is often very strikingly beautiful in its wintry garb. You get spacious views hidden during the summer by the wealth of foliage.

It must be confessed that when roads are ice-bound and riding precarious it is advisable to stay at home, but we do enjoy many calm dry clear days that tempt us out, and wise cyclists take every advantage of such. Choose your day when at all possible.

To obtain the best out of winter cycling one must be properly equipped and suitably clad. As to clothing, some prefer a polo-neck jersey, gauntlet mitts, and plus-fours or similar nether garments. In the bag take a roomy cape and a sou'wester and leggings—just in case! Then, even a snow squall will not harm you.

Warming Up

With a three-speed gear you can drop into low gear to get a spot of fast pedalling when the air is frosty and you need to keep your circulation going. The riding position should not be too low; it is better to sit up and face the elements.

You will require good lighting, if likely to be abroad after dusk. Dynamo lighting is now in favour, and with the improved modern sets you can put your faith in your lamps. A red rear light that is reliable should be used.

As to the machine itself, it is advisable to have good non-skid treads on the tyres. Badly worn smooth tyres in winter may be risky. And no cyclist likes "skids".

Keep the cycle well greased and oiled. The chain, unless protected by a gear-case, should be periodically treated with graphite grease, removing any surplus, just a thin film being sufficient. Pack all bearings with grease, the pedals in particular. Bright parts of the machine should be smeared with a thin coating of Vaseline.

In Inclement Weather

Many young folk depend upon the bicycle for getting them to work, and must perforce turn out in all kinds of weather. What if it does rain, or there are snow showers? Provided you are suitably clad, you can face up to anything. Cyclists who need to wear glasses require a hat or cap with brim or peak to afford protection—spectacles blurred by rain or moisture obscure the outlook.

The outfit for wet weather includes poncho, sou'wester, and gaiter leggings. The cape should be roomy to fit well over the handlebars, with a full skirt, a deep storm collar, and thumb loops. Avoid a skimpy cape!

Cycling spats are quicker to put on than overalls, and not so hot to ride in; they can be slipped on in a few seconds, and serve their purpose quite well; they are also kinder to the crease in your trousers, if you cycle to business.

Shoes for wet weather cycling should have strap-over fronts. Cold feet can be avoided by wearing a pair of silk socks beneath the usual thick cycling stockings with "roll-tops". Both shoes and stockings should be tight-fitting to keep feet warm and snug in cold wet windy weather.

For Emergency

The wet-weather outfit should be nicely rolled up and packed into the bag or container and strapped to the machine, ready for use as required. It may be fine when you start out and stormy on your return journey.

Efficient mud-guards are essential in winter. There are various kinds of side shields, mud-splashers, or flaps that can be slipped on and off the mudguards easily; these help to protect the feet from splashes, and take up little room when not in use. Efficient mud-guarding makes a difference to comfort when riding in the rain.

Some riders are miserable enough if hands and wrists are exposed to cold rain; it is no trouble to carry a pair of mitts in the bag—these are better and warmer than gloves with separate fingers, and keep hands and wrists warm in the wettest of weather; they are easily slipped on if it starts to rain.

Do not try to be "brave and hardy" in wintry conditions by cycling in flimsy garments and with no protection; it is more sensible to be well prepared to withstand anything the elements have in store.

Record Repeater—(*Continued from page 75*)

used for adhering celluloid materials together. A cellulose cement—made from scrap celluloid dissolved in equal parts of amyl-acetate and acetone—or even cellulose paint, such as transparent cellulose lacquer, or the coloured stuff used for spraying, which is thin, makes the best bonding adhesive. It should be used, even if you cut the main parts from thin wood. It has a good grip on wood as well as plastics.

Completing the Repeater

When the adhesive has set, which should be in a couple of hours, remove the repeater parts from the makeshift press and inspect it for faults, if any. If you have been careful, no faults should be seen. The work should be quite flat and a lot more rigid in the hands.

Prise away the centering waste stuff. It should come away easily, unless you have accidentally spread some of the adhesive on it, in which case it may be sticking here and there. Use every precaution when attempting to take it away.

A back view of the work is shown at Fig. 2. It will be observed that a certain part of the underside material is cut away, apart from the outside shape. You will, for example, need to clear the three spindle holes, and see that the buffer bar is separated so it is free to bend. The rest of the inner cutting is a clearance gap for the needle.

Note the dotted line. The clearance gap must not extend beyond this line. When you have cut the underside to shape (this is easily done by fretsawing in the normal way, with the work supported, face side upwards, on a cutting table), smooth all edges, then prepare the pads.

These pads are essential, and their position very important. You need three thin felt, or baize, pads ½in. in diameter. Also a thin rubber pad, of the same diameter. Note that *thin* pads are wanted.

The rubber pad could be a bicycle inner tube patch, preferably a new patch. The felt pads must be of the same thickness. When adhered in position, as shown, the repeater is completed ready for testing on a gramophone.

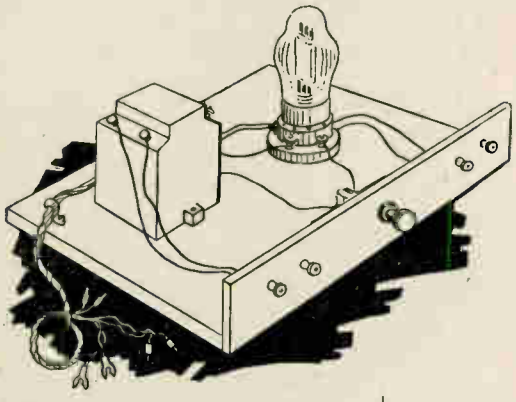
A ⅜in. Needle Clearance

Having placed a record on the turntable, set the repeater on it, so one of its holes engages with the spindle. Fit a playing needle in the pick-up or sound-box to project ⅜in. Set the needle on the record, inside the gap, and start the motor.

When the record has finished playing, the needle should escape into the guide track and, with a quick, swirling action, be taken to the start of the record. You will be fascinated at the simplicity of the whole action, but much depends on the sound track terminating properly so the needle is free to ride across the repeater.

How the amateur radio enthusiast can construct a

ONE-VALVE AMPLIFIER



THIS unit is easy to make up, and none of the few parts required is critical. Any Low Frequency coupling transformer with a ratio of between about 1 : 3 and 1 : 5 is suitable, and this and the simple on-off switch and terminals are easily obtainable. A valve can be bought at any radio shop, if one is not already to hand, and the type to use will be explained later.

What the Amplifier will do

The signal from a crystal set, one valve set, microphone or gramophone pick-up is taken to the two terminals connected to the transformer. The transformer provides a certain amount of amplification, and the valve a great deal more, so that the signal at the output terminals is very much stronger.

The amount of amplification obtained depends upon the valve type and high tension voltage. However, there should be no difficulty in getting good speaker volume if a loudspeaker of average efficiency is used.

Where the input to the amplifier is strong (as if used with a one valve set tuned to local stations) the output will be more than sufficient for ordinary domestic listening.

Valve Type

If a valve is to be bought, then a pentode such as the Cossor 220HPT (or any of its equivalents produced by other manufacturers) is recommended. Such valves take little current and amplify considerably.

Any valve to hand can be tried, of course. A triode valve, though cheaper and quite good, amplifies rather less than a pentode.

If a triode valve is used and reasonable loudspeaker reproduction is required, the input to the amplifier must be fairly strong. (A good one valve set, or an efficient crystal set on local stations, would give just about sufficient volume). The best type of triode is that known as a Power, or Small Power valve.

A suitable valve holder is required. A pentode valve holder is shown in the diagram. A triode has no central pin on its base, so if such a valve is used, then the holder will only need to be of the four-pin type. Alternatively, the five-pin holder shown can be used, and it will then be quite in order to plug in either a triode or pentode without changing any connections.

Construction

A baseboard 5ins. by 4ins. by ¼in. thick has a terminal strip about 1½ins. high screwed along the front. Dry varnished plywood is suitable for the latter. Drill holes for switch and terminals and fix these in position.

Screw down the transformer and valve holder as shown in Fig. 1. This diagram also shows all the connections. Some valve holders have the one terminal marked with "A" instead of "P" and this is quite in order, "Anode" and "Plate" being the same. "F" means "filament" and "G" means "grid".

Some older transformers have two terminals marked "P" and two marked "S". This means "Primary" and "Secondary". Connect the primary terminals to the two input terminals, and the secondary terminals to grid bias and "G" on the valve holder when using this type of transformer.

For the battery leads, lengths of insulated flex are used. After marking the ends with suitable tags and plugs, all the leads may be twined together to make a single battery cable.

If Fig. 1 is examined carefully, there should be no danger of making any errors.

Battery Supplies

The best grid bias voltage will depend upon the valve and high tension voltage. Therefore, try various voltages between 1·5 and 9 to find which gives best results.

For maximum volume a 120 volt high tension battery is required, but a lower voltage will give quite good results.

If a one valve set is being used, the amplifier can be driven from the same batteries. If this is done it will be best to omit the H.T. minus and L.T. minus battery connections from the amplifier, instead of taking a wire to the earth terminal of the one valver. This will avoid unnecessary duplication of leads.

For low tension, the 2-volt accumulator will be used in the usual way.

Using the Amplifier

With crystal or one valve sets, connect two short leads from the

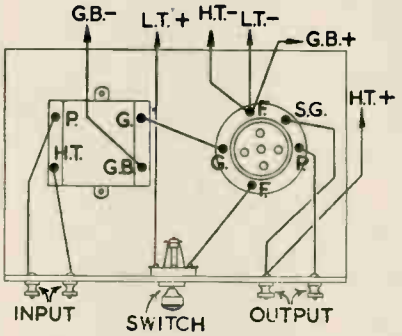


Fig. 1—Complete wiring diagram

phone terminals on the set to the input terminals on the amplifier. Then connect speaker or earphones to the output terminals (see Fig. 1).

With a gramophone pick-up, two leads are taken from it to the input terminals. But with some types of pick-up results may be slightly better if the transformer is disconnected. In this case take one pick-up lead to grid bias and the other to terminal "G" on the valve holder.

If one earphone is connected to the input terminals and a second to the output terminals, sounds picked up by the former will be heard amplified in the latter. If a change-over switch is added so that each earphone is used alternatively as microphone and earpiece, a two-way "amplified telephone" results. With two small speakers instead of earphones, volume will be sufficient for a small loud-speaking telephone communicator similar to that used in modern offices.

Smoothing China

I HAVE a china vase, the neck of which has been broken, leaving an irregular edge. Could you tell me a way to get it even.

(N.A. C.—Newport)

WE suggest you try filing it flat. Use a sharp second cut file, keep it lubricated with water and use it carefully—the result should be a reasonably smooth end. This could be polished by rubbing first with bathbrick and water, and finishing with fine pumice powder and water.

A helpful instrument for the handyman for cutting and DRAWING ELLIPSES

THE ability to draw ellipses accurately is necessary to all who desire to produce their own designs. Careful selection of a suitable portion on an ellipse will often supply a curved line which might otherwise prove difficult to draw. A simple method which employs nothing but a length of cotton and three pins is known to most craftworkers (Hobbies, July 7th, 1948, page 138), but a more practical and permanent instrument may be made as follows.

It consists essentially of four "channels" centrally mounted on a square base of thin sheet metal. These four channels "A" in diagram, form two continuous "run-ways" at right angles to each other, but with an open space at their crossing.

Moving Parts

There are two sliding-pivots "P", each capable of freely moving to-and-fro within the extreme limits of its own run-way.

These pivots are joined together by a beam "B" having a series of holes along its centre line. The shape, or "flatness" of an ellipse depends upon the number of holes between pivots. If a pencil point be inserted through any of the remaining holes, and a slight sideways pressure applied, the beam will move. One slider travels horizontally and the other slides at right angles to it. The resulting pencil line will be a perfect ellipse.

The size of ellipse depends entirely upon the distance of pencil-hole from pivot-hole. If pivot adjustments remain constant and pencil moved from hole to hole, then a series of parallel ellipses will be produced.

The Channels

Start with the four channels. They are made by bending thin brass strips round any suitable flat former. An odd length of brass curtain valance rail will serve, and also supply the bases of sliding pivots. Brass strip need only be paper thickness, and should be soft enough to permit of easy shaping with pliers. The semi-tubular shape, shown in inset "A", Fig. 1, gives adequate strength.

The length of channels controls the maximum difference possible between width and length of ellipse, though it has nothing to do with size of ellipse. For example, if a run-way is made up of two 6in. channels then, no matter how big the ellipse, it cannot be "flattened" by more than 6ins. Though, of course, the flattening may be of any desired lesser degree. From which it will be seen that the length of channels must be carefully considered in conjunction with the work the instrument is expected to achieve.

Next make the sliding-pivots, shown at "P" inset, Fig. 1. Cut off two 1½in. lengths of the "former" used for shaping channels. Taper the ends slightly and solder a thin brass bolt upright in the centre of one side. Make sure the whole article slides freely in the grooves of the channel.

Cut out a 2in. square of tin or brass and solder the four channels into position. This is the only rather tricky piece of work involved, since each pair must be in perfect alignment or the sliding-pivot will not be able to cross the junction. In the centre of junction drill a fairly large hole through the base plate. This will enable the trammel, as such an instrument is called, to be truly centred when in use, since it makes the crossing of axis lines visible during adjustment.

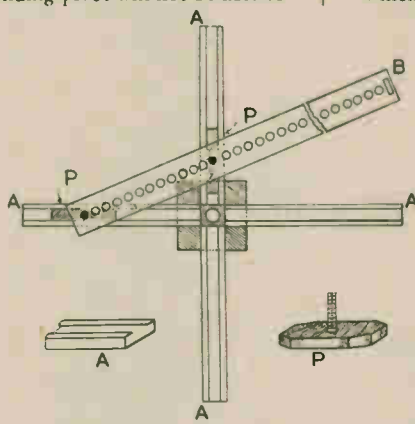


Fig. 1—Plan of general layout

Beam Piece

All that remains is the beam "B". A strip of any transparent plastic material, about 1in. wide and 1/16in. thick, will serve admirably. Its length depends solely on the size of biggest ellipse required. The maximum possible length of ellipse being twice the distance between end holes of beam. Down the centre drill a series of holes, reasonably close together, and having a diameter which just permits passage of the pivot shanks. At the extreme end make a small slit as indicated.

This slit should be just large enough to admit the passage of corner of razor blade, point of stencil knife, or whatever type of cutting tool you employ, or, of course, a circle for a pencil. The tighter the fit and the less projection through the beam, the truer will be the ellipse.

Trammel Adjustment

Construction being now complete look at Fig. 2 and consider how the trammel is adjusted and used.

Draw the two axis as usual. Place the instrument over the lines so their crossing is centrally seen through hole in the base. Runways must coincide with axis lines, and may be held in place by drawing pins so fixed at ends that half their heads project into grooves of channels.

Remove the horizontal pivot and slide the other to the centre of runways. Place end hole of beam over pivot shank and insert pencil in hole which lies over end of axis. Move in direction of arrow (Fig. 2) until the beam is in position indicated by dotted outline. The pivot will now be somewhere near bottom of its runway. Slide in horizontal pivot and insert it through hole of beam which is immediately over centre of cross-roads. Screw on bolt nuts sufficiently to steady beam, but not to grip it.

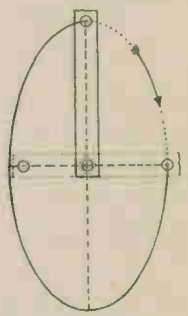


Fig. 2—Details of setting trammel

Pencil or Ink

Draw the pencil round and the ellipse is produced as required. The operation is far simpler than the explanation, and anyone can produce ellipses at a very first attempt. If an ellipse is smaller than the channels then the blank spaces caused by intruding arms must be filled in after by freehand drawing.

For use with ink it is necessary to enlarge the hole nearest the slit in the beam until it will accommodate the end of a bow-pen. This must project through somewhat beyond ink-charge or unsightly blots will appear.

When using ink it is advisable to pass a small round-headed screw through hole preceding the one used by pen. With the head of this screw resting on the paper the beam will be raised clear and smudges avoided.

In order to vary the size of an ellipse when using pen or knife, do not forget it will be necessary to vary adjustment of both pivots.

Hobbies DESIGN

No. 2768 17-11-48

SUPPLEMENT TO HOBBIES No. 2768.

MODEL OF LEYLAND LORRY

SIZE 13ins. LONG, 3ins. HIGH.

THE ARROWS INDICATE THE DIRECTION OF GRAIN OF WOOD.

FUEL TANK. (3) — CUT 2 3/16ins. GLUE TOGETHER, SHAPE TO SECTION AND SCREW TO 2.

VACUUM TANK. (4) — CUT 2 3/16ins. GLUE TOGETHER, SHAPE TO SECTION AND SCREW TO 1.

(5) — CHASSIS. CUT TWO 3/16ins. GLUE BETWEEN 1 AND 2.

FILLER CAP. MAKE FROM WASTE WOOD AND CARD.

(6) CHASSIS. CUT ONE 3/16ins. GLUE BETWEEN 1 AND 2.

(7) ENGINE GLUED HERE

(8) ENGINE. CUT TWO 1/2ins. AND TWO 3/16ins. GLUE TOGETHER AND SHAPE TO SECTION.

SECTION

(23) CUT TWO FROM THIN CARD.

SEAT BLOCK. CUT TWO 3/16ins. GLUE TO 7.

(9)

(10) CUT ONE 3/16ins. DRILL HOLE AS SHOWN IN SECTION.

CAB FLOOR. CUT ONE 1/8in.

(13) SEAT. CUT TWO 1/4in.

(14) SEAT BACK. CUT TWO 1/8in.

SKETCH SHOWING SEAT CONSTRUCTION

GLUE TO PIECE 9.

SECTION

STEERING COLUMN. CUT ONE FROM 1/8in ROUND ROD. GLUE IN PIECE 10.

(11)

(12) STEERING WHEEL. CUT ONE FROM THIN CARD AND GLUE TO 11.

SECTION

(15) No. PLATE

CAB FRONT. CUT ONE 3/16in. PAINT ON RADIATOR, LAMPS, ETC.

(24) (25) TOOL BOX. CUT THREE 2.1ins. AND GLUE TOGETHER.

NOTE.—This design sheet is only presented free with the current issue of Hobbies and not with back numbers. Further copies may be obtained.

PANELS OF WOOD REQUIRED FOR THIS DESIGN

ONE H2 ONE G2 ONE G3

The price is shown in Hobbies Weekly, November 17th, 1948, but is subject to revision. See the current edition of Hobbies Handbook, or write for price to Hobbies Limited, Dereham, Norfolk.

(1) CUT ONE 1/8in.

VACUUM TANK

FUEL TANK

PAINT ON

(16)

(28) CAB SIDE.

GLUE WINDOW INSIDE

(17)

(25) CUT ONE 3/16in.

SECTIONS

(18) CAB TOP. CUT ONE 1/8in. SHAPE TO SECTIONS.

PIECE (20) CUT ONE 1/8in.

PLATFORM SUPPORTS (21) CUT 12 1/8in. SHAPE ENDS TO SECTION.

(26)

(27) WASHER. CUT TWO 1/8in. THESE FIT LOOSELY ON THE FRONT AXLE.

Instructions how to build a 12in. wooden

MODEL 6-WHEEL OPEN LORRY

AN excellent miniature six-wheel lorry 12ins. long can be made from the patterns on the other side with the aid of a fretsaw and a few tools. All parts are numbered on the patterns and these instructions should be read in conjunction with them and studied carefully so that a good idea of construction is obtained before commencing. Do not paste the patterns down, but prick them off on to the actual wood and pencil in the outlines. You will then have the design sheet to which to refer in working.

Parts which adjoin others are shown by dotted lines, and these, too, serve as useful guides for measurement. The panels of wood provided allow ample room for all. Cut each part carefully to the pattern, and where any shaping is required—as shown by the cross sections—it can be done with file and glasspaper, etc.

Chassis

Build the framework of the chassis first as shown at Fig. 1. Before putting it together make up the vacuum tank and the fuel tank from three pieces shaped to a cylinder. Glue them on each long side at the position indicated, nailing or screwing from the inside before putting the whole thing on to the cross members 5 and 6. Part 6, it will be noted, is at the rear end. Get out the parts shown in Fig. 2, shape and glue in place.

The cab floor (7) is in line with the front end, the engine is put on centrally and the seats and steering column added. Make the seats as a complete piece shown in the sketch, and glue in place. The hole for the

The cab is next enclosed by back, front and two sides (see Fig. 3). The back fits between the sides, which in turn stand behind the front. Notice the shape of the last-mentioned, No. 15. Cut to the shape shown and then glue firmly between the sides. Now shape off the upper front edge so it comes in line with the angle of the side windows, keeping the slope carefully parallel the whole way. Cut pieces of Cellophane and glue on the insides to form the side windows and the opening in the back of the cab.

Cab Completion

Now you can complete the cab (see Fig. 4) with the roof and the small centre column between the windows (No. 40). Notice the shape of the ends of this column. A little glue is added to the top and bottom end, and then it is pulled forward from inside to fix behind the front and to the roof. Any inside painting to the cab must, of course, be done before the roof is put on.

The front windows must be cut accurately to the two apertures. Glue a tiny angle of card or thin wood in the corners (see detail Fig. 4) and then with glue on its edges, drop the Cellophane into position.

Undercarriage

The platform piece (19) has a number of cross struts on the underside (21) glued on each in the positions given. The front end of the platform and on the reverse face to these struts, the front end board (22) is glued. You notice where the platform comes by the dotted lines on the pattern of 22. At the back end of the platform there is a little stop board (No. 20) glued along flush with the

You can now add the two pieces forming the frame for the spare wheel glued on the underside as shown in Fig. 6. The spare wheel shown is one similar to the other two front wheels, and can be made with them in due course. Note the detail in Fig. 6 showing the slip of card (No. 23) forming an angle plate at the front end of the platform underneath.

The tool box consists of three pieces of wood glued together (No. 24), Fig. 7, with an inside spacing piece (No. 25). Paint this black or brown, add the two shaped wire pieces shown, to each end, and drive up into the underside of the platform in line with the front end, as seen in the picture of the finished model.

Mudguards

Mudguards can now be added. The front ones (No. 28) are carefully cut and shaped from wood, glued around the appropriate aperture (see Fig. 4). Cut the outside shape of these mudguards first, and then round off before cutting the inner line. This will reduce likelihood of breakage. The detail on the sheet shows the building of the rear mudguards. The back of each of these with its suggestion of spring leaves painted on, is glued towards the rear of the chassis frame where you see marked by the dotted lines on the pattern of parts 1 and 2. Get them exactly opposite so the wheels may run accurately.

Cut the mudguards themselves in thin card and glue along the edge of the wood holding the pins until firm. Then you can glue the front flap portion of the mudguards (31) on the outside with the tabs underneath held by means of clips as shown by the detail on the sheet.

construction clear. Three front wheels are made complete, one being a spare to slide into the brackets previously fixed. The centre disc of each wheel is solid with a rim on one side and a hub cap in the centre (see section). Glue a wheel on one end of the axle at the point shown. Now add piece No. 26 to the outside of the chassis at the position marked on the patterns of 1 and 2. Outside 26 a wooden washer No. 27 is added.

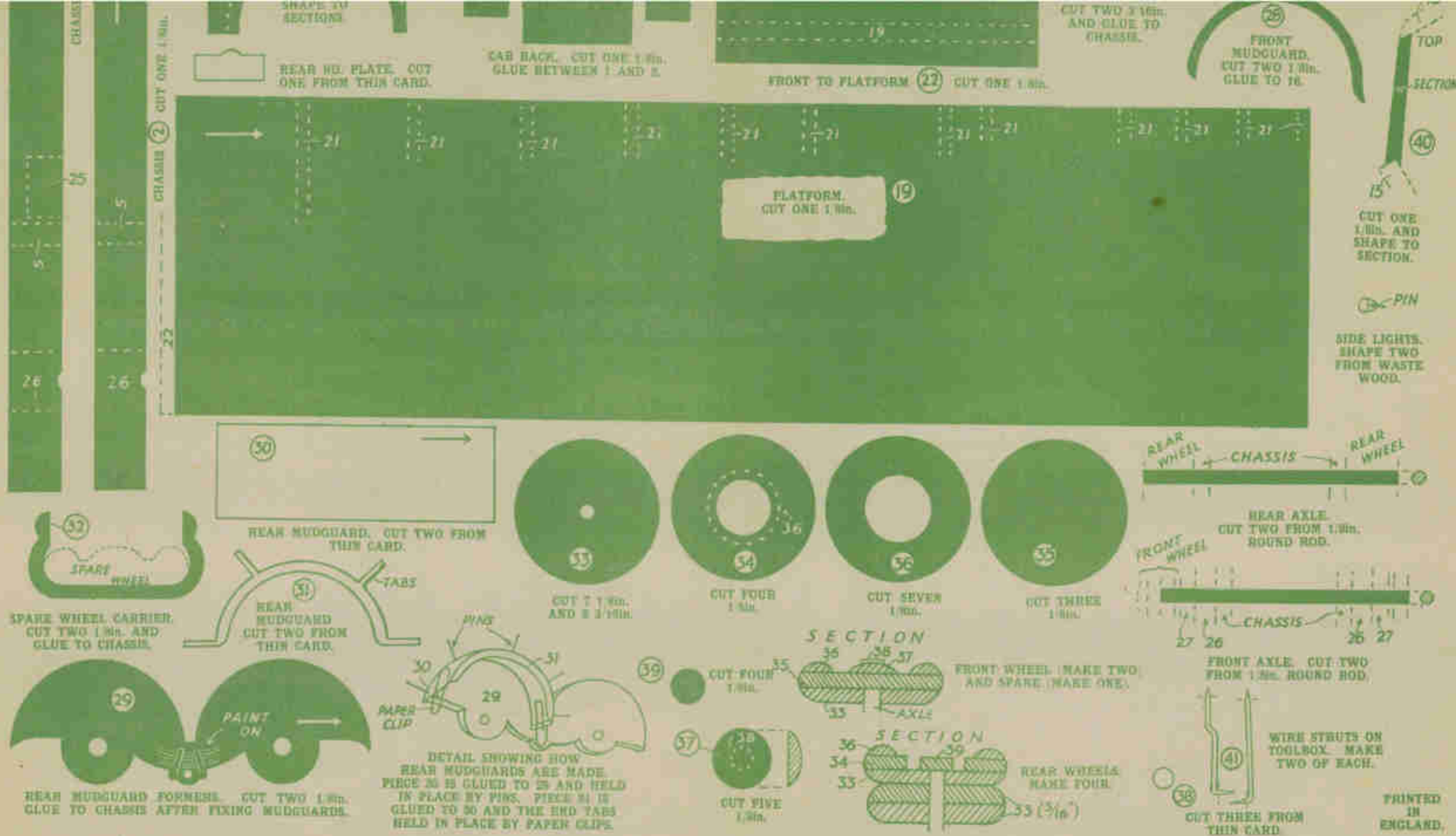
The wheel and axle is threaded through from the outside, the axle passed through a similar fitting the other side and the second wheel glued on. A cut-away view of this fixing is shown at Fig. 8 with the wheels indicated by the dotted lines.

Painting

The whole model is now cleaned ready for painting, colouring being a matter of choice. Tyres will be the usual grey, the cab red, with the cream top. Paint on the radiator, number plate, lamps and decoration of which are shown in the picture with helpful positions on the pattern of the cab front. The lorry can be painted brown or dark grey with the chassis black.

Doors, handles, hub cap, bolts, tool box, lid, tank bandings and other little points can also be painted on. The bottom of the cab at the front has, of course, the metal bumper painted along. Do not forget the rear number plate also, pattern of

We are indebted to Leyland Motors Ltd., for the helpful details supplied in the construction of this model of their Hippo vehicle.



the angle shown for part 10, and this must be done before the outline of part 10 is cut to prevent breakage. Glue the column in position, and then add the thin card steering wheel. The whole unit is then glued on to the floor of the cab as shown by the dotted lines on pattern 7.

glued on to the framework chassis, keeping the rear end in line with it (see Fig. 5).

The Wheels

The wheels are built in wood, and a section of front and rear makes

the care taken in the final painting which makes the whole model really good.

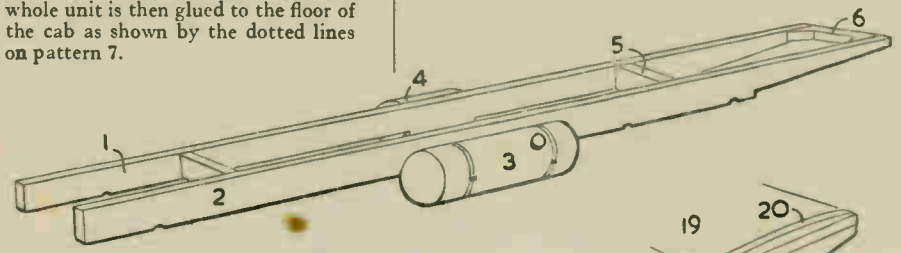


Fig. 1—The framework of the chassis

Fig. 5—The tail board

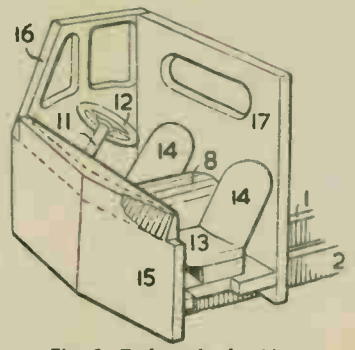


Fig. 3—Bodywork of cabin

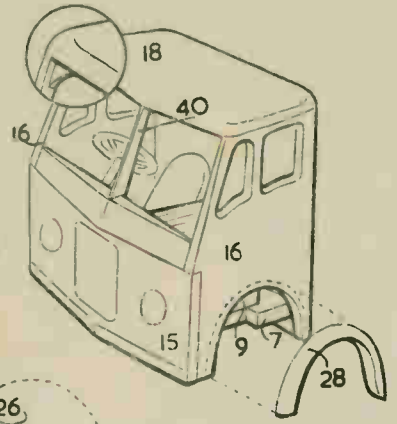


Fig. 4—Detail of cab and mudguards

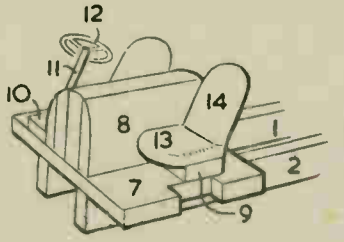


Fig. 2—Engine and seating

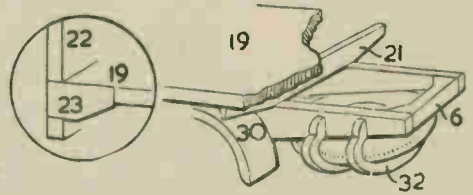


Fig. 6—The tail end of the chassis

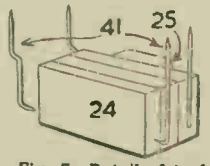


Fig. 7—Detail of tool box and fixing

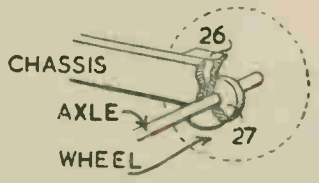


Fig. 8—

The second of our new series on running

MODEL RAILWAYS

ELECTRICITY as a motive power for model railways may have a lot to recommend it, but despite this, the humble clockwork mechanism provides an extremely efficient and reliable source of power to those who are unable to use electricity, either by reason of its expense or total absence.

In matters of cleanliness and correct lubrication, the spring-driven motor employed for driving a model locomotive is often treated in a very cruel way. It may get oiled at spasmodic intervals—sometimes not at all, and as for a "clean-up"—this may take place once in the proverbial "blue moon".

Lubrication Important

The general performance and overall efficiency of an engine, both in sweetness of running and hauling capacity is more dependent on correct lubrication and cleanliness than can ever be imagined, and now that the gradually short evenings are with us, there is no better time to give model locomotives an overhaul so they may be in good trim for winter running.

The mechanism should first be removed from the engine body by taking out the appropriate screws generally to be found immediately under the boiler, as well as the knobs at the cab end of the reverse and start/stop control wires. The mechanism is withdrawn with an upward pull-away from the cab-end of the body; holding the latter in an inverted position meanwhile.

The next step in the rejuvenation of the mechanism is that of removing the congealed oil and grease from the pivots of the gear-axles and gears, as well as the unwinding of any pieces of thread, wool or fluff which have become inextricably wound around the axles themselves.

Unwanted Fluff

Incidentally, the braking effect of fluff wound round the driving-wheel axle has to be seen to be believed. So before starting to clean the mechanism, wind it up fully and see how far it will travel on a given length of track, or how many times it will run round a given oval. When all cleaning has been carried out, repeat the test and the tremendous improvement will be seen very obviously.

Some good quality petrol should now be purchased ("lighter-fuel" for preference, as modern "coloured" petrols are not too satisfactory) and poured into a large basin; this part of the work being carried out under "no smoking" conditions. The mechanism should be now fully wound up and placed under the surface of the petrol, being allowed to run down whilst in that position.

Clean the Gear Wheels

Should this treatment fail to dislodge all the grit and foreign matter clogged into the gear-wheels, it is a good plan to use an old but stiff tooth-brush dipped into the liquid, thoroughly scrubbing about among the teeth of the wheels. Do not, however, use the tooth-brush whilst the wheels are actually revolving. Otherwise the hairs of the brush will be torn out, and, binding up the mechanism, do more harm than good.

When the mechanism is absolutely clean, remove it from the petrol and allow it to dry off naturally before proceeding to oil it with a really good-class sewing-machine or gramophone motor oil. Use the oil very sparingly on the bearings of all the various spindles, as well as on the bearings of the coupling-rods; taking great care not to allow any to get on to the treads of the wheels.

It may be wondered why it is so essential that only a modicum of oil should be used, and that the wheel-treads should be kept so clean. There are very good reasons. If too much oil, or too thick an oil is used for internal lubrication, it will only pick up every bit of fluff and grit that are thrown up by the engine as it travels along the track. If the wheel-treads get oily, not only will the locomotive tend to slip with a heavy train, but any grit on the rails will be collected on to the wheel-treads and form a sticky mass of material which will ruin the running of the best engine.

Spring Treatment

Now as to the spring, which needs especial treatment. A tube of graphite grease should be obtained from a gramophone dealer, and this should be spread rather lavishly between the leaves of the spring, whilst the mechanism is in a run-down condition. A little may also be placed on the winder ratchet and pawl ("click").

It is important to emphasise the absolute uselessness of lubricating the spring of an engine with oil. As a spring unwinds, the leaves have to be able to separate easily, as well as to rub against one another. When oil is applied, this separation becomes erratic—due to a vacuum being formed between the leaves—and the running of the engine thus becomes also erratic, and its pulling-power very capricious.

Probably one of the greatest drawbacks of the spring-driven engine is its pronounced tendency to emulate a jet-propelled racing car, both in accelleration and top speed; this failing being particularly noticeable in some of the smaller uncontrolled types of mechanism.

One of the most simple methods of slowing a mechanism down is by the introduction of heavy motor-car oil ("Mobiloil C") into the governor cage.

Written by an expert for the beginner who wants to build a model railway at home.

This treatment will considerably reduce the speed of the engine with but a slight loss of power.

There is another method—which has the advantage of permanency—which consists of slightly increasing the weight of the governor balls; this being accomplished with the aid of a soldering iron and a spot of solder.

Electrically Driven Engines

Dealing now with the cleaning and oiling of electrically-driven engines, it will suffice to say that the same washing in petrol will work marvels, but it must be well remembered that under no circumstances must the power-unit be driven under its own power whilst in the petrol, as the slightest spark from the commutator and ————!

The petrol bath has no deleterious effects upon the armature, whether it be shellaced or plain enamelled wire, but in no case dry out the mechanism by artificial heat, as many insulation troubles may be started off in this way.

Get Inside

All the bearings of the mechanism should be treated to a spot of thin oil, not forgetting those which are normally out of sight, such as the rear armature bearing in an L.M.C. mechanism. Never oil the commutator if the brushes are carbon and the commutator copper. Such combinations are self-lubricating.

Finally, run the motor under its own power, and press a small piece of fine glass-paper (not emery-paper) against the revolving commutator, thus cleaning it up brightly. It will be found a good idea to wrap the glass-paper around a matchstick for this purpose.

To those not in the habit of spending a few hours at the commencement of the season "getting ready for the road", it may be truly said that the time thus spent will be repaid a thousand-fold during the winter, when bad light often mitigates against a really 100 per cent. good locomotive overhaul.

(To be continued)

A handy and easy-to-make piece of work is this

OPEN LOG HOLDER

SINCE the compulsory saving of coal came about, more and more people are resorting to burning wood. A well-stocked wood store it seems is very worth-while these days, and one should save all the prunings and cuttings from trees, and sawn-down trees should now be converted into logs ready for burning in the winter evenings.

Having the stock made up and stored in a dry but airy shelter or shed, the next thing to think about is the convenience of handling for actual use. Now in this article described here we believe we have the very thing for storing or keeping the wood handy for making up the fire.

The log rack illustrated in Fig. 1 measures 19ins. long overall, is 14ins. high and 10ins. wide, a very convenient size for the ordinary living or dining room. Any variety of wood is satisfactory and answers if about ¼in. or ⅜in. thick. Salvaged timber scraped and cleaned would also do, as it could be suitably stained and varnished or painted.

The rack is made somewhat like a cradle, with two sloping sides, a slatted floor upon which the logs rest and a back rail which acts as a stiffener to the sides.

In Fig. 2 we see a side view of the rack with the general dimensions of the parts. A start is made with the lower rails A. There are two of these cut from stuff 16ins. long by 4ins. To get the curve, a distance of 7ins. must be marked down from point X.

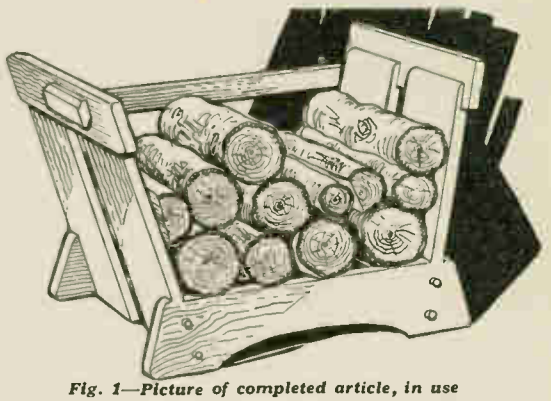


Fig. 1—Picture of completed article, in use

Each end of the rack is made complete, as detailed in Fig. 2. These are, for each end two boards 13ins. long by 4ins. wide, one cross rail, B, measuring 8ins. by 1½ins. and a top rail 9¾ins. long by 3ins. wide. Trim each pair of boards and cut away a notch 3½ins. long and ½in. wide in each.

Connect the boards with the rail, B, screwing all firmly together with countersunk brass screws. Take care to keep the spacing between the two boards even all the way up so when the top rail, C, is added, an overlap of ⅜in. is allowed at each end.

Before the top rail can be fixed on to the boards, the latter will have halvings cut to a distance of 1½ins., down from the top edge, and a detail of this is shown in Fig. 3. Set lines across the boards with the square and cut along these with a tenon saw to ½in. deep. Clean away the unwanted wood with the chisel, or cut down to meet the cross-cut line with the tenon saw. Round off the sharp corners and finally glue the rail in place and add either round-head brass screws or countersunk screws.

The position of the two rails, B and C, is explained in Fig. 2.

Some little attention must be paid here to getting the correct angle as seen in Fig. 2. First then, lay one of the rails, A, on the floor or bench, and erect the ends upon it temporarily while the spacing is checked. A measurement of 16ins. should be spaced between the tops of the two sets of boards as in Fig. 2, while at the bottom of rail, A, the measurement of 10½ins. should be spaced out.

Back Rail

The narrow top rail, D, can now be prepared and screwed on, the measurements and shaping being given in Fig. 2. Two screws at each end of the rail should be driven in to hold the sides perfectly rigid. The floor of the rack consists of five slats of wood each measuring 12ins. long and 1in. by ½in. in section. They are spaced out across the width and screwed to the end rails, B, as shown by the dotted lines in Fig. 2 and in detail in Fig. 4.

Two handles of simple shape, as shown, are screwed on to the ends of the rack, and the circled diagram in Fig. 3 gives an underside view of one of them, while the side view in Fig. 2 shows their actual shape and position.

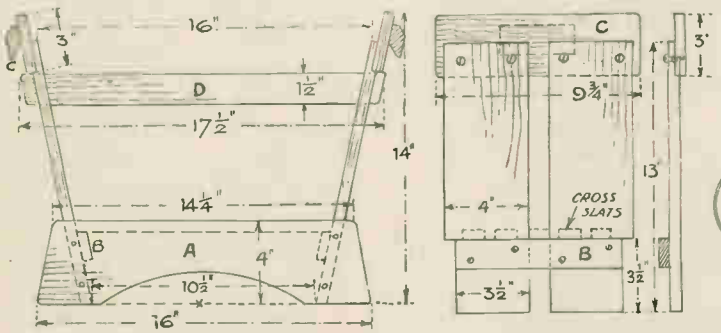


Fig. 2—Side and end view with dimension of parts

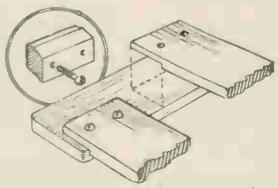


Fig. 3—Top rail fixing, and handle detail

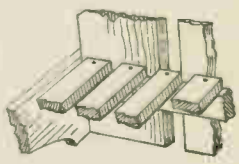


Fig. 4—How the floor slats are fitted across

Picture Enlarging—(*Continued from page* 81)

more accustomed to the light and the image. Often this will overcome the trouble.

One remedy which the writer has had occasion to use in extreme cases is to make a clean hole on the negative with a sharp needle, on the edge of the negative or in a spot that is not to appear in the print. The light will penetrate this hole and when it is focussed and appears as a perfectly round spot on the easel without any fringe or furring, you can be fairly certain that the image is sharp.

Finally, do get into the habit of developing to finality. The instructions given with the paper will state the approximate time required for the paper to be fully developed. If you find that when this time is reached the print is too dark, then you have undoubtedly overexposed. On the other hand if the image is poor and lacking in brilliance, or is on the grey side, then it requires more exposure that you estimated.

Watch these points carefully; make a study of them and you will find that the question of exposure is not so difficult as it seems.

Another chapter on the interesting subject of PICTURE ENLARGING

IT is over 45 years since the author made his first enlargement with a piece of apparatus having a paraffin lamp for its illuminant and the exposure requiring something like 20 minutes. The first result was so good that another picture was made from a second negative of a similar subject, a woodland scene. The negatives were, of course, glass plates, ½ plate size, and the size of the enlargements 12ins. by 10ins.

Pictures that Last

Those two pictures still give enjoyment, for they were framed and have always found a place on one of the home walls. This foreword is given simply to illustrate the pleasure which any amateur photographer can be assured of getting once an enlarger is installed in the home, no matter whether it is a home-made one or one that has cost you a few guineas to purchase.

One has only to start projecting some negatives on to the screen to realise that there is an immediate urge to take the hobby more seriously.

Some folks, when the subject of enlarging has been mentioned, have made the remark that this branch of the work must be very expensive.

Of course it can be, like every other hobby. But there is no need to make it so, and if the few hints which are given in this short article are read and put into practice, it will soon be realised that if ordinary care is practised in the darkroom, and extravagance avoided, no amateur need be deterred from enjoying what is, undoubtedly, the most exciting and satisfying section of the hobby.

Economical Working

It follows that where enlarging is to be done, larger sizes of bromide papers are required than hitherto have been in use for contact printing. It has often been found that beginners lumber themselves with three or four different sizes and of different grades, surfaces and makes of papers. This is obviously extravagance, for much pocket money can be used up in providing such a store.

Paper Size

Further it is very unnecessary and extremely inadvisable. Advice is very strongly urged to go for one make of paper and one size only at first. You will learn a tremendous lot of valuable information, which it is necessary to get, by this method of concentration in the early days. The best hint that can be given on this point is to start with paper not larger than 8½ins. by 6½ins. and of an ordinary grade of matt surface, such as Ilford Ordinary.

Chemicals are the next item that comes to mind. Here again, do not be tempted at first to have an array of bottles of this, that, and the other on your shelf, causing much time to be spent in weighing, dissolving and mixing. That sort of work is only economical where large numbers of prints are to be made. It is better to buy a few packets of developer such as Johnsons Metol-Quinol Pactums. With these, all the necessary chemicals are accurately compounded and the powders only require dissolving in the stated quantity of water, all for a few pence.

Stain Preventer

Acid-fixing powder can also be bought in small quantities as and when required, and you would be well advised to have a small quantity of Clearing Bath. This, if used between the developing and fixing, will prevent those stains which often occur on prints made by beginners.

While on this point, do make it a rule to work with clean measures, dishes and hands. Chemical stains caused by lack of cleanliness in the dark-room are most difficult to overcome in the prints, yet are so easily prevented.

In the first attempts at making any enlargement it will be found that the old difficulty of exposure time is the hardest nut to crack. The most economical and certainly the most satisfactory way to solve this is by trial strips. Cut a strip from one of the pieces of paper about ½in. wide from across the narrowest side of the piece and, when you are satisfied that the image on the screen or easel is perfectly sharp, pin this strip across the image so it has some of the highlights and shadow details on it. Of course, this must be done with the orange cap on the lens.

An interesting picture taken by the author

Give the whole of the strip five seconds exposure, then cover up four-fifths of the piece and allow another five seconds. Cover three-fifths and give a further five seconds and finally cover two-fifths and again give five seconds. Your strip has now got exposures ranging from five to 25 seconds and when this is developed to finality, you should have in that strip somewhere near the correct time of exposure for the whole of the picture that is to be enlarged. And it has only cost you a fraction of the cost of the paper to ascertain it.

Trial Exposures

If the section that received 25 seconds is not 'dark' enough then it means that the negative is on the dense side and requires more exposure. Or it may mean that the light is not strong enough, or that you are using too small a stop of the lens. Those are the points which your trial will disclose.

A word regarding the focussing. It sometimes happens that with a dense negative the image does not stand out clearly on the easel; it is difficult to discern detail. Try racking the lens very gently to or fro to get your eye

(*Continued foot of page* 80)

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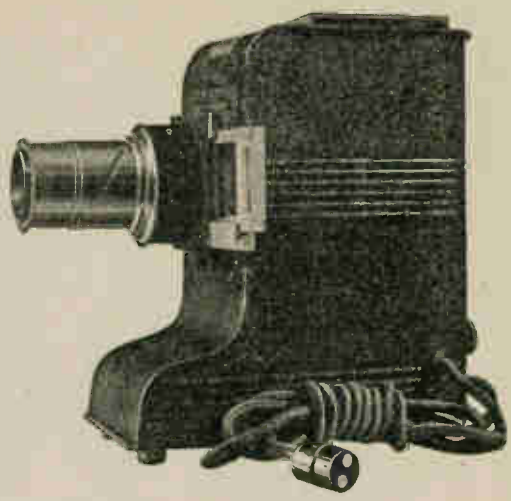

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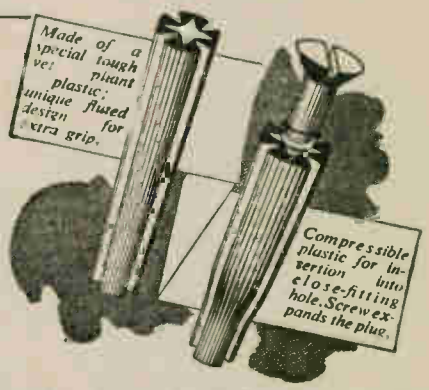

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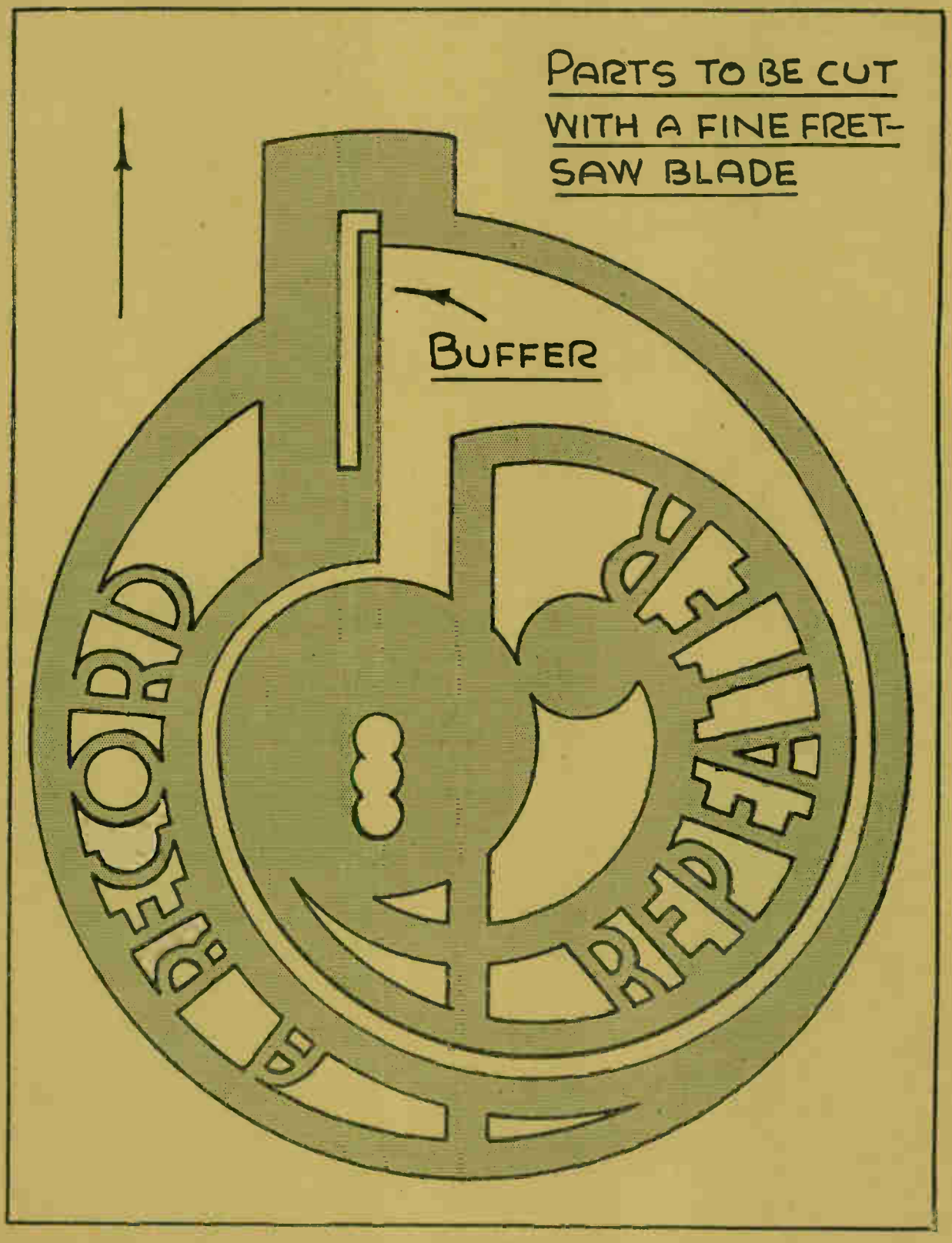

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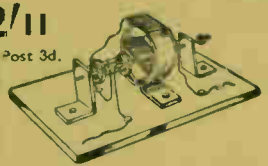

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Hobbies WEEKLY

CONTENTS

November 24th 1948 Price Threepence Vol. 107 No. 2769

Model of a Modern

ROAD ROLLER

THE flint and sand method of road making and surfacing has almost disappeared, and the bituminous surface taken its place. We do not, therefore, these days, see much of the old steam road roller, and its place has been taken by the more up-to-date Diesel-engined roller pictured in our sketch. It is an interesting model to make up in wood. It might be of interest to note, in passing, that Sir Thomas Aveling invented the steam roller in 1867, and since then the firm of Aveling and Barford, Grantham, have been the pioneers in the introduction of new ideas to meet new needs in the art of road making and surfacing. The present model was prepared from constructional diagrams and data having been generously loaned by that firm for the purpose.

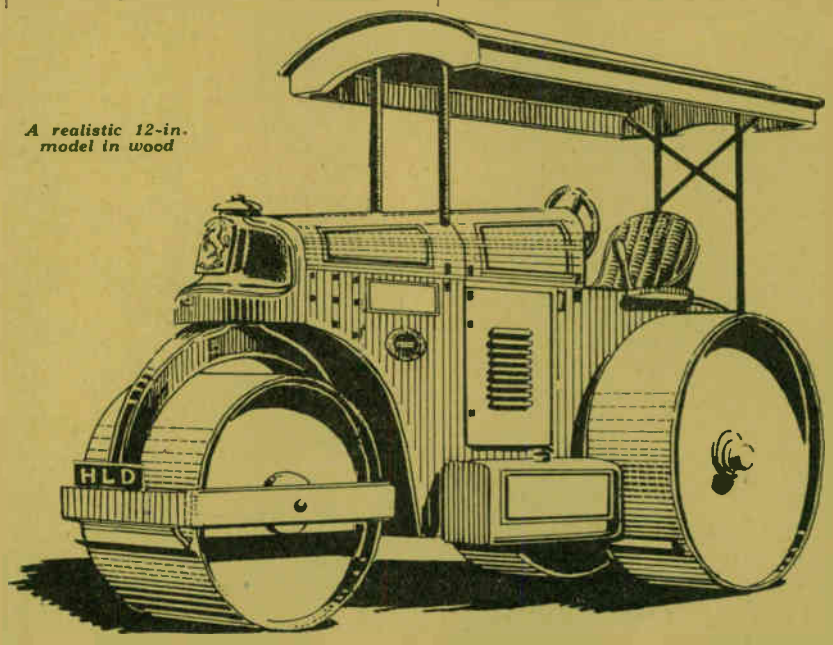
Part Diagrams

The model has a length of 11⅜ins. and height 6½ins. We give in Fig. 1 a side view and a front view which show the position of all the parts. Below the diagrams is a scale for measuring off certain parts which, perhaps, do not appear quite plain in the other diagrams. The whole model is made from wood with stout card for the treads of the rollers and the top part of the awning, etc.

It is really a very simple model to construct, as all the pieces contained are straightforward in shape, and easily cut with the fretsaw. Here little additional hand shaping is required, and when the model has been completed and painted or enamelled, it should look very attractive and, we might add, prove a winner at any model engineer exhibition.

Commence work on the floor, A, seen in Fig. 2. The piece forming the foundation of the model is ½in. thick and its two ends are slightly bevelled to the shape of the lower parts of the sides, B. Fig. 3 gives the outline for cutting the two ½in. thick sides. Note from Fig. 3 that the fore curved part of the pattern is enlarged from this diagram by the simple method of squaring, the squares being enlarged to ½in. on the full-size lay-out. Note carefully in this respect, the position of the hole for the axle of the rear rollers.

Three pieces C, D and E (Fig. 2), can next be cut and glued between the sides, B, which have already been fixed to the floor, A. The lengths of C, D and E are 2½ins., 2⅜ins. and 2ins. respectively, and their widths 1 1/16 ins. Piece, C, has its ends bevelled



A realistic 12-in. model in wood

to fit as seen in Fig. 2. Pieces, D and E, are square across. A cross rail, F (Fig. 2), is glued and pinned between the sides to support the head of the front roller. This rail measures $1\frac{1}{16}$ins. by $\frac{1}{2}$in. by $\frac{1}{2}$in.

From a block of wood measuring $4\frac{1}{2}$ins. by $1\frac{5}{8}$ins. by $\frac{7}{8}$in., the main top engine covering, G, is cut and shaped. In Fig. 4 the piece is shown shaped and tapered. To the large end of this covering piece is fixed a shaped $\frac{1}{2}$in. thick piece, H, $1\frac{5}{8}$ins. wide and 1in. deep. It takes the same curve as the

out in colour on a thin piece of wood and glued to the top of the turned front.

Complete the body by adding the curved back end, of stout card bent round to the curve of the two sides. The seat and its side guards are made from pieces, I, J, and K, in Fig. 6. Piece, I, is cut to the shape shown with piece, J, made of card and bent round to form the back. The two side guards, K, measure $1\frac{1}{2}$ins. long by $\frac{3}{4}$in. wide and $\frac{1}{8}$in. thick. They are checked out to meet the seat (see

are $\frac{7}{8}$in. in diameter and have, of course, a $\frac{1}{4}$in. hole in the centre.

In assembling the rollers glue one on to the axle, allowing the latter to project on the face $\frac{1}{8}$in. Then push the axle through the body of the machine and out through the opposite side. The second roller is then added to match the first, regarding the spacing, etc. A full $\frac{1}{16}$in. should thus be allowed as clearance between the edge of the rollers and the body of the machine, see front view, Fig. 1.

For the front roller a similar

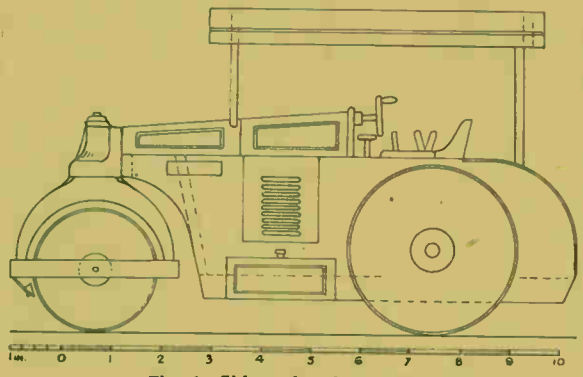
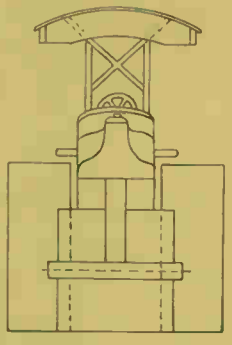


Fig. 1—Side and end elevation with helpful scale in inches



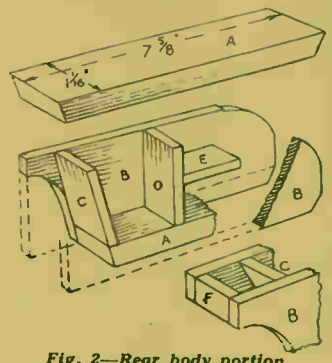


Fig. 2—Rear body portion

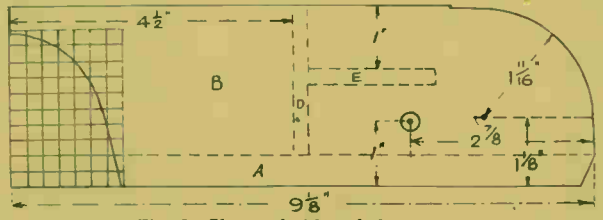


Fig. 3—Shape of sides of the body

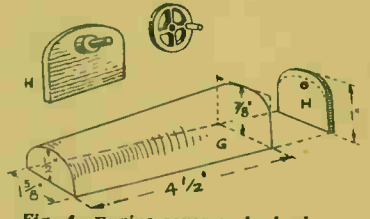


Fig. 4—Engine cover and wheel

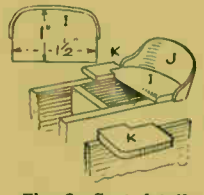


Fig. 6—Seat details

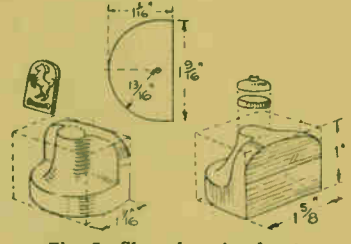


Fig. 5—Shaped engine front

Fig. 8—Front roller construction

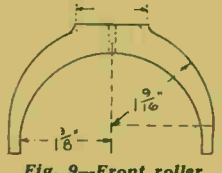


Fig. 9—Front roller holder

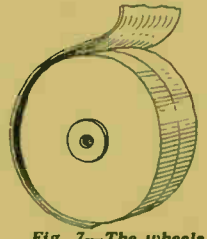


Fig. 7—The wheels

piece, C, shown by the dotted line in the diagram. Cut a $\frac{1}{8}$in. hole in piece, H, to take a short length of rod to represent the steering pillar. Then over the latter, glue on a washer $\frac{1}{4}$in. diameter and $\frac{1}{16}$in. thick. The steering wheel shown in Fig. 4 is made from $\frac{1}{8}$in. wood and is $\frac{7}{8}$in. in diameter, with rounded edge and a short piece of rod to serve as a handle.

The shaped front of the machine, above the front roller, is made from a solid block of wood, $1\frac{5}{8}$ins. by $1\frac{1}{16}$ins. by 1in. The shaping can be got by studying the two details and the plan in Fig. 5. Two little caps are made from $\frac{1}{8}$in. wood as shown, $\frac{1}{4}$in. in diameter and glued on, while the trade mark "Invicta", showing the rampant horse trade sign is carried

Fig. 6) and glued in place. Round the front edge of the seat and three edges of the side pieces, K.

The large rollers and the back axle are next made. First cut a piece of $\frac{1}{4}$in. round rod for the axle $4\frac{3}{8}$ins. long and round off each end with file and glasspaper. Fig. 7 shows how the rollers are constructed from two $\frac{1}{2}$in. discs of wood glued together and with stout card glued round. The radius for the wheels is $1\frac{5}{8}$ins.

The card will be cut in two strips, each being $1\frac{1}{2}$ins. wide by about 11ins. long, to allow for trimming off to a butt joint.

On the outside of the rollers a $\frac{1}{8}$in. disc is glued, while on that side nearest the body of the machine, a $\frac{1}{4}$in. disc or washer is added. Both

method of construction may be adopted. Four $2\frac{3}{8}$ins. diameter $\frac{1}{2}$in. thick discs are cut and glued and clamped together and a strip of card, measuring 8ins. long and $2\frac{3}{8}$ins. wide, bent round and glued on firmly. As an alternative two, instead of four, discs are cut and these are held apart by two or more 2in. lengths of round rod glued firmly into holes drilled in the discs just as seen in the diagram, Fig. 8. The card will be bent round in the same way as the previous method.

The main support for the front roller is made from $\frac{3}{4}$in. wood, cut to the shape in Fig. 9. Drill a $\frac{1}{8}$in. diameter hole through the thick upper part to take the screw which will pivot the support to the front end of

(*Continued foot of page* 91)

How to add lighting and heating circuits to make an ELECTRIFIED DOLL'S HOUSE

EVERY building that has any pretensions of being up-to-date must necessarily be "all-electric". The Doll's House, for instance, made from our Design No. 237 Special and illustrated in Fig. 1, must be no exception to modern practice. It will greatly add to the interest and realism of this model if it is fitted up in the modern manner with electric lighting and heating.

A number of realistic tiny fittings are now obtainable, as well as plastic furnishings, and the electric fittings can be made use of in the following instructions.

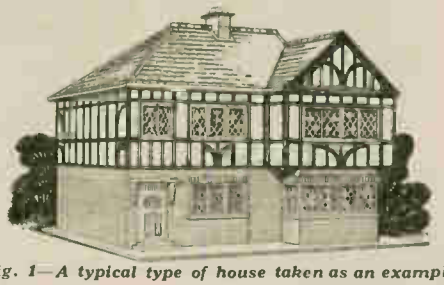


Fig. 1—A typical type of house taken as an example

Safety First

The first essential, of course, in planning the electrical equipment of the Doll's House is to ensure complete safety, both from fire or from accidental shock. For this reason it is obviously safer to take the supply from a low-voltage battery and not from any household electric service. Practically all miniature electric fittings are made with tiny low-voltage lamps which cannot be used on high voltages.

Using Batteries

The dry battery is much to be preferred to the accumulator. It has no acids or liquids to spill, nor is there so much danger of spoiling it by accidental short-circuiting the terminals. For the purpose, therefore, the most convenient economical and safe way of providing current will be to obtain two large square dry cells. Allowing for special occasions when all the lights will be on in each room of the doll's house at one time, this battery will be large enough to last for several months, if the lights are not on too long.

Accommodation for the two batteries may be provided by an additional lean-to shed or a garage at the back or side of the doll's house. Or they may be located in the roof.

The two dry cells connected up in series will give current at approximately 3 volts, which besides being suitable for these miniature lamps, is an absolutely safe voltage to handle.

General Wiring Scheme

Before describing the method of wiring in detail, a simple diagram as Fig. 2 of the arrangement will help to make matters quite clear. Here, one fitting only is shown, merely to illustrate the principle in connecting it to the electric circuit, without reference to any actual position it may take up in the house.

The two dry batteries, A, are shown connected in series. That is, the positive terminal of one is joined to the negative terminal of the other. The two free battery terminals are then connected to two bars, C,C, which run along the back wall outside each room. They can thus be made use of at any point convenient for connecting on individual fittings such as lamps and fires.

In any of these branch circuits a separate switch, D, can be included, if desired, so each appliance can be cut off or on without affecting the rest.

Or for the sake of simplicity the switches at D can be omitted, and one only fixed at B between one of the "bars" and the battery. Operating this switch will then turn all the lights in the house on or off simultaneously.

The Bars

The best arrangement for the bars will be as in Figs. 3 and 4. These show the back view of the doll's house with its six rooms indicated by the dotted lines, and the holes made for the passage of the flex into each compartment.

Across the middle of each room two brass strips or stout wire are fixed on the back of the house, strips ⅜in. wide by 24 gauge would suit very well. These strips will be screwed to the back wall as shown in Fig. 4. Small washers are placed under the fixing points to keep the bars just clear of the back and allow room for the spring clips used for connecting on the branch circuits. The method is illustrated in Fig. 5. At the extreme end of the bars nearest the battery two terminals, A and B, are fixed to lead in current from the battery.

Constant Light

Notice particularly that by feeding current to the starting end of one bar and the finishing end of the other the length in circuit is approximately the same, at whatever point current is lead off to a branch.

This avoids any excessive variation in the brilliancy of the lamps due to unequal "volt-drop". Otherwise, those nearest the battery would

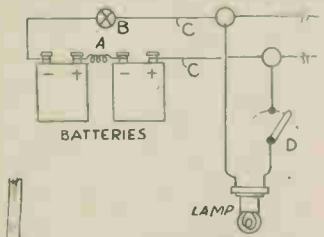


Fig. 2—(above) Simple wiring diagram

Fig. 4—(left) Section of back wall

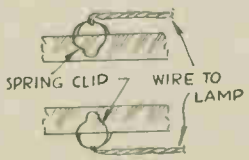


Fig. 5—Clip contacts to strips

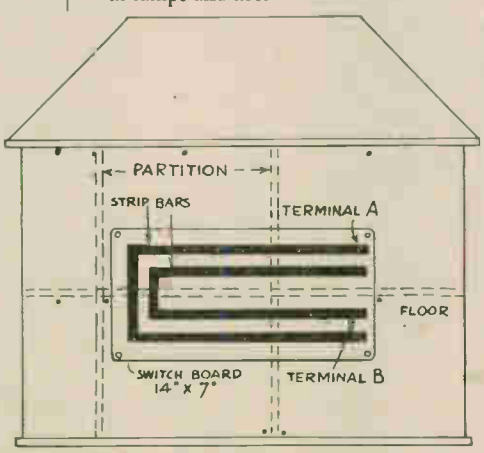


Fig. 3—Bar strip positions on back of house

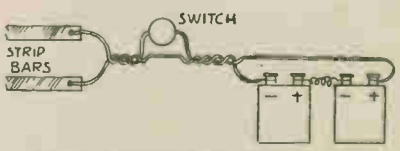


Fig. 6—Inserting a separate switch

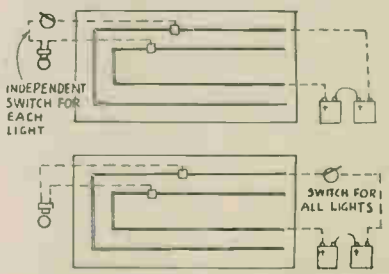


Fig. 7—Distribution of lights suggested

glow more brightly than those farthest off.

Battery to Bars

For connecting the batteries to the bars and to one another a length of 5-amp. twin-flex such as used with ordinary household appliances is convenient. It can be tucked away out of sight in the "shed", or wherever the battery position decided upon may be. The required length can be measured when the latter point has been settled, leaving an extra 6ins. or so for emergencies.

If the battery position is outside the building the ends of the twin flex can be attached direct to the terminals A and B, Fig. 3. If they are inside the building, a hole large enough to pass the flex will have to be bored through the back of the building to enable the ends to be attached to the bar terminals.

Main Switch

The same position will also do for fixing a main switch (in Fig. 3) to control all the lights together from one point. To bring this switch into the circuit, divide one of the wires of the twin flex as in Fig. 6, and after baring the insulation for about ¾in., twist the bare-stranded wires together tightly where they pass into the terminal posts.

To prevent the unsightly appearance of the braided covering fraying back, slip a short length of rubber cycle valve tubing over the ends.

The Branch Circuits

When all the lights and fittings are intended to be controlled from one switch (as in Fig. 6), the branch circuits to the various items in the rooms are very simply made. Nearly all the miniature electric light fittings on the market are made with their own connections, the wires terminating in a small spring wire clip, similar to those used as paper fasteners.

The Wiring

After fixing the lamp, etc., therefore, in its required position, it is only necessary to carry the wire connection along the nearest convenient angle in the room. Pass the connections out to the bars at the back of the room through a hole drilled in a suitable position. The two spring terminal clips are then pushed over their respective bars (shown in Fig. 5).

To avoid drilling large holes, the clips can be removed temporarily by untwisting the wires, replacing them after the wires have been passed through to the back.

When each of the branch circuits has to be controlled by its own switch the circuit can be treated exactly as in Fig. 6, the switch being inserted in one only of the twin connecting wires, which is divided for that purpose.

Grouping

In most cases readers will prefer to use their own judgment regarding the arrangement and grouping of the various kinds of fittings in each room. The following, however, might be found useful for the doll's house under review. Entrance Hall: one ceiling light with coloured globe a little out of centre in the ceiling to allow of staircase if the latter is included. Dining: one electric fire in place of open grate as desired and one ceiling lamp and shade. Drawing Room: one electric fire, one portable standard lamp. Kitchen: one centre ceiling lamp and shade, that is, if a Kitchen is taking the place of either of the above rooms. Bedrooms: one centre ceiling pendant with shade. Bathroom: one centre ceiling light and shade. The two diagrams in Fig. 7 show the distribution of lights, etc., under the two methods described in the earlier part of this article. The reader may remember that the Doll's House described was No. 237 Special, and patterns for it are obtainable for 10d. post free.

From the Editor's Notebook—

WHAT friendly and helpful people my readers are, to be sure! Some time ago C. Hardy of Whangarei, New Zealand, asked me to get him a Coronation Coach design which was published years ago and is now out of print. I mentioned his need in a Note, and now he tells me quite a number of readers wrote him with an offer of one. One reader sent half a plan of the Lord Mayor's Coach, which showed a good spirit but was not altogether helpful! Anyhow Mr. Hardy was very grateful and says that "quite a number of enthusiasts scattered all over New Zealand will be oiling their machines as soon as plans and materials become available"!

* * *

DO you realize what an amazing variety of models it is possible to make from our designs and the articles in these pages? I was struck by this thought in reading a letter from Mr. A. Smallbone of 11 Rossetti Gardens, Flood Street, Chelsea, S.W.3 recently. He has been a user of the fretsaw for many years, and expresses his gratitude of the help of these pages with suitable appreciation. He made the old-time Locomotive, the "Human Torpedo" (1944), the Roman Catapult, and various ships. What an interest such a range brings in the construction of each. The same reader suggests a model of an early type steamship which brought in the era of steam in the Atlantic crossings. No doubt he, and other readers, will be glad to know I have a design for one in hand for early publication. By the way, Mr. Smallbone is willing to pay a good price for a copy of the design of the Sydney Bridge Model (No. 1900) which we published about ten years ago and is now out of print. Perhaps some reader can oblige.

* * *

MOST readers, who are handymen about the home, will be interested in a new type of wall plug, useful on all those occasions when screws are required to hold fast in brick, plaster, compositions, etc., or even in rubber, concrete and glass. The Hewitt Wall Plug has a fluted side, and is compressible, so it can be inserted into a closely fitting hole. The fact that the plugs can be cleanly cut by a reasonably sharp knife, and that screws can be replaced at any time without in any way impairing the holding power of the plugs, will prove a great saving of time and trouble to the amateur domestic handyman. They are obtainable from ironmongers or usual stores or you can read particulars in our advertisement pages from to time time.

* * *

AN offer is made by C. F. Parsons, 50 High Street, Warwick, to present a copy of the pre-war design of Big Ben, No. 209 Special to a reader. Should several write to him, of course, he can only choose one, and readers should write direct to the address given.

* * *

MOST pastime subjects have been dealt with in books, and you can learn a lot in this way without having to do it the hard way of experience. My library shelves cover most of the needs of anyone with a hobby, and I can usually recommend you to some books of interest if you care to enquire. The books themselves can generally be obtained on loan from the local council, municipal or county library or of course you can buy them from booksellers in the usual way.

The Editor

Hints by which you can ensure getting GOOD RADIO RESULTS

THE radio constructor or listener can attend to a number of items which should not be overlooked if best results are to be obtained. He should not be satisfied with distorted or mediocre reception, but search for the fault and remedy it. This further article on radio generally will be as helpful as the others to the amateur radio fan.

Aerials

With a small receiver the efficiency of the aerial can make a vast difference. With powerful receivers the effect is less noticeable, though even with these a good aerial will improve reception of distant stations.

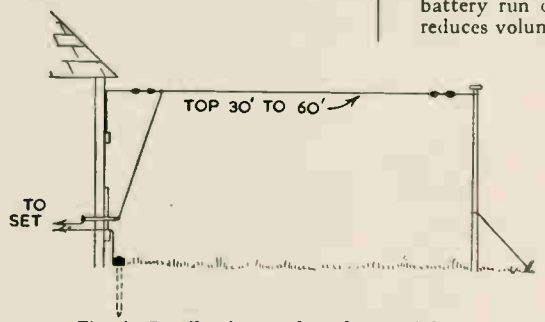


Fig. 1—Details of a good outdoor aerial

A sound outside aerial is illustrated in Fig. 1. The down-lead should be 1ft. or more from the walls, and the top portion should be as high as possible. Actually it is the height above earthed objects which is most important, so it is best not to have the wire over buildings. With a crystal set try to get up at least 50 ft. of wire to assure maximum volume. The lead-in should be of well-insulated wire, or a tube can be used. Two or three insulators should be added at each end of the top portion.

Indoor aerials *can* give good results, even with crystal sets. It is usually best to take the wire round two sides only of the room, and down the corner to the receiver. The thin, inconspicuous, plastic-covered wire is very suitable.

Earths

Connecting a good earth to a small set can change a signal from a whisper to ample volume. Contact to the ground itself is necessary. Sometimes rising water-pipes can be used; if not, a metal earth tube or spike should be driven at a spot where the soil does not become too dry.

Battery Tappings

Fig. 2 will help to show how the different voltages influence results. High Tension Plus always goes in the maximum voltage socket. If a Screen Grid plug is provided, its position must be found by trial. As the voltage applied is increased, efficiency increases to a certain point, then begins to fall off again. The best voltage is generally between 50 and 90.

The voltage applied to the Detector governs the ease with which the valve oscillates. Too low a voltage will give weak results; too high a voltage violent reaction which does not build up the signal fully. So this plug should be tried in various sockets on the battery, and results noted.

Of all voltages, Grid Bias is most critical. Low bias makes the H.T. battery run down quickly; high bias reduces volume and causes distortion.

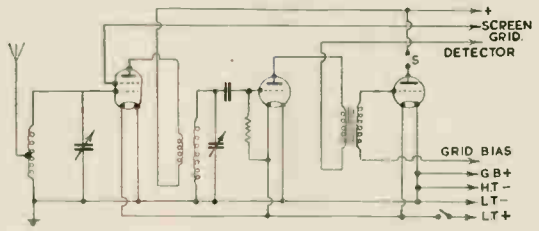


Fig. 2—Diagram of the voltages applied

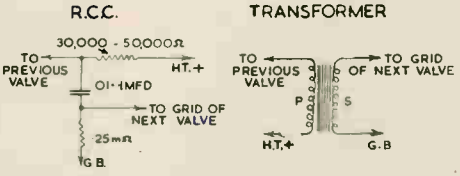


Fig. 3—Particulars of changing coupling

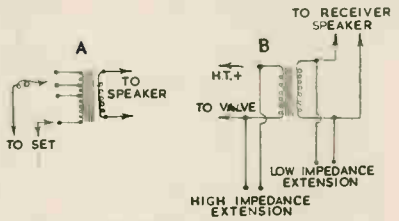


Fig. 4—Circuit for output matching

As the bias depends on the valve (or valves), adjust the plug (or plugs) 1·5 volts at a time, until best results are obtained. Always apply as much bias as the valve will take without reception being spoiled.

Intervalve Couplings

Because Resistance Capacity Coupling is much cheaper, it is quite often used where transformer coupling would give much louder results. Fig. 3 shows the difference, and the connections. In a small 2 or 3-valver, a transformer should always be used if maximum volume is wanted.

Normally it should have a step-up ratio of between 1 : 3 and 1 : 5. (The R.C. Coupling cannot step-up signals, of course.) In Fig. 3, "P" indicates the Primary, and "S" the Secondary. Sometimes it is worth while trying the effect of reversing the connections to the Secondary.

As the primary has far less resistance than the 30,000 to 50,000 ohm resistor, more voltage reaches the previous valve, which is often an added advantage.

Output Matching

For maximum volume to be realised, the impedance of the speaker should match that of the valve driving it. Many speaker transformers have several tappings on the primary, as shown at "A", Fig. 4. By trying combinations of these the best tapping can be found. The correct tapping is that giving maximum volume and best quality.

Sometimes confusion arises when connecting an extra or extension speaker. Two main impedances (impedance—alternating current resistance) are in general use. One is from 5 to 15 ohms, the other approximately one hundred times greater. Therefore if a low-impedance speaker is connected where a high-impedance one is required, or vice versa, results will be very poor indeed, signals being almost inaudible.

High - impedance extensions are always connected to the valve anode and H.T. Plus: that is, to the *primary* of the speaker transformer in the receiver. Low-impedance speakers must be connected to the *secondary* of this transformer, as shown in "B", Fig. 4. Moving-coil speakers without transformer should be connected in this way.

All high-resistance earphones of 500 to 2,000 ohms may be connected directly to the anode of the output valve, though they should not, of course, be used with valves giving a very powerful output. However, large supplies of ex-service low-resistance phones are on the market, and these should be treated as moving-coil speakers as regards matching with a transformer.

Notes about the track in the construction of MODEL RAILWAYS

THERE are, of course, many different types of model railway tracks at present on the market, ranging from the cheaper "tinplate" to true-scale permanent way. Each class has some special feature claimed for its use. Thus, tinplate track is evidently the best type to use if the layout is of a semi-permanent or portable nature. The better classes of track, which boast varying degrees of fidelity to the real thing are best to use if the railway is to be permanently housed in a loft or garden shed.

With tinplate track, there is the one disadvantage of not being able to lay it in any configuration desired, this being due to the fact that each individual piece is mathematically designed to fit with any other piece without any need for cutting or bending.

Altered Lay-outs

Admittedly, there are many different workable layouts possible with tinplate, but it will be found well-nigh impossible to reproduce any given prototype layout of a station or goods yard without either cutting or bending the rails.

If the track being used consists of a simple "oval" of tinplate, it is easily possible to arrange it to allow a train to be run in each direction at the same time by incorporating a loop line along one or other of the flat sides of the oval.

Or, alternatively, a loop may be added which also includes a short siding at one or both ends of the loop; and by this means a greater amount of instructive amusement may be obtained by working in a goods train from the siding, and allowing it to run "turn and turn about" with the main-line passenger train.

With Large Baseboard

As the more general "oval" of track is placed upon a baseboard which will only just accommodate it, it will frequently be found that such station buildings as are added will of necessity be placed within the oval of track; and in this position they do not look at all convincing. If at all possible, it is best to try and arrange for a baseboard about 6ins. larger in each direction than the size of the actual tracks.

At this juncture it will be well to settle once and for all the much-discussed question of the advisability of laying tinplate (or steel track, for that matter) out of doors.

Neither tinplate track, steel track nor "sheridized"-steel track is effective when laid out-of-doors except during the summer months; and then only when the weather is really kind. Rust, of a particularly pernicious character sets in very quickly, being aided in its destructive work by dew as well as rain; and the writer has conclusively proved that no amount of creosoting, painting or other dressing will effectively preserve the running surface through a normal English winter.

Outdoor Running

If outdoor running is desired, then brass scale track should be used, and even so, it should be mounted at least 1ft. above ground level to keep it free of worm-casts, fallen leaves and rain-splashed earth.

Reverting to the types of model track available, it should be remembered that, as there are still in existence (on the second-hand market, particularly) many different rail-sections, care should be taken to ensure that the rail purchased will line-up with that already possessed, so that rail-joints are truly in line and that any point-work is standardized.

In this matter it is well to bear in mind that if a layout is situated 2ft. or 3ft. above floor level, a derailment caused by shoddily-laid or badly-matched rails can well involve the user in a crash to the floor of many pounds-worth of rolling-stock.

For choice, brass track is to be desired; firstly, on account of the ease with which it can be worked up into points and crossings (which makes for a financial saving), and secondly, on account of the ease with which it can be kept clean; this latter feature being all-important if the railway is an electrically-driven one.

Steel Tracks

Steel track, on the other hand, is made of the same material as the "real thing", and naturally looks more realistic; but it is, however, much more difficult to keep clean, and far more obstinate of manipulation.

The zinc-coated "sheradized" steel rail is not, by any means permanently rustless. The coating will eventually wear off, and its useful life depends upon the amount of wear and the atmospheric conditions prevailing on the railway.

There is a great advantage to be gained by mounting the track upon battens of flat stripwood laid parallel with the rails beneath the sleepers. It lies in the fact that should any track alterations be desired to an existing layout, it is obviously more simple to take up the track which has been strengthened by battens, than if the latter were not present.

Even brass track gets covered with an impalpable layer of greasy dust, and to remove this it will be found best to make a swab of a piece of linen (not of any material from which hairs or strands will readily be withdrawn) soaked in petrol. Upon rubbing this along the track all the grime and most of the superficial tarnish will at once disappear, and the track be left in a sweet-running condition. Never use paraffin or methylated spirits for cleaning rails.

Rusty track can be quickly cleaned by thoroughly soaking it in ordinary "household" (cloudy) ammonia for about half-an-hour, rubbing them to dislodge any rusty particles, and finally washing them in hot water and allowing to dry.

About Ballast

Generally speaking, ballast is not to be advised on track unless it is completely free from dust and fine grit, and is fixed down to the base-board in some way. Free ballast has an annoying habit of getting thrown up into the gears of passing engines with very bad results to their mechanisms. However, there is a source of "ballast" which is available to all model railwaymen, and one which may be stuck down to the baseboard with weak glue or even paste. It is none other than stale bread, of which most households get a fair amount.

Size for "O" Gauge

If the old bread—with its crusts—is placed in the oven and thoroughly baked till it is as hard as the proverbial brick, it may be ground as fine as desired by rolling on a hard surface beneath a rolling-pin. The lumps should be about ⅛in. across for an "O" gauge railway, and all the useless dust should be thrown away. The lumps will be found to consist of a delightfully indiscriminate assortment of earthy-coloured particles which will represent ballast to an ideal degree. This material should be stuck down to the track and base-board, afterwards being treated to a thin coat of size or weak glue to still further hold it in place.

Preservation

A good tip for preserving the running surface of steel track used out-of-doors is that of rubbing a block of household black-lead along the rail-heads. As this substance is classed among the conductors of electricity, and the film between the wheels of the engine and the track is so thin, it may be used on lines operated electrically; thereby materially improving the contact between the locomotive and the track.

(To be continued)

This handy ironing article for the housewife is

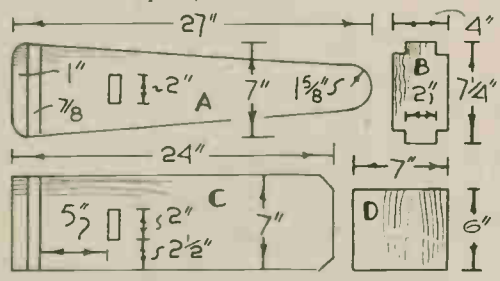
A SLEEVE BOARD

AN ironing board is ideal for most purposes, but where the sleeves of certain garments are concerned, a special board is needed, and a typical item is illustrated herewith. It will be seen that very few parts are required. Almost any sort of ⅞in. thick wood can be used. White deal or red cedar is undoubtedly more readily obtainable.

The Arm Wood

You need a piece for the arm 27ins. by 7ins. This must be shaped as shown, then mortised and checked ¼in. deep. This also applies to the base piece. The mortises, of course, are 2ins. by ⅞in., the checking being ⅞in. wide by ¼in. deep.

With a tri-square, mark off the guide lines, then the depth of the groove. The guide lines should be cut across with a chisel or penknife, then a corner removed as a guide for the teeth of a tenon saw. Make the cuts ¼in. deep, then proceed to remove the waste wood with ¾in. chisel, or a router, the cutter of which should be set to ¼in.



The shaped wooden parts required

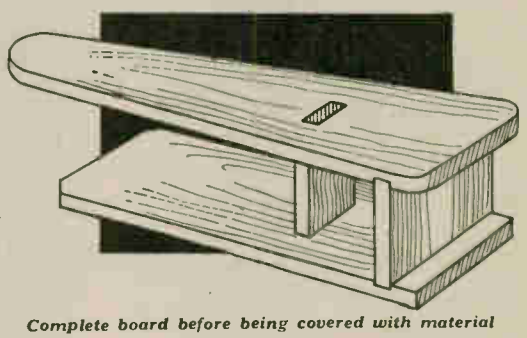
Having prepared parts A and C, make the supports, B and D. Note the direction of the grain. B should be a neat, tight fit in the mortises of A and C. Try the parts temporarily together. If fitting truly, assemble with glue and screws, using 1½in. by 8 flathead iron screws.

The heads should be countersunk slightly below the surface of the wood. Have about three screws, driven into D, with a single screw at each side of the tenons of B.

With medium glasspaper wrapped in a cork block, remove the sharp edges from the wood. The arm now needs to be padded. Like the board on ironing tables, the arm is first covered with flannel or blanket to act as a cushion.

To get the shape, turn the arm up on the material and cut around it to leave a 1in. margin all round. Turn the work upright again and tack the material to the arm. The blanket or flannel needs to be covered with linen.

The treatment for the padding material is similar as the covering material. The edges are set off with strapping and studs, or brass-headed nails. There is no need to stain or paint the board. In its natural state the wood is sure to get dirty so perhaps it is as well to darken down the base portion at least. Use a good hard paint.



Complete board before being covered with material

Material Cover

To save using strapping, you should allow 2ins. of a margin all round, then put a fold in the material (a 1in. hem) so the cut edge is at the inside. The fold should be level with the edge of the arm, at the underside.

There must be no wrinkles in the flannel and linen coverings. It is a good plan to tack down the ends first, then do one side. When tacking the remaining side, put some stretch into the material to take up any slackness. Some women prefer two coverings of linen, especially if it is woven very openly. Flour bags provide suitable material for the purpose, or old pillow cases, bed sheets, etc.

Road Roller—(*Continued from page* 86)

the machine. Then connect up the two extremities of the support with a simple framework of ⅜in. by 3/16in. wood (see Fig. 10), with small glued angle blocks inserted as shown to hold the frame firmly together.

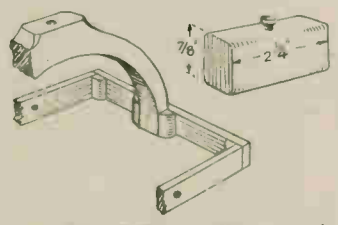


Fig. 10—Front roller support

Drill holes in the side rails of the frame to take a length of ⅛in. round rod which runs through from side to side and through the holes in the roller. While putting the roller on the rod add two ⅜in. diameter washers as spacing washers to go between the frame and the end disc of the roller.

Included in Fig. 10 is a diagram of a simple box which is to go on the left side of the model (Fig. 1). It is made from two pieces of ⅜in. stuff glued together and afterwards shaped and fitted with a little wood capping.

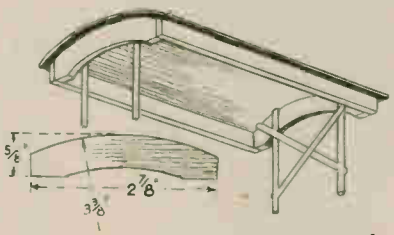


Fig. 11—Canopy and support rods

Details of awning are given in Fig. 11. Two side rails ⅜in. by 3/16in. in section and 6¾ins. long are fixed to two shaped ends (see Fig. 11). Over this is carried a sheet of stout card 3½ins. wide by 6¾ins. long. Add some small glued blocking pieces on the underside to strengthen before fixing it to the machine. A suggestion is given for making the trellis supports for the awning. A cross piece is first made up as shown in the front view, Fig. 1, from ⅛in. or 3/16in. strips, and these are directly fixed to the inside of the end section of the awning. Then the four uprights are carried down to glue on the inside of the sides at the back and down to the shaped engine cover at the front. Holes can be made to receive the ends of the uprights glued in. Levers and brake wheel can be added as desired.

Suitable Colouring

The whole model would look well finished in green and yellow enamel with certain details picked out in black. The panelling on the sides should be in line on the green backing, an edging of red giving a touch of the brilliancy here needed. The underpart and top of the awning should be light grey with the treads of the rollers also in this colour. Careful painting must be done for good results.

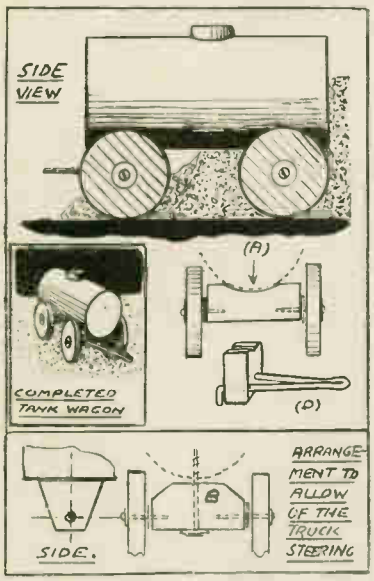
How odds and ends can be used in making
TWO TOY TRUCKS

TO be a first-class job, toys should be realistic, that is resemble as close as possible miniatures of the article portrayed. It is a great mistake, however, to fall into the error of thinking that to be realistic a toy must have a lot of elaborate work put into it.

Toys, too, should be fairly easily put together, and in the articles described here the two characteristics of realism and simplicity are well to the fore.

Timber Truck

First, let us consider the timber carriage. All kiddies love something on wheels. Why this should be it is hard to say, but engines, motors, trucks, carts, etc., etc., go straight to the heart of a youngster. You can be quite sure, therefore, that the timber carriage would form a very acceptable present. Moreover it is remarkably



easy to put together, and also it resembles what it is supposed to be—a timber wagon loaded with logs.

The wheels can be bought or cut from an old round pole, say a length of discarded curtain rod. Cut the discs carefully with a fairly fine saw, being generous in the first case with regard to width, the desired thickness being later secured by rubbing flat on a piece of suitable glasspaper.

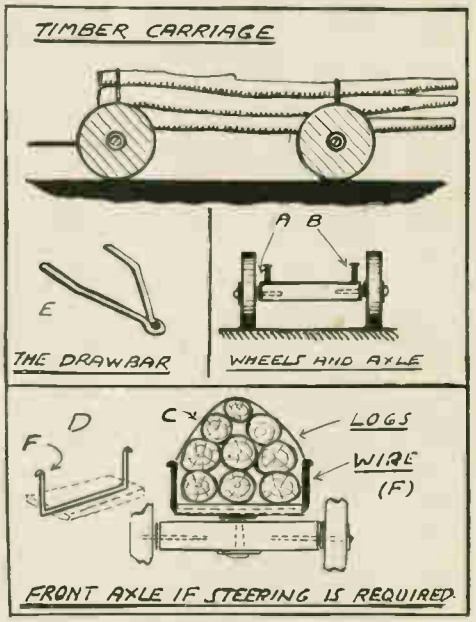
Each pair of wheels is attached to an axle as shown in Fig. 1 (bottom right hand sketch). The discs are held in position by long thin screws, a washer (A) being introduced at both sides to assist easy running.

Further screws (B) are inserted vertically in the ends of the axle (which should not be too thin) to help hold the "logs" in position. In the front axle bore two horizontal holes and then shape the simple "drawbar' (E) from any stiff piece of wire, push this through the holes and then bend the ends down.

A "drawbar" is fitted to make the model quite modern (shafts have gone years ago) and it acts both for realistic coupling to some already existing tractor or the attaching of a pull-string if desired.

All that remains now is to connect the two axles by means of the logs—which form the body in themselves. The "logs" are several carefully chosen "sticks" cut from a tree. They should be fairly straight, about the same length and should give to the finished wagon the proportions shown in the sketch.

The sticks are held together to the axles by a strand of wire as indicated, this being tightened up with a pair of pliers. There is no need to paint this toy, but if it is desired the wheels and axles could be red, the drawbar, screwheads, etc., being black.



Oil Tanker

The oil tank trailer follows the same lines as the timber carriage. Here, however, the axles are deeper and are curved out on top to take the tank, which is a further section cut from curtain rod. The wheels are again discs (sliced from the same length if desired).

A drawbar is also fitted, made of wire. In this case an extra item is the filling cap on top, this being a section of circular wood shaped to go on top of the tank, and held by a screw. Tank and axles are held together by longish screws from below. This model requires paint, the tank being red with the wheels a contrasting colour.

As just described, neither of the trucks will steer and for a very quick-made model this characteristic is really not advisable. But if steering is desired it can be effected by making a rather different front axle in both cases.

Taking the timber carriage first, the logs instead of being put straight on to the axle are mounted on the length of wood (D) (bottom sketch, Fig. 1). Under this, and recessed into it on the lower side goes the length of wire (F). This need not be fastened, for when the binding wire (G) is put over the top of the sticks and secured to the ends of (F), all is tight.

The actual axle taking the wheels comes below. It is just as in the case of the non-steering vehicle but should be quite wide from back to front as also should be the wood (D), this keeping things firm when the drawbar is pulled. Pivoting is best with a small bolt bought from any ironmongers.

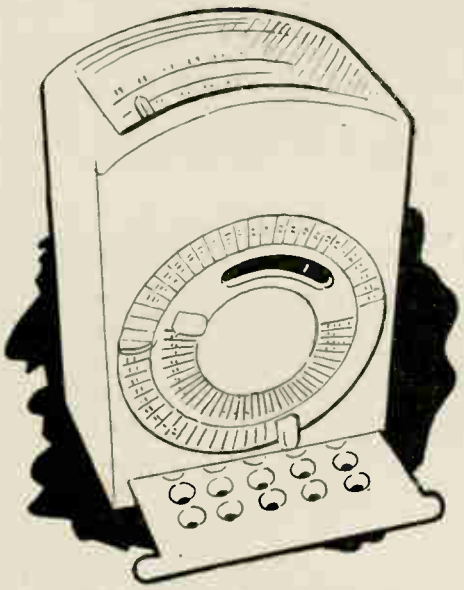
It is possible to maintain a level position for the logs if the back axle is made a little deeper (or packed up a shade if already made), but this does not detract from the appearance of the finished model. With the front axle so arranged the timber carriage will follow nicely any 'pull string' or toy tractor.

The tank truck is made to steer by simply altering the shape of the front axle as shown in the lower sketch (Fig. 2). To prevent the axle pulling over when a drag is put on the bar, make the top surface of the new piece of wood fairly wide as shown in the side view, so as to give a good bearing area on the bottom of the tank. The pivot in this case has to be a long screw prepared by removing the thread from the length (B) which lies inside the axle. Well smoothed with a file the wood will rotate quite easily on the metal.

Often the most realistic impressions can be secured with the simplest of materials and the most elementary of designs. In the main, realism is a matter of broadly correct proportions and outlines rather than fine detail.

For less than 20/- photographers can make for themselves

AN EXPOSURE METER



General view with light shutter open

ONE of the most useful accessories that any photographer—either amateur or professional—can have is a reliable exposure meter, particularly in these days when films are in short supply, and it is necessary to use them to the best advantage with the minimum of poor exposures.

Unfortunately, exposure meters are rather costly, and even good second-hand ones are hard to come by at a price which does not strain the pocket. So it is of interest to describe the construction of one which can be made at an all-in cost of under one pound.

This is made possible by purchasing an ex-Government surplus meter movement which is available from Messrs. Surpluses, as advertised in this issue, and a 22mm. by 40mm. light cell, also obtainable there. The other items required can be found in any workshop or junk room.

It may be mentioned that the exposure meter described here has given the author every satisfaction, and is in every way equal to commercial models.

The Case

This can be made from various materials, but one of the most satisfactory and attractive is sheet Perspex which can be obtained in several colours. A few odd offcuts which can be obtained for a few pence will suffice. The best thickness to use is $\frac{1}{8}$in.

The case is in two compartments, for meter and light cell assembly, with a light shutter sliding in front of the light cell to effect change from high to low light range. The accompanying photographs and sketch should make construction plain. The top Perspex window (clear Perspex) is bent to shape by heating in hot water, when it becomes slightly plastic. The various parts of the case and the shelf can be stuck by using the special cement which makes a very strong job.

The light shutter, which is mounted in the light-cell compartment and slides in and out, has fifteen by 1/16in. holes drilled in it. These holes are countersunk to approximately half the depth of the material by a 3/16in. drill. A projection stuck on the back of the shutter prevents it being removed when in the open position. For use in bright light this shutter is closed, and for dull light it is open.

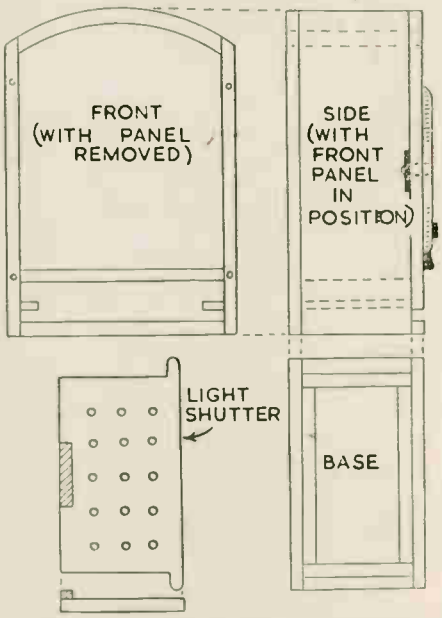
Mounting the Meter and Light Cell

The Perspex shelf or division separates the meter and light cell compartments. Two 4 B.A. screws secures the meter to this shelf. The Perspex can be very easily drilled and tapped to take these screws, or the meter can even be stuck in position if taps are not to hand. Care must be taken to mount the meter so that its scale appears centrally in the Perspex window. Details of a meter scale are given later.

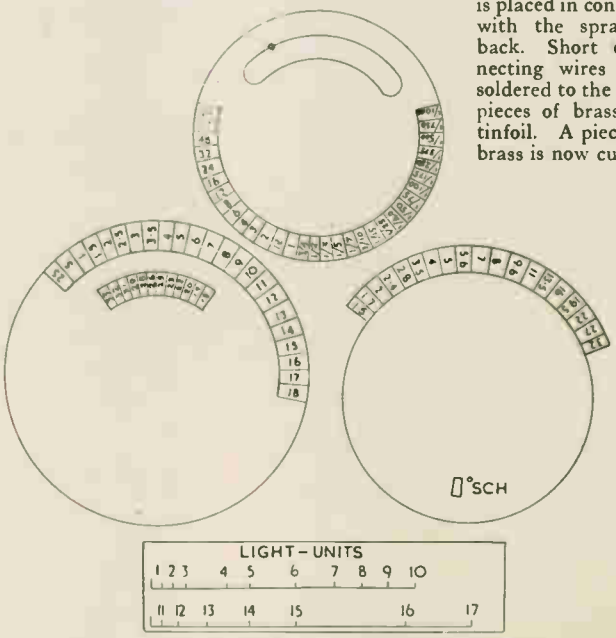
The two connections from the photo electric light cell must be made to the sprayed metal back, and the sprayed metal edge on the face of the cell.

To ensure good contacts a frame of thin sheet brass or tinfoil approximately $\frac{1}{8}$in. wide is cut to the size of the cell. This is placed on the face of the cell and makes contact with the sprayed metal edge on the cell face.

Another piece of brass sheet or tinfoil slightly smaller than the cell, is placed in contact with the sprayed back. Short connecting wires are soldered to the two pieces of brass or tinfoil. A piece of brass is now cut to



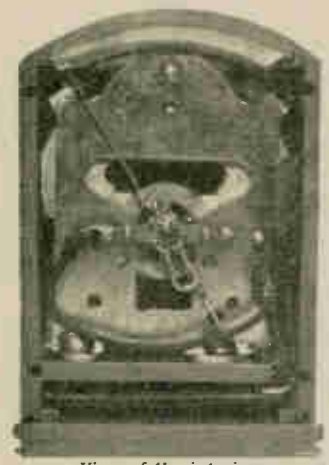
Front, top and side section of case, with plan of light shutter



The markings on the dials—use a magnifying glass to read

the size of the cell, and two pieces of springy metal is obtained approximately ½in. by ¼in. (i.e., two pieces of clock spring).

The whole assembly is now placed in the light cell compartment in the form of a "sandwich" arranged in the following order from the front of the compartment to the back (see diagram and photographs).



View of the interior

The springs should be so adjusted that they hold the whole assembly firmly in position. It should be noted that it is necessary to use a 22mm. by 40mm. light cell, otherwise the calibrated scale described in this article will not be suitable. Other sizes and types of light cells may be used of course if the reader calibrates his own scales.

Connections to Meter

The connections from the two brass or tinfoil contacts are taken through a small hole in the dividing shelf or partition, and soldered to the meter contacts.

A copy of the meter scale is printed here full size and can be cut out and used direct on the meter by readers.

Conversion Dials

These consist of one fixed and two movable scales mounted concentrically. The centre movable scale is marked in times from 1/1000 seconds to 96 seconds. The second movable scale is marked in lens apertures from f2 to f32 in 19 steps. The fixed scale is in "light units" and corresponds to the meter scales. There is also a secondary fixed scale to make allowance for differing film speeds.

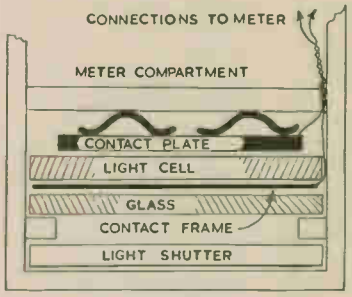
These dials could be constructed from a variety of materials depending upon the facilities available. Discs can be cut out from 1/16in. Perspex, and the figures, etc., scratched on with a scriber, paint being then rubbed in to make the markings prominent. It would be possible to stick the reproductions of the dials in this article on to thin metal discs, and varnish them over to ensure permanency.

Hints on Use

(1) Always point meter slightly downwards.
(2) Note meter reading. If light shutter is closed, read from HIGH scale. If open read from LOW scale.
(3) Turn dial No. 2 to film speed.
(4) Turn indicating spot on dial No. 1 to Light Unit No. as read on meter scale.
(5) Speed and aperture can now be read off scales on dials Nos. 1 and 2.

Adjustment and Use

Before use, the meter should be adjusted to zero by the controlling springs. It is advisable to disconnect the light cell when doing this. Once adjusted it is unlikely to require further attention.



Section of light cell compartment

If the meter scales have been copied carefully, it will be found that the meter is quite accurate enough for normal use. If another meter is available it could be checked for calibration and any changes made by altering the position of the indicating spots on the movable dial.

When Preparing Solutions

WHEN mixing chemical solutions the powder ought not to be dropped into the water in one mass, as it would then probably clog together and take considerably longer to dissolve. Nor should the water be poured on to the chemical. The correct way is to bring the water to a gentle swirl with the stirring rod and sift the powder in gradually.

Where quantities are given in ounces it is useful to remember that 20 oz. of water is equivalent to 1 pint. A good idea is to keep a glass jar specially for measuring and mixing the solutions, marked off with strips of paper to indicate its capacity at different levels—say, for 4, 5, 10, 15, and 20 ounces.

A percentage solution is prepared by taking so many parts of solid and making up to 100 parts with water. Thus, 100 oz. of water in which 10 oz. of chemical are dissolved would be a ten per cent solution.

* * *

Home Boot Repairing

BOOT and shoe repairing comes within the scope of the home craftsman and those who tackle the job find real pride in being able to turn out smartly mended footwear, at the same time keeping the family well shod at minimum cost. The main outlay will be five or six shillings for an iron Last.

It will be noted that the Last has three feet—one to fit the soles of larger boots and shoes, another for smaller footwear, and another rather different in shape for use when repairing heels. It is designed to stand in the required position without further support.

A quarter of a pound of boot nails will probably be sufficient for a start, the ½in. size for thick soles and smaller ones for the lighter shoes. Leather soles and heels may be bought already cut to shape and requiring only final trimming. It may come somewhat cheaper, however, to choose a piece of leather of about the right size and thickness and cut the pieces out as required. Bits left over often come in useful—say, for straightening up the heels.

Practice will make the amateur proficient, but it may be mentioned that many workers find it a good idea to make new leather more durable by soaking in water for a short time, then when nearly dry again hammer all over on the last, working outwards from the middle.

Having cut the sole roughly to shape, nail holes should be pricked fairly close all round, and when nailed in position there will be a little further trimming with a knife, followed by a rasp to smooth up the edges.

* * *

Tin

ALWAYS glad to know more about the materials craftsmen use, I was naturally interested in a short talk on tin. One fact which rather surprised me was that an ounce of this metal will roll out into more than five square feet of tinfoil.

For thousands of years, it seems, Britain was a pioneer in tin, the bulk of world supplies coming from Cornwall. Towards the end of last century, however, places like Malaya began to produce big quantities on a much cheaper scale, and took precedence as the world's largest source of supply.

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